THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology,
Chemistry, Pharmacology, Public Health, and News.

IN TWO VOLUMES ANNUALLY.

VOL. CCXVII.

VOL. II. FOR 1929.

ONE HUNDRED AND SEVENTH YEAR.

EDITED BY

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LONDON
ISHED BY THE PROPRIETORS, THE LANCET LIMITED, NO. 7, ADAM STREET, ADELPHI, W.C., IN THE
COUNTY OF LONDON, AND PRINTED BY HAZELL, WATSON & VINEY, LTD., 52, LONG ACRE, W.C.2.

MCMXXIX.

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REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings—such, for instance, as Brain and Cerebral, Heart and Cardiac, Liver and Hepatic, Child and Infant, Goitre and Thyroid, Diabetes, Glycosuria and Sugar, Eye, Ophthalmic, and Vision, Lunacy and Mental Disease, Arsenobenzol and Salvarsan, &c., &c., and that regional headings are more frequently used than pathological. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (A.) = Annotation, (C.) = Correspondence, (N.I.) = New Inventions, (L.A.) = Leading Article, (M.L.) = Medico-legal, (M.T.T.) = Modern Technique in Treatment, (O.) = Obituary, (P.I.) = Parliamentary Intelligence, (R.) = Review, (R. and A.R.) = Reports and Analytical Records, (A.D.) = Clinical Interpretation of Aids to Diagnosis, and (N.P.) = New Preparations.

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PUBLISHED BY THE PROPRIETORS, THE LANCET LIMITED, No. 7, Adam Street, Adelphi, W.C., in the County of London, and printed by HAZELL, WATSON & VINEY, LTD., 52, Long Acre, W.C. 2.

Lectures

ON THE

PHYSIOLOGY OF GLYCOGEN

AND THE

RÔLE OF INSULIN AND EPINEPHRINE IN CARBOHYDRATE METABOLISM.

Delivered at the London Hospital

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LECTURE I.

(Delivered on May 14th.)

THE behaviour of the blood-sugar curve following the ingestion of soluble carbohydrates indicates that absorption must start at once. Under ordinary conditions none of this seems to occur in the stomach itself, as far as can be judged by chemical analysis, either of solutions of sugar left for some time in the viscus after ligation at the pylorus or of the chyme as this is discharged into the duodenum. Absorption of sugar takes place mainly in the upper levels of the small intestine, and different types of experiment have been employed to study the process. The oldest of these consists in placing known amounts of sugar in solution in isolated loops of intestine (Thiry-Vella) and then removing and analysing the contents after varying periods of time. The chief objection to this method depends on the fact that only an isolated portion of the entire gut is employed, an objection which is overcome in the method recently introduced by Cori and Cori,[1] in which the entire gastro-intestinal tract of small animals, such as the white rat, is used. The animals, kept for some time previously on a standard diet, are starved either for 24 or 48 hours, after which 2 or 3 c.cm. of a strong solution of sugar is placed in the stomach through a small flexible catheter passed by way of the mouth. The rate of absorption is ascertained by subtracting, from the amount of sugar that was given, the amount found by analysis of the gastro-intestinal contents after killing the animals at varying periods. Cori and Cori state that, when sufficient is given, the amount of sugar absorbed is constant from hour to hour, at least up to four hours, and they define as the coefficient of absorption that number of grammes of sugar absorbed per 100 g. of body-weight per hour. This is characteristic for each sugar, but it varies according to the time the animal was starved *prior* to giving the sugar. *It is independent* of the strength of the sugar solution.

For the monosaccharides the coefficients are given as follows: After 48 hours' starvation *d*-galactose 0·106 g., *d*-glucose 0·178 g., *d*-fructose 0·077 g., *d*-mannose 0·034 g., *l*-xylose 0·028 g., and *l*-arabinose 0·016 g. After 24 hours' starvation the coefficient for glucose is 0·206 g. These figures show a high degree of selectivity, dependent not at all upon molecular weight but markedly so on the structure of the molecule. Thus, the pentoses are absorbed at about one-eighth the rate of the better-known hexoses, and the slight stereoisomeric difference between glucose and mannose makes a marked difference. These results stand out in sharp contrast with those obtained for the rate of absorption from the peritoneal cavity, as determined on mice by C. F. Cori and Goltz.[2] In this case the sugar was absorbed at a diminishing rate with time, indicating that the concentration affects the process, and different sugars were absorbed at equal rates. When injected intravenously, different sugars were also found, by analysis of the so-called free sugar of the tissues, to be absorbed very rapidly and at equal rates into the liver and into the muscles, although it took a shorter time for equilibrium between blood and liver to be attained than between blood and muscles dependent probably on differences in the richness in blood-supply.[3]

I have only instanced a few of the numerous results which these workers have placed on record, but they are sufficient to show that the intestinal mucosa is endowed with a very highly specialised selective action, which is absent in the case of certain other absorbing membranes. It seems remarkable that bacterial decomposition should not account for a measurable fraction of the sugar which disappears from the intestine during four hours and that the concentration of the solution should not affect the rate of absorption. Cori and Cori state that no significant amount of glucose disappears when a solution of it is placed in the excised gastro-intestinal *tract kept in isotonic saline solution at body temperature* for four hours. At my request Magee and Auchinachie have repeated this experiment and on one or two occasions have been able to recover all the glucose. On other occasions, however, there were considerable deficits which may have been due to bacterial destruction or to incomplete washing of the sugar out of the walls of the gut. Is it not possible also that bacterial action might occur in the intact intestine, in situ, but be retarded or absent in the excised one? Corroboration or otherwise of the accuracy of the coefficients of absorption as given by Cori and Cori for different sugars would be most important since their subsequent researches, in which they compare the amount of sugar absorbed, on the one hand, with the amount that can be accounted for by combustion and glycogen formation on the other, depends on it. One also wonders whether the higher coefficients of absorption observed for rats starved 24 hours, as compared with those starved 48 hours, may not have been due to greater bacterial destruction in the former case. It may be added that another of the Cori's conclusions—namely, that the rate of absorption is independent, within wide limits of the sugar concentration, has been called in question by Pierce, Osgood, and Polansky.[4] These workers found, on repeating Cori's experiments, that the rate of absorption was less between the second and third hours than between the first and second. In a reply to this criticism, however, Cori, Cori and Goltz[5] point out that Pierce, &c., did not feed enough sugar to let the absorption proceed for three hours.

Although there may be reasons to doubt the reputed extreme accuracy of the coefficients, it is nevertheless certain that the striking differences observed cannot be mainly attributed to differences in the extent of destruction of the sugars by the bacteria of the intestine. That the hexoses are more readily absorbed than the pentoses has been confirmed by Magee and myself[6] in experiments of a different type from those of the Cori's. In these, we measured the rates of diffusion of equimolecular solutions of various sugars through the walls of isolated loops of rabbit's intestine, kept alive by being suspended in oxygenated Tyrode's solution.

The different sugar solutions were placed in neighbouring loops of approximately equal weight and small portions of the outside solutions were pipetted off at intervals for determination of the reducing power by the Shaffer-Hartmann method. It was found in preliminary experiments that diffusion proceeds through pieces of gut which had previously been killed, either by heat or by the action of sodium fluoride, much more rapidly than through the living gut and that, in equimolecular concentration, pentoses diffuse more rapidly than hexoses, being dependent solely on the concentration of the sugar solution. Through living segments on the other hand, glucose diffused as quickly as pentose, or in some experiments more quickly.

It is undoubted, therefore, that the intestinal mucosa absorbs hexoses more rapidly than pentoses, and I cannot resist wondering whether the former undergo some change in the process. That the blood-sugar may consist of some form of glucose which differs in configuration from a mixture of the α- and β-glucoses, has been suggested by various authors, without any evidence being adduced to support the suggestion. It has, however, generally been assumed that this change, if it occurs, depends either on a preliminary conversion of glucose into glycogen or on the action of some hormone such as insulin, but is it not possible, as has been hinted at by various writers, that some change actually occurs in the glucose molecule while it is passing through the intestinal mucosa?

INTERPRETATION OF CHANGES IN THE BLOOD-SUGAR.

It is not my intention here to enter further into the various interesting questions regarding intestinal absorption which await investigation by these methods, but, confining ourselves to the sugars, it may be of interest if I refer to the significance of the results which we have just been considering in connexion with the behaviour of the blood-sugar following carbohydrate ingestion. When this is observed in man at short intervals, after moderately small amounts of sugar have been taken in the post-absorptive state, very constant results are obtained, and it is considered that any unusual heightening or lengthening of the curve, which is obtained by plotting percentages of blood-sugar against time, is indicative of a diabetic tendency. Useful though this method may be as a clinical test, it should always be borne in mind that numerous factors enter in to influence the behaviour of the curves, for not only does this depend on the rate of intestinal absorption of the sugar, which again is dependent on many factors, but also on the rate at which the tissues utilise the sugar that is absorbed. This disposal may be influenced in several ways, and there is accumulating evidence to show that these are largely controlled by the concentration of insulin in the blood.

How complicated the matter really is may be illustrated by comparison of the blood-sugar curves following ingestion of fructose and glucose. The former sugar has a very small influence as compared with that of the latter and this is used clinically as a test of the efficiency of the liver, on the assumption that the difference depends on a rapid polymerisation of the fructose to glycogen in this organ. If Cori and Cori's results on rats apply in the case of man—namely, that fructose is absorbed at only half the rate of glucose—then it is possible that this may in itself account for the smaller influence which fructose has on the curve. But the problem is really a complex one, since galactose was found by the Cori's to be absorbed even more rapidly than glucose, whereas this sugar, according to Folin and Berglund,[7] has little influence on the blood-sugar level.

When the intestinal factor is eliminated, by injecting intravenously at a slow continuous rate, the tolerance towards sugar may be determined by observing whether any is excreted in the urine. By this method Sansum, Woodyatt, and Wilder[8] showed, several years ago, that 0·85 g. of glucose could be tolerated per kg. body-weight and per hour, both in man and laboratory animals. In the white rat (under amytal anæsthesia) and in the mouse, however, Cori and Cori state that the tolerance is three times as great (2·5 g. per kg.), except during the summer months when there is a lowered tolerance (1·6 g. per kg.) and this was found to be related to the development of a certain degree of ketonuria.

THE GLYCOGEN OF THE LIVER.

Physiologists have become so familiar with the view that the glycogen of the liver represents a storage form of carbohydrate, that they have neglected to take notice of many well-established facts which indicate that it is also, in a sense, an internal secretion. As Cramer[9] has pointed out, this was the original conception of Claude Bernard, who believed glycogen to be produced out of protein, not denying, however, that it is capable also of being formed out of absorbed carbohydrate. And at the outset of a discussion of the significance to be attached to variations in the amount of glycogen which can be found in the organ after death, it is important to recognise that this is only a balance between processes of production and loss and may be no measure therefore of the rate at which these processes are proceeding during life; as Cramer puts it, "one should look upon the glycogen of the liver dynamically, and not, as has been done, statically as a mere store of excess of carbohydrate."

When food is withheld, the amount of glycogen in the liver rapidly becomes decreased and then increases again. In the white rat, for example, Barbour, Chaikoff, Macleod, and Orr[10] found the average percentage, in 24 hours after withdrawal of food, to be 0·16 per cent. (average of 48 rats), whereas after 48 hours it was 0·32 per cent., and these figures have, in general, been confirmed by Cori and Cori. Hershey and Orr[11] found that a steady increase occurs during later periods of starvation, although the values for individual rats were observed to be less constant than for those killed after 24 or 48 hours. The increase can be seen from the following results of an observation in which three rats were killed at each period.

	Per cent.
After 72 hours' starvation	0·21 and 0·21
" 96 " "	0·65, 0·23 and 0·34
" 120 " "	0·42, 0·23 and 0·92
" 144 " "	0·78, 0·78 and 0·78

These results confirm those previously obtained by Pflüger on the dog in showing that a new formation of glycogen, or gluconeogenesis, is occurring in the liver during starvation. Protein and fat are the only known sources for this glycogen, and there are many who believe that the former is alone available, but this question does not concern us here.

Although it has been recognised for some time that starvation alone does not cause all the liver glycogen to disappear, it is usually taught that this occurs when the fasting animal is made to perform muscular exercise. But Hershey and Orr have been unable to confirm this. Again using the white rat, these workers induced muscular exercise, either by causing the animals to work until exhausted on a treadmill, or by making them swim, with short intervals of rest, in cold water, every precaution being taken to see that the time elapsing between termination of the exercise and removal of the liver was as short as possible. The preliminary fasting period was 24 hours and, in order to rule out all chances of error, a litter mate, left fasting at rest, was used as a control in each observation. The following are typical results:

	Glycogen per cent.
After 2 hours' exercise the liver contained	0·16
And that of the control rat	0·16
After 3 hours' exercise the liver contained	0·16
And that of the control rat	0·20
After 6 hours' exercise the liver contained	0·14
And that of the control rat	0·14

The liver of a rat which ran on the treadmill for 23 hours still contained 0·20 per cent. glycogen.

In none of these experiments was it possible to induce any greater reduction in liver glycogen by muscular exercise than by fasting alone. Corresponding results were obtained in the rats which were made to swim in cold water. Thus, in two rats that were in the water off and on for a period of 90 minutes, following a fast of 24 hours, the percentages of glycogen were 0·17 and 0·18.

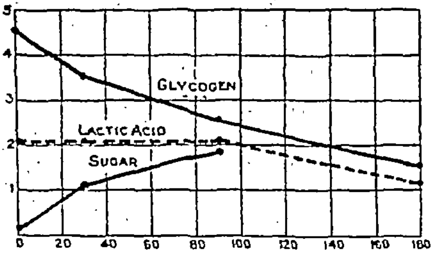
Before concluding that it is impossible to rid the liver of glycogen by starvation combined with muscular exercise, it was decided to repeat the observations by what is usually considered to be an infallible method for this purpose—namely, by inducing strychnine convulsions while the animal is under artificial respiration. In three rabbits, deprived of food for 48 hours and then injected with sufficient strychnine to induce convulsions for periods of 38, 44, and 57 minutes, the liver contained 0·09, 0·06, and 0·08 per cent. of glycogen respectively, and in other observations of a similar nature still larger amounts were found. These results show that the glycogen of the liver is of much greater metabolic significance than is implied in the notion that it represents a storage form of carbohydrate.

In pathological conditions, also, it is questionable whether all traces of glycogen ever disappear from the liver; at least we have always succeeded in demonstrating its presence in the liver of completely depancreatised and fasting animals several days after they had been rendered diabetic by removal of insulin. Bordering on the pathological are those conditions established after repeated injection for a week or so of thyroid extract. Cramer and Krause[9] found that the glycogen in the liver became so far reduced, even when carbohydrate food was given during the thyroid injections, that its amount could not be estimated by the Pflüger-Bertrand method, and this has been confirmed by Kuriyama[11] and by Burn and Marks,[12] but probably some traces were present. It is important that it is only after the thyroid hormone has been repeatedly injected for some time that the glycogen almost disappears. During earlier stages no change occurs in the actual amount of glycogen in the liver, although it appears to be more readily convertible into sugar, as judged from its behaviour after injecting insulin or epinephrine. Thus, it requires very large doses of insulin to lower the blood-sugar, but only very small ones of epinephrine to raise it. These results suggest that it is not alone the percentage of glycogen in the liver that determines the readiness with which this organ may discharge sugar into the blood, but also the sensitivity of the glycogenolytic mechanism.

Of course, it would be dangerous to affirm that the liver can never be entirely cleared of glycogen, but for the present we must regard this substance as an essential intermediary in liver metabolism.

Considerable attention has in the past been given to the disappearance of glycogen from the liver which occurs immediately after death—the so-called post-mortem glycogenolysis—but it is not my intention to enter into this subject further than to allude to an interesting difference between the process in the liver and that in the muscles. The actual amount of glycogen which disappears in a unit of time under similar conditions is very much alike in both cases, but the substances which are formed from it are different. As the glycogen disappears from the liver, free sugar increases and there is no increase in lactic acid (see Fig. 1), whereas in muscle there is no increase in free sugar but lactic acid ultimately accumulates almost in proportion to the glycogen which has disappeared (Macleod and Simpson[14]). (Compare with Fig. 3.) We will again have occasion to refer to the significance of these results.

FIG. 1.



Showing disappearance of glycogen from the liver with increase of free sugar and decrease of lactic acid. (Lactic acid in parts per 10,000; glycogen and sugar in parts per cent.)

Accumulation of Glycogen in the Liver.

Turning now to the conditions which cause glycogen to accumulate in the liver, we again find that the storage hypothesis is entirely inadequate. Perhaps the results which show this most convincingly are those obtained, first of all by Pollak[15] and later by Markowitz,[16] as a result of injecting epinephrine repeatedly into animals after the glycogen of the liver had been reduced to a minimum, through fasting and strychnine. Each injection of epinephrine was followed by hyperglycæmia, and after the injections had been repeated many times during several days, the liver was found to contain considerable amounts of glycogen. This is shown in Table I.

We shall see in the succeeding lecture that Cori and Cori have attempted to explain this result as dependent on a transfer, or shift, of glycogen from muscles to liver, but even if this were to account for the glycogen accumulation following one injection of the hormone, it certainly could not do so for that remaining after repeated injections during several days.

TABLE I.—*Glycogen in Rabbits after Repeated Injections of Epinephrine.*

No.	Days(a)	Glycogen (per cent.).			Remarks.
		Liver.	Heart.	Muscle.	
7	6	0·33	0·330	0·14	Prior to injection withheld for 5 days and strychnine injected.
28	6	0·16	0·234	0·13	Ditto (4 days).
8	5	0·98	0·14	0·19	Ditto (5 „).
22	9	1·05	0·100	0·20	Ditto (5 „).

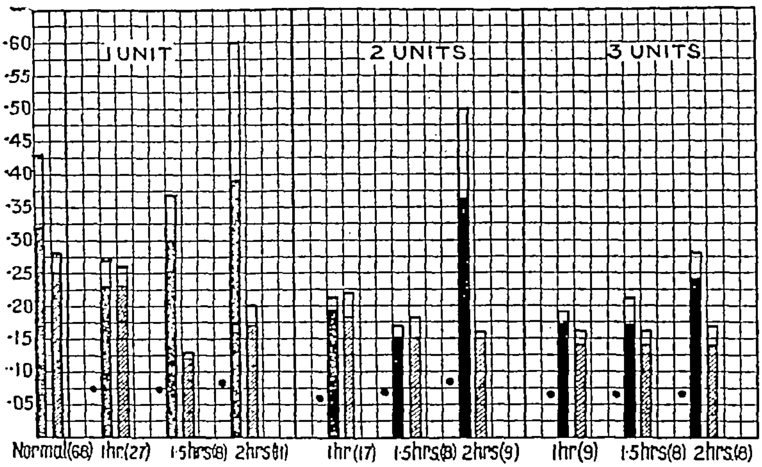
(a) Days on each of which from 3–6 c.cm. 1–1000 adrenalin injected in frequent doses.

But although epinephrine stimulates the internal secretion of glycogen in fasting animals it is generally regarded to do the opposite—namely, to hasten its breakdown when given to animals with large stores of glycogen in the liver. This latter belief is mainly based on experiments by Ritzmann, but Olmsted and Coulthard[17] found it very difficult in the spinal cat to obtain corroborative evidence. It was only when the preparation was allowed to stand for some hours after decapitation, so as to get rid of all anæsthetic from the blood, that they were able, by actual measurement of glycogen in small pieces of liver, to demonstrate that a decrease in percentage occurred as the blood-sugar rose. In view of these results, this hormone must be regarded as having a reversible action, causing glycogen to be deposited in the liver when none is there and to be broken down when abundance is already present. The other hormone which most definitely has an influence on carbohydrate metabolism—namely, insulin—exhibits similar reversible effects, although the procedures necessary to demonstrate them are different in detail. Thus, when insulin is given without food to fasting white rats it first of all causes the glycogen content of the liver to become reduced, but this is followed by an increase, provided a convulsive dose has not been given. This is shown in the accompanying chart (Fig. 2) and will be referred to again when we come to consider the action of insulin. Reversible effects of insulin are also seen by comparing its action on normal and diabetic animals. When it is given along with food to normal animals, glycogen is always deposited in the liver much more slowly than after food alone, as will be shown later, whereas there is an invariable and often a marked increase in liver glycogen when insulin is injected into diabetic animals, both when food is also given and when it is withheld.

Although the observations which we have just considered, as well as those of Cramer, show quite clearly that glycogen must be produced in the liver cells out of non-carbohydrate material, by some sort of secretory process, it must not be lost sight of that it can also be deposited in them by condensation of glucose, and other hexose monosaccharides, carried to the viscus by the blood. At least, this is the simplest way by which the gradual increase in glycogen percentage can be explained when food rich in carbohydrate is fed to a previously fasted animal. In our observations of this type on white rats it was noted that the increase in glycogen was usually less marked during the first hour or so after feeding than later, the maximum, of about 4 per cent. being reached in approximately four hours. This retarded onset in glycogen deposition may possibly depend upon an unpreparedness of the liver to condense the sugar;

it cannot be due to inadequacy of a supply of blood-sugar, since this begins to mount within a few minutes of feeding the rats and, in our experiments, had reached the peak in at least one hour after feeding, and probably much earlier.

FIG. 2.



Influence on glycogen, in white rats, of varying amounts of insulin injected after 48 hours' fasting. Ordinates, per cent. glycogen; abscissa, times of killing after injection; black columns, liver; cross-hatched columns, muscles. Numbers in brackets give number of animals averaged in each case, and the unshaded portion of each column, the percentile error. Black dots, blood-sugar percentage.

Many factors may come into play in the formation of glycogen in the liver and some of these, such as the presence of insulin and epinephrine, we will discuss more fully later. Others concern the chemical structure of the carbohydrate present in the circulating blood, but inasmuch as the observations have been mainly restricted to the liver of cold-blooded animals they do not concern us here. A decided increase in glycogen occurs in the liver in the spinal cat, especially during the first hour or so after decapitation. Olmsted and Coulthard,[17] who discovered this, could give no suggestion as to what the precursor of the glycogen might be, although the blood-sugar, meanwhile falling, was no doubt partly responsible. Recently Cori and Cori,[18] finding that *d*-lactic acid readily forms glycogen in the liver when given to rats, by feeding or injection, have attributed the result to *d*-lactic acid coming from the muscle glycogen. The only difficulty in this explanation is that the glycogen remains unchanged in the muscles of the spinal cat, according to Best, Hoet, and Marks.[19]

THE GLYCOGEN OF THE MUSCLES.

Turning now to the glycogen of muscle, which has come to occupy so important a place in physiology, let us consider first of all the question of its formation. This seems to be mainly dependent on the sugar of the blood, which may be derived either from the breakdown of liver glycogen or more directly from absorbed glucose. Some puzzling facts have recently been brought to light concerning the influence of the liver. After this organ has been removed in the dog the muscle glycogen steadily declines, Mann and Magath[20] finding that it was on an average 0·3 per cent. immediately after the hepatectomy, and 0·15 per cent. four hours later. Curiously enough, this diminution does not occur when the liver is practically eliminated from the circulation in the spinal cat, by ligation of the portal blood-vessels along with removal of the remaining abdominal viscera. In both groups of experiments the percentage of blood-sugar falls, but it is possible that it does so relatively less rapidly in the eviscerated preparation, on account of a leakage of sugar from the liver through the patulous hepatic veins. But even if we allow for this leakage of sugar, it is difficult to account for the constancy in the glycogen of the muscles of the eviscerated preparation since, though not visibly contracting, they are meanwhile producing heat at the rate of at least 2 calories per kg. of body-weight and per hour. If the immediate fuel for this combustion is the glycogen of the muscles, as is the present-day teaching, then we must imagine that glycogen is being built up in each muscle at a rate which is just exactly the same as that at which it is being broken down, and that its source is, in large part, the sugar which is escaping into the blood from the liver, since the total amount of sugar originally present in the blood is far from sufficient to account for the energy expended.

Best, Hoet, and Marks[19] have shown that when glucose is added to the blood of the eviscerated preparation, no glycogen is formed in the muscles unless when insulin is injected along with the sugar. On the other hand, Choi[21] has shown that when the glucose injections are made into an animal from which the abdominal viscera have not been removed, glycogen is formed in the muscles, this being dependent upon the insulin secreted by the pancreas, since no glycogen formation occurs in animals from which this organ, but not the liver, has been removed some hours preceding hepatectomy. This is shown in Table II. It is no doubt for the same reason that the fall in glycogen in the muscles of hepatectomised dogs is prevented when glucose is injected intravenously, but according to Mann and Magath[20] much more glucose must be injected to accomplish this than the 0·25 g. per kg. per hour that suffices to maintain the blood-sugar at its normal level. Although these results show that glycogen formation can occur in the muscles in the presence of insulin, this does not mean that insulin is essential for the process, since glycogen is formed in the muscles of diabetic (depancreatised) animals. Thus Chaikoff[22] found the average percentage of glycogen in the muscles of dogs on the third day of acute diabetes (caused by withdrawal of insulin from previously depancreatised animals) to be 0·425 per cent., and on the fifth day 0·350 per cent. During this interval at least 2 calories per kg. an hour were used, so that a dog of 7 kg. (about the average of the animals used) would have expended at least 2 × 7 × 48 = 672 calories, representing about 160 g. of carbohydrate, in the two days, and for this, large quantities of muscle glycogen must have been formed, unless we assume that other substances than glycogen can serve as the fuel for energy production in muscle. We cannot say what factor may be responsible for glycogen formation in the muscles when there is no insulin available in the body, but it would seem most likely that it depends in some way on the liver. In other words, the material which is

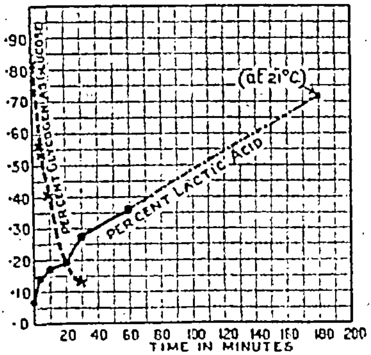
TABLE II.—*Effect of Injection of 3·5 g. Glucose on Glycogen of Muscles in Spinal Cat.*

—	Average per cent. glycogen in muscles.		No. of expts. averaged (3 muscles in each).
	Before injection.	After 2½ hours' injection of glucose.	
Eviscerated	0·685	0·689	6
Abdomen intact ..	0·516	0·570	3
Depancreatised ..	0·477	0·466	3

used for glycogen formation in the muscles when no insulin is present may be glucose that has passed through a glycogen stage in the liver or has been manufactured in this viscus, or even in the muscles themselves, by a process of gluconeogenesis.

In so far as experimental evidence goes at present, however, the only way by which glycogen can be formed in the muscles of an eviscerated preparation is by injection of glucose in the presence of insulin. Fraser and I, using this preparation, have tried to find some carbohydrate derivative which would form glycogen in the muscles independently of this hormone, but without success except in one experiment in which di-hydroxyacetone was injected.

FIG. 3.



Decrease of glycogen and increase of lactic acid in mammalian muscle after death.

These substances have been fructose, r-sodium lactate, di-hydroxyacetone and glycogen hydrolysed by diastase, so as to form a mixture of dextrine and sugar. Solutions of them were injected continuously into the femoral vein during periods of several hours without causing the glycogen percentage of certain selected muscles of the fore and hind legs to become increased over the percentages found present in the same muscles excised before the injections began. An unsuccessful attempt was also made in these experiments to demonstrate a possible influence of the liver, by adding to the glycogen solutions extracts prepared from this organ by faintly acidulated water.

During fasting, in the white rat the muscle glycogen steadily declines for between 24 and 48 hours, after which it remains at a constant level at least for several days. When food is given at this stage the glycogen does not, as a rule, begin to increase until after an hour or so (as illustrated in Fig. 5, Lecture II.), although absorption of glucose has been for some time sufficient to raise the blood-sugar level considerably. This latency may be dependent on inability of absorbed glucose to form muscle glycogen, either until after it has passed through a glycogen stage in the liver or until it has stimulated the pancreas to secrete sufficient insulin so as directly to affect the process of glycogen formation in the muscles. In connexion with the former possibility, it is to be remembered that glycogen formation in the liver itself does not increase much during the first hour after sugar is given to fasting animals.

The impossibility of detecting glycogen formation in mammalian muscle which has been isolated from the influence of the abdominal viscera stands out in contrast with the glycogen formation which Meyerhof and others have demonstrated to occur in isolated frog muscle under certain conditions. This result, like others, makes it probable that there are considerable differences in the chemical mechanism of amphibian, as compared with mammalian, muscle.

Breakdown of Glycogen in Muscle after Death.

Before turning our attention to the question of glycogen utilisation in the muscles, it may be well here to refer to a series of observations regarding the behaviour of glycogen in mammalian muscles after death. It is usually assumed that glycogenolysis sets in immediately, but although this is the case when the muscle has been injured, we have found that the contrary is the case for undamaged muscle. The most rapid onset of glycogenolysis occurs when the muscle is first of all frozen and then ground up into small pieces. Thus Simpson and I found,[14] when we allowed the frozen muscle powder to thaw, that practically all glycogen disappeared from it in from 20–30 minutes. Even when the temperature after thawing was not allowed to rise more than a few degrees above freezing-point, the disappearance of glycogen was very rapid, and it was also found that lactic acid did not increase nearly so quickly as the glycogen disappeared. These changes are shown in the accompanying curves (Fig. 3), which are taken from more recently performed experiments done along with Thomas. It will further be noted from these curves that lactic acid went on accumulating in the muscle suspension long after all the glycogen had disappeared. In the curve shown, the lactic acid failed to reach the amount represented by the glycogen to start with, but in other experiments it sometimes exceeded this. The irregularity of the result in this respect may indicate the operation of some as yet unknown influences on the change. The interpretation which we have put upon these results is that some substance is formed between glycogen and lactic acid, and it is possible that the presence of this in the muscle to start with accounts for the excess of lactic acid which was sometimes found after longer standing. We have been unable to demonstrate the nature of this intermediary substance. It is apparently not sugar since little increase could be detected in the reducing power of a 70 per cent. alcoholic extract of the muscle mixture by the time the glycogen had all disappeared. There was also no change in free phosphate, using the Doisy-Bell method, and we have been unsuccessful in correlating the disappearance of glycogen with breakdown of phosphagen. We suspect that this intermediary substance may be some carbohydrate, perhaps a trisaccharide, which is destroyed by 30 per cent. KOH and is insoluble in 70 per cent. alcohol. I have already alluded to the different results obtained with liver under similar conditions.

TABLE III.—*Percentile Change in Glycogen at Varying Intervals after Death.*

—	Time left after death.		Change per cent. in glycogen.			Condition of muscles.
			Sartorius.	Gracilis.	Gastrocnemius.	
	hrs.	mins.				
Rabbit.	—	40	−4·2	No change.	+10 h.c.	Soft, pink, irritable.
	2	—	−54	−10	+2 h.c.	Greyish, irritable.
	4	10	−84	−70	−63	Opaque, very slightly irritable.
Cat	2	30	−34	−14	−2·5	Irritable.

h.c. = higher than control.

As these researches were in progress, Orr and his associates noted that there was very little, if any, difference in the percentage of glycogen in the muscles removed from rats that had been dead an hour or so, as compared with that in muscles removed immediately after killing. This observation led to a special study by Miss Mackay[15] of the behaviour of glycogen in intact muscle, in which she compared the percentages in certain muscles removed under ether anaesthesia from one limb (in rabbits) with those of the corresponding muscles from the opposite limb removed at varying periods after death. The results are summarised in Table III. in which the changes in glycogen at the periods indicated after death are expressed as a percentage of the amounts present in the corresponding muscles immediately before death.

It can be seen that post-mortem glycogenolysis in intact muscle is very slow compared with that occurring in pulverised muscle, that its rate varies considerably in different muscles, and that the glycogen, instead of decreasing, may actually increase in amount. Incidentally, it was observed by Miss Mackay that the irritability of the muscles towards electrical stimulation persisted longer in those which had been dissected free from the surrounding tissues and kept moistened with gauze soaked in Ringer's solution than in muscles left in situ without any dissection. The onset of rigor was also delayed in the dissected muscles. The most noteworthy result was, however, the apparent increase in glycogen observed especially in the gastrocnemius muscles. Since this was not very marked, however, it might signify nothing more than a relative increase due to blood having drained out of the muscle after death. In more recent experiments which Fraser and I have performed, this possibility has been ruled out, since we did not remove the muscles from the left leg until immediately after death.

Rabbits killed either by chloroform or by stunning were used. Certain muscles were then dissected from the left leg, and after leaving the carcass for an hour at room-temperature, the corresponding muscles of the right leg were removed. Table IV. shows some of the results, and in this case these are given in actual percentages, as well as in percentile changes.

TABLE IV.

No.	Muscle.*	Glycogen. Per cent.		Percentile change + or —	Lactic acid. Per cent.	
		Left.	Right.		Left.	Right.
31	T.a.	0·69	0·83	+ 20	0·21	0·27
	G.	0·61	0·65	+ 7	0·1	0·33
33	T.a.	0·55	0·44	— 20	0·05	0·07
	G.	0·54	0·52	— 4	0·04	0·07
35	T.a.	0·31	0·44	+ 40	0·05	0·22
	G.	0·34	0·41	+ 22	0·07	0·19
38	T.a.	0·60	0·75	+ 25	0·07	0·11
	G.	0·70	0·89	+ 27	0·10	0·18
39	T.a.	0·28	0·29	+ 5	0·08	0·12
	G.	0·24	0·20	— 23	0·09	0·12
40	T.a.	0·31	0·65	+110	0·07	0·09
	G.	0·42	0·29	— 32	0·06	0·11

* The animals were killed by chloroform, but similar results were also obtained in those killed by stunning.

T.a. = tibialis anticus; G. = gastrocnemius.

The usual variability, both in the glycogen content of corresponding muscles in different animals and in that of different muscles in the same animal, is seen, but in only one animal was the percentage less in one hour after death in both of the muscles examined. It is possible that corresponding muscles of the two sides did not contain the same percentages of glycogen at the time of death, and this will require further investigation. In the light of observations on other animals than the rabbit it has been assumed that the percentages are alike. We also determined the percentage of lactic acid, using for this purpose the modified permanganate oxidation method after removal of sugar from an alcoholic extract of the muscle, by means of copper sulphate and milk of lime. An increase is evident in all cases, but no relationship can be detected between either the glycogen percentage to start with or the extent of the post-mortem increase in glycogen and the increase in lactic acid.

These results, which it may be stated are not dependent upon any changes in the water content of the muscles, suggest the presence of some hitherto unknown precursor from which both glycogen and lactic acid are derived. This must either break down first of all into glycogen, lactic acid being formed at an independent rate out of the general store of glycogen, or it must be a substance from which both glycogen and lactic acid are formed. In the former case, the substance would be a larger molecule than glycogen, whereas in the latter, it would be a smaller one and might be a lower dextrine or some poly-saccharide, perhaps a tri-saccharide. We have so far been unsuccessful in demonstrating any change in the free sugar of the muscle extractable by alcohol, but this may be because we used strong alcohol in preparing the extracts.

I have already referred to experiments by Simpson, Thomas, and myself in which it was shown that glycogen disappears from pulverised frozen mammalian muscle after thawing much more rapidly than lactic acid accumulates, and from which it was concluded that between the two some intermediary substance, possibly a tri-saccharide, must be formed. It is just possible that we are dealing with the same substance in both groups of experiments, but if this be the case then we must suppose that the agency for its conversion into glycogen becomes destroyed by freezing and pulverising the muscle. May it be because of destruction of the architecture of the muscle-fibre by the fine ice crystals which form in it when it is suddenly frozen, that the power of glycogen synthesis disappears?

Breakdown of Glycogen in Muscle during Life.

With regard to the breakdown of glycogen in mammalian muscle during life, very little is definitely known, at least for muscle which is under perfectly physiological conditions. That the percentage of glycogen remains unchanged for at least an hour after the blood pressure has been reduced to zero makes one wonder whether its failure to rise in the muscles of an eviscerated preparation, even when excess of glucose is present in the blood, may not indicate that a part of the glycogen-forming powers have disappeared, although they can be stimualted in the presence of an excess of both insulin and sugar.

It has been known for long that the glycogen becomes reduced when the muscles contract, and, of the older experiments, I need only recall here those of Manché[24] and Chandelon,[25] who compared its amount in the muscles of one leg, paralysed by cutting the nerve-supply, with those of the opposite leg in which there had been more or less activity. An experiment of this type more recently performed is that of Best, Hoet, and Marks,[19] who, by injecting convulsive doses of insulin into cats in which the sciatic nerve of one leg had been severed, found that the glycogen content of the paralysed muscles remained high, while it became very low in those undergoing contractions. Incidentally, it may be remarked, these results also show that the glycogen of one set of resting muscles cannot be drafted, by way of the circulation, to provide glycogen for an active set, even although the demands of the latter may be urgent. In the light of these results and also those obtained on isolated frog muscle, it is to be expected that glycogen will decrease when mammalian muscle is stimulated. Some results obtained by Miss Mackay will illustrate this.

In the decapitate cat three muscles were dissected from the left leg, and the corresponding ones of the right leg were then stimulated electrically, either through the nerve or directly. The extent of reduction in glycogen, calculated as a percentage of the amount originally present in the resting muscles, is shown in Table V.

Even a few moments of activity is seen to be associated with a decided reduction in muscle glycogen, and this becomes more marked as activity is maintained.

In these experiments the liver was still intact and it contained a rich supply of glycogen, owing to previous feeding of the animals with sugar. Had the liver been absent it is probable that the glycogen would have become more rapidly reduced by activity, and it was the original intention of the research to study this possible influence of the liver. With this in view Miss Mackay performed several experiments in which the muscles in animals with the liver intact and containing much glycogen were left at rest for an hour or so after stimulating them, but the extent to which the glycogen reappeared, as judged by comparison with the results shown in Table V., was very limited, if any really occurred. I have formed the impression, both from these experiments and from those more recently performed by Fraser and myself, that the failure to demonstrate decided glycogen formation in the muscles of the spinal preparation unless when insulin is present in excess is due to the low blood pressure.

TABLE V.—*Percentile Fall in Glycogen in Stimulated Muscle with its Blood-supply Intact.*

Time of stimulation.	*Method of stimulation.*	Fall in glycogen (in per cent. of amount found in control muscle).		
		Sartorius.	Gracilis.	Gastrocnemius.
St.*	Directly on muscles.	100	81	94
30–40 mins.	"	81	62	75
5 mins.	"	43	36	35
2 "	Through foot and thigh.	38	—	25
1 min.	Directly on muscle.	43	—	—
1 "	Through foot and thigh.	20	—	—

* St. = Stimulated till muscle would contract no longer.

Finally, something must be said concerning the behaviour of the muscle glycogen in white rats after varying degrees of exercise, either on a treadmill or by swimming in cold water. I have already alluded to the behaviour of the liver glycogen in these experiments. Table VI. shows the results for the muscles.

TABLE VI.—*Glycogen (average per cent.) in Muscles of Fasting White Rats after Exercise (with Controls). Fasting Periods 24 Hours.*

Duration of exercise.	Exercised rats.	Control rats.	No. used.	Duration of exercise.	Exercised rats.	Control rats.	No. used.
1 hr.	0·26	0·28	2 and 4	3 hrs.	0·26	—	1*
"	0·24	0·30	3 and 3	6 "	0·27	0·27	1 and 1*
"	0·27	0·37	3 and 3	7 "	0·20	0·24	1 and 1
"	0·28	—	6	23 "	0·10	0·18	1 and 1
2 hrs.	0·26	0·27	1 and 1	Sw.	0·07	—	1
2½ "	0·11	0·28	1 and 1	1½ hrs.	0·05	—	1
3 "	0·24	0·37	1 and 1				

Sw. = Swimming. * Rat lost 4 g.

It is seen that even prolonged exercise in the rat does not depress the muscle glycogen very much, a result which stands out in contrast with that obtained by artificial stimulation of the muscles of a spinal preparation. With the exception of those that were made to swim in cold water off and on for 1½ hours, the rats may be said to have been in a "steady state" of activity without having been markedly exhausted at the end of it. Nevertheless, running on a treadmill for several hours is strenuous enough work for a rat. The results show that in the steady state of muscular activity, not only are the oxygen requirements of the acting muscles continuously provided for but those of glycogen as well. Glucose derived from the glycogen of the liver no doubt furnishes the raw material for the reconstruction of much of this glycogen in the muscles, but it is possible that some is also manufactured in the muscles themselves out of protein and fat. I can see no way for putting this possibility to the test of experiment, but it is significant that the percentage of blood-sugar, even after the longest periods of exercise, was practically the same in the exercised rats as in the controls. It was certainly not lower. Taking the results of both groups of experiments together, it would appear that it is only when muscular activity is so strenuous that the oxygen-supply cannot keep pace with the demands that the glycogen is significantly lowered. This would presumably be the case in muscles of the spinal cat when they are artificially stimulated and also in those of intact animals injected with strychnine or with large doses of insulin. In seven rabbits given convulsive doses of strychnine, Hershey and Orr found that the muscle glycogen averaged 0·001 per cent., the lowest value obtained after convulsions had lasted for 57 minutes being 0·03 per cent. It is worthy of note that some glycogen was always found present.

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RADIUM TREATMENT BY THE IMPLANTATION OF SCREENED SEEDS.

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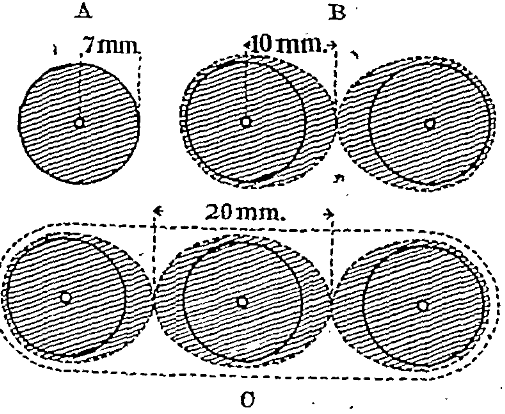
IT is now some two years since radium treatment by the method of implanting screened seeds containing radon was introduced into England. The rapidity with which this technique has made a place for itself among the longer established method of applying radium is attested by the number of papers in this and other journals in which cases so treated are described in considerable detail. In the Medical Research Council's report on the work done in certain hospitals during the year 1927 we find but one reference to the implantation of platinum radon seeds, but in Gask's Hunterian Lecture, delivered in January of last year, the method is described at length, as it is also in earlier publications of this speaker and a number of others, notably Gosse and Chester-Williams, and Stanford Cade. The general plan of treatment and its results in a rather limited field are thus fairly familiar to readers of THE LANCET. It has, however, a far wider range of usefulness, and it has seemed possible that some suggestions along this line from its originator might be of general interest to the British medical profession.

Advantages of the Screened Seed.

The advantage of the implantation method as compared with surface applications are too well known to need any amplification here. Those which the seed screened with platinum possesses over the unscreened or "bare tube" and the gold container of radon are perhaps less generally comprehended. The bare tube offers no obstacle to the passage of caustic beta radiation. Therefore a zone of necrosis invariably forms about each implanted seed. By using very minute quantities of radon in each seed the amount of this necrosis can be greatly reduced, but it can never be entirely eliminated. Moreover, when the amount of beta radiation is limited, an equal limitation is placed upon the therapeutic gamma radiation available from the same source, so that effective dosage is proportionately reduced. To offset this, a great number of these small containers must be used in a given neoplasm in order to ensure adequate dosage.

The gold seed as produced in the United States for the past three years substitutes gold for glass, the radon being gathered and placed in a long capillary tube of either material, this long tube being thereafter subdivided into seed lengths. The glass seeds are sealed off with a flame; the gold seeds are pinched with an ordinary pair of pliers, the cutting edges of which have been purposely dulled. Though this usually makes a gas-tight seal, if there are any imperfections in the gold tubing leakage is likely. The violent reactions which have been reported in some cases where the gold seed has been used were probably due to this cause. The gold seeds are estimated by their designer as being twice the size of the bare tubes, but by virtue of their wall thickness of 0·3 mm. filtering out all but 8·8 per cent. of the beta radiation. As they contain twice the amount of radon that is used in glass seeds they are capable of transmitting twice the amount of gamma radiation possible by the older method. The greatest drawback they possess—aside from the dangers of leakage already mentioned—is the "chisel-like" ends left on each seed by the method of separation with pliers. Not only are these sharp ends likely to induce unnecessary trauma as they are introduced, as there is *no* way in which they can be recovered, they must remain as an irritative foreign body in the tissues they were used to treat, a circumstance which makes it quite impossible to use them under many conditions.

FIG. 1.



The diagram (A) shows a cross-section of a platinum radon seed embedded in tissue, the cross-hatching representing the "zone of potential tissue change" about the seed: this zone is represented by a circle with a radius of 7 mm.

The diagram (B) illustrates the implantation of two seeds; cross-firing increases the zone of potential tissue change, so that the "limiting isodose line" must now be represented by the dotted line at the *periphery of the cross-hatched area*. The seeds are implanted 2 cm. apart to avoid overlapping of the zones of *potential tissue change*.

At the bottom (C) are three seeds implanted 2 cm. distant from one another. The zone of potential tissue change about each seed is represented by a cross-hatched area, showing how the effect of the centre seed is now increased by 3 mm. on each side. In actual practice it has been found that the radiation extends somewhat beyond the limiting isodose line represented by the dotted line enclosing *all three* schematic representations of the seeds and their surrounding zones of potential tissue change.

The fact that the platinum radon seed consists of a perfectly tight glass tube encased in platinum 0·3 mm. or 0·4 mm. thick, does make it, as was recently stressed by Duffy, somewhat larger than the gold seed. This disadvantage is, however, so trifling as in itself to be negligible, and when it is offset by the absolute certainty that leakage will not occur; that no trauma can be induced by its perfectly rounded ends; and that it can be removed as soon as treatment is concluded, its pre-eminence is readily recognised. Should any occasion arise wherein it is deemed undesirable to remove the seeds, the thread attached to each one can be easily omitted, though in practice this is seldom necessary. Even without its thread the platinum-screened seed is superior to the gold because of insurance against leakage and absence of irritation from the rough ends.

Application of the Platinum Radon Seed to Malignancies of the Mouth and Throat.

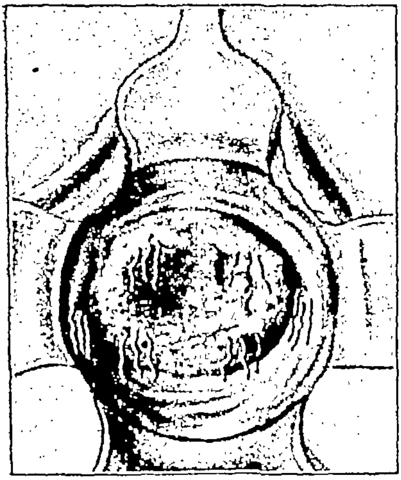
As most of the publications in England have referred only to the use of the platinum seed in treating intra-oral lesions it will be of greater interest to discuss at length some other applications of this form of therapy. Therefore it will be necessary only to touch briefly upon its use in the mouth and throat. In a publication made three years ago in the *Annals of Surgery* I called attention to the peculiar adaptability of the removable platinum seed to malignant lesions of the tongue. Especially is this true when the lesion is situated far back upon the dorsum of the tongue, where needles cannot be kept in place and no foreign body should be permitted to remain indefinitely in the tissues because of the extreme mobility of the parts. In any area of the mouth elimination of necrosis is essential because of the great vascularity of the tissues, so the assurance that no leakage of radon from the tube can occur is most desirable. Lesions at the root of the tongue and on the floor of the mouth, as well as those found in the tonsil or larynx, can be successfully implanted from the outside, thus doing away with any possibility of infection of the attached threads by the mouth secretions. This is, in practice, a purely hypothetical objection, but as it can reasonably be brought forward, it is desirable to provide against any such possibility.

In the œsophagus the dangers from tissue necrosis are perhaps greater than in any other area wherein radium therapy has been tried. Sloughing there means a fistula into lung or trachea, with rapidly fatal results. There is no doubt that a number of patients have met inevitable death sooner because of radium having been used by a method where necrosis could occur. By using the platinum-screened seed this danger is definitely eliminated, and even in cases where complete stricture had already taken place the lumen of the œsophagus has been restored to patency, and the patient so far relieved that he could return to a gainful employment, resuming his ordinary diet and habits.

Implantation as an Adjunct in Gynæcology and Urology.

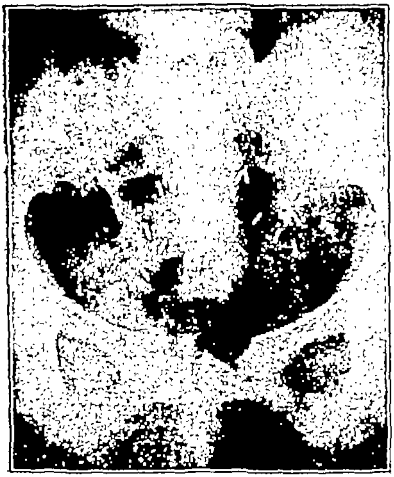
The treatment of early and moderately advanced cancer of the uterine cervix by radium has now been so standardised as to rank with surgery as an efficient method of treatment, being regarded as the method of choice in many clinics. In such a cavity as the uterus, however, the implantation method has, apparently, no place. Yet during the past three years this particular form of radium therapy has found an ever-increasing usefulness in cases showing involvement of broad ligaments and vagina, in which all methods—of surgery and radium alike—have heretofore proved impotent. When the cervical canal is completely blocked by malignant exuberations, or the cervix has become a sloughing mass, insertion of the usual uterine applicators becomes impossible. The woman who presented such a condition was once doomed to die unaided by anything more than palliation. Yet it is now possible for a skilful operator

FIG. 2.



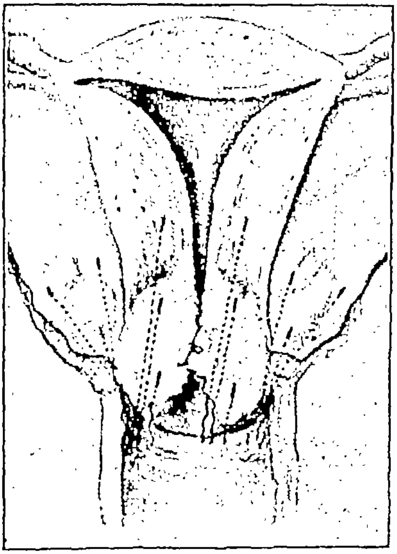
Advanced carcinoma of the uterine cervix. Removable platinum seeds have been implanted in the infiltrated tissues of the malignant cervix.

FIG. 4.



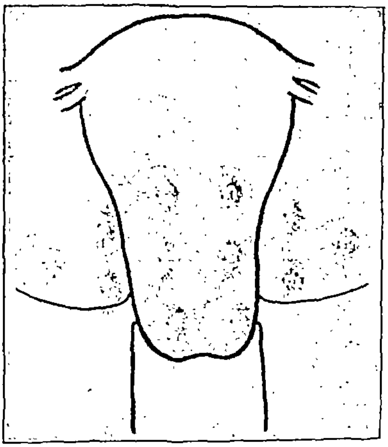
Advanced carcinoma of the uterine cervix. Radiogram showing platinum seeds in position, immediately after implantation.

FIG. 3.



Advanced carcinoma of the uterine cervix. Cross-section (semi-schematic) showing the position of the implanted seeds in relation to the seed-threads.

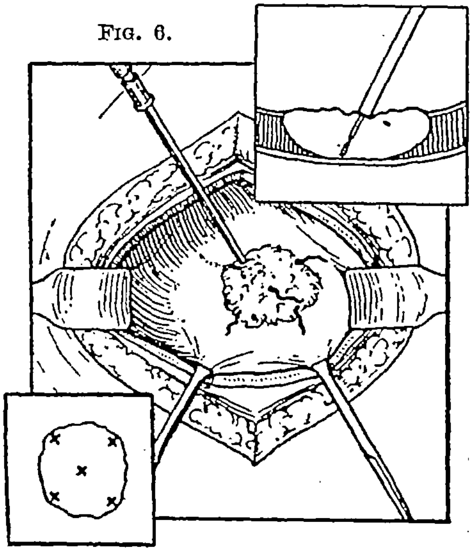
FIG. 5.



Advanced carcinoma of the uterine cervix. Schematic view showing zones of tissue irradiated by each seed.

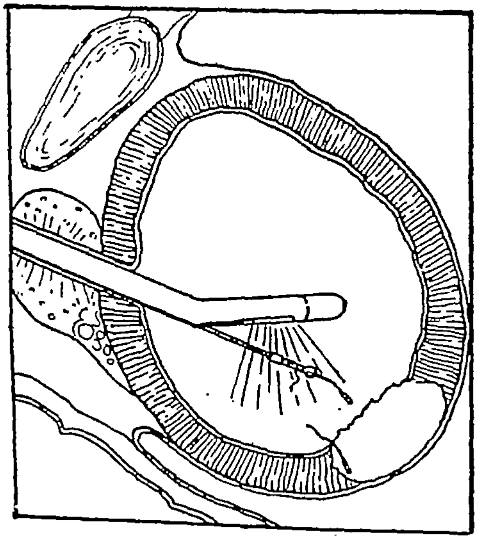
to implant even the highly friable tissues infiltrated by advanced carcinoma, and to remove the seeds after a suitable exposure, without inflicting any further trauma upon the carcinomatous area. The effect of such treatment has proved astonishing. The intolerable pain rapidly subsides, foul-smelling discharge is lessened or ceases altogether, elimination of the toxic focus polluting the blood stream permits a marked improvement in the patient's general condition. The malignant area "cleans up" in a short time to such an extent that it will be possible to make use of the regular means of applying radium, as is done in the cases seen when only moderately advanced. So much benefit has accrued to this hitherto hopeless class of patients that even if we regard it merely as a form of palliation, the results amply justify the employment of the method.

FIG. 6.



Carcinoma of the bladder. Implantation of removable platinum radon seeds through suprapubic cystotomy. Note distribution of seeds as shown by protruding threads. Insert shows relative position of seeds (at left); actual deposition of seed at base of tumour (at right). The shoulder of the implanter limits the depth of implantation to 1 cm.

FIG. 7.

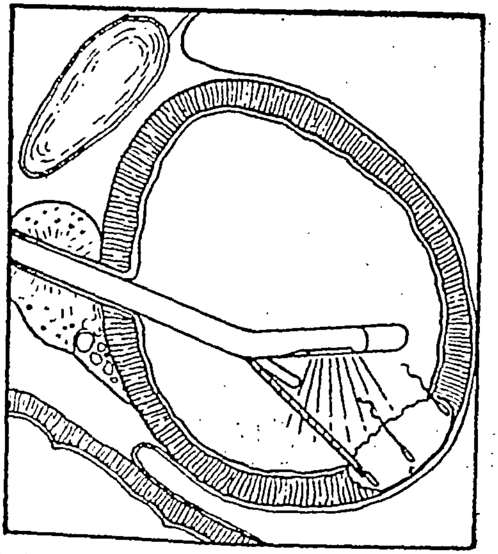


Implantation of removable platinum seeds through the cystoscope using flexible cystoscopic implanter. Protruding threads serve as a guide to the operator in the proper distribution of the seeds.

In lesions lower down in the general tract, carcinoma of the vagina and vulva, implantation may be employed by the same general technique which has been indicated for similar types of lesion elsewhere. Cancer of the vulva is very seldom seen, but in those few cases where the method has been used the results have been eminently satisfactory.

It is in dealing with vesical neoplasms in both sexes that the implantation of screened seeds has found one of its greatest fields of usefulness. The bare tubes formerly used showed, despite the serious objection of necrosis production, that radium was a very effective agent in combating malignancy in the bladder. When the dangers of necrosis and sloughing were eliminated by the introduction of proper screens, the popularity of radium as a substitute for surgery or fulguration rapidly increased. In the recently issued text-book of Eisendrath and Rolnick the method of implantation is dwelt upon at considerable length. When removable platinum radon seeds are used the operation may be carried out either cystoscopically or through a suprapubic incision, but its usefulness in connexion with cystoscopic work especially commends it.

FIG. 8.

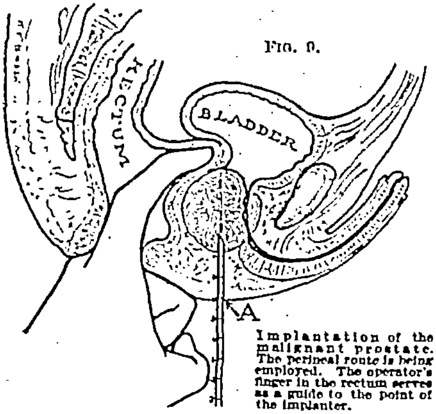


Illustrating method of removing seeds through the cystoscope after adequate dosage has been delivered. This may be done with the ordinary cystoscopic forceps.

"One employs a seed filtered by 0·8 mm. of platinum, capable of delivering a dosage of 333-1/3 millicurie hours—that is, 2·5 millicuries of radium emanation destroyed in ten day's time. These seeds are placed in the neoplasm at a distance of 2 cm. apart. The Muir implanter is passed through the channel of an operating cystoscope. The site for the deposit of the first seed having been selected, the point of the implanter is thrust into the neoplasm and the seed placed in the loading slot. This seed, pushed by the plunger, is carried into the tissues to a predetermined depth. When it reaches this depth, its progress is automatically halted by the shoulder of the instrument which prevents the point from advancing beyond a certain distance. When the instrument is withdrawn, the seed remains in place, the thread attached to it being plainly visible protruding from the point of entrance. The first seed deposited thus serves as a landmark, from which the proper location of all subsequently to be implanted can be readily ascertained. The total number, of course, depends upon the size of the growth and the estimated invasion of the surrounding bladder wall by possible malignancy. . . . When the period of exposure to radiation has expired—this is ordinarily nine or ten days—the seeds are withdrawn through the cystoscope, using either an ordinary forceps or an instrument specially designed to meet this need. The threads attached to the seeds must be cut off to a length not exceeding one centimetre before being placed in the loading slot, for if too long they may become entangled in the cystoscope as that instrument is withdrawn, and the seeds thus displaced or even dislodged entirely. With the exercise of a little care and deliberation, however, such accidents can be readily avoided."

In treating malignancy of the prostate it is customary to permit the seeds to remain permanently in the tissues, which causes no foreign body reaction nor irritation when the smoothly rounded platinum seeds are used. The implantation is generally done under novocaine infiltration; occasionally, when indicated, the sacral method is used successfully. Implantation is done preferably through the perineum, but where a suprapubic opening already exists it may be utilised for open insertion. A few operators make a suprapubic exposure especially to facilitate the implantation. The operator keeps his left index-finger in the rectum to guide the needle point of the implanter; when he feels the resistance of the tissues to the advance of the needle he will realise that the point has penetrated to depth sufficient to permit the seed to be deposited. The deepest seed must be deposited first, otherwise implantation may begin on either side. Four seeds are customarily employed, being deposited at the apices of the prostatic lobes in such a way as to bear the relation one to another such as is borne by the apices of a right-angle pyramid. But one portal of entry is necessary. The angle of the handle of the implanter can be altered without entirely withdrawing the instrument. The point can be withdrawn and the angle changed so that each seed will be deposited not less than 2 cm. from the others. The arrangement of the seeds can be clearly seen in the accompanying diagram (Fig. 10).

FIG. 9.

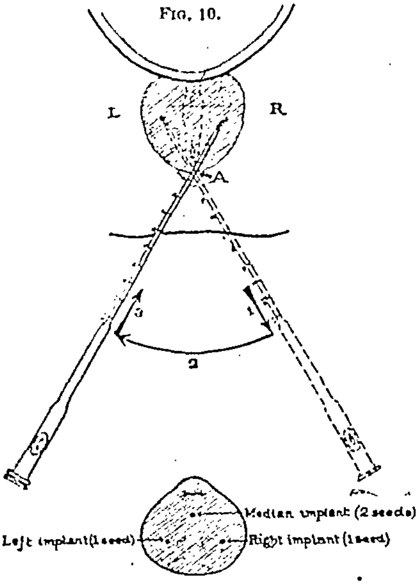


Implantation of the malignant prostate. The perineal route is being employed. The operator's finger in the rectum serves as a guide to the point of the implanter.

Suprapubic insertion does not differ especially from the transperineal technique, though the work is naturally much simplified by the free exposure of the site of malignancy. The seeds generally used in either case contain 2·5 millicuries of radon, which when left permanently in situ provides 333-1/3 millicurie hours of gamma radiation. This method of treating malignancy of the prostate will be found vastly superior to needles which have proved so traumatising that they have been largely abandoned in American clinics where much prostatic work is carried on. Lowsley and Kirwin in their text-book call attention to the possibility of permitting these prostatic patients to leave the hospital much sooner than under any other conditions of treatment. "This possibility of escaping the prolonged hospital stay will often induce him to undertake the radium treatment when other forms of therapy would be refused."

The simplicity and accuracy which are among the *most salient features of this technique have greatly* extended the field of usefulness within the bounds of which radium has in the past been so closely restricted. It should serve to bring about rapid fulfilment of the prophesy made a few months ago by Mr. Hayward Pinch that, "in the very near future radium would form as much a part of the up-to-date surgeon's armamentarium as the scalpel," and it might be added—will prove itself as generally useful.

FIG. 10.



Implantation of the malignant prostate. The method of altering the angle of the implanter, so as to place the seeds at the different angles desired, is here shown. Insert gives schematic representation of the prostate after implantation is completed.

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THE CHOLESTEROL OF THE BLOOD PLASMA IN EPILEPSY.

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THERE have been many attempts to find some chemical change in the blood related to epileptic seizures, though until recently they have met with but little success. Lately, however, several observers have reported alterations in the blood cholesterol in epileptics. De Crinis[3] in 1920 stated that the blood cholesterol was increased before an attack. Pezzali[6] in 1923 found uniformly low levels of the blood cholesterol in epileptics, especially during seizures. Popéa and Vicol,[7] noting that the lipoid was almost absent from the suprarenals after death in status epilepticus, found a decrease in the blood cholesterol during and after the attacks. They concluded that the fall was due to the consumption of the circulating cholesterol during the fits. Robinson, Brain, and Kay[8] found that the average blood cholesterol level in a group of epileptics was lower than in a corresponding group of controls, and that the average level was lower in blood taken within 24 hours of a fit than in blood taken after a longer interval. They found that the fall in the blood cholesterol preceded the attack in 10 out of 11 cases in which serial estimations were made. Osnato and Killian,[5] and Goodall[4] have also investigated the blood cholesterol in epilepsy but with negative results. Their deductions, however, are open to criticism and we shall discuss them later.

The present paper is an account of serial estimations of the cholesterol content of the blood plasma in 21 epileptics and five controls, comprising two normals and three patients suffering from diseases of the nervous system other than epilepsy.

Method.

The method employed was that of Bloor,[1] the only modification being that 1 c.cm. of plasma was used in 25 c.cm. of the alcohol and ether mixture. It has been found that this method will only give satisfactory results if the instructions in the original paper are strictly adhered to. In this series of estimations there has been little difficulty in matching the green colour produced, but it has been found that the following conditions are important. All glassware used in the final extraction with chloroform must be absolutely freed from moisture, preferably by drying in hot air; if this is not done a yellow tinge in the final green colour makes it difficult to match with the standard, and also gives too low a result. The acid used to develop the colour must be fresh and the amount (0·1 c.cm.) very accurately measured; the slightest excess gives a blue tinge in the green. The colour develops best within Bloor's limits of temperature—viz., 20–22°C.—and readings should be made 12 to 15 minutes later. It has been noticed that the colour does not develop fully in less than ten minutes and may begin to fade if left much over 15 minutes; consequently not more than six or seven estimations can be made with the same standard. With every precaution we have found that the method gives a difference of about 3 per cent. in different estimations of the same samples of plasma—e.g., in three separate such estimations on the same sample the results were as follows:—

1. 0·203 }
2. 0·202 } Per cent. of cholesterol
3. 0·208 } in 100 c.cm. plasma.

Therefore in the following series variations of less than 10 mg. between successive estimations may be due to experimental error. The estimations have been done on oxalated blood plasma, obtained by venepuncture. Estimations on whole blood have not been included, as experience showed that after extracting this with the boiling alcohol and ether mixture the extract had, in some cases, a brownish tinge which interfered with the final colour. This did not occur with blood plasma.

It will be appreciated that the necessity for repeated venepunctures made it difficult to secure a large series of estimations, especially in children. Moreover, venepuncture was usually impossible when status epilepticus was actually in progress. Most of the observations have been made during the night with the patients at rest in bed, several hours after the last meal. This has been done partly because the fit incidence is higher at night and partly to eliminate the effect of meals and of possible changes due to muscular exercise, although, as a matter of fact, in curves obtained during the day meals alone did not affect the level (see Series 12 and 13 in Appendix I.). The epileptics investigated were all patients living an active outdoor life at the Colony, Lingfield, and were clinically healthy except for fits; patients with conditions known to be associated with a low blood cholesterol—e.g., anæmia or infective conditions—were not included, and all the cases, with two exceptions (Nos. 12 and 29), apparently belong to the "idiopathic" group.

We regret that owing to one of us leaving England, it was not possible for us to include as many determinations of the plasma cholesterol in controls as we should have liked. We felt that it was better to publish our investigations as they stood, rather than that the determinations in normals and epileptics should be made by different persons. The lack of controls, of course, does not affect the validity of conclusions based upon differences in the plasma cholesterol in different groups of epileptics, and the normal blood cholesterol as determined by the method we employed is well established.

Average Plasma Cholesterol Level in Epileptics.

The first point to which we shall direct our attention is whether or not our investigation confirms the findings of Robinson, Brain, and Kay that the average blood cholesterol level is lower in epileptics than in normals, and lower at a time near the convulsion than in intervals of freedom from attacks.

The normal level of blood cholesterol varies within fairly well-defined limits. Campbell[2] gives the normal figures for free and ester cholesterol as from 0·150 to 0·230 per cent. Robinson et al, using Sackett's[9] modification of Bloor's method, gives the following values for plasma:—

	Max.	Min.	Mean.
39 males	0·212	.. 0·142	.. 0·163
32 females	0·217	.. 0·133	.. 0·172

Sackett obtained results varying from 0·115 to 0·280.

As our investigation was not primarily directed to determine average levels we have not performed a number of determinations upon normals. Two healthy persons, however, upon whom serial determinations were made yielded means of 0·241 and 0·207 per cent.; and we have also employed as controls three patients suffering from diseases of the nervous system other than epilepsy.

The following table embodies our results so far as they throw light upon the average plasma cholesterol level in epilepsy:—

Present investigation.					Robinson, Brain, and Kay.
Class of patient.	Patients.	Series.	Readings.	Average (plasma cholesterol).	
Controls	5	5	32	187	167
Epileptics: Blood removed more than 24 hours before or after a fit	7	10	59	142	155
Epileptics: Blood removed within 24 hours of a fit, excluding cases of status ..	15	17	111	137	135
Epileptics: In status or serial epilepsy	4	5	26	100	—

These figures appear to us to justify two conclusions:—

1. The average blood cholesterol in this group of 10 epileptics is below normal.

2. Status epilepticus and serial epilepsy are associated with especially marked depression of the blood cholesterol. The extremely low figure of 0·030 per cent. was obtained in one of our patients at the end of a severe attack of status. The numbers are insufficient to justify any conclusion being drawn as to the relative level of the blood cholesterol at times near and remote from the attack.

Osnato and Killian [3] have criticised the findings of Robinson, Brain, and Kay and drawn contrary conclusions on grounds which appear to us entirely inadequate. They report a single determination of the blood cholesterol in 22 epileptics, in four of whom the blood was obtained within 24 hours of a fit. Such small numbers in our opinion justify no conclusion whatever as to the behaviour of the blood cholesterol in relation to the fits. Osnato and Killian criticise Robinson, Brain, and Kay on the ground that the blood cholesterol varies in normals during the day more than the difference between normals and epileptics. Such criticism is misdirected, and appears to be based upon a misunderstanding of the nature of averages. In the series of Robinson, Brain, and Kay there are 121 epileptics and 71 controls. Any normal variation ought on Osnato's hypothesis to be common to both groups and cancel out. It is unthinkable that, as he seems to imply, 121 epileptics should all have been examined by chance at the lower part of their normal range, and the controls all by chance at the upper part. The same fallacy underlies Osnato's stress upon anæmia or fever as possible causes of the differences between normals and epileptics, since the controls were taken from the same hospital population as the epileptics. Osnato and Killian, moreover, performed no serial blood cholesterol determinations in epileptics, and misquote the number performed by Robinson, Brain, and Kay as 2 instead of 11.

Goodall [4] has recently published the results of an investigation of the blood cholesterol level in six epileptics, three determinations being made in the interparoxysmal and three in the preparoxysmal period. He states that "the mean value for the blood cholesterol in the preparoxysmal phases is not markedly different from that in the interparoxysmal phases. The variations from the mean tend to be greater in the former," and "the preparoxysmal cholesterol usually tends to be slightly lower than the interparoxysmal value." Goodall's findings, as far as they go, appear to support the conclusions of Robinson, Brain, and Kay, but we feel that it would not be justifiable to lay much stress upon them. Since the blood cholesterol in epilepsy may vary greatly from hour to hour especially in the proximity of a fit, it is doubtful if much information can be gained from so small a number of determinations. Either the serial method or the averaging of determinations in large groups would seem to be essential.

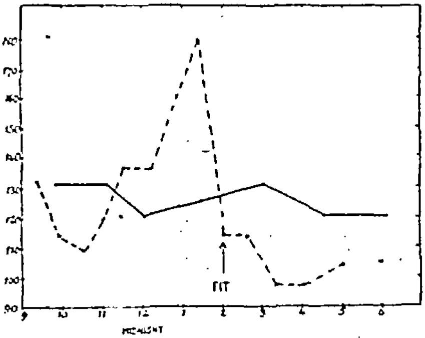
Variability of Cholesterol Level in Epileptics.

Our special object in this investigation was to study the behaviour of the plasma cholesterol level in epileptics by means of serial determinations, to observe whether abnormal variations in the level occurred, and, if so, whether these were in any way related to the occurrence of fits.

It is first necessary to form an opinion as to the normal limits of variation of the blood cholesterol. The simplest mode of expressing the variability as determined over a given series of determinations is to take the average level of the series and the range—i.e., the difference between the highest and lowest value in the series—and to express the range as a percentage of the average. For example, if the average of seven serial determinations were 150 mg. per 100 c.cm., the highest value obtained being 200 and the lowest 125, then the range is 75, and $\frac{\text{range}}{\text{average}} = \frac{75}{150} = 50$ per cent.

There are comparatively few data upon which to base an opinion as to the normal variability of the blood cholesterol. We have made two series of determinations on healthy adults, yielding variabilities of 5 per cent. in each case; and three series of determinations on patients suffering from organic disease of the nervous system not associated with convulsions—namely, two early cases of disseminated sclerosis and one case of parkinsonism following epidemic encephalitis. These patients, who, of course, cannot be treated as normals, yielded variabilities of 13, 22, and 5 per cent. Osnato and Killian quote Somach and Halpern who made four serial determinations on four normals. The variability in these normals estimated by us from the published charts was approximately 15, 12, 27, and 10 per cent. The average variability of these nine series of determinations on non-epileptics, six of whom were normals, was about 13·3 per cent.

We have divided the serial determinations we have made upon epileptics into two groups: (1) those which do not include a fit, and (2) those in which a fit occurred during the period in which determinations were made. The average variability in the former group was 20 per cent., and in the latter 31 per cent. Thus the occurrence of a fit during the period of observation is found to be associated with a variability of the blood cholesterol level which is 50 per cent. greater than when no fit occurs, in which case the variability differs little from the normal.



Charts representing two series of determinations of the plasma cholesterol of the same patient made on dates separated by two months. The continuous line represents the series in which no fit occurred, the interrupted line a series including a fit, which began as the blood was withdrawn at 2 A.M. The marked fall in the plasma cholesterol between 1.15 and 2 A.M. thus preceded the attack. (Series Nos. 8 and 21.)

Consideration of Some Individual Series.

Certain points of interest emerge from a consideration of individual series of determinations.

(1) *Cholesterol Instability Without a Fit.*—Three series of determinations, Nos. 15, 16, and 17, showed abnormal variability—namely, 57, 42, and 35 per cent. respectively, without a fit occurring. Series 15 and 16 were made on the same patient, and in each case because it was thought likely that a fit would occur as the patient exhibited the usual prodromal manifestations. This expectation, however, was not fulfilled, yet the cholesterol instability often associated with a fit occurred.

(2) *Fall in Blood Cholesterol Level Preceding a Fit.*—Robinson, Brain, and Kay made 11 series of determinations preceding an attack and found that in ten of these a fall in the blood and plasma cholesterol

preceded the attack. We have records of 12 series which include attacks, but only four of these are comparable with Robinson, Brain, and Kay's series in that a number of determinations were made before an attack. In three of these four the attack was, as in Robinson's series, preceded by a fall in the plasma cholesterol. The accompanying chart is of interest as illustrating two series of determinations made in the same patient, one including and one (No. 8) not including an attack. It will be observed that the curve which includes an attack exhibits the pre-paroxysmal fall described by Robinson, Brain, and Kay, previous to which the cholesterol level is high as De Crinis observed. The marked variations occurring in the space of a few hours show how misleading a single determination of the blood cholesterol may be. Determinations separated by only three-quarters of an hour—namely, those at 1.15 A.M. and 2 A.M. differ by 64 mg. per cent. An isolated determination would lead to diametrically opposite conclusions concerning the blood cholesterol level according to whether it was made at the former or the latter time, both of which are within an hour of an attack. It is in the light of such observations that we feel bound to criticise the adequacy of the data upon which Osnato and Killian and Goodall base their conclusions.

Conclusions.

The task of conducting biochemical investigations into epileptics is beset with difficulties, of which the chief is to obtain material immediately before a convulsion. Our attempts to achieve serial estimations of the blood cholesterol before a fit were successful on only four occasions. But we have in addition obtained serial estimations in a number of cases of status epilepticus and serial epilepsy.

Our figures confirm the observation of Robinson, Brain, and Kay that the average blood cholesterol level in epileptics is subnormal, and that of Popéa and Vicol that it is exceptionally low in status epilepticus and in serial epilepsy. We have also found that the blood cholesterol level is more variable in epileptics at about the time of a fit than in periods of freedom from attacks; and that in three out of four cases a fall in the cholesterol level preceded an attack, as Robinson, Brain, and Kay first observed. In our present state of ignorance concerning both the nature of a convulsion and the metabolism of cholesterol we can offer no opinion as to the nature of the association between changes in the blood cholesterol level and the occurrence of fits.

APPENDIX I.

Serial Determinations of the Plasma Cholesterol in Non-epileptics.

1. Normal, male, aged 44. Night of Jan. 28th–29th.

10 P.M.	0·238	2.30 A.M.	0·242
11.30 P.M.	0·238	4 A.M.	0·247
1 A.M.	0·235	5.35 A.M.	0·247

2. Normal, female, aged 34. Night of Jan. 28th–29th.

10.30 P.M.	0·208	2.45 A.M.	0·202
11.45 P.M.	0·202	4.10 A.M.	0·213
1.15 A.M.	0·208	6 A.M.	0·210

3. Early disseminated sclerosis. Male, aged 22. Night of Dec. 21st–22nd.

9.5 P.M.	0·178	3 A.M.	0·166
10.35 P.M.	0·178	4.30 A.M.	0·172
12.5 A.M.	0·156	6 A.M.	0·170
1.35 A.M.	0·166		

4. Early disseminated sclerosis. Male, aged 22½. Night Dec. 21st–22nd.

9 P.M.	0·179	3 A.M.	0·185
10.30 P.M.	0·185	4.30 A.M.	0·208
12	0·179	6 A.M.	0·208
1.30 A.M.	0·166		

5. Post-encephalitic parkinsonism. Male, aged 21. Night of Dec. 21st–22nd.

9 P.M.	0·125	3 A.M., specimen broken.	
10.30 P.M.	0·129	4.30 A.M.	0·128
12	0·125	6 A.M.	0·130
1.30 A.M.	0·124		

Serial Determinations of the Plasma Cholesterol in Epileptics.

Group 1. Series not including an attack.—Nos. 6 and 7 (G. H.). Two serial estimations, first during the morning of July 9th, and next during the night of Nov. 5th–6th. Last fit in No. 6 on July 6th, next on July 11th. Last fit in No. 7 on Oct. 30th, next on Nov. 6th. Drugs (routine): bromide grs. 10 in morning and grs. 20 with grs. 2 of luminal at night.

No. 6.	July 9th.	No. 7.	Nov. 5th–6th.
11.30 A.M.	0·119	10 P.M.	0·125
12.30 P.M.	0·119	11 P.M.	0·131
2.30 P.M.	0·119	12	0·119
		1 A.M.	0·125
		4 A.M.	0·122
		5.30 A.M.	0·119

No. 8 (A. C.). During night of Sept. 14th–15th. Last fit Sept. 12th, next on Sept. 17th. Drugs (routine): bromide grs. 20 at night. (See also No. 21.)

10 P.M.	0·131	3 A.M.	0·131
11 P.M.	0·131	4.30 A.M.	0·119
12	*0·119*	6 A.M.	0·110
1.30 A.M.	0·125		

No. 9 (A. E. B.). Night of Nov. 5th–6th. Last fit Oct. 23rd, next on Nov. 14th. Drugs: bromide grs. 20 and luminal grs. 2, at night.

10 P.M.	0·179	2.30 A.M.	0·183
11 P.M.	0·179	4 A.M., specimen lost.	
12	0·186	5.30 A.M.	0·179
1 A.M.	0·179	(See also Nos. 14, 15, 16.)	

No. 10 (H. B.). Night of July 21st–22nd. No fit for a year. Four grains of luminal were given during the night as an experiment, but it had no apparent effect on the cholesterol level.

10 P.M.	0·108	3 A.M.	0·108
12	0·104	4 A.M.	0·101
2 A.M.	0·108	6 A.M.	0·108

No. 11 (A. G. M.). Night of Nov. 5th–6th. Last fit early morning of Nov. 5th, next on Nov. 24th. No. 32 is from the same patient during a night when a fit occurred. Drugs (routine): nil.

10 P.M.	0·125	2.30 A.M.	0·133
11 P.M.	0·125	4 A.M.	0·109
12	0·125	5.30 A.M.	0·125
1 A.M.	0·130		

No. 12 (S. C.). During day of Nov. 20th. Last fit three days previously, next fit five days later. Drugs: luminal grs. 2 at night.

11.15 A.M.	0·102	3.5 P.M.	0·104
12.5 P.M.	0·099	4.35 P.M.	0·106
1.35 P.M., specimen lost.		6.5 P.M.	0·108

No. 13 (P. E. W.). During day of Nov. 20th, 1928. Major fit a few hours previously; next fit seven days later.

11.10 A.M.	0·093	4.30 P.M.	0·089
1.30 P.M.	0·075	6 P.M.	0·090
3 P.M.	0·088		

No. 14 (A. E. B.). (See also No. 9.) During morning of July 21st. He got up saying he felt he was going to have a fit, but was determined to stop it as he wished to play cricket that afternoon. No fit occurred.

8.30 A.M.	0·204	10.20 A.M.	0·192
9.15 A.M.	0·192	12 noon	0·179

No. 15 (A. E. B.). During night of July 21st–22nd. The sister in charge of the home was confident that a fit would occur during this night, as the patient had been irritable and a fit was due. Last fit June 20th; next August 1st. No fit occurred in July, the average number for other months being three.

8.45 P.M.	0·217	12.15 A.M.	0·156
10 P.M.	0·156	1.45 A.M.	0·168
10.45 P.M.	0·142	3 A.M.	0·105
11.15 P.M.	0·125	6.30 A.M.	0·174

No. 16 (A. E. B.). During night of Sept. 14th–15th. A fit was similarly predicted but did not occur. Last fit August 23rd; next Sept. 20th.

10.5 P.M.	0·147	3.5 A.M.	0·122
11.5 P.M.	0·099	4.35 A.M.	0·147
12.5 A.M.	0·109	6 A.M.	0·139
1.45 A.M.	0·109		

No. 17 (E. S.). During night of July 21st–22nd. This was a patient who was liable to multiple automatic attacks at night, but was then in a period of freedom from attacks. No. 25 is from the same patient when attacks occurred. Drugs: luminal grs. 4 at night.

10.15 P.M.	0·101	3.45 A.M.	0·128
11.15 P.M.	0·174	4.45 A.M.	0·156
12.15 A.M.	0·184	6 A.M.	0·130
1.45 A.M.	0·174		

No. 18 (H. D.). During night of Sept. 14th-15th. Last fit four years previously. Drugs: luminal grs. 2 at night.

10 P.M.	0·128	3 A.M.	0·113
11 P.M.	0·125	4.30 A.M.	0·147
12	0·119	6 A.M.	0·140
1.30 A.M.	0·147		

No. 19 (C. J. H.). During night of Sept. 14th-15th. The attendant at the home felt sure this man would have a fit during the night. The fit occurred at 11 A.M., five hours after the last cholesterol determination. This patient is very rarely convulsed during the day.

10 P.M.	0·128	3 A.M.	0·113
11 P.M.	0·125	4.30 A.M.	0·147
12	0·119	6 A.M.	0·140
1.30 A.M.	0·147		

No. 20. (O. O.). During day of Nov. 20th. Last fit five hours previously. A major fit is usually followed by another in a few hours, but this did not occur on this occasion. Drugs: luminal gr. 1 in morning; bromide gr. 10 at night.

11.5 A.M.	0·119	3.15 P.M.	0·147
12 noon	0·138	4.40 P.M.	0·132
1.40 P.M.	0·114	6.15 P.M.	0·114

Group 2. Series in which fits occurred during observation.—It has not been found easy to collect specimens showing estimations just before fits as their occurrence is so irregular, and so few patients have any but a brief warning. The results which have been obtained are as follows:—

No. 21 (A. C.). During night of July 14th-15th. A major fit occurred at 2 A.M. Fits occurred on nine previous nights and on the following night. No. 8 is a curve from the same patient during a night without a fit.

9.35 P.M.	0·132	1.15 A.M.	0·178
10.5 P.M.	0·114	2 A.M.	0·114*
10.35 P.M.	0·109	2.30 A.M.	0·114
11.5 P.M.	0·119	3.15 A.M.	0·099
11.35 P.M.	0·136	4 A.M.	0·096
12.5 A.M.	0·136	5 A.M.	0·104

*Major fit commenced as this specimen was being collected.

No. 22 (W. H. T.). Night of July 18th-19th, with two major fits at 5.45 A.M. and 7.45 A.M. Previous fit on June 17th. Several fits followed during the two days after the cholesterol determination.

9.30 P.M.	0·132	3.30 A.M.	0·141
10.15 P.M.	0·132	5 A.M.	0·137
11.45 P.M.	0·119	6 A.M.	0·120
1.30 A.M.	0·125	6.30 A.M.	0·120
2.30 A.M.	0·132	8 A.M.	0·150

No. 23 (W. W.). During day, Nov. 21st. Major fit at 10.50 A.M.

10.15 A.M.	0·100	11.15 A.M.	0·094
10.45 A.M.	*0·087*	*11.45 A.M.*	0·110

No. 24 (M. C.). During day, Dec. 14th. A few estimations during a long period of serial epilepsy. Fits at 9.35, 11.20, and 11.55 A.M., and 12.27 P.M.

9.30 A.M.	0·109	11.40 A.M.	0·109
10.10 A.M.	0·116	12.30 P.M.	0·110
10.40 A.M.	0·109	1 P.M.	0·111
11.10 A.M.	0·100		

No. 25 (E. S.). During night of Jan. 25th-26th. Attack of automatism at 0.10 A.M. (See also No. 17.)

10.45 P.M.	0·208	4.5 A.M.	0·181
11.35 P.M.	0·214	5.45 A.M.	0·181
1 A.M.	0·211	6.25 A.M.	0·178
2.35 A.M.	0·195		

No. 26 (H. R. M.). During day, July 22nd. *These estimations made during a severe attack of status epilepticus.* The attack started at 6.5 A.M. and stopped at 7.30 A.M. At 7.10 the patient stopped breathing and was in a very serious condition. Drugs (routine): bromide, grs. 30, at night; luminal, grs. 2, in morning.

7.15 A.M.	0·061	8 A.M.	0·083
7.40 A.M.	0·036	8.45 A.M.	0·093

No. 27 (H. R. M., same patient as 26). These estimations were made in another attack of status, on Sept. 11th, when his condition was not quite so serious. The status began at 5.15 A.M. Thirty major fits occurred between 5.15 and 5.36 A.M. without return of consciousness between. Then fits occurred at 5.46, 5.55, 6.10, and 6.20 A.M., when the attack ended.

5.50 A.M.	0·131	7.20 A.M.	0·104
6.20 A.M.	0·109	8.30 A.M.	0·104
6.50 A.M.	0·108	10.30 A.M.	0·110

No. 28 (L. N. D. L.). During a long attack of serial epilepsy on August 5th: fits occurred at 10.25 and 10.44 A.M. During the previous 48 hours 213 fits had occurred.

10 A.M.	0·101	11.30 A.M.	0·100
10.30 A.M.	0·094	12 noon	0·104
11 A.M.	0·098		

No. 29 (J. D.). Four estimations at the end of a status beginning at 12 noon and lasting 18 minutes. Seven major fits preceded the status, Dec. 7th.

12.35 P.M.	0·110	3 P.M.	0·092
2.30 P.M.	0·110	4 P.M.	0·090

No. 30 (V. T.). Estimations during repeated slight attacks of petit mal which began at 8 A.M. and continued until 11 A.M.

8.45 A.M.	0·125	10.20 A.M.	0·125
9.15 A.M.	0·150	10.45 A.M.	0·135
9.45 A.M.	0·127		

No. 31 (A. H. M.). Dec. 7th. Estimations during repeated attacks of petit mal, beginning at 8 A.M. and ending at 10 A.M., attacks occurring every three or four seconds.

8.50 A.M.	0·114	10.20 A.M.	0·104
9.20 A.M.	0·114	10.50 A.M.	0·131
9.50 A.M.	0·100		

No. 32 (A. G. M.). Night of July 21st-22nd. Fits occurred at 11.57 P.M. and 4.30 A.M. (See No. 11.)

10 P.M.	0·192	1.45 A.M.	0·208
10.30 P.M.	0·192	2.45 A.M.	0·208
11 P.M.	0·160	3.45 A.M.	0·208
11.30 P.M.	0·192	4.30 A.M.	0·240
12	0·165	5 A.M.	0·223
12.30 A.M.	0·178	6 A.M.	0·233
1 A.M.	0·150		

APPENDIX II.

Clinical Notes on Epileptic Patients Investigated.

Nos. 6 and 7 (G. H.). Male, aged 21. Four brothers and sisters died of convulsions a few days after birth, another stillborn. Physically ill-developed and undersized, but much stronger than formerly. Mentally dull. Stricture of posterior urethra (? congenital) treated surgically in 1927. First fit aged 8. About five attacks a month with unconsciousness and partial or complete convulsions. A few automatic attacks in addition.

No. 8 (A. C.). Male, aged 25. Father committed suicide. Mother alcoholic. Father's cousin epileptic. Mentally normal and physically robust. First fit aged 13, ascribed to concussion two years earlier. Large number of major fits, almost all at night, averaging ten a month. Often has fits every night for a week or more at a time. Occasional short attacks of automatism.

No. 9 (A. E. B.). Male, aged 26. Both parents died insane. Formerly of normal intelligence, but now deteriorating mentally. Physical condition good. First fit aged 14. Very large number of major attacks chiefly in small groups.

No. 10 (H. W. B.). Male, aged 25. Severe head moulding at birth. Some asymmetry of chest. Left-handed. Mentally normal. Physically frail. First fit aged 14. Frequent major fits persisted for six years. Recurred a year later in smaller numbers. Last fit recorded Sept., 1927.

No. 11 (A. G. M.). Male, aged 22. Some stigmata. Large and coarse features. Large square hands with thick fingers. Ears, lobules adherent. Slow slurring speech. Some tremor. Poor circulation. Mentally dull and deteriorating. First fit aged 12 (? due to sunstroke). Large number of majors, often occurring in series, lasting a few days and accompanied by some mental confusion. Considerable improvement last six months apparently due to pot. borotartrate.

No. 12 (G. C.). Male, aged 16. Mentally three years retarded and deteriorating. First fit aged 6, occurred within 24 hours of a fracture of the skull. Fits recurred at the age of 10. A year later trephined in right fronto-parietal region and bone, said to be pressing on the brain, removed. No improvement in fit incidence resulted. Now has about seven major attacks a month, the left side being more involved than the right.

No. 13 (P. E. W.). Male, aged 23. Mother hysterical. Physical condition and intelligence good. Mentally rather unstable. First fit aged 3, recurred aged 8. Major attacks have occurred regularly since, with rather increasing frequency, now averaging six a month.

Nos. 14, 15, and 16: see No. 9 above.

No. 17 (E.S.). Male, aged 35. Physical and mental condition good. First fit aged 23, supposed to be due to being blown up and buried a year previously. Major fits, ten in 1927 and two in 1928. Short automatic attacks, characterised by extreme fright and screaming and almost always arising in sleep have occurred for years. The number varies from one up to six a night. The periods of freedom from these attacks are now increasing, and during 1928 he was clear for eight consecutive months. The improvement may be due to luminal, grs. 4, nightly.

No. 18 (H. D.). Male, aged 25. Mother had fits and died of tumour of the brain. Brother died of convulsions while teething. Father intemperate. Mentally a little dull. Physically strong. First fit aged 13, ascribed to a fall.

Very frequent major fits, often in series and sometimes accompanied by grave mental confusion, until in 1924 luminal medication (grs. 2 daily) was started, since when fits have been completely absent.

No. 19 (C. H.). Male, aged 33. Physical condition good. Mentally deteriorating. First fit aged 25, supposed to be due to heatstroke in India. Major fits, all at night, occur at the rate of seven or eight a month.

No. 20 (G. G.). Male, aged 17. One sister insane. Undersized. Face and head asymmetrical. Ears prominent. High palate. Hyper-extensible joints. High grade feeble-minded. First fit aged 10. Mostly major type in groups of three or four.

No. 21 (A. C.). (See No. 8 above.)

No. 22 (W. H. T.). Male, aged 22. Mentally dull and deteriorating. Physically fairly strong. First fit aged 7. Major attacks often in groups of eight or ten spread over three or four days, averaging four or five a month in all.

No. 23 (W. S. W.). Male, aged 12. Physically and mentally normal in spite of frequent fits. First fit aged 11 months, ascribed to fall on the head two months previously. Major attacks occur in groups from one to eight about once a month.

No. 24. (M. C.) Female, aged 14. Physical condition good. Mentally a little subnormal. First fit aged 12 months. Second attack a few years later. During 1928 isolated major fits every two or three weeks, gradually becoming more frequent until the beginning of December, when they averaged 20 a day and are still (1/2/29) continuing at about the same rate.

No. 25 (E. S.). (See No. 17 above.)

Nos. 26 and 27 (H. R. M.). Male, aged 26. Formerly in the Navy. Mentally deteriorating. Physical condition fair. First fit aged 7, said to have followed a fall downstairs. Large and increasing numbers of major fits. Prolonged series of true status epilepticus every few weeks. A case of severe epilepsy.

No. 28 (L. N. D. L.). Male, aged 18. Physically hypotonic. Tremors, some stigmata. Intelligence nearly normal, but conduct very abnormal, especially when fit incidence is high. First fit aged 8. Large numbers of attacks, mostly major in type, occurring very irregularly.

No. 29 (J. D.). Male, aged 28. A sister died of convulsions at 18 months. Feeble-minded and deteriorating. Physically not robust. Slight right hemiplegia. First fit aged 2. Now has about three isolated majors a month, and, in addition, about two attacks of status epilepticus, lasting 15 to 60 minutes, a year.

No. 30 (V. T.). Male, aged 16. Father had convulsions during teething, and mother's mother died of asthma. Mentally and physically normal. First fit aged 7, ascribed to measles. Major attacks average two a month. Also very large numbers of slight attacks consisting of jerking head and eyes to right, and lasting two or three seconds. (These were diagnosed at one time as a sternomastoid tic.) Luminal partly controls the majors, but neither it nor any other drug influences the minor attacks. Occasionally free from minor attacks for a day or two, but more often they occur almost continuously for some hours.

No. 31 (A. H. M.). Male, aged 14. Family history clear. Physically and mentally normal. Many scars due to falling in attacks. First fit aged 7. Very frequent short attacks with loss of consciousness. Often falls. Rapid return of consciousness. May have a day or two free from attacks; on other days attacks are practically continuous. Bromide and luminal medication useless. ? A case of pyknolepsy.

No. 32 (A. G. M.). (See No. 11 above.)

We desire to express our indebtedness to Dr. H. D. Kay for his helpful advice upon many points. The expenses of the investigation were in part defrayed by the Medical Research Council and in part by the London Hospital Epilepsy Research Fund.

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COMPLICATIONS AND MORTALITY OF APPENDICITIS.

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APPENDICITIS, like many other evils, appears to be a by-product of our modern, high-speed, material "civilisation." At any rate, that is the impression left after reading the painstaking researches of Short[1] and others. In spite of the advances of surgery the total death-rate for the disease is not diminishing in this country, while in the United States it increased 30 per cent. in the first 20 years of the century.

TABLE I.—*Mortality per Million from Appendicitis* (Willis,[2] Adams,[3] and H. H. Greenwood[1]).

	U.S.A.			*British Isles.*				
Year ..	*1901*	*1911*	*1921*	*1913*	*1918*	*1921*	*1924*	*1927*
	110	120	144	69	66	72	74	70

The figures given in Table I. are not the same as the case-mortality and do not explain whether the disease is more common or whether it actually has a higher mortality. As it was rare before the latter years of the last century there can be little doubt that it is now more common. Is the increasing mortality in the country where the Ochsner treatment had its origin due to this expectant treatment? This seems hardly likely from the figures given by institutions where it is practised. More probably the disease has become more common or more severe in character.

Comparison with other Abdominal Urgencies.

Some years ago I investigated the results at the London Hospital, taking two periods of a few years each, first about 1900 and then about 1914. The percentage mortality was as shown in Table II.

TABLE II.—*Percentage Mortality.*

Year.	Appendicitis.	Perforated gastric ulcer.	Intestinal obstruction.
1900	27	66	50
1914	6	40	39

I ascribe the improvement to recognition of the importance of early operation and to better after-treatment, principally the use of Fowler's position. While the statistics for institutions have improved, the general death-rate from these diseases has not fallen proportionately. The figures given by Willis[2] for the United States and Greenwood[4] for this country are as given in Table III.

TABLE III.—*Mortality per Million.*

U.S.A.			*Great Britain.*			
Year.	Appendicitis.	Hernia and obstruction.	Year.	Appendicitis.	Hernia.	Obstruction.
1901 ..	110	130	1918 ..	65	64	81
1910 ..	120	120	1927 ..	70	50	64
1921 ..	140	106				

The falling mortality of intestinal obstruction is curious, for in hospital cases the improvement seems so small compared with that obtained for cases where the peritoneum is involved—viz., appendicitis and perforated gastric ulcer. During the same number of years I met 1000 cases of appendicitis and 150 of intestinal obstruction and had practically the same number of deaths in each group—viz., 50—which agrees closely with the published figures.

Case-mortality.

I should put the case-mortality at about 5 per cent. or rather more, judging from my own experience for the past 20 years and the results of other surgeons who give long series. An analysis of cases gives the impression that there is a great variation in the severity of the disease from time to time (Table IV.).

TABLE IV.—*Comparison of Case-mortalities.*

—	Cases.	Mortality per cent.	Date.
Grey Turner[1] ..	1339	6·7	1909–1929
McNeil Love[2]	607 expectant 2706 immediate	3·8 6·7	1920–1924
Gatch and Durman[3]	202	7·2	1924
Greenwood[4] ..	200	—	1927–1929
Warren	1072	6·0	1909–1929

Factors likely to affect the mortality are: (*a*) period, (*b*) age, (*c*) sex, (*d*) accidental complications, (*e*) severity of infection and natural complications, and (*f*) treatment.

(*a*) *Period.*—In my own cases there was a notable difference in series at different times (Table V.).

TABLE V.

Date.	Cases.	Bad cases (per cent.).	Secondary operations (per cent.).	Mortality (per cent.).
Pre-war, 1910–14 ..	433	9·2	3·5	1·3
War, 1914–17	268	10·4		7·4
Immediate post-war, 1919	164	11·4	6·5	8·7
Late post-war, 1921–25	187	9·6	1·6	4·8

The cases labelled "bad" were those with spreading peritonitis or intestinal obstruction or both. It is difficult to grade cases according to severity; the surgeon has to go partly by the general and local condition of the patient and partly by what he finds at operation. Since it is, as a rule, advisable to explore as little of the abdomen as is compatible with dealing with the mischief, it is often impossible to say how far the peritonitis has spread. Grey Turner, in a very interesting communication, reports 1339 acute cases, of which 110 had diffuse peritonitis or severe primary complications, such as intestinal obstruction or pylephlebitis, with a mortality of 33 per cent. He separated off groups of cases with flank peritonitis or localised abscess which, together with simple acute cases—i.e., those without peritonitis (1160 in number)—had a mortality of 2·9 per cent. My observations and notes are not accurate enough for such subdivision, but of 1072 acute cases there were 107 with diffuse peritonitis or obstruction or a combination of these, with a mortality of 41 per cent. The remaining 965, including abscesses, localised peritonitis, and simple inflamed appendices, showed a mortality of 2·6 per cent., which agrees closely with Turner's figures for this class of case.

The 1910–14 cases were consecutive at the London Hospital, as were the next group during the war. There is a higher mortality and slightly higher percentage of severe cases among the second group, and I suggest that this is caused by malnutrition and the absence of many abled-bodied patients who would probably have a lower mortality (see under Age). As a matter of fact, the latter would probably be cancelled out by the greater proportional number of women, whose resistance seems to be higher. The next group forms an interesting series. They occurred immediately after the war, when deficient feeding and the great influenza epidemic may have lowered the resistance of the nation. In addition the series includes practically all the night emergencies at the London Hospital for some months. All these factors together probably account for the poor results, for although the incidence of severe cases only showed an increase of 2 per cent. the patients responded badly to treatment, and there were severe and unusual complications, such as secondary hæmorrhage, wide sloughing of the abdominal wall, and an unusual number of secondary operations—viz., 6·5 per cent., compared with 3·5 per cent. for 1910–17.

The next series, for contrast, represents a practice in an agricultural district. The figures suggest a mortality about the same as that of London in peacetime, but the true mortality is lower, for amongst the nine cases which died the following things happened.

1. A woman who had had an acutely inflamed appendix removed without drainage had done well and was about to get up 14 days after operation when she became acutely ill with signs of some great abdominal urgency. Laparotomy revealed thrombosis of the inferior mesenteric vessels and gangrene and carcinoma of the sigmoid colon.

2. An old man of 65 with myocardial degeneration and fibrillation had an acute appendicitis with abscess. The appendix was removed, and the abscess drained and healed in a few days, but 10 days later, before he left hospital, he succumbed to his cardiac condition.

3. A girl of 6 developed a general peritonitis in 30 hours. At operation there was turbid fluid and lymph all over the intestines and the appendix was slightly inflamed; she died in a few days. It was probably a case of pneumococcal or streptococcal peritonitis, but in the absence of bacteriological evidence I felt obliged to include the case in the appendicitis series.

Excluding these cases, the mortality is a little over 3 per cent.

(*b*) *Age.*—Next to early diagnosis the patient's age is the most important factor affecting the mortality (Table VI.).

TABLE VI.

Age.	Cases.	Complicated cases.	Died.	Mortality per cent.
0–5	21	5	3	14
5–10	122	13	11	9·0
10–15	197	13	12	6·0
15–20	191	20	11	5·7
20–30	281	17	10	3·5
30–40	131	9	3	2·3
40–50	63	14	6	9·5
50–60	47	10	7	14
60–70	11	3	3	37
70–80	7	1	—	—

The mortality diminishes rapidly after the first decade and slowly falls until about the fortieth year, when it again rises sharply. It is curious, but probably only a coincidence, that none of the septuagenarians died. The reason for the greater mortality at the two extremes of life are: (1) The difficulty in diagnosis in children, in whom early appendicitis is often mistaken for dietary indiscretion and unfortunately often treated by parents with a purge. (2) The young also show an inferior resistance to acute infections—e.g., peritonitis. (3) The more elderly seem to have diminished sensibility, so that they take little notice of pain in the abdomen until their condition has become serious. The pain of an incipient appendicitis is probably less severe than that of an intestinal colic from some dietary lapse, and is disregarded. It is surprising how slightly persons of a certain age show the severity of the trouble either subjectively or objectively; for instance, a man of 58 was regarded by his doctor as a case of subacute intestinal obstruction as he had had neither increased pulse-rate nor fever for a week. Two days before I saw him he was relieved by an enema, shortly after which he began to have pain and distension. When I saw him he was distended, and my impression was that of a subacute obstruction which had become acute, probably because of a growth in the colon. Operation, however, revealed fibrino-purulent peritonitis and obstruction from a gangrenous appendix. Cases like this are unfortunately not uncommon, and have a high mortality.

TABLE VII.

Sex.	Number.	Died.	Mortality per cent.
Male	575	40	7
Female	480	25	5·

(*c*) *Sex.*—As might be expected, the female sex, with its greater power of passive resistance, shows a slightly lower mortality (Table VII.).

(*d*) *Accidental Complications.*—By these I mean accessory diseases which either lower the resistance or actually kill the patient, who may have practically recovered from his appendicitis. Mention has already been made of myocardial degeneration, thrombosis of the mesenteric vessels, and gangrene of the colon; to these may be added diabetes, perforation of a duodenal ulcer, and pulmonary embolism. Most of these cases should really be excluded, but it is invidious to make a distinction. These casual complications formed one-sixth of the total deaths.

(*e*) *Direct Complications.*—These are peritonitis, intestinal obstruction and combinations of the two, and are the important causes of death in appendicitis. Direct complications form a large percentage of the whole. In 1072 cases there were 107 direct complications—i.e., 10 per cent., and of these 44 died—i.e., two-thirds of all the deaths. It is often difficult at operation to settle the degree of spread of peritonitis. I have retained the term "spreading peritonitis" for cases where there was matting of intestines by recent lymph with loculated pockets filled with pus, more or less foul, together with redness and distension of the intestine. The type of case where there is merely turbid or semipurulent fluid, widely disseminated amongst the intestines, but without lymph and with but little redness or distension of the intestine (which clinically often suggest peritonitis) have not been included under this heading. Such cases mostly have a fairly smooth recovery, though they may pass into the more severe type. The rate of spread and virulence of a peritonitis cannot be measured in time, but only by the severity of the infection and the resisting powers of the individual's peritoneum. It is almost impossible to say whether a condition of local peritonitis is an early stage of a severe infection, which will probably advance rapidly, or a later stage in a condition which is to some degree held under control by the natural defences of the peritoneum. A good many cases of spreading peritonitis recover; my impression is that those which die are either late, owing to neglect or wrong diagnosis, or especially virulent infections—e.g., streptococcal cases.

Intestinal Obstruction.

These cases form an interesting group, to which insufficient attention has been directed. In 1924[8] I collected my cases and found that I had met 34 during a period in which I had seen 1011 cases of acute appendicitis, but some of the cases had followed operations by other surgeons. In the present series of 1072 patients there were 32 cases of obstruction or obstruction combined with peritonitis. In 1924 I reported 180 cases of obstruction; 68 were strictures, 40 intussusceptions, and 54 bands and kinks. Of the last group no less than 34 were directly due to appendicitis. I do not know how many I have missed and confused with peritonitis. During the discussion on my paper one surgeon of great experience stated that he had never met with the condition, which makes me think that it is often confused with peritonitis and paralytic ileus. The literature on this subject is not extensive; Harrigan[9] describes 8 cases, of which only 3 were immediately post-operative; Rayner[10] notes 3 cases out of 126 cases of appendicitis; Carlson and Marshall[11] among 875 cases of appendicitis found 15 cases of obstruction, of which 8 were immediately post-operative. They make the pertinent remark that possibly a good many cases labelled "acute dilatation of the stomach" are really obstruction of the small gut by lymph bands and peritonitis.

Clinically cases of obstruction due to appendicitis fall into two main groups: (1) primary, and (2) post-operative; the latter may be further divided into immediate and late. By immediate I mean cases which demand attention whilst still in hospital for the primary operation. The late post-operative cases may occur weeks, months, or years after the operation or attack of appendicitis and do not come into the discussion here, though they form a notable percentage of all cases of obstruction of the bowel due to bands and kinks.

Primary Obstruction.

As a rule the whole affair is recent and acute; the symptoms are like those of acute obstruction, but probably with some fever and localised tenderness and resistance in the right iliac fossa, suggesting something more than a simple obstruction. Of this type the following is a good example:—

A woman aged 70 had been ill for 24 hours with repeated vomiting, abdominal distension, and constipation. The temperature was subnormal, the pulse normal, and the right iliac fossa tender. Laparotomy was performed immediately, and showed an acutely inflamed appendix adherent to and kinking the lower ileum, with marked distension of the gut above and emptiness below. Removal of the appendix from its lymph bed automatically released the gut and the patient made a good recovery.

A similar clinical picture may be produced by *cancerous obstruction of the lower colon* with distension of a cæcum, which is becoming ulcerated and perhaps beginning to leak. In middle-aged or elderly persons the distinction between these two conditions is extremely difficult. The following is a less common type:—

A boy aged 8 suffered from belly-ache and occasional vomiting for a month. His appetite was bad, his temperature irregular, and he sweated at night. For two days before I saw him the vomiting had been more urgent and the bowels confined. When seen he had a typical abdominal facies, marked distension of the abdomen, and visible peristalsis of small intestine; his temperature was 100°F. and his pulse-rate 100. Laparotomy was done immediately, and it was found that two or three feet of the ileum immediately above the cæcum were kinked and matted by adhesions. The ileum above was dilated and the colon below collapsed. An acutely inflamed appendix was removed from the middle of the matted coils of intestine and adhesions broken down. As it was uncertain whether the intestinal contents could pass along such a length of damaged intestine, a lateral anastomosis was made between the ileum, above the kinked part, and the cæcum. A valvular cæcostomy was done at the same time and the patient made a good recovery.

Post-operative Obstruction.

This type is pathologically similar to the last, but in addition there is frequently suppurative peritonitis —i.e., pockets of foul pus between adherent coils of intestine. Clinically, in my experience it is commoner and more fatal than the primary variety. The danger is in part due to the greater difficulty of diagnosis, for it is not easy in the early stages to distinguish atonic ileus or early-spreading peritonitis from obstruction caused by a recently formed lymph band. This is partly because the patient has been ill longer and has already been through one operation, so that his vitality is depressed. Complete diagnosis may not be easy, but is less important in the primary cases, since in these it is usually fairly clear that the condition is one of abdominal urgency with signs pointing partly to obstruction and partly to some inflammatory affection, and immediate operation is definitely indicated. The main point is to open the abdomen by the paramedian rather than the iliac incision, so as to give plenty of room if adhesions have to be dealt with or an anastomosis formed.

In the post-operative type diagnosis may be difficult and is extremely important, for, on the one hand, a true mechanical obstruction has to be relieved, and, on the other, inflamed intestine should not be handled and abused if the condition is really a simple peritonitis. The sudden onset of paroxysmal abdominal pains, with rising pulse-rate and falling temperature, in a patient who has been going on smoothly after the original operation is suggestive. When associated with bilious vomit, becoming brown, and a soft abdomen, there is almost certainly obstruction, and there should be little hesitation in operating. Visible peristalsis of the small intestine is, of course, decisive, but to wait for its appearance is to incur grave risks, for it occurs late in the more acute obstructions. Where there is a mixture of obstruction with suppurative peritonitis, diagnosis and treatment are alike difficult, but I cannot help thinking that in some cases expectant measures are adopted when operation would be better.

The following is a fairly typical example:—

A boy of 17 who had been ill for one day was operated on and a gangrenous appendix was removed; there was foul pus in the pelvis, which was drained. Three days later, after good progress, there was severe abdominal pain and vomiting, but an enema gave relief. The next day, as pain and vomiting recurred, the abdomen was opened and the small intestine was found distended above a mass of matted intestine with pockets of pus. The adhesions were freed, a valvular ileostomy with catheter was made in the ileum above the obstruction, and a pelvic drain was reinserted; the patient made a good recovery and was out in a month. Catheter drainage of the ileum in such cases is a life-saving measure and the wound usually heals up in two to three weeks at the latest.

I cannot help thinking that some of the cases called "post-operative obstruction" really had obstruction at the start, but, owing to the small amount seen at operation, obstruction was missed. In the worst class of case the surgeon is on the horns of a dilemma, since too much zeal in breaking down adhesions may spread infection further, yet adhesions must be freed if they cause obstruction.

(*f*) *Treatment.*—We are all agreed that the diseased appendix is best removed, but there is some diversity of opinion as to when exactly this is best done. The main point at issue is the treatment of cases which have been in progress some time, for practically all surgeons admit that in early cases immediate appendicectomy is the safest course. In cases which have lasted some time the bulk of surgeons advocate immediate operation in almost every case, but there is quite a considerable school which adopts expectant measures based on the teaching of Ochsner. These consist mainly in placing the patient in the Fowler position, giving no fluid by mouth, but only rectal saline as nourishment, and possibly also morphia, but only operating if the condition becomes worse. Very good results are claimed by the advocates of this method, but it must be remembered that cases so treated are to some degree selected and very possibly include only those which would have done equally well if operated on immediately. Unless the figures include all the appendicitis cases met with over a reasonably long period the conclusions are not sound. Adams[3] gives the following figures for comparison, quoting Love's statistics for the London Hospital (Table VIII.).

TABLE VIII.

—	*Cases Treated Expectantly.* No.	Died.	Mortality per cent.	*Cases Treated by Immediate Operation.* No.	Died.	Mortality per cent.
London Hosp.	341	12	3·5	1677	95	5·5
St. Thomas's..	211	9	4·2	901	76	8·4

Adams points out that in the latter series there were over 400 cases of general peritonitis with a mortality of 20–30 per cent., and raises the question whether the series treated expectantly contained the same proportion of severe cases—i.e., whether it was a straight series without selection. Deaver and Magown[11] give copious statistics from the Lankenau Clinic from which I quote a few figures.

Of 5488 operations for acute appendicitis, from 1901 to 1919, 327 died.

1901–05	..	Mortality percentage		..	..	10·5
1906–10	..	"	"	..	..	5·6*
1910–15	..	"	"	..	..	3·7*
1915–21	..	"	"	..	..	4·2*

* Ochsner treatment adopted.

In 1918 the mortality was 5·2 per cent., showing the same increase from war and influenza that I found in my own cases. Ashurst[12] gives an account only of severe cases—i.e., those which were drained, as follows: immediate operation, 210; mortality, 10 per cent.; delayed operation and Ochsner treatment: mortality, 35 per cent. Of the latter group, six cases died without any operation, being too ill for it.

Ashurst gives a useful hint about the diagnosis of diffuse peritonitis—viz., that rigidity alone is often associated with the presence of an exudate of turbid fluid in the peritoneum, which is relatively innocuous and often does not need drainage, but if distension is present as well there is probably a definite fibrinopurulent peritonitis. He shrewdly adds that surgeons who practise delay may claim as successes due to delay cases which would do equally well if treated by immediate operation; "only those who look inside the abdomen can know the true condition of affairs during the acute stage." Willis[2] quotes Ochsner as having a mortality of 4·5 per cent. in the early years of the century and one of 2 per cent. in 1924, but gives no details of the number of cases and whether they were a straight sequence.

The advantage claimed by the upholders of expectant treatment over immediate operation seems therefore to be not more than 2–3 per cent., which is less than the differences I have found in my own cases, all treated on very similar lines in series occurring at different times, so that it is hard to believe that waiting is any great advantage. Love,[4] who advocates expectant treatment, does not seem wholly wedded to this method, as he states that in general peritonitis appendicectomy is advisable if possible. It is clear that the cases treated on expectant lines are selected cases and not a straight series. In the same way a surgeon might claim that drainage is bad because the mortality of drained cases is 10 per cent., while of undrained it is about 0·75 per cent.

Time of Election for Operation.

A good deal of stress has been laid upon the danger of operating at a certain period of the disease. This is put variously; perhaps the most usual is to regard the third to fifth day as the time to avoid operation. Personally I find the disease advances with very varying rapidity; some cases are no further advanced in three days than others in 24 hours. Some have spreading peritonitis after a day; others after a week have little but lymph round the inflamed appendix. There can be little doubt that many patients do not notice the earlier symptoms or put them down to dietary indiscretions, and only seek advice when the appendix is perforated or a localised abscess has burst and the condition is serious. Adams[3] remarks that there may be marked pathological changes in an appendix which causes no pain at all and may certainly give rise to no vomiting; if so, the patient may easily make an error of 48 hours in the length of the history he gives. With this view I entirely agree. The expectant method demands enormous care in watching for any adverse symptoms which may suggest immediate operation. Pulse-rate and temperature will have to be taken two-hourly and the abdomen must be frequently inspected; even then mistakes are easy. One case of this type always recurs to me.

At a children's hospital the resident one morning said to me: "I wish you would see a child who, I thought, had appendicitis last night, but to-day I am not at all sure about it, and think I may have been mistaken." I examined the boy and could find no tenderness or rigidity of the abdomen; there was no pain and the pulse and temperature were normal. Knowing the resident to be a careful man I replied: "Although I can find no signs now, since you found them last night I believe it is wisest to operate." I did so, and found a completely gangrenous appendix with little or no effusion. The child made a speedy recovery; waiting might have meant disaster.

I have met with many similar cases though seldom quite so dramatically. Another danger arises from mistakes in diagnosis. I well remember a former colleague of mine telling a story against himself. He had decided to adopt the plan of waiting between the third and fifth day in cases of appendicitis with a mass in the right iliac fossa. The first case on which the plan was tried proved to be one that did not improve; so laparotomy was done next day and revealed an intussusception. A twisted ovarian cyst may mislead in the same way, though this is a less serious error. A distended and leaking cæcum above a cancer of the colon, or a slowly leaking duodenal ulcer, might be mistaken for appendicitis, with disastrous results if the patient be treated on expectant lines.

I feel that one cannot judge the condition of the appendix with sufficient surety by the clinical progress of the case, for the condition found at operation is frequently more severe than would be expected from the physical signs. (The converse also is true, but of less consequence.) Expectant treatment can only be used in institutions where the patient is constantly under skilled observation, and even then it may have to be given up for active measures, with loss of valuable time and additional danger. My impression is that delay should only be practised where conditions are very unfavourable for operation, either because the patient has some additional disease such as pneumonia, nephritis, and diabetes, and the appendicitis does not appear to be severe, or where the local conditions, as at sea or far from civilised appliances render the success of any operation problematical.

Scope of the Operation.

It is very important to consider how much should be done in the more severe cases. It is just as important not to do too much as to do too little. In the earlier cases the appendix can usually be removed with little difficulty, but where the disease has been present for some time it may be wiser simply to drain any abscess (it should be noted that it is easy to miss loculations of pus, where more than one are present) and leave the appendix for a future operation, I find that I fail to remove the appendix in about 1 case in 20. Judging from the remarks of Love, some surgeons are too anxious to remove the appendix at all hazards in every case, and thus sometimes do harm by breaking down adhesions and spreading infection. If the appendix does not come to hand in about five minutes, it is best to be satisfied with opening the collections of pus in cases where the adhesions are many, dense, thick, and œdematous. The only reason for going further is the relief of obstruction, where this is present, by division of adhesions and possibly by cæcostomy or ileostomy. Except in the more difficult cases such an operation will not take more than 10 to 15 minutes and may not take more than five.

The Incision.

This will depend on the type of case and the habits of the surgeon. The muscle-splitting, paramedial, and pararectal lines of approach all have staunch advocates, and I note that Grey Turner[8] recommends muscle-cutting in the right iliac fossa for cases where drainage is needed. I was not impressed with the results of this method which I used to see when I was house surgeon, and I determined never to use it. In those days it led to trouble from vomiting and prolapse of intestine. But this may have been due to the use of heavy gauze packs as well as to the type of incision. I have made more use of the muscle-splitting incision than any other, but where the diagnosis is uncertain or complications, such as obstruction are likely, and in women, I frequently employ the paramedial, displacing the rectus muscle outwards. Some surgeons think that drainage through the muscle-splitting incision is poor, and suggest a suprapubic stab, but I have not been struck by any great advantage in this. In about 4 per cent. of all cases in this series there was need for a secondary operation for draining a residual abscess or for obstruction. The advantages of an incision in the right iliac fossa in the early definite cases are obvious, as there is far less risk of spreading infection amongst the small intestines; moreover, it is much easier (and therefore safer) to reach the appendix, and by extending the splits in the layers of muscles widely a very free exposure can be obtained. Where the condition is advanced the problem is somewhat different, as the surgeon must be able to cope readily with pockets of pus disseminated amongst the coils of small intestine and to relieve any mechanical obstruction. The nicest judgment is needed if he is to exert the right amount of interference in these patients, for in one case the adhesions may be walling off infection from susceptible areas and in another a quite recent and apparently delicate band of lymph, which is broken by a touch, may be obstructing a loop of ileum quite as effectively as an organised fibrous band. He should keep a very sharp look out for coils of distended small intestine, and if, when he has broken down lymph bands, the coils do not readily empty into the lower intestine, a valvular enterostomy may save life and be useful both for the administration of saline and the evacuation of gas and liquid fæces.

Drainage.

The percentage of cases drained is some criterion of the severity of the series, but allowance must be made for the predilections of individual surgeons, whose ideas of when to drain vary considerably. Greenwood,[4] who must be congratulated on recording the most successful series of cases, gives the impression that he drained only 18 per cent. and that Grey Turner drained 26 per cent. (My interpretation of the latter's communication is that more than half were drained, and expresses surprise that Flint records 1080 acute cases from Leeds, of which presumably half required drainage. I have drained about half my cases. All this goes to support my view that appendicitis varies in severity from causes associated with time and place. Greenwood advocates draining through the loin when pus is present there. This sounds reasonable, but in my earlier days I remember seeing this done fairly often and always being struck by the way pus refused to come out of a loin tube, even when the patient was lying on his back (I refer to the days before Fowler's position was employed), while it came readily through a tube in the right iliac fossa. Consequently I have never employed this mode of drainage.

Drainage through a muscle-splitting incision is said to be bad, but I have not found it so. In about 4 per cent. of my cases a secondary operation was needed for residual abscess or obstruction, and, while it is true that some of these were in patients operated through the right iliac fossa, others had been done through the paramedial route. My usual plan is to keep a tube down into the pelvis (when this needs draining) for two days and then shorten the tube, so that it just goes through the abdominal wall; I usually omit it about two days later. If the tube comes out too early a residual abscess may form, but if it is left in too long the pressure may cause a fæcal fistula. More than one-third of the cases of obstruction occurred before any operation was done, but the possibility of a drainage-tube causing *complications* such as obstruction makes it important to take the tube out as soon as possible.

Conclusions.

1. Appendicitis appears to be developing a more severe character or is more common.
2. The disease shows a considerable variation in its severity, depending on time and place; the mortality in my experience varies from 3 to 10 per cent.
3. Expectant treatment may give good results in certain hands, but as a general measure its advantages are not proved and its wide adoption might lead to further disasters. The mortality is greatest in children, who are certainly not cases for expectant treatment, owing to the rapid and insidious way in which complications, such as peritonitis, develop in young subjects, and their liability to acidosis from starvation.
4. Early diagnosis and immediate operation are the counsels of perfection, but failure to diagnose early is by no means always the fault of the practitioner, for in children and old people the diagnosis may be quite difficult, and many persons regard a stomach-ache too lightly and do not send for the doctor till they have developed a well-marked peritonitis.
5. The main causes of death are peritonitis and mechanical obstruction; the latter can be very largely prevented by suitable technique at operation, and a careful watch should be kept for this important complication.

(*Bibliography at foot of opposite page.*)

Clinical and Laboratory Notes.

ACCESSORY SPLEEN WITH RECURRING TORSION OF ITS PEDICLE.

BY R. CHARLES ALEXANDER, F.R.C.S. EDIN.,
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CASES of accessory spleen giving rise to symptoms which call for surgical interference are rare. In 1914 I published, with Archibald Romanes, a paper[1] recording a case which came under our observation and giving a short review of similar cases from the literature. The interest of the present case is enhanced by the fact that, owing to its resemblance to the former case, a correct preoperative diagnosis was made.

A housewife, aged 35, was admitted to my wards in the Dundee Royal Infirmary in June, 1929, on the recommendation of Dr. J. Wilson of Anstruther. She complained of recurring attacks of pain in the abdomen, and of a lump, which she had felt in various situations in the abdomen. The pain was of a burning character and the attacks lasted about three days. During the two years previous to admission, the interval between the attacks had gradually diminished from six to two months. The pain was situated above and to the left of the umbilicus, and usually came on when she was tired; it was more severe if it coincided with a menstrual period. It was not accompanied by vomiting, but there was sometimes a feeling of nausea when she stooped. During the attacks of pain she had felt a lump in the upper abdomen "about the size of a small orange," and she volunteered the statement that the lump was larger during the menstrual period. Between the attacks she felt well; there was no dyspepsia, and the bowels moved freely. She had lost weight during the preceding four months. There was a family history of tuberculosis, and after the birth of her first child some years ago she had had a bilateral pleural effusion which had taken some time to clear up.

She was a woman of poor physique and looked rather tired. The abdomen moved freely, and from time to time one could grasp a firm spherical tumour, about the size of a tangerine orange. It was tender to touch and could be moved rather freely about the abdomen. There was no ascites and the percussion note showed no enlargement of the liver or spleen. Rectal examination was negative. Radiographic examination with and without barium failed to reveal any abnormality in the alimentary tract. The blood count showed some increase of the red cells—viz., 6,050,000.

I was encouraged by the resemblance to the former case to make the preoperative diagnosis of accessory spleen with recurring torsion of the pedicle. The possible alternatives were an omental cyst, or a mass of tuberculous glands. The latter would possibly have shown calcified areas in a radiogram. The increase in size of the tumour during the menstrual period suggested that it was of glandular origin.

On June 13th laparotomy was performed under general anæsthesia. A perfectly spherical red tumour was found attached by a thin pedicle about three inches in length to the centre of the anterior aspect of the gastro-hepatic omentum, the pedicle allowing the tumour to swing freely in the abdomen. The pedicle was ligated and the splenculus removed. The spleen was normal in size and position, and no other splenculus was detected. The other abdominal viscera were normal, except the appendix, which was long and buried in adhesions. This was removed and the abdomen closed. Recovery was uneventful.

It seems probable that up to two years before the operation the splenculus was sessile and gave rise to no symptoms, their onset being determined by the formation of the pedicle, torsion of which produced congestion in the organ with resulting pain. Prof. L. R. Sutherland reported that the section on microscopic examination showed the appearance of normal spleen; there was no evidence of hæmorrhages or fibrosis, as was seen in the specimen from the previous case.

Since the publication of the previous paper, I have sometimes noted the presence of small splenculi at operations. None has been larger than a filbert. I have occasionally found them in relation to the greater curvature of the stomach when I was performing partial gastrectomy frequently in the pedicle of the spleen near its hilum, and occasionally in the great omentum. I have seen no record of other cases similar to the two I have recorded, but R. Finaly[2] notes the presence of an accessory spleen in the sac of a left inguinal hernia, the spleen being attached to the upper pole of the epididymis. He quotes a case reported by Sneath where an accessory spleen simulated a third testis and was connected by fine cord-like attachments to the normal spleen.

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[1] THE LANCET, 1914, ii., 1089.

[2] Nederland. Tijdschr. v. Geneesk., July 24th, 1926, p. 397 (quoted in Brit. Med. Jour. Epitome of Current Med. Lit., 1926, ii., 40).

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THE USE OF BONE-PLATES IN THE TREATMENT OF FRACTURES.

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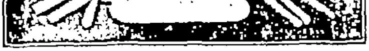
DURING 1920, when I was visiting surgeon on the staff of the Orthopædic Hospital, Beckett Park, Leeds, I used bone-plates and bone-pegs in six cases of ununited fracture of the humerus and showed the later successful cases at the Leeds and West Riding Medico-Chirurgical Society. The idea originated in a paper by Gallie and Robertson,[3] although Hey Groves[4] had previously used bone-plates fixed by metal pegs in a somewhat similar manner. To avoid the elaborate and tedious manufacture of bone-screws with the tapping-out of corresponding holes in the bones, I used bone-pegs square in section and tapering slightly. I found that these grip sufficiently firm to hold the fractured ends in good apposition and can be expeditiously inserted. I have continued to use them for certain cases ever since and find that their sphere of usefulness lies mainly in the more deeply seated fractures, where a subsequent operation for the removal of a metal plate which has, so to speak, outworn its welcome, is a serious undertaking. For the more easily accessible



Bone-plates and pegs.

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[3] Gallie, W. E. and Robertson, D. E.: Brit. Jour. of Surg., 1919, vii., 211–202.

[4] Groves, E. W. H.: Ibid., 1918, p. 330.

fractures, such as those near the distal end of the radius, ulna, or tibia, the metal plate can still claim advantages which scarcely need emphasising.

The accompanying photograph illustrates plates and pegs. The pegs are shown inserted in the upper plate in position, but they are too large for the holes and should sink through for about three-quarters of their length. After being driven home the projecting ends are nipped off with sharp bone-forceps and the rough end filed down level with the plate. Care should be taken not to use too powerful a blow when driving in the pegs, lest the plate be split. The bone-plates are slightly hollowed on the under surface to allow of close apposition to the bone. Both plates and pegs are prepared as Mr. Hamilton Bailey[5] directs, that is, by boiling for 20 minutes on three successive days. Their strength is apt to become impaired by too prolonged boiling.

A CASE OF SPASM OF THE CERVIX UTERI.

By L. J. Green, M.R.C.S. Eng.

I should like to know whether the following case is to be regarded as exceptional.

The patient, aged 25 and healthy, had had one previous uneventful confinement, and was first seen in labour at 8 A.M. The abdomen was much distended, the os four-fifths dilated, the membranes bulging but unruptured, and no part could be felt presenting. Pains, felt only in the lower abdomen, were occurring every three minutes. The patient, having had no sleep, was tired out, labour having commenced at 6 P.M. on the previous evening. She was of a babyish type with small power of endurance and control, moaning and crying for help. The fœtal heart was heard beating to the left of the umbilicus. At 10.15 A.M. the condition of the os and membranes was unaltered, but the head could be felt presenting and the pains were stronger and felt in the sacral region.

At 1 P.M. the patient was screaming for "help," with such phrases as "take it from me." As the os seemed fully dilated and the patient was much exhausted and the abdomen was distended, it was deemed advisable to rupture the membranes. After doing so the hand was temporarily withdrawn from the vagina and the patient immediately re-examined to determine the exact presentation. I was astonished to find that the os was now only two-fifths dilated, the sensation imparted to the fingers unmistakably suggesting considerable muscular tone. I was so astonished that I examined the patient with unusual persistence and deliberation. It seemed certain that the previous diagnosis of full dilatation of the os must have been mistaken and that the patient was in reality in the early part of the first stage of labour. In view of her sleepless night and her poor psychological make-up I decided to adminster a sedative. She was informed that delivery was some distance ahead, advised to compose herself, and given omnopon gr. ¼ hypodermically, whilst a hot enema was ordered to clean out the bowel, which was discharging a little fluid fæces with each pain. The fœtal heart was then heard beating one inch below and to the left of the umbilicus.

At 2.15 P.M. there was an urgent telephone message. A live, male child of 8 lb. had been born precipitately.

The only explanation of this case appears to be that following the manual rupture of the membranes, the cervix went into an unusually strong spasm which rapidly passed off. It is, of course, conceivable that I was mistaken (1) in the diagnosis that the os was fully dilated, made before rupture of the membranes; (2) in the diagnosis made after rupturing them that the os was only two-fifths. These possible errors can be eliminated (*a*) because the os was four-fifths at 8 A.M. and 10.15 A.M., (*b*) because of the particularly careful examination after finding that the os was two-fifths.

The spasm of the cervix may have been a neuromuscular disorder due to a sleepless night, the patient being restless, weak-spirited, terrified, very fat and uncomfortably distended abdominally. But more remarkable than the sudden onset of the spasm is the rapidity, as acute as its onset, with which it must have subsided, with most humiliating sensations on the part of the obstetrician, who was not equal to the intellectual emergency and whose judgment must have seemed so wide of the mark. Was this rapid subsidence of the spasm of the cervix due, one wonders, to the omnopon and connected with the patient's immature psychological status?

Medical Societies.

MEDICO-LEGAL SOCIETY.

At a meeting of this Society held on June 27th, Sir William Willcox took the chair, and Dr. E. Temple Gray read a paper entitled

The Medico-Legal Expert in France.

The difference between the status of the *médecin légiste* and that of the medico-legal expert in England was, he said, essentially due to the wide difference in legal procedure between the two countries, and especially to the difference in the position of witnesses. Crime was investigated by the officials of the Parquet, which was a department of the office of the Ministère Publique, and was so-called because they sat at a table below the bench, on the floor of the court. It was possible for the prosecutor to find himself, later on, on the bench to try the case with the earlier stages of which he had been concerned. All the evidence was heard in the form of statements, which were not taken on oath, and were known as *procès verbaux;* no oral evidence was heard until the actual trial before the superior court. When the case opened before the Cour d'Assise, the clerk read over the charge, the Ministère Publique might open, and the witnesses answered their names and retired to a separate room. They gave evidence, but could not be interrupted; they made speeches. The object of this procedure was, in theory, that their evidence should be spontaneous. In practice, however, they had plenty of time to prepare it. A witness might change a statement which he had made before the Parquet, and the court might listen to hearsay. Journalists, politicians, and professors of philosophy were in special request as witnesses. Cross-examination, as understood in this country, was quite unknown. Witnesses for the defence were heard, and the defending counsel spoke last. There was no summing-up, but the questions for the jury were agreed by both sides or fixed by the court.

Whereas medical witnesses in England enjoyed the same privileges and disabilities as other witnesses, in France their position was laid down specially in the civil code. *Médicins légistes* were organised into panels, which were composed of specialists in various departments of medicine, who need not possess the Diploma of Legal Medicine. The panel also contained a large number of men who in this country would be police surgeons. Besides this peculiar status, the medical witness in France had another privilege; the civil code imposed on him a very stringent *secret professionel.* The medical man was the first person mentioned in this provision, which gave a schedule of professions whose members were forbidden to divulge confidences they had received in their professional capacity. A third factor contributing to the authority of the medical witness was the great importance which the court attached to the written reports of evidence, and the small part played by oral testimony. These *procès verbals* were not verbal, but survived from mediæval times, when the police and other officers of State were unable to write. French law defined a large number of functionaries who were allowed to make verbal reports, which were accepted without question in a court of law.

The medical expert was, for all practical purposes, called by the judge; he was named in much the same way as an English coroner named his autopsist. An expert "committed" to make an inquiry signed a declaration before the *juge d'instruction* that he would report on faith and conscience, and on his report, upon which he would probably not be cross-examined, depended the technical evidence which would come before the court. He was invited to say whether responsibility attached to any person, and whether any action should be taken on the preliminary police inquiry. In a case of rape, for instance, he might be asked to describe the signs of the victim's resistance, and when insanity was pleaded in defence he would report on the responsibility of the accused. If two alienists decided that an accused person was not responsible, their report would be more or less conclusive.

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[5] Bailey, Hamilton: The Lancet, 1929, i., 820.

The Medico-Legal Institute of Paris.

In 1903, the old Morgue had received the name of the Medico-Legal Institute, partly in deference to popular prejudice, and partly because the serious teaching of medical jurisprudence began there in that year. The present building, a splendidly equipped affair, had been opened in 1923. The bodies of all persons who died in Paris under circumstances requiring investigation—roughly 2000 every year—were sent to the Institute, which was also the centre for all medico-legal inquiries and examinations for workmen's compensation. The finances were rather complicated, as they were divided among three bodies; the first two would roughly correspond to the Home Office and the London County Council, and the third, the medical faculty, had no counterpart in London. The building was organised into two departments. The first, which was more or less deserted, contained what was ominously called the reception room; the autoclave, for disinfecting the clothes of the bodies; a large *vestière*, in which all bodies were classified; and spacious refrigerating cellars where they were stored. Refrigeration was performed by an ammonia plant which only needed to be worked for six hours a day. Bodies were kept at about 10 degrees of frost before examination and at freezing-point afterwards. This provision greatly assisted the autopsist. Small refrigerating safes were provided for viscera and fœtuses. There were also a waiting-room and chapel. The second, the busy part, held the headquarters of the medico-legal school and the departments of identification, pathology, and toxicology. It contained post-mortem rooms; pathological, toxicological, and research laboratories, a library, and a museum. The Dean of the School presided over the *Service d'Identification*, which did for the police much work not necessarily performed by teaching authorities in this country, consisting roughly of the identification of weapons, clothes, and other material. The scientific side of the institute was presided over by the municipal authorities, who had full control of the material. In contrast to the practice in England, an expert who was not on the teaching staff could not perform autopsies in this department, and the students therefore lost the advantages of his experience.

Dr. Temple Gray referred to the special committee of the Medico-Legal Society, which had been appointed some years before to consider and report on the possibility of founding a similar institute in this country, and suggested that it should resume its work.

Discussion.

Dr. LETITIA FAIRFIELD said that the committee of the Society had left the situation in an unsatisfactory position, but that the obstacles to the plan were not always realised by the public. The first difficulty was the position of the coroner in this country. The coroner's court was a magnificent institution, but it would be difficult for a medico-legal institute to collect all the material into one centre, and have it examined and dealt with by experts under the authority of the criminal court, without encroaching on the province of the coroner. The second difficulty was constituted by the very complicated organisation of the University of London. Edinburgh and Glasgow, in which medical instruction was centralised, possessed excellent medico-legal institutes. In London, however, the concentration of teaching material in one centre would immediately create difficulties with the many medical schools. The third difficulty lay in the very intricate relations between the London County Council and the coroners' courts in the various boroughs. The fact, however, remained that there was a great need for a medico-legal institute in this country, not only to concentrate the best teaching of medico-legal methods, but also to ensure that crime should be dealt with in the most scientific and up-to-date manner, which, whatever the public might think, was not the case at present. All these difficulties were simple questions of organisation, and could be overcome. The real trouble was that it was nobody's business to defray the initial cost. To create an institution similar to that of Paris would require a considerable capital sum, and none of the various bodies concerned—the Home Office, the London County Council, and the University of London—felt sufficiently interested to justify the expenditure. If some great philanthropic donor could be induced to realise the vital importance of this project to British medicine, the other obstacles would very soon be overcome. This country performed some of the finest medico-legal work in the world, but instruction in the subject was not organised, and encountered unique barriers. Dr. Fairfield hoped that the committee would spare no pains to produce a solution.

Dr. E. MACNAMARA asked whether the defence also was allowed, under French law, to call expert witnesses, whether they were subject to cross-examination, and what importance was attached to their evidence as opposed to that of the official experts.

Mr. E. R. BOLTON suggested that the scope of the medico-legal institute should include the work of the analyst, which was closely allied to that of the doctor but was very little studied from the legal aspect. He felt that cross-examination was a vital part of expert evidence, and produced the most valuable testimony.

Mr. E. HINKS agreed with Mr. Bolton on the importance of the chemical side of medico-legal work. He quoted the remark of a legal friend that, in practice, everybody concerned in an English criminal trial knew the criminal's record, and suggested that in reality the English procedure might therefore not differ greatly from the French, in which the prisoner's antecedents were made public at the opening of the case.

Mr. A. CREW declared, on the contrary, that the jury, who had to decide the facts, did not know the prisoner's record, and that if they ascertained it by accident the trial was generally held to be invalid. He remarked that in this country the medico-legal expert was usually regarded with suspicion—in many cases rightly so—and inquired how he was regarded in the public opinion of France.

Sir BERNARD SPILSBURY corroborated Dr. Fairfield's exposition of the difficulties in the way of founding a medico-legal institute in London. When the institute came into being—for he regarded its foundation only as a matter of time—a fresh difficulty would arise, that of planning a building and an organisation for a volume of work which was now very difficult to estimate, but which would certainly be three times as heavy as that of Paris. It was hard to see how a large enough expert staff was to be recruited. There would, however, be little difficulty in centralising inquests, for recent legislation had permitted the transfer of a body from a coroner's court to any suitable centre for investigation. It would be impossible to model an English institute upon any given continental one; the organisation would have to grow from small beginnings along lines dictated by conditions in this country. Any institute would be an improvement on the present unsatisfactory procedure, which kept medico-legal experts out of touch with workers in other branches of medicine. It was, however, useless to consider the question until the financial problem had been solved, as, from the cost of foundation, the expenses of the institute would have to be defrayed for the first few years. It would be impracticable to house the institute in any existing building, such as a discarded poor-law infirmary, for its work could only be carried out in a building specially designed for the purpose. Until the general public appreciated the necessity for an institute, or some serious disaster occurred, it was unlikely that any Government would take up the matter.

The CHAIRMAN inquired whether, in Dr. Temple Gray's opinion, the accused in France had such a fair chance of receiving justice—or of being acquitted—in France as in England. Reports of *crimes passionels* suggested that many persons were acquitted who would certainly be convicted in this country. He doubted whether teachers of forensic medicine in London could find the time to travel to a central institute.

Dr. TEMPLE GRAY, in his reply, stated that the French prisoner received equal justice with the English. Getting justice and being acquitted were not the same thing. French juries were very lenient, and their sentiment tended to balance any bias which the procedure might give to the prosecution. The jury might send for the President of the Court to inquire what effect their recommendation to mercy would have on the judgment. In addition to the official experts, it was the custom to nominate others of a lower standing to check their work. These, although not officially called by the prisoner, substantially assisted in his defence. The judge might ask an expert to attend and explain his report—rather an ominous invitation. Given the right teacher, a medico-legal institute could be started in a shed; the first toxicological bureau in Paris was housed under thoroughly insanitary conditions in the old Morgue. The future London medico-legal institute should start from the same small beginnings. The French were one of the most economical people in the world, and if they could afford an institute this country could, but the project would not be realised by the provision of a large sum of money. The first step towards a solution was to consider the manner in which the various institutes of the world had overcome their difficulties. It was essential that the medical profession be corporately represented on the managing board. Medico-legal experts in France were, on the whole, estimated by public opinion at their individual value. Dr. Temple Gray ended by pleading that, when the proposed institute was founded, the Medico-Legal Society should take a fitting part.

ROYAL SOCIETY OF MEDICINE.

SECTION OF UROLOGY.

A MEETING of this Section on June 27th, with Mr. SWIFT JOLY in the chair, was devoted to cinematographic demonstrations of three operations—prostatectomy, litholapaxy, and urethrotomy—performed by Sir John Thomson-Walker. The last of these films was accompanied by a talking film, a clearly enunciated description being given as each step of the operation was undertaken. The meeting, a large one, showed high appreciation of the demonstration, and this was expressed in a few words by the PRESIDENT.—Mr. FRANK JEANS, Mr. F. E. FEILDEN, and Mr. F. M. LOUGHNANE commented on details, after which Sir JOHN THOMSON-WALKER expressed his thanks for the assistance he had received from Mr. C. P. G. Wakeley, to whom he was indebted for the idea, and from the staff of the Department of Urology, King's College Hospital. The spinal anæsthesia had been given by Mr. Cecil Hughes. He could not speak highly enough of the work of the Medical Department of the Kodak Company. They had provided conditions under which a student could sit and quietly watch operations much more easily than if he was present in a more or less crowded operating theatre. The sound reproduction was carried out by the His Master's Voice Company, and hearers would judge of its success; if there were faults, they were faults of the speaker, not of the reproducer. An important question was, what was the value of moving pictures from the educational standpoint? He thought the profession was on the threshold of a good deal of change in this respect. It was well known to be impossible to show every student every sort of case or every sort of operation, but this new method enabled him comfortably to see and study half a dozen in an afternoon. Thus, he was sure, the means at the disposal of the Universities and teaching hospitals would be supplemented—he did not say they would be entirely changed—by this combination of moving picture and sound reproduction.

Sir John Thomson-Walker was cordially thanked.

Reviews and Notices of Books.

BIBLIOTHECA OSLERIANA.

Collected, arranged, and annotated by Sir WILLIAM OSLER. London: Humphrey Milford, Oxford University Press. 1929. Pp. 786. 63*s*.

THIS is the catalogue of the books illustrating the history of medicine and science collected, arranged, and annotated by Sir William Osler, and bequeathed by him to McGill University, Montreal. It is a vast volume of 786 quarto pages and shows Osler's catholicity. In the bequest to McGill we see the design of the testator to make the library possess a definite educational purpose, and this it does and much more also with its assistance. The plan of the catalogue was foreshadowed in 1911 and the work occupied Osler's few leisure moments throughout the intervening period until his death in 1919. Its preparation helped in some measure to mitigate the anxiety which the war brought him, an anxiety so sadly justified in the event, and at the time of his death the general outline had been sketched. It has fallen to Mr. W. W. Francis, the librarian of the Osler Library, Mr. R. H. Hill of the Bodleian Library, and Mr. Archibald Malloch, librarian of the New York Academy of Medicine, to complete the task by issuing the catalogue, their work being made possible by the whole-hearted coöperation of Lady Osler, who regrettably did not see the work finished.

The object of the index as laid down by Osler was to enable the hard-pressed student to learn first the evolution of knowledge in any subject and, secondly, the life and work of the men who made the original contributions; the general idea thus was to present in a comparatively small number of works the essential literature centring about the men of the first rank, arranged in chronological order. The Bibliotheca Osleriana, comprising about 7600 bound volumes, is grouped into eight sections as follows: (1) Prima: the beginnings (early civilisations), the medicine of the Greeks and the Arabians, the science and medicine of the Middle Ages, and the science and medicine with its scientific foundations and alliances of the sixteenth century down to the present day. (2) Secunda: the works of men which have some special interest but which are not so important as those in the Prima. (3) Litteraria: books dealing with the literary vocations and hobbies of medical men, with the relations of medicine and science to the world of letters, medical and philosophical poems, and "medicated" novels, or novels containing medical characters. (4) Historica and (5) Biographica: general histories of medicine and the stories of special medical movements or institutions. (6) Bibliographica: includes a vast collection of important catalogues. (7) Incunabula: a collection of more than 100 works printed before 1500. (8) Manuscripta: a collection in many languages comprising nearly 300 specimens, and including some of the collector's own writings.

It will be gathered that we have here a work of reference of the highest value both to individual students with many different wants, to those who want to correct or revise or criticise, and to all librarians. The advantage of sectional arrangement for reference is made available by a full and careful index of some 80 pages. It is unfortunate that the introductions which Osler intended to write as headings to the sections were never written, for his explanation to students how the Bibliotheca Osleriana was to be used would assuredly have made delightful reading. How to obtain and to pursue a knowledge of the history of science and of medicine would have been the very theme for his bright, learned, and logical pen, while the essays would certainly have constituted a wonderful commentary upon his own life—the life of the untiring and loving student.

While the library here catalogued constitutes the bulk of the literature brought together by Osler with a definite educational purpose, his bequests to the Medical Faculty of McGill did not exhaust his collection, for to Johns Hopkins University in Baltimore he left a collection of works, chiefly modern, on the arteries, blood, and tuberculosis, while to the Tudor and Stuart Club, at the same University, he left a collection of important editions of English works in memory of his only son Edward Revere Osler, who was killed in the war.

Recent Advances in Ophthalmology.

Second edition. By W. Stewart Duke-Elder, F.R.C.S., *Assistant Ophthalmic Surgeon, St. George's Hospital.* London: J. and A. Churchill. 1929. With 4 coloured plates and 110 text figures. Pp. 405. 12*s.* 6*d.*

A second edition of this work has been called for within 18 months of its original publication. The author has taken the opportunity to add new matter based on as many as 370 additional references and has still managed to keep the volume to a reasonable size. The new work on the eye here described can only be followed by those medical men whose knowledge is based on a fairly broad scientific foundation. In the first chapter the accounts of the structure of the atom and the nature of radiation take the reader at once into deep waters; in the last, a discussion of those aspects of Pavlov's experimental work which tend to prove that all cerebral action is reflex leaves him in a whirlpool. The new work detailed in the intermediate chapters is for the most part easier to grasp. The "chronaxie" of the retina—that is, its sensitiveness to electric stimulation of a certain duration—has been found to differ in different parts, the required duration being greater in the periphery than in the foveal region; this result is not surprising in view of the distribution of the rods and cones. In the chapter on embryology the important additions to our knowledge arising from the recent work of Miss Ida Mann have been incorporated.

From the clinical standpoint the chief interest of the book is found in Chapters IV., V., and VI. Chapter IV. is devoted to the newer methods of diagnosis—the slit lamp, ophthalmoscopy with red free light, and the examination of the angle of the anterior chamber by the gonioscope, and Chapter V. with the vascular circulation, the nature of the intra-ocular fluids, and the intra-ocular pressure. Much attention is devoted to the origin and nature of the vitreous. Its chemical composition is practically identical with that of the aqueous, with the addition of two constituents which, absorbing water and swelling up in solution, give rise to increased viscosity, elasticity, and a certain amount of solidity. A substance in this state is called by physicists a "gel"; it is structureless except to the ultra-microscope. In Chapter VI. the three diseases discussed are retinitis, glaucoma, and cataract. The problems connected with glaucoma do not appear to have advanced much nearer to a final solution. Mr. Duke-Elder appears to regard it as a disease in which increase of intra-ocular pressure is not necessarily the essential symptom. He says on p. 206:—

> "A series of cases like those reported by Pickard (1926), wherein a cupping of the disc resembling cavernous optic atrophy was accompanied by symptoms akin to glaucoma without detectable rise in the intra-ocular pressure, is difficult to explain on orthodox lines. Experimental evidence also seems to suggest that the formation and development of scotomata are not entirely dependent on pressure, but in some cases, at least, are due to changes in the fluid traffic of the retina; and clinically the progress of the symptoms does not run by any means parallel with the tension and frequently continues after its efficient relief."

This is hard doctrine for those who look upon glaucoma and raised intra-ocular tension as synonymous terms. We do not get much practical guidance with regard to non-operative methods of treating glaucoma. The action of adrenalin on the eye is to cause contraction of the arterioles, but to render the capillaries more permeable. An initial lowering of tension is followed by a slight rise. Hamburger's glaucosan, which tends to lower the tension but dilates the pupil, is only suitable for secondary glaucoma. In clinical work we have little justification for experimenting, since Mr. Duke-Elder finds both glaucosan and histamine unreliable drugs. The new method of intravenous injection of salt solution is mentioned, but only as a measure preliminary to operation. A chapter on general methods of treatment sets out the views of the author, founded on his own work at the Moorfields light clinic. In the final chapter on neurology, new matter concerning the pupillary paths and the oculo-motor system will be found. To the index of subjects an index of authors has now been added.

The activities of ophthalmologists seem to be extending rapidly just now, and Mr. Duke-Elder is keeping pace with them with great skill and judgment.

Electrotherapy.

The Principles of Electrotherapy and their Practical Application. Second edition. By W. J. Turrell, M.A., D.M., B.Ch. Oxf., D.M.R.E. Cantab., Consulting Physician, Oxford County and City Mental Hospital; Physician in charge of the Physiotherapy Department, Radcliffe Infirmary, Oxford. *London: Humphrey Milford, Oxford* University Press. 1929. Pp. 413. 10*s.*

Dr. Turrell's book is based upon a large practical experience of the diseases and complaints which can be cured or alleviated by electrotherapy. It is divided into six parts. An interesting historical chapter is followed by one on the therapeutic action of current electricity. The chief forms of the electrical current used in medicine are here outlined. A nice discrimination is shown by the author in describing the responses of the individual to currents of high and of low frequency, and of the currents which can be derived from the static machine. The therapeutic action of radiant energy is then considered; Dr. Turrell himself makes great use of the tungsten arc in hospital practice. Electrical Accidents and Electro-Diagnosis are discussed, and finally the application and mode of action of electricity in certain diseased conditions are outlined. This section takes up nearly 150 pages and should be of service to those who, having acquired some knowledge of the mode of action of the various currents, seek to apply them to patients.

Dr. Turrell has a long record of clinical experience, and has turned it to account in the application of electrical currents to damaged tissues or pathological conditions of widely different types.

UROLOGICAL ROENTGENOLOGY.

By HUGH H. YOUNG, M.D., Clinical Professor of Urology, Johns Hopkins University; Director, James Buchanan Blade Urological Institute; and CHAS. A. WATERS, Instructor in Clinical Roentgenology, Johns Hopkins University; Assistant Visiting Roentgenologist, Johns Hopkins Hospital. New York: Paul B. Hoeber. Pp. 499. $20.

THIS monograph is No. 7 of a series issued in America under the title of the Annals of Roentgenology. It is produced primarily for the use of radiologists though it contains material worthy of close study by urologists. Its main value lies in 518 figures, the majority being reproductions of actual radiograms of various conditions of urological interest. Taken for the most part from the service of the Blade Urological Institute and the Johns Hopkins University, these reflect the magnitude of the clinical area served by this institute and the ability of its director to make full use of the copious material. The radiograms—many of which are pyelograms, cystograms, and vesiculograms—cover every imaginable urinary condition and form a valuable collection for reference. Case-histories give a clue to the interpretation of the figures, though special points illustrated by individual radiograms should in some places have been more precisely indicated. Where radiograms are not supplied the text, which except in the first chapter is slender, is elucidated by beautiful drawings by Mr. Wm. P. Didusch. This first chapter, entitled Combined Roentgenological and Urological Study, is rigidly confined to the discussion of these aspects of technique which are common ground to both specialties—opaque media, the position of the patient for pyelography, perirenal insufflation, and so forth. Elsewhere the text consists of urological smatterings which are not sufficiently recondite to be valuable to the urologist and are of questionable importance from the radiologist's point of view. The authors have supplied them deliberately, however, holding that an intimate knowledge of the problem at issue on the part of the radiologist is essential to the success of the combined effort to solve it.

The book is beautifully though expensively produced. It represents faithfully the present stage in development of a youthful subject whose growth has been rapid and promises to continue so. The object of Dr. J. T. Case, the editor of the series, to supply a diagnostic guide rich in the fruit of experience of leading authorities in special fields has certainly been achieved in this volume.

PHYSICAL DIAGNOSIS.

Second edition. By CHARLES PHILLIPS EMERSON, A.B., M.D., Professor of Medicine, Indiana University School of Medicine. London: J. B. Lippincott Company. 1929. Pp. 553. 35s.

THIS book has been written because of the author's belief in the profound importance in medicine of the examination of the patient's body through the use of the unaided special senses, and his conviction that this will remain the primary and fundamental method of diagnosis. It is a rare change to have before us a book on diagnosis in which the use of microscopes or test-tubes is neither mentioned nor inferred. In the elucidation of disease, however, there can be no real subdivision, and a book rigidly confined to physical diagnosis is necessarily incomplete. In a work of over 500 pages on diagnosis in medicine we have a right to expect some material help in connexion with all the common medical states, but are occasionally disappointed in this one. For example, a search through the book for information on pernicious anæmia reveals only three references to this malady—the condition of the tongue, the colour of the skin, and the occasional enlargement of the spleen—the description of the blood being outside the scope of the work. If we accept these limitations as imposed on the author by his title, we can enjoy the pleasant writing and excellent balance of the sections allotted to each disease. The first chapter opens with an interesting historical sketch of the great masters in medical diagnosis, while the second deals with general body characteristics, types and attitudes in disease. The pages devoted to the general body surface contains a comprehensive account of the various skin conditions. The physical signs of the chest are accurately described and assessed with the mature pen judgment of an expert. References to recent contributions to literature are almost entirely confined to American publications. The photographs, the work of the Indiana University Department of Illustrations, are worthy of high praise.

OUTLINES OF DENTAL SCIENCE.

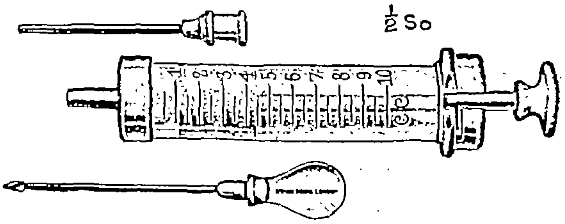
Dental Histology. By A. LIVINGSTON, M.D.S., M.B., Ch.B., L.D.S., Director of Dental Studies and Sub-Dean, King's College Hospital Dental School. Edinburgh: E. and S. Livingstone. 1929. Pp. 143. 7s. 6d.

THIS volume, which is one of a series of small books intended to cover the whole field of dentistry, is devoted to the histology of the dental tissues. It is clearly written and within the compass of 147 pages manages to convey a considerable amount of information. For revision purposes the student may find it useful, though used by itself it is scarcely full enough to satisfy examination requirements. The last chapter is devoted to microscopical methods and might with advantage have been more detailed. Should further editions be called for we would suggest that the meagre chapters on the structure of the tongue, oral mucosa, salivary and lymphatic glands might well be deleted and replaced by a more comprehensive description of histological methods with some account of the optical principles of the microscope. The illustrations are not numerous enough to be of real use.

New Inventions.

AN IMPROVED TROCAR AND CANNULA.

IN the aspiration of small abscesses, particularly in children, it is important to be able to carry this out as expeditiously as possible and with the minimum amount of inconvenience to the patient. The following are the outstanding points in the trocar and cannula here illustrated. (1) Comparatively short distance between point of trocar and end of cannula. (2) Close-fitting of end of cannula to trocar, which is narrowed for the purpose, thus enabling the cannula to slip easily into the opening made in the skin. (3) Convenient length and bore of cannula. The trocar is 2 in. long, No. 6 French catheter gauge, and is used with a 10 c.cm. metal and glass syringe.



The apparatus has been made for me by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E.

GEORGE JESSEL, M.D. Oxf., D.P.H. Manch.

THE LANCET.

LONDON: SATURDAY, JULY 6, 1929.

PROBLEMS OF EPILEPSY.

There are at least two recognisable types of unsolved problem, the simple and the complex. In a simple, which is not synonymous with an easy, problem the task before the investigator is a well-defined one, for example the extraction of the active principle of a gland or the isolation of the infective agent responsible for a disease. The discoveries that rewarded the patience of Ehrlich, Ross, and Banting were solutions of such well-defined problems. On the other hand, there are diseases which at present defy explanation by their very complexity, and the two outstanding examples of these are cancer and epilepsy. The investigator of these baffling problems has no determined starting-point. Like a wanderer in a maze he is compelled to take one turning after another, following the path to which personal predilection invites him without any guarantee that it leads in the right direction, or even that it is not a blind alley. It is characteristic of our state of ignorance that the very use of the term "epilepsy" should be of problematic value. Many writers refuse to employ it except for a symptom evoked by a number of pathological states, and they speak therefore of the "epilepsies."

Good will come from an emphasis upon the variety of lesions of which a convulsion may be evidence. But the existence of comparatively gross causes for epilepsy in some cases does not justify the assumption that such are its only causes. Actually there is evidence for the existence of a constitutional ætiological factor even sometimes when a focal lesion is also present. The oft-quoted incidence of epilepsy in about 5 per cent. of cases of gunshot wound of the head in the late war, and the constancy of this rate in all combatant countries, appear to point to a predisposition to convulsions latent in these individuals; there seems no other adequate explanation for the fact that a family history of epilepsy is obtainable from some 30 per cent. of epileptics and is not uncommonly present in patients with an organic "cause" for their convulsions, such as a head injury. If a "constitutional" basis exists in at least a proportion of epileptics it is natural to inquire whether the epileptic habitus is one of its manifestations. The practitioner with experience of epileptics soon learns to recognise that they often exhibit a characteristic facies, apart, of course, from such accidents as scars and a bromide rash. So typical is the appearance of many epileptics that it is often possible to make a correct diagnosis at sight before the history has been given. We have at present no means of deciding whether the epileptic facies is the result of the fits or the expression of an underlying diathesis. Equally uncertain is the relationship between mental deterioration and epilepsy. It was at one time believed that the mental degeneration of the epileptic was largely, if not entirely, the result of the large quantities of sedative and depressant drugs which fell to his lot. This is almost certainly untrue, for the mental condition of most epileptics is improved by anticonvulsant drugs, and it is a striking fact that they do not as a rule experience the depressant effects of bromide and luminal to the same extent as normal persons. Sedatives appear to fulfil a physiological need in epileptics. It does not seem, however, that any direct relationship exists between convulsions and mental deterioration, for every clinician is familiar with epileptics who deteriorate little if at all in spite of frequent fits, while others, perhaps less frequently and less severely convulsed, nevertheless become progressively demented. Is the mental deterioration of the epileptic possibly also an expression of a constitutional defect, of which degeneracy and convulsions are independently variable manifestations?

The conception of an epileptic diathesis involves the view that there exist potential epileptics who lack the precipitating factor, the trigger which fires the charge. Such must have been the previous condition, on this hypothesis, of the 5 per cent. of wounded who only became epileptic following their injuries. The hypothesis of a constitutional abnormality underlying some forms of epilepsy is the incentive, implicit if not explicit, of most metabolic investigations into epilepsy. If epileptics possess no common metabolic abnormality such researches are doomed from the outset to disappointment. Such has indeed been the outcome of many painstaking labours in the past. A long list might be made of metabolic functions in epileptics which have been conclusively shown to be normal. Even reported abnormalities have hitherto found no general acceptance. Other observers have failed to confirm the alkalosis reported by Bigwood, or the "ammonia dysregulation" upon which Bisgaard and Norvig lay stress. It is, however, possible that a new and interesting chapter has been opened by the recent researches into the behaviour of the blood cholesterol in epilepsy. De Crinis and Pezzali first observed abnormalities in the blood cholesterol level in epileptics, and Popéa and Vicol drew attention to the association of a low blood cholesterol and disappearance of the lipoid of the suprarenal cortex in status epilepticus. Robinson, Brain, and Kay reported in our own columns[1] that the average blood cholesterol was lower in epileptics than in controls, and described 11 series of determinations, 10 of which showed a fall in the blood cholesterol level preceding a fit. We publish this week a communication reporting a further investigation of this question by Dr. Gosden, Dr. Tylor Fox, and Dr. Russell Brain. Using the method of serial determinations of the blood cholesterol at frequent intervals, these workers have confirmed the observations of Robinson, Brain, and Kay and demonstrated not only a depression of the blood cholesterol level during status and serial epilepsy, but its instability in association with isolated fits, and in four further instances a fall preceding an attack. Dr. Gosden, Dr. Fox, and Dr. Brain do not commit themselves to any theoretical explanation of these phenomena and are careful not to attribute any causative relationships between disturbances in the blood cholesterol level and the occurrence of convulsions. We know so little at present concerning the metabolism of cholesterol that these observations cannot be said to throw any direct light upon the cause of epilepsy. They do, however, appear to indicate the existence of a metabolic abnormality in epileptics and to suggest lines of research.

A definite fact concerning cholesterol which has long been familiar is its intimate relationship with the liver. It is secreted in the bile, being presumably by the liver from the blood stream. These tions upon the blood cholesterol in epilepsy re assume an added significance in the light investigation of the lævulose tolerance test optics reported by Dr. GOSDEN and Dr. TYLOR n this journal last week. These workers have only a small number of observations to record, they are of unusual interest. In several severe of epilepsy the lævulose tolerance tests yielded ts hitherto associated with extensive destructive ns of the liver. Less severe cases showed an airment of lævulose tolerance of less degree. 's to be hoped that further investigations will made on these lines. It is common experience t considerable destruction of the liver may take ce without any detectable abnormality in the vulose tolerance test. The findings of Dr. GOSDEN and r. FOX point therefore to a functional liver deficiency f extreme severity occurring in epileptics, though here is nothing in their observations to indicate the hysiological relationship of this disturbance to the ttacks. A number of years ago MYERSON observed in a small series of autopsies upon epileptics that the weight of the liver was subnormal in a large proportion of cases. This observation has since been confirmed by THOM, and more recently by PATTERSON and WEINGROW. Here there are hints, both anatomical and physiological, that constitutional abnormalities may be present in epileptics, and there are sufficient indications to encourage energetic research into their hepatic functions. Those who regard epilepsy as merely a symptom must admit that if they are right there is little hope of alleviating the complaint on a large scale. Those who seek an epileptic diathesis may encourage themselves with the knowledge that, if such could be discovered, an important advance would have been made towards a cure.

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[1] The Lancet, 1927, ii., 325.

It is one of the fascinations of epilepsy as a subject of research that it presents so many aspects which, though necessarily related, are nevertheless to a large extent capable of independent consideration. It is not improbable that a metabolic abnormality might be discovered and relieved in epilepsy without its convulsant effects being understood, a situation similar to that which has arisen in the treatment of pernicious anæmia. Hence there is unlimited scope for those whose interest leads them to seek the physiological nature of a convulsion or the precipitating factors which lead to the onset of a fit. The belief that cerebral vasoconstriction plays such a rôle has long been held, though perhaps never on grounds which could entirely withstand criticism. The relationship between the concomitant vasomotor changes and the attack well illustrates the complexity of the problems of epilepsy. Blanching of the cerebral cortex at the beginning of a fit has been observed on several occasions by surgeons, but at the time when stress was laid upon this observation it was not fully understood how profoundly the opening of the skull alters the normal conditions of cerebral circulation. Moreover, even if cerebral vasoconstriction does occur at the beginning of a fit, parallel to the generalised cutaneous pallor, this is far from a proof that it causes the attack. Such vasomotor changes may merely indicate the participation of the sympathetic nervous system in the neural discharge which constitutes the fit. However, even if the vasomotor origin of the convulsion should prove to be mistaken, it will have shown once again the value of error, for this theory has led to the illuminating researches of COBB and FORBES which have gone far to establish the existence of vasomotor nerves to the cerebral blood-vessels. Those who look elsewhere than in the circulatory system for the genesis of the fit will probably expect to find it in a disordered metabolic state of the cerebral neurones, which expresses itself in a tendency to an uncontrolled discharge of energy. Here we reach the obscure realms of excitation and inhibition which neurology is now only beginning to explore. Already, however, we can recognise possible relationships between sleep, trance, narcolepsy, catalepsy, and epilepsy. The long familiar influence of waking and sleeping upon epileptic fits has recently been analysed in this journal by Dr. MARY LANGDON-DOWN and Dr. BRAIN, who have demonstrated that some epileptics react to sleep in a manner diametrically opposite to others, and suggest that this difference may lie in their response to the inhibitory influence which in PAVLOV'S view is the essential nature of sleep. From such considerations, at present necessarily speculative, it is but a step to the excitations and inhibitions which find expression in thought, feeling, and action, the influence of which upon epileptics is as profound as any metabolic or physiological changes. When fear may precipitate a fit and interest or effort avert one it is clear that psychology may have light to throw upon the nature of epilepsy.

In conclusion two facts may justifiably be emphasised. There was never less cause for pessimism as to the outcome of research upon epilepsy. But there was never a subject of research which so much necessitated a broad outlook in its investigation, and the closest possible collaboration between the biochemist, the physiologist, and the clinician.

COSMETIC SURGERY.

AWHILE ago we published a lively account of the award of 200,000 francs damages against an eminent Paris surgeon in a French court of law.[1] A patient, contemplating matrimony, was concerned as to the lack of symmetry of her legs. She consulted a surgeon who consented to perform an operation, reducing the right leg; owing, however, to difficulties of circulation, gangrene supervened and amputation became necessary. This substantial award of damages being regarded as a serious threat to certain aspects of French surgery, Dr. DARTIGUES, a past president both of the Société des Chirurgiens de Paris and of the Société des Médecins de Paris, brought the matter before the General Council of the Association Générale des Médecins de France in a vigorous protest. From this address it seems that the judge took the view that this particular operation was not necessitated by therapeutic considerations, that French law is not prepared to recognise certain operations of a merely "facultative" nature, and that the patient was deemed to be so strongly obsessed by her physical deformity that she was incapable of forming an independent judgment, or giving a legal consent to the operation which was, in fact, performed.

Without more exact knowledge of the grounds of the judicial decision (which, moreover, may be subject to appeal), it is difficult to comment on it. In England it would presumably be a mere issue of negligence. Cosmetic surgery has not yet occupied our judges' time, though they are familiar with claims for damages when dermatitis is alleged to have supervened after the application of hair-dyes. A woman's desire to look her best, and the disadvantage which age or disfigurement impose upon her matrimonial chances, are matters of which English judges and juries would undoubtedly take notice. In breach of promise actions juries are invited to assess the damage caused to a woman through the default of a fiancé to whom she was engaged during several years of her most marriageable age. In cases arising out of traffic accidents, injuries such as facial scars would similarly be regarded as a particular reason for liberality of compensation, and, if some physical disability were caused which modern surgery could ameliorate or remove, the cost of such further operation would no doubt be put forward as special damage due to the original accident. The criminal aspects of cosmetic surgery are even more speculative. As the law recognises the profession of surgery, it must admit the right of the patient to consent to the infliction of any bodily injury in the nature of a surgical operation, though such consent does not discharge the surgeon from the usual duty to exercise due care. STEPHEN, in his *Digest of the Criminal Law*, says further, that everyone has a right to consent to the infliction upon himself of bodily harm not amounting to maiming. He goes on to say that no one has a right to consent to the infliction upon himself of death, or of an injury likely to cause death, or of bodily harm amounting to maiming, *for any purpose injurious to the public*. He explains that he inserts the italicised words because it would be absurd to say that, if a dentist pulls out a patient's front tooth on the ground that the tooth, though not diseased, is unsightly, the patient and the dentist both commit a misdemeanour. For a clearer view of the English law we must wait till some definite case of the kind comes before the courts.

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[1] THE LANCET, March 16th, p. 576.

Dr. DARTIGUES, in his address, asked what was the proper sphere of "plastic" and "æsthetic" surgery, the epithets being in his opinion synonymous. Nobody doubts the propriety of using surgery as a corrective of congenital malformation or variation from the normal human type. It is equally applicable to remedy injuries due to accident or, as the last fifteen years have shown, injuries due to war. Coming down to the removal of facial lines or wrinkles and similar supposed blemishes upon feminine beauty, Dr. DARTIGUES has no hesitation in offering the resources of surgery here also. Æsthetic surgery in his definition is the sum of all operations of a plastic character intended to remedy natural or acquired defects in the human morphology which prejudice the personal and social value of the individual. He would agree, no doubt, that it is for the surgeon and not the patient to decide upon the propriety of the operation. If the beauty parlour movement develops a type of unqualified practitioner who, for a large fee, will exploit some fashionable operation for the mere removal of fancied blemishes, the law could hardly ignore the adverse consequences of risks thus run. Not long ago Prof. ARCHIBALD YOUNG, writing in our columns on the injection treatment of varicose veins, stated that he had several times been asked by quite young girls to apply the treatment to some odd superficial vein which caused no trouble whatever. Operation for mere beautification may be among the things which are lawful and yet not necessarily among those which are expedient.

DIPHTHERIA PROPHYLACTIC.

SINCE active immunisation against diphtheria became an everyday practice much attention has been devoted by laboratory workers to the subject of the antigen. In America this was originally an underneutralised mixture of toxin-antitoxin which was later replaced by a mixture in which the slight excess of toxin was further reduced, and the latter until quite recently has been extensively employed throughout the United States. Certain objections have, however, been raised from time to time to toxin-antitoxin mixtures and in this country they were superseded several years ago by toxoid-antitoxin. Toxoid, described by G. RAMON in 1923 and named "anatoxine" by him, is a modification of diphtheria toxin brought about by the addition of formaldehyde and exposure to a temperature of 38° to 40° C. for from four to six weeks. The process deprives the toxin of its toxicity but leaves the preparation in possession of well-marked antigenic properties, and it is in general use in serum laboratories for the preparation of diphtheria antitoxin. In this country toxoid alone has never replaced toxoid-antitoxin for immunisation of humans, although the procedures involved in its manufacture in the laboratory are simpler. As well as being a very efficient immunising agent, it has the further advantage that, since it contains no antitoxin fraction, immunised individuals are not sensitised to horse serum, a factor of some importance in these days when serotherapy is so widely employed for various conditions. It has, however, been given an extensive trial in France and Canada and now[1] we are indebted to Drs. GEORGE and GLADYS DICK for information on the comparative values of the immunity induced by toxin-antitoxin mixture and toxoid.

Two groups of susceptible individuals each numbering 100, mostly student nurses, have been immunised with each type of prophylactic to the point of being Schick negative. In the toxin-antitoxin group a preliminary injection of 0·5 c.cm. followed by four injections of 1 c.cm. at weekly intervals was given, whilst an interval of three months or longer was allowed to elapse before the reapplication of the Schick test. The toxoid group received three doses of 0·5, 1·0, and 1·5 c.cm., a two weekly period intervening between the injections, and retests were made not sooner than six weeks after immunisation was completed. It was found that in the toxoid group 91 per cent. of the total number, and excluding children 93·3 per cent., gave a negative Schick test, whilst in the toxin-antitoxin group 82 per cent. became negative reactors. Thus it appears that toxoid is a better immunising agent than toxin-antitoxin. The incidence of reactions has been carefully noted in the toxoid group, when 31·0 per cent. showed small local reactions, 0 per cent. large local reactions, 28·5 per cent. slight general reactions, and 6·3 per cent. moderate to severe local reactions. These observations are of considerable value, for the reason that toxoid has made little headway in this country, in spite of the advantages noted above, is probably because one or two workers have reported severe reactions following its use. The suggestion has been made that the reactions are the result of sensitiveness to some product of bacterial metabolism in the antigen, whilst others are of the opinion that the sensitiveness is towards some protein constituent of the medium in which the organism was originally grown. The Drs. DICK show, by an analysis of the nine severe general reactions represented by the 6·3 per cent. mentioned above, that when the original Schick test was performed five were marked and one was a moderate pseudo-reactor, whilst two had previous attacks of diphtheria. Whatever the real explanation of these reactions, the practical point that emerges is that they can be avoided or mitigated by commencing the immunisation of pseudo-reactors or persons in whom diphtheria has formerly occurred with small doses such as 0·1 or 0·25 c.cm. In view of to psycho-analysis (in the strict sense) a weight to which no other system of mental analysis is prima facie entitled. Psycho-analysis, both as a theory of psychology and as a therapeutic technique (the word covers both senses), deserves to be treated with the greatest respect. And though the Committee are non-committal about the most important issues, they pronounce quite definitely on some of the criticisms to which psycho-analysis has been subjected. They reply to the suggestion that "psycho-analysis applied as medical treatment may cause insanity in the patient" with the categorical "No proof of this charge has been discovered by the Committee." They refute the suggestions that psycho-analysis ignores the relation of the body to the mind, that it is materialistic and that it is inordinately expensive. They are satisfied that it is impossible to make a verbal record of an actual psycho-analysis in order to present it to a sceptical public. On all these points the contentions of the psycho-analysts are upheld.

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[1] Jour. Amer. Med. Assoc., June 8th, 1929.

The summary of "modern psycho-analytical methods and teaching," which the Committee "has reason to believe" to be "correct as far as it goes," lays great stress on the resistances which prevent the emergence into consciousness of parts of the unconscious mind, and describes the aim of a psycho-analysis as the overcoming of these resistances. In the replies to criticisms of psycho-analysis, which replies (provided by the President of the British Psycho-Analytical Society) and criticisms the Committee "leaves to the judgment of the reader," the element of resistance in the attacks of critics is emphasised. Thus the Committee, while declining to commit itself upon the truth or value of Freudian psycho-analysis, may fairly be said both to treat it with respect and to recognise that the charge of emotional prejudice which psycho-analysts make against their critics may have some foundation.

NEOSALVARSAN AS A PULMONARY ANTISEPTIC.

INTEREST in chronic lung diseases and the applications of surgery to their treatment has been greatly stimulated by Dr. R. A. Young's masterly review of this subject in his Lumleian Lectures delivered in London in March of this year.[1] Of such conditions there are few that demand greater care and judgment on the part of the physician than that of empyema, particularly when streptococcal in origin, and of chronic bronchiectasis. In the former there is general agreement that too early operation may and in fact usually does lead to that troublesome condition, chronic empyema. This result of treatment by open operation has led many workers to treat such cases by continuous aspiration, with or without irrigation of the cavity with some form of antiseptic solution. That most usually employed has been Dakin's solution—neutral 0·5 per cent. solution of sodium hypochlorite—though others have also found their advocates. Recently Dr Hans Edel[2] has recorded a few cases which he has treated with intrapleural injection of neosalvarsan. His treatment has been to aspirate the pus through a needle of moderate size, using the same needle to inject at once a solution of neosalvarsan. Edel has found that the pleura is able to withstand large doses of this solution without undue reaction; thus his usual initial dose has been 0·45 g. dissolved in 10 c.cm. distilled water, which is gradually increased up to 0·6 g. according to the general reaction and the degree of refilling of the empyema. The surprising tolerance shown by the pleura to such high dosage suggests to Edel that considerable local thrombosis occurs round the site of the injection. It is, of course, well known that neosalvarsan even in far weaker solutions is a powerful antiseptic, especially against streptococci, and it is natural that the attempt should be made to utilise it at the site of infection instead of in the blood stream alone. Edel has gone further and has injected solutions of similar strength (from 0·15 to 0·6 g. dissolved in 10 c.cm. of water) into the bronchial tree in cases of bronchiectasis. His method has been similar to that used for the introduction of lipiodol into the lung, namely, cocainisation of the trachea and direct injection through a laryngeal catheter. In the few patients he has so far treated Edel reports considerable success, the total quantity of neosalvarsan used being in one case as much as 5·25 g. Another patient suffering from right-sided pulmonary gangrene and empyema received in all 0·9 g. into the pleura and 2·7 g. into the lung, a total of 3·6 g. The patient became afebrile two days after the first injection and in 12 days the empyema had disappeared, "cure" resulting in seven weeks, though the X ray still showed some thickening of the pleura. The local application of arsenical bactericides in pulmonary conditions is a method to be watched with interest, although clinicians may hesitate to copy the high dosage employed by Dr. Edel until further results have been reported.

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[1] THE LANCET, 1929, i., 593, 697, and 805.

[2] Die Lokalbehandlung eitriger Lungenprozesse mit intrahorakalen Neosalvarsan-injektionen, Med. Klin., April 20th, 929.

LOSS OF APPETITE IN CHILDHOOD.

THE literature of anorexia in children is voluminous and the underlying causes sponsored by individual writers innumerable. Some fresh light has, however, been recently thrown on the subject by a stimulating article from the pen of Dr. Joseph Garland,[1] who attributes the trouble essentially to a failure of management in the earliest weeks of life and confirmed in childhood by improper training and discipline. Thus he suggests that the initial loss of weight that occurs before the establishment of complete lactation is in itself an advantage to the baby, as during these first few days the sensation of appetite has time to develop, a sensation that the baby is never likely to lose subsequently. Once breast feeding has been established a transient loss of appetite is a usual occurrence during acute febrile disturbances, and may in fact be interpreted as a protective mechanism since the gastro-intestinal tract, under the circumstances, is not commonly prepared for the reception and utilisation of food. It is frequently found that the mother's greatest source of anxiety during the illness of a child is the failure to take nutriment, and it may require considerable patience to explain the situation to her. In many cases it should be realised that the appetite difficulty is not a real one at all, but exists only in the fertile imagination of the over-anxious parent. This is often the case with infants at the breast who take their feeds so rapidly that the mother becomes obsessed with the idea that little or no milk has been taken; weighing the baby before and after feeds will generally banish this illusion. Sometimes an artificially fed infant will fail to finish its carefully calculated allowance but continues to gain at a satisfactory rate. This baby does not require as much food as another infant of the same age and weight. One of the greatest boons that could be granted mankind would be an appreciation of the fact that all human beings are individuals with varying digestive capacities with varying temperatures, levels of activity, and caloric requirements.

The period of starting new foods, which includes very definitely the weaning period, presents often the first great obstacle to the continuation of a normal appetite. Habits of feeding have become firmly fixed, and infants, like their elders, resent change. Where such difficulties arise it is absolutely essential to ensure firmness in management on the part of mother and nurse, even if this entails two or three days' misery for all concerned. The physical causes of anorexia, admittedly much less frequent than the psychic, are usually quite apparent in themselves, although frequently it is necessary to disabuse a parent or nurse of the idea that a physical cause exists where in reality a search reveals none, and where it is obvious that the true fault lies elsewhere. It should be mentioned that over-feeding with milk is a natural mistake which a zealous mother frequently makes without realising the fact that milk, particularly with a child over a year old, is a very filling and appetite-destroying food; in no case should a child be given more than a pint a day. The importance of fatigue upon appetite cannot be over-estimated, and is especially apparent as a result of the intense "urbanisation" to which the modern child is subjected. Even in play the possibility of fatigue is present and disaster frequently awaits the highly strung child, who forces himself to follow the leadership of older and stronger children. It can readily be seen how difficult it is to analyse the cause of anorexia in a given case, and how much reliance must be placed on a detailed history of the home life and surroundings. While the shortcomings and difficulties of the particular case are being poured out by the despairing parents, the child himself is delighting in the fact that he will not eat a morsel of vegetables and that only with the utmost coaxing can he be persuaded to take any milk pudding. What a little price, he may well feel, is the loss of a few meals for such a sense of importance? Many children will not eat because that is what is expected of them, but who can blame them when they hear their parents discussing their own food idiosyncrasies at every meal?

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[1] Garland, J.: New Eng. Jour. of Med., 1929, cc., 1135.

The clinical picture is known to all but the correct lines of treatment are difficult to carry out. Dr. Garland indicates some of them. A thorough explanation of the situation should be given to both parents in the absence of the child and they should be exhorted to ignore all symptoms and never discuss details of the patient's management in front of him. It should be almost unnecessary to remark that heaping a child's plate with all that he is supposed to eat for the entire meal is to discourage him from the start. In the same way the meal should be attractively served on a tray, which is removed without comment at the end of a specified time and under no circumstances should he be urged or bribed to eat. In many instances it will be advisable to separate the child entirely for a time from his home surroundings and place him among other children where he will have companionship and judicious management. The whole subject is admittedly difficult and indicates the necessity for adequate instruction of parents in mothercraft, so that the child's habits can be trained on correct lines from the beginning.

A MODEL MEDICAL MUSEUM.

THE museums of most of our medical schools contain magnificent accumulations of admirable preparations. But as instruments of education they suffer from three substantial defects: (1) the rare and curious is much too prominent; (2) their arrangement fosters the notion that pathology has to do with states rather than processes; (3) the labelling and accessory illustrations are wholly inadequate, chiefly, we fancy, because the things in bottles are primarily looked upon as the objects in guessing competitions in examinations. The ideal that the exhibits in a museum should be illustrations of a text-book of their subject and should be amply supplemented by reading matter, pictures, diagrams, and so forth, has for a long time guided the arrangement of zoological and antiquarian collections. Those who wish to see the same plan applied to medicine should visit the museum at 33, Gordon-street provided by the generosity of Mr. Wellcome and presided over by Dr. Daukes. If they have not been before, they will be surprised, and we believe delighted. In a well-illustrated volume[1] (which may be had gratis from the museum by those interested) Dr. Daukes has explained the theory and practice of what he has done in a very interesting and informative way. We hope he will gain many converts to his methods, and those who are not prepared to go with him all the way will find many useful hints about museum technique.

RADIUM TECHNIQUE.

A POST-GRADUATE course on radium therapy will be held at St. Bartholomew's Medical College, London, from Monday, Sept. 30th, to Thursday, Oct. 3rd. Entry to the course, which will be of an introductory character, is limited to about 30 men, those who are likely to work with radium being preferred. Lectures will be given on the physical properties of radium and radon by Prof. F. L. Hopwood, on the biological aspect of radium by Dr. R. G. Canti, on its surface application by Dr. N. S. Finzi, and on its use in combination with deep X rays by Dr. W. M. Levitt. The applications of radium to the treatment of special regions will be made by Sir Charles Gordon-Watson for the rectum, Prof. G. E. Gask for the tongue and mouth, Dr. Malcolm Donaldson for gynæcology, Mr. Douglas Harmer for the larynx and air passages, and Mr. Geoffrey Keynes for the breast. On each day there will be demonstrations in the out-patient department or in the wards, and on three of the days operations will be carried out by members of the staff, including, besides those already mentioned, Dr. J. D. Barris, Mr. F. A. Rose, and Mr. Bedford Russell. Application for admission to the course, which is something of a new departure, should be made to the Dean of the Medical College. The terms may be seen in our advertisement columns.

One important side of radium technique is dealt with in our own columns this week by Dr. Joseph Muir of New York, who has made the subject peculiarly his own, for it was he who originated the use of the screened radon seed in the treatment of malignant growths. That the method opens up a promising line of work was admitted by Prof. Gask when addressing the British Empire Cancer Campaign a year ago.[2] Surrender of the use of radon is by no means a foregone conclusion even should a largely enhanced quantity of radium become accessible for general use in the near future, for increasing stress is being laid on the unwisdom of allowing radium element to leave the centres where it can be jealously guarded. Dr. Muir has for long championed the use of the glass tube containing radium emanation encased in a layer of platinum 0·3 to 0·4 mm. thick; although somewhat larger than the gold seed in common use in America, it has the advantage of being watertight and smooth, while it can be removed as soon as the treatment is concluded by means of the threads which are left in position. The unscreened or bare tube Dr. Muir regards as standing condemned owing to the zone of necrosis which invariably forms around it. In the œsophagus the dangers of tissue necrosis are great enough even with the screened tube, and sloughing in this position means a fistula into lung or trachea with rapidly fatal results; but even in complete stricture Dr. Muir claims to have restored the lumen of the œsophagus and to have so far relieved the patient as to permit him to resume ordinary diet and habits. In the uterus when the cervical canal is completely blocked by malignant tissue, he regards it as possible for a skilful operator to implant such screened seeds in the highly friable tissues without inflicting further trauma, and in this way so to clean up the malignant area as to render possible the more usual application of radium.

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[1] The Medical Museum. By S. H. Daukes, Director of the Wellcome Museum of Medical Science. London: Wellcome Foundation, 33, Gordon-street, W.C. 1929. With 44 figures. Pp. 172.

[2] THE LANCET, 1928, i., 844.

In prostatic cases the radon seed enables escape from the prolonged hospital stay which deters from other forms of treatment.

THE WELFARE OF THE DEAF.

ON Thursday next, July 11th, at 3.30 P.M., the National Institute of the Deaf will hold its fifth annual meeting at the Caxton Hall, Westminster, S.W., when Lord Charnwood, who will preside, will be supported by Sir Frank Benson, Mr. Somerville Hastings, M.P., and others who realise the importance to the community of promoting the interests of the deaf. There are some 40,000 persons in Great Britain who have been deaf from birth or very early life, and while it is incumbent upon the State to make proper provision for these unfortunate people who demand our utmost sympathy, the loss in personnel and money to the country from want of proper attention to this afflicted class is very great. The appointment by the Government of a Departmental Committee at an early date to investigate this question was advocated by the Duke of Montrose in vigorous terms at the last annual meeting of the Institute, while it is now 40 years since any Government Department has made inquiry along the needed lines. The industrial hardships caused by deafness and their grave social implications were emphasised at an important meeting of the Institute, which was held at the London Mansion House three years ago, when the Duchess of Atholl pleaded the cause of the deaf eloquently. Much has been done by the untiring efforts of the Institute, in spite of financial difficulty, but official help is needed for much remains to be done. The meeting at the Caxton Hall next Thursday will be open to the public, who are invited to lend their support.

MATERNITY AND CHILD WELFARE CONFERENCE.

WHAT bids fair to be a most successful meeting, promoted by the National Association for Prevention of Infant Mortality in conjunction with many other allied bodies, opened at Friends House, Euston-road, on Tuesday last. The Marchioness of Aberdeen and Temair, who presided at the inaugural session in the unavoidable absence of the Minister of Health (who is to deliver his Presidential address later in the week), referred to the world-wide interest now awakened in this subject and the recognised need for obtaining the full coöperation of the fathers in the movement. Lady Aberdeen laid great stress on the disastrous results to family life from the maternal morbidity and morbidity dating from childbirth, and also gave expression to the general rejoicing and relief at the recovery of H.M. The King from his recent illness. After wishing success to the deliberations of the delegates, who number nearly 1000 and include representatives of the overseas Dominions and more than 36 English-speaking countries, Lady Aberdeen presented the challenge shields and prizes to the successful competitors in the various competitions arranged under the auspices of the National Baby Week Council. The Imperial Challenge Shield, which was won last year by Benoni in the Transvaal, has been won for 1928–29 by Kalutara, Ceylon, and Dr. C. P. Williams, Medical Officer of Health for Ceylon, was in attendance to receive the Certificate of Merit on behalf of the Kalutara Baby Week Committee. The Maharaja of Burdwan presided in the afternoon, and the whole of the first day was devoted to the consideration of the welfare of the child between 1 and 5 years. The branches of the subject discussed included child guidance clinics, the State care of children, the prevention and cure of crippling, and the handicap of illegitimate children, whilst the psychological aspect of the problem was debated in the evening at the annual meeting of the Association of Infant Welfare and Maternity Centres. Among the other subjects for discussion at the conference are maternal morbidity, special V.D. clinics in connexion with maternity and child welfare held departments, and methods of preventing undue delay in the out-patient departments of hospitals.

THE Imperial Social Hygiene Congress will be held from July 8th to 12th at Livingstone Hall, Broadway, London, S.W. 1., Lord Linlithgow presiding. Invitations have been sent to the Governments, universities, and organisations concerned with social hygiene throughout the Empire, and 200 delegates are expected.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which was completed with the issue of June 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. J. H. Fergusson to be Surg. Rear-Admiral.

The following appointments are notified: Surg. Lt.-Comdr. (D.) C. Williams to *Pembroke*. Surg. Lts. H. L. Duncan to *Carysfort*, T. A. Cochrane and J. Cassen to *Vivid*, W. P. E. McIntyre to *Effingham*, J. W. Nesbitt to *Cleopatra*, and E. B. Pollard to *Victory XI*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. D. M. Craig to be Surg. Lt.

Proby. Surg. Lt. A. H. Shelswell to be Surg. Lt.

The following appointments are notified: Surg. Lt.-Comdr. R. H. O. B. Robinson to *Victory*, for R.N. Hospital, Haslar. Surg. Lt. R. L. S. Stubbs to *Pembroke*, for R.N. Barracks.

ROYAL ARMY MEDICAL CORPS.

Capt. P. N. Creagh (late R.A.M.C., T.F.) to be Temp. Capt., and temporarily relinquishes the rank of Capt.

ARMY DENTAL CORPS.

Capt. A. F. Salsbury to be Maj.

TERRITORIAL ARMY.

Lt.-Col. H. F. Humphreys to be Bt. Col.

Maj. G. H. Stevenson (late R.A.M.C., Militia) to be Maj.

Capt. R. K. Nisbet relinquishes his commn.

Lt. D. O. Vaughan to be Capt.

Lt. E. S. Kirkhouse (late 3rd Bn. K.O.S.B.) to be Lt.

G. B. Matthews to be Lt.

Supernumerary for Service with O.T.C.—2nd Lt. G. B. Scholefield (late R.E.) to be Lt. supern. for serv. with Med. Unit, Univ. of Lond. Contgt., Sen. Div., O.T.C.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. C. B. Baxter, from Active List, to be Maj.

Lt. L. Gardiner (Army Dental Corps), from 6th Bn. E. Surrey R., to be Lt.

INDIAN MEDICAL SERVICE.

Capt. L. K. Ledger to be Maj.

Temp. Lt. Mir Saleem Mahmood relinquishes his temp. commn.

DEATHS IN THE SERVICES.

Lt.-Col. George Henderson, late I.M.S., who died at Inverness on June 23rd in his ninety-third year, was educated at Aberdeen University and graduated M.D. in 1868, obtaining the L.R.C.S.E. in the same year. In the following year he went to India and for some time served in the Indian Medical Department as civil assistant surgeon at Shahpur. In 1865–67 he became officiating professor of medicine and surgery at Lahore Medical College and afterwards superintendent of the Lahore Central Jail. Later he became officiating superintendent of the Botanical Gardens in Bengal and professor of botany in the University of Calcutta. Subsequently he was appointed civil surgeon at Gujranwala and also served at other stations in the Punjab. He retired in 1890. Lt.-Col. Henderson leaves a widow, two sons, and two daughters.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXVI. CHARTS OF FRACTIONAL TEST-MEALS.

PART I.*—NORMAL CURVES.

GASTRIC analysis is a less exact procedure than the majority of biochemical investigations, for not only do the stomach contents exhibit a greater normal variation in their chemical composition than do most substances recoverable from the body, but this variation is itself dependent on a series of factors which change in a given individual from hour to hour and from day to day.

The Variable Factors.

The more important of the variables concerned may be divided into: (*a*) extrinsic, and (*b*) intrinsic factors—and these may be further subdivided in the following manner:—

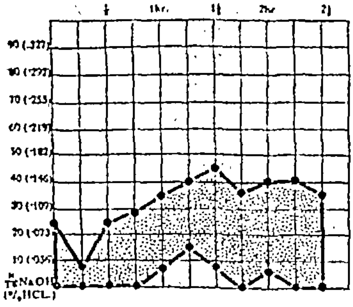
Extrinsic Factors.—(1) *The composition of the meal.* This will vary even when a fairly simple dietetic material, such as oatmeal gruel or toast and water, is selected in every case.

(2) *The Fasting Stomach Content.*—This varies considerably from case to case and even in the same individual from day to day.

Intrinsic Factors.—(1) The *stomach content* at any moment is a mixture of food, of secretion from the gastric glands, of secretion from the salivary glands, and of duodenal contents regurgitated through the pylorus. Not only do these factors vary from individual to individual, but in every individual there is some degree of daily personal variation.

(2) *Psychic factors* can be of great importance. Difficulties in swallowing the tube and apprehension after swallowing it will sometimes cause an inhibition of gastric secretion, and as the subject under investigation is almost invariably being examined for the first time, inhibition is a factor which must be taken into account.

FIG. 1.



The limits of normal curves for free HCl.

(3) *Errors in Sampling.*—The stomach contents are never homogeneous. Those recovered from the pyloric antrum are usually more acid than those at the cardiac end, and in addition it is obvious that in an actively secreting stomach the contents close to the mucosa will be the first to receive secretion. Experience in the withdrawal of samples for gastric analysis overcomes grave error from this cause in most cases, but it is clear from the foregoing paragraphs that inexperience in the practical side of collecting samples for gastric analysis is a more important potential source of error than is the possibility of inexpert chemical analysis of the samples themselves.

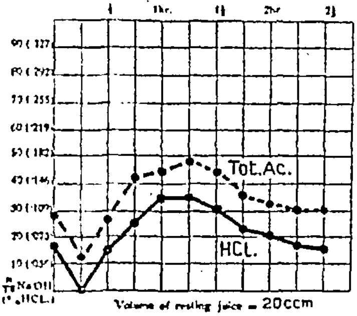
For these reasons, whenever an important decision rests on the interpretation of a fractional gastric analysis, the recovery of the samples should be confided to someone fully experienced in the procedure.

Collection of Samples.

If, however, the practitioner himself desires to collect the samples, it should be done according to the following technique, fuller details of which are available in current text-books.

The patient is allowed no food or drink after 9 o'clock on the night preceding the examination. At that hour it is well to give some charcoal biscuits or a glass of milk containing powdered charcoal, in order to provide a substance readily recognisable if a high degree of pyloric stenosis is present. On the morning of the examination, about 9 o'clock the patient swallows the tube and by means of a 20 c.cm. "Record" syringe the whole of the fasting stomach content is withdrawn, measured, and carefully preserved. If the total bulk is less than 10 c.cm., it is probable that the stomach had not been completely evacuated, and it is sometimes well to introduce one or two syringes full of warm water to assist in recovering the residual contents. In such cases it must, of course, be noted that the fluid withdrawn has been diluted by the water added.

FIG. 2.



The average normal curve for free HCl and total acidity.

The stomach being empty, the patient, with the tube in position, is given a pint of gruel made by boiling two tablespoonfuls of fine breakfast oatmeal in a quart of water until the total bulk has been reduced to one pint. The mixture is then strained and flavoured with salt, unless chloride estimations are to be made.

It is at that stage of the examination that the patient is most likely to experience discomfort or nausea, and, therefore, a light magazine or daily newspaper should be provided and the patient encouraged to read very attentively for at least ten minutes. At quarter-hourly intervals, after swallowing the meal, samples of 5–10 c.cm. are withdrawn by the syringe and preserved in test-tubes, labelled one-quarter, one-half, &c. Care should be taken to ensure that these samples are recovered from the stomach contents and not from the duodenum or some isolated loculus. This can be accomplished by noting that the tube is at the right depth and occasionally withdrawing it one or two inches, or getting the patient to swallow it deeper if its position has materially changed.

If the stomach appears to empty with undue rapidity, the tube should be moved about and aspiration attempted in different positions before it is assumed that the contents have all passed on. At the end of 2½ hours it is usual to empty the stomach completely and to make a note of the volume of the contents, a 10 c.cm. sample of which is [illegible] for analysis. The samples thus collected, [illegible] notes concerning the patient and the total volume of the fasting content and the final residuum, may be forwarded to a laboratory for analysis and will not undergo material chemical change during a period of fully 12 hours.

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* Part II., on the interpretation of charts in patients showing high acidity, low acidity, and of charts suggestive of gastric carcinoma will follow next week.

Details of the Report.

A report of a fractional gastric analysis should supply information on the following points:—

(*a*) The volume and character of the fasting stomach content.

(*b*) The character of the samples recovered at intervals after the taking of the test-meal.

(*c*) The volume and character of the total stomach content at a sufficiently long time after the taking of the meal for it to be reasonably expected that the stomach will be nearly empty. Two and a half hours is usually the longest time over which the examination is continued, but in cases of pyloric obstruction the analyst sometimes continues to extract specimens for three hours or longer. In any case, the total volume of the stomach content at the end of the examination should be determined and recorded.

As in every laboratory procedure, it is wise to supply the analyst with brief details of the case and special points requiring particular investigation. Thus, in a case of suspected cancer of the stomach it will always help the analyst if he is informed of the provisional diagnosis, and he will in such circumstances apply particular attention to the investigation of the fasting stomach content and may make special search for occult blood, lactic acid, or the presence of abnormal cells in the samples investigated. Or, again, in cases of suspected pernicious anæmia, he may, if warned, proceed to special tests with a view to determining whether an achlorhydria is absolute or whether under additional stimuli the mucosa may be capable of producing some acid.

Normal Curves.

The accepted standard of the normal in fractional gastric analysis is derived from the series of 100 healthy medical students examined by J. A. Ryle and T. I. Bennett, who showed that in 80 per cent. of such subjects the fasting stomach content did not exceed 100 c.cm. and might be almost completely absent; also, that the free HCl fell practically to nil immediately after taking the meal, and subsequently rose to a height somewhere below 50 N/10, falling away from this point during the later time of the investigation. Fig. 1 shows a shaded area within which fall all the readings for free HCl in any of these 80 per cent. of normal subjects, and a curve which conforms roughly to this shaded area must at once be accepted as not differing materially from the normal average.

The Curve of Total Acidity.—This in normal subjects is closely parallel to the curve of free HCl and stands at 10–20 c.cm. higher than the former curve. The two curves are never exactly parallel owing to factors such as regurgitation from the duodenum occasionally diminishing the free HCl without so greatly affecting the total acidity.

It will be observed that the curves, both of free and total acidity, tend to rise during the first hour and to fall subsequently. The shape of the average normal curve calculated from a large series would, therefore, be somewhat as shown in Fig. 2, but the relatively wide shaded area in Fig. 1 makes it clear that a considerable departure from the *average* may occur without anything approaching abnormality being present.

Exceptional "Normal" Curves.

In our study of healthy subjects we observed that extreme deviations from the normal might occur in an important percentage of cases. Thus about 5 per cent. showed a complete absence of HCl with a low total acidity, and about an equal number showed a very abundant secretion with a high concentration of HCl. Although such pictures are most frequently encountered in pathological conditions and will be referred to again in later paragraphs, it must never be forgotten that they may occur in normal men.

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Physician to Out-patients, Middlesex Hospital.

Special Articles.

TUBERCULOSIS ASSOCIATION.

ANNUAL PROVINCIAL MEETING, CAMBRIDGE, JUNE 27TH–29TH.

THE meeting which was held in the Medical School at Cambridge from Thursday, June 27th, to Saturday, the 29th, was divided into four sessions.

I. THE PREVENTION AND HEALING OF TUBERCULOSIS BY TURTLE-VACCINE THERAPY,

Dr. ERNEST WARD (Paignton) being in the chair,

Dr. FRANZ NAGELSCHMIDT (Berlin) said that if the turtle-vaccine therapy had been used systematically from the time of its discovery by Friedmann, much of the expenditure on the campaign against tuberculosis, which had had relatively meagre results, could have been avoided. For various reasons the method had fallen into early disrepute, but in various countries about three million cases had now been treated by it, and protective inoculation had been extensively carried out, so that we were now in a position to review the results and revise any hasty judgments. The main stated objections to turtle-vaccine therapy were that it was too dangerous, that it was too harmless, that the tuberculous lesions would have healed just as well without the vaccine, and, finally, that many of the cases so treated were not tuberculous. Since 1922, the opponents of the vaccine had ceased to say that it was dangerous or that the bacilli might become virulent; on the other hand, it was evidently not inert, as witness the report of the American Board of Health, and the experimental results of guinea-pig immunisation against tuberculosis by Aronson in 1914, and by Rabinovitch, Klebs, Klemperer, and Reichenbach. It would be difficult to refute the objection that the cases would have healed just as well without vaccination, but Szalai, in Hungary, had inoculated with turtle-vaccine more than 15,000 patients in the last few years, and had lowered the death-rate from tuberculosis by more than 60 per cent. Willies, in dealing with a heavily infected group of 75 baboons, had vaccinated 35 of them; 40 were unvaccinated, and all died; whereas of the 35 vaccinated ones only one, which had very advanced tuberculosis, died. All the others healed or kept well, except two which fell from a rock in the Hagenbeck Zoo. Autopsies on these animals showed that they were free from tuberculosis. The last objection—viz., that the vaccinated cases were not tuberculous at all—did not require serious refutation.

The Nature of the Vaccine.

Vaccination with the turtle tubercle bacillus, published by Friedmann in 1912, was fundamentally different from vaccination with extracts of bacteria or of dead tubercle bacilli. It represented an active immunisation with a species of living tubercle bacilli which was avirulent for warm-blooded animals. The bacillus was not a saprophyte, and it could live long enough in the human or animal body to produce strong and lasting immunising effects. Other species of tubercle bacilli were of no use for this purpose. The living tubercle bacillus of human and bovine origin must be rejected because, even in a weakened form, it could become virulent by injection into the human or animal body. Up to the present time only the turtle tubercle stock grown in 1903 from the tuberculous lungs of a sea-turtle with spontaneously acquired tuberculosis answered all the demands that a tubercle vaccine suitable for men and other warm-blooded animals should fulfil. The turtle tubercle bacillus was non-pathogenic in the bodies of warm-blooded animals; the optimum temperature for its culture was 98·6° F., and it could be kept alive or active in the human or animal body for many months or years. The turtle bacillus stock had not changed biologically since its original culture. The characteristics of growth on artificial media, its ability to create immunity against tuberculosis of bovine or human character in warm-blooded animals, and to heal non-advanced tuberculosis had not been changed. So that it was a real "virus fixe." Even though the turtle vaccine was not able to produce a tuberculosis of the human or bovine type, it could produce an immunity to both types. This was shown by the fact that individuals giving a negative reaction to tuberculin generally reacted positively to prophylactic or curative turtle vaccination.

In regard to the prophylactic power of the turtle vaccine, Dr. Nagelschmidt cited the case of two parents with open tuberculosis who had five children, the first and last of whom were vaccinated. The intermediate three children all died of tuberculous meningitis. In all the later literature no case showing harmful results following vaccination had been published.

Technique.

In order to get the best results with the vaccine, said Dr. Nagelschmidt, it was important to follow Friedmann's directions exactly. Patients with tuberculous cachexia, with multiple tuberculous foci, generalised tuberculosis and meningitis, &c., were unsuitable for such treatment. Children with tuberculous lesions, on the other hand, showed striking improvement, as, for example, in fistulæ, and in bone, joint, and gland tuberculosis.

The vaccine was prepared under the supervision of Prof. Kruss, Director of the Leipzig University Institute of Hygiene. It was made in three strengths, varying in the number of bacilli to the ampoule, the grades being labelled "very weak," "weak," and "strong." The contents of each ampoule were about 0·5 to 0·7 c.cm. The injections were made subcutaneously, the site of election being 2–3 inches behind the greater trochanter. Intravenous injection was made only in special cases; as for example, in early and encapsulated tuberculosis of joints; recent and closed spondylitis without abscess formation; Poncet's tuberculous rheumatism of joints; recent tuberculous iritis, choroiditis, uveitis, and episcleritis; early unilateral renal tuberculosis; tuberculous orchitis, and epididymitis, with or without fistulæ. The treatment advised in these cases was an intravenous injection of 0·1 to 0·5 c.cm. "weak," together with a subcutaneous injection of 0·1 to 0·5 "strong."

Prophylactic vaccination might be undertaken if possible immediately after birth. Infants should receive 0·5 c.cm. "weak." In somewhat older children with small tuberculous foci the dose should be 0·5 c.cm. "very weak." The protection thus set up lasted for 10 to 12 years, but might cease sooner in cases exposed to massive, virulent, or frequent infection. Intercurrent infections, such as influenza and whooping-cough, destroyed the immunity, and in such case revaccination should be carried out. Revaccination should also be done in the event of the development *of a tuberculous focus.*

In surgical tuberculosis, the only cases not suitable for treatment were those which had, or were suspected to have, closed and deep-seated abscesses. If, however, these abscesses were about to perforate or were near the skin surface, they could be opened surgically, allowed to form fistulæ, and six weeks later an injection of turtle vaccine could be given. An alternative method was to give an injection of vaccine at once, and the abscess allowed to perforate spontaneously. After vaccination cold abscesses flared up, perforated, and then healed.

A local tissue reaction at the site of injection was noticed in some cases consisting of small abscesses or the formation of granulation tissue containing giant cells and turtle tubercle bacilli. The appearance or non-appearance of a local tissue reaction was not always essential for a prognosis, but its character was often a useful guide in the further treatment of the case.

In pulmonary tuberculosis the more chronic and inactive the disease the smaller the dose given, the more active the disease the larger the dose.

Experiment on a Large Scale in Prophylaxis and Treatment.

Dr. Nagelschmidt then described an experiment conducted in Pest-erzsebet, a suburb of Budapest. It was, he said, a manufacturing town of about 60,000 inhabitants, with approximately 90 per cent. of workmen. The people were very poor, and the houses were mostly very miserable and very damp. Six to nine people often shared one room. Two to three slept in one bed, many on the floor. The town had no money to support people out of work, or to supply them with food and milk. The conditions were *incredible in a civilised country.*

A physician of the town, Dr. Eugen Szalai, heard of the turtle vaccine method, went to Berlin to study it, and then gave about 2000 vaccinations in 1922. Soon after this a period of famine, revolution, and inflation ensued, and his work was interrupted until July, 1925. At this time Dr. Szalai introduced compulsory notification of cases of tuberculosis, clinically diagnosed as well as open cases, and again instituted the turtle vaccine therapy and prophylaxis. No other method of treatment was used, and the results were striking.

In the whole of Hungary there were 62 towns with more than 10,000 inhabitants (in 1922 there were 49). These 62 cities had in 1923 an average mortality from tuberculosis of 23 in 10,000. Pest-erzsebet had 39 deaths per 10,000. In 1928 Pest-erzsebet had only 18 deaths as against 28·8 in Budapest, and an average of 20·4 in the 62 towns. In 1923 Pest-erzsebet held the thirty-seventh place among the 62 Hungarian towns and to-day it took the sixth place. Dr. Nagelschmidt was confident that at the end of the present year it would hold the first place. The physicians of Pest-erzsebet stated that cases of advanced tuberculosis were now rarely seen. This was the first experiment with turtle vaccine therapy on a large scale in one administrative area.

In the years 1925, 1926, and 1927 *4812* cases of *pulmonary* tuberculosis in the first stage were treated. Of these 12 died, 9 became worse, and the remainder were cured. 216 cases in the third stage were vaccinated. Of these 67 died, 23 cases became progressively worse, and 100 resumed their work. 126 cases of the third stage were not treated with vaccine. Of these 115 were dead and 10 became worse; not a single case improved.

In conclusion, *Dr. Nagelschmidt said that* no untoward results had followed the vaccination; that in really early cases of tuberculosis the percentage of clinical healing reached 98 per cent.; that in tuberculosis of infants healing almost always occurred; and that turtle vaccination should be tried in almost all cases of surgical tuberculosis, for operative measures could often be avoided by its judicious use.

Discussion.

The CHAIRMAN said he would like to have heard more about Dr. Nagelschmidt's own cases, and also about the cases treated in this country. He remembered that about 1913 there were three vaccines of live avirulent tubercle bacilli in use—viz., those of *Friedmann*, Calmette, and Nathan Raw. In his opinion the results of treatment were not impressive. It was an unfortunate feature of all the "cures" for tuberculosis that they only gave good results in early cases. He asked Dr. Nagelschmidt how the vaccine was prepared, what was the correct method of dosage, and how many bacilli there were in each ampoule.

Dr. S. VERE PEARSON (Mundesley) asked how much publicity had been given to the method of preparation. As far as he recollected, the method of preparation of the Friedmann vaccine had not been published in full. He inquired why the turtle tubercle bacillus had been chosen for the vaccine in preference to avian and reptilian bacilli.

Dr. F. R. WALTERS (Farnham) expressed the view that it was a great drawback if a remedy was only available for early cases, and emphasised the tendency to spontaneous cure in tuberculosis. He looked forward to the publishing of further evidence.

Dr. W. H. DICKINSON (Newcastle-on-Tyne) felt that the results given by Dr. Nagelschmidt were almost too good to be true. He had seen ten cases air. She agreed with Dr. Agassiz, that there was a marked contrast between the radiographic and physical signs in *non-tuberculous fibrosis* of the lung.

Dr. George Jessel (Lancashire) agreed with Dr. Burton Wood that the tuberculous child was not the precursor of the adolescent consumptive, and that in the diagnosis of intrathoracic tuberculosis common sense and not far-fetched physical signs were necessary.

Dr. Esther Carling (Peppard Common) wished to know what was going to be done about the child wrongly diagnosed as tuberculous. All of them could not be sent to open-air schools, because these were only to be had in the large towns. In her opinion, delicate children should be treated in sanatoria without notification.

Dr. Ward was in accord with the prevalent view about the value of paravertebral dullness. From the practical point of view one need not wait for elaborate tests to be done before treating a delicate child.

Dr. W. C. Fowler (Pinewood) thought that negative Pirquet cases should be treated rather than cases giving a positive reaction, which he regarded as an indication of protection against tuberculosis.

Dr. Herbert said that the question of physical signs in enlarged mediastinal glands needed further investigation. Although he did not very often find paravertebral dullness in children's chests, one could not, he thought, arbitrarily dismiss the sign as valueless. The dullness might not be due to the actual presence of glands, but to some reflex irritation. Dr. A. I. G. McLaughlin and he were at present engaged in the analysis of a series of cases in order to estimate if possible the value of the various signs said to indicate the presence of enlarged mediastinal glands.

Dr. Margaret Sharp (Bradford) and Dr. Niven Robertson (Chesterfield) were both sceptical about the value of paravertebral dullness, and the latter thought the diagnosis of intrathoracic disease in children an extremely shady business, although he admitted that the use of lipiodol made a very pretty radiogram.

Dr. G. M. Mayberry (Dagenham) said that he had not heard the importance of temperatures in diagnosis emphasised as much as he would have liked, and drew attention to the number of cases of so-called tuberculosis cured by attention to the tonsils and adenoids.

Dr. Pearson thought that there was a great difference to be observed in the incidence and type of tuberculosis in children between 1 and 4 years and after that period. He also stressed the value of taking rectal temperatures.

Dr. Dickinson said that in his experience patients with bronchitis did not readily develop tuberculosis.

Dr. C. H. C. Toussaint (London) stated that in a series of 60 cases labelled as tuberculosis in childhood he knew of only two who had developed true pulmonary tuberculosis in early adult life. It seemed that we might be compelled to change our views and direct more attention to the young adult contact who appeared to be in good health, but who might well be in the latent stages of pulmonary tuberculosis.

The question of tuberculosis in childhood was of great administrative importance. It seemed to be the unanimous opinion of the meeting that there had been gross over-diagnosis of the condition, and if this were so much money had been and more still was being wasted on *treatment*. In London difficulty was arising owing to the fact that the County Council had limited certain open-air schools to notified cases of tuberculosis. Dr. Toussaint considered this to be a great mistake.

[The report of the two remaining sessions is unavoidably held over. These dealt with III. The Correlation of X Ray Findings in Pulmonary Tuberculosis, and IV. Gas Poisoning and Gunshot Wounds of the Chest in relation to Tuberculosis.]

A NATIONAL CAMPAIGN AGAINST RHEUMATISM.

At a meeting held in London at the house of the Royal Society of Medicine on June 20th, a new association having for its object an organised campaign against rheumatic diseases was inaugurated under the title of The National Association for Combating Rheumatism. Sir Thomas Horder took the chair.

Letters of approval and encouragement were received from Sir George Newman (Chief Medical Officer of the Ministry of Health) and others and were put before the meeting by Dr. M. B. Ray, the acting hon. secretary, who also read the proposed constitution and policy of the Association. This emphasised the great crippling effect of rheumatic diseases on a large section of the community, and the important part they were playing in the production of sickness and suffering. It was felt by those responsible for starting the campaign that it was high time to make a concerted effort to deal effectively with the problem in all its aspects. About one-sixth of the total invalidity of the country could be charged to diseases commonly classed as "rheumatic"; they were responsible for the loss of three million weeks of labour, and for the payment of about two million pounds in sick benefit annually. At present there were proper treatment facilities for only a minority of sufferers, and it was felt that, since the causes of these conditions were still obscure, adequate facilities for research as well as for treatment should be provided. In the forefront of the Association's policy was placed the need for educating medical opinion upon early diagnosis and the importance of continuous treatment. The public should be told of the value of further research, whilst efforts directed towards prevention were essential. A system of following up cases needed to be organised, and efficient home treatment should be carried out. Bound up with this was advice about suitability of occupation, in which employers of labour might well be invited to interest themselves. Climatic and occupational factors must be carefully studied, and research must not be confined to the laboratory. Coöperation was required between the laboratory worker, the clinician, the biochemist, and the radiologist, and social workers also should be interested in the campaign. It was hoped that a system of uniform reporting of results would be arrived at; this would certainly aid the collection of statistics, and enable the value of various forms of treatment to be assessed. Another proposal was the establishment of treatment centres.

Sir Claude Hill (Governor of the Isle of Man) formally moved that the Association adopt the proposed constitution and policy, and said that he was much impressed by the scope of the campaign now being undertaken. He hoped industrial interests would be successfully enlisted, and especially that clinics in different parts of the country would be established for dealing with these diseases. He also suggested that the organising secretary should be a man who would be able to travel, so as to ensure the sympathy of the industrialists, and persuade them that their support was needed. The Association, on the suggested lines, would be in a good position to meet what everyone cognisant of the facts would feel to be a real need.

Dr. Malcolm Campbell (Droitwich) seconded the resolution, and mentioned the great aid in the movement which could be afforded by the various women's organisations.

The Chairman agreed about the desirability of a close liaison between the industrial and the purely medical aspects of the problem, and said this had been in the minds of the Committee from the start. He mentioned that the Prime Minister had signified his willingness to become a member of the Council.

Mr. Henry Lesser (President of the National Association of Insurance Committees) moved the acceptance of a list of 71 ladies and gentlemen proposed as members of the Council.

Dr. E. J. SPRIGGS, in seconding, said that in discussing this matter with people and trying to get their help he had found it useful to point out that this was not a charitable appeal. Though rheumatism affected certain classes, no social grade was exempt. It was not proposed to start a new organisation which should replace or absorb any in existence, but one which should coöperate with other bodies for the prevention and adequate treatment of rheumatism. Much good work was already being done and it was "bad business" to have it done in different places separately.

The list of names was then accepted by the meeting.

Dr. FORTESCUE FOX emphasised the need of enlisting all who could help this important movement forward, and hoped that the international aspect would be borne in mind. Good work in this connexion was going on in other European countries.

Dr. J. VAN BREEMEN (Amsterdam), speaking as hon. secretary of the Ligue Internationale contre le Rheumatisme, referred to the Ligue's meeting to be held in October at Budapest, at which ten nations were already represented. Among points on which information from all sources would be welcomed were: the relation between acute and chronic rheumatism and the significance of serological and blood examinations. It would be a great help to receive for consideration at the Congress information and suggestions from England.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Water-supply.

THE amounts of water in the Edinburgh reservoir are still extremely low and the Water Committee find it necessary to issue another warning. It is suggested that the consumers should aim at saving 2 gallons a day, which in the population supplied in the Edinburgh area would mean a saving of 1,000,000 gallons daily or 30,000,000 gallons a month. It was pointed out by the engineer that the use of water for flushing the drains and sewers is not wasteful but a necessary health provision, and the amount so used is comparatively small. The aqueduct from the Talla reservoir is being duplicated; but the duplication cannot be finished in time to relieve the situation this year. The manager of the Glasgow Water Department says that earlier in the year there was some anxiety, but at present there is an assured supply for four months. The notices posted in the tramcars some time ago calling upon the citizens to conserve the supply as much as possible seem to have had an effect.

Finances of Edinburgh University.

At a recent meeting of the University Court Sir Alfred Ewing, the Principal, said that the ordinary revenue had increased from £110,000 in 1913–14 to nearly £250,000 in 1927–28, and in the current session it would probably be £251,000. In these figures no account is taken of scholarships or bursaries for which the University is only a trustee. Of the whole regular income, about £48,000 comes as interest from endowments, Parliamentary grants amount to £91,800, and £107,000 is paid in fees. The ordinary revenue includes also about £9000 in donations and subscriptions (apart from capital donations), and in payments by local authorities for services rendered. Of disbursements the salaries of the teaching staff constitute the heaviest item—about £141,000. Pensions and contributions to the federated superannuation scheme account for £15,000; wages and grants to departments for expenses require £25,000, and libraries and museums about £9000. The cost of administration, including the salaries of the Principal and of members of the secretarial staff, is about £18,000. Some £30,000 is required for maintenance of premises, and £10,000 for alteration and adaptation of buildings, and for certain apparatus and equipment. The whole expenditure charged to the ordinary account for 1927–28 was about £253,000, leaving a deficit on the year's working of £3190. For the current year the estimated deficit is £1670, and is likely to be more. Sir Alfred pointed out that enlargement of the University, in respect of buildings, subjects, and staff, cannot fail to increase the annual charges that fall on ordinary revenue. As a rule, the increase in revenue from fees arising from a new development does not compensate for the increase in annual charges. Hence new sources of revenue must be found. It is for consideration whether, in the disposal of future capital grants from the Carnegie Trust, the trustees should not be invited to consider the wisdom of giving some relief from the increasing burden of maintenance, by granting sums for the better endowment of existing professorships and lectureships, whose value is established, but whose cost is now a burden on the general funds. The bequests and gifts which have made the expansion of the University possible have amounted to over £1,174,000 since 1918. Fully half of this has been invested to provide endowments for particular or general purposes, whilst the remainder has been or is being applied to various extensions of premises and work, including provision for an extensive and much-needed reconstruction of the Medical School.

An Auxiliary Hospital in the Country.

The Auxiliary Hospital of the Victoria Infirmary, Glasgow, at Philipshill, near Busby, was formally opened on June 27th. Beautifully situated in rural scenery, the grounds of the extension cover some 33 acres, and two of the eight pavilions which will ultimately be in use are now completed. It will serve as a convalescent hospital where patients, having passed the stage for constant medical and surgical attention, can be transferred to convalesce, and thereby release beds for the long list of sufferers awaiting admission to the infirmary.

Mr. William Gray, who presided, said that the natural evolution of hospital treatment seemed to demand that buildings in the cities should be regarded as clearing-houses for cases in the acute stage; when that stage had been passed the patients should be placed in brighter and more attractive surroundings than the ward of a city hospital. They would not have been able to proceed with the work if Mr. Gilchrist Macbeth had not offered to contribute £20,000 if it was undertaken. Miss Innes had contributed £13,000 for the building of a chapel and to defray the cost of a ward.

Major Walter Elliot, M.P., late Under Secretary of State for Scotland, who gave an address on the general hospital problem, spoke of the damaging effect of urban noise on minds and tempers. If this problem could not be solved for the healthy, let an attempt at least be made to solve it for the sick. Glasgow was on the verge of a further expansion and the governors of the hospital were to be commended for having got a little ahead of the procession which would shortly follow out of the city. Such expansion had been in the mind of the late administration in considering Scottish local government and the relation between the voluntary, city, and parish hospitals. Not only had the hospitals of Glasgow to be treated as a unit, but extensions outside the area had to be recognised as part of the system. The decision that public hospitals should be under one health authority meant that its relations with the voluntary hospitals must be closer than before, and by submission of local reorganisation schemes to the Department of Health it was hoped that overlapping might be avoided. He was certain that they could always look to the central department and to the present Secretary of State for Scotland for sound reasoned judgment on these great matters.

EPSOM COLLEGE.

THE annual general meeting of the Governors of Epsom College was held on Friday, June 28th, at the Office, 49, Bedford-square, W.C., when the Chairman of the Council, Dr. Raymond Crawfurd, presided.

The report of the scrutineers showed that the following were the successful candidates for pensionships and foundation scholarships:—

Pensionerships.

	Votes.		Votes.
*Mylan, Dr. James G. ..	6723	‡Alford, Mrs. Mary A...	5417
*Johnstone, Dr. George W.	5930	†Benson, Dr. Alfred ..	4897
*Ogilvy - Ramsay, Mrs. Isabella	5673	‡Harris, Dr. Arthur G. R.	4584

* Ordinary Pensioners. † Highett Pensioner.
‡ Burney Yeo Pensioners.

Foundation Scholarships.

Porter, John D.	21,027	Hogg, Robert D. ..	13,926

In proposing the adoption of the report and the income and expenditure account, the Chairman expressed the Council's regret that three warm friends of the College had died since the last annual general meeting—namely, Lord Rosebery, who was President, Dr. Francis de Havilland Hall, who was a Vice-President and for some time acted as Vice-Chairman of the Council, and Mr. Æneas Mackay, who was a member of the Council. Dr. Crawfurd stated that the sum of money required for the new sanatorium was not increasing as rapidly as the Council would wish, and he urged all friends of the College to procure donations for this special purpose. He added that if two sums of £5000 could be obtained the work would be started at once. In reference to the school, he said that progress was being made in all directions, and that the Council had brought into force a much improved scale of salaries and emoluments for assistant masters, and this had been greatly appreciated. The Council had received with great pleasure a sum of £1000 which Lord Beaverbrook had placed at the disposal of Mr. Stanley Baldwin in gratitude for his escape, as well as the escape of his associates, in a motor accident. This generous gift was being expended on the furtherance of scientific education at the College.

The report submitted to the Governors showed that since the last annual general meeting an open entrance scholarship of £100 per annum in classics at Pembroke College, Oxford, had been won by E. V. E. White. Eighteen candidates entered for the first examination for medical degrees, as follows:—London, 11 candidates, of whom 4 were completely successful, 5 were successful in two subjects out of three and 1 was successful in one subject out of three; Oxford, 2 candidates, both of whom were completely successful; and Cambridge, 5 candidates, 4 of whom were successful in all subjects, and 1 was successful in one subject. Sixteen candidates presented themselves for the University of London higher certificate, of whom 6 were completely successful and 8 were partially successful, whilst 8 candidates out of 12 were successful at the University of London matriculation examination. Of 87 boys who presented themselves for the University of London general school examination, 76 gained school certificates, 8 with honours, of whom 42 gained exemption from matriculation. Thirty-three boys obtained the War Office certificate "A"; out of 3 candidates for the Royal Military College, Sandhurst, 2 were successful, gaining 3rd and 70th places; and 1 boy was successful for the Royal Navy paymaster cadetship, taking the 6th place. The report further stated that A. L. Novis had been awarded his "cap" for England, being the second Old Epsomian to win his Rugby international during the last two years; W. J. Leaning had been elected captain of the Oxford University boxing team, and D. L. Rhys had represented Sandhurst in cricket, boxing, and fencing.

The Governors were able to elect only nine members of the Council to serve for a further period of three years, instead of ten as prescribed by the Act of Incorporation, owing to the death of one of the candidates, and it was decided to adjourn the meeting until Friday, July 26th, when a tenth member would be elected.

ELECTION OF DIRECT REPRESENTATIVES FOR THE DENTAL BOARD OF THE UNITED KINGDOM.

THE second election of direct representatives for the Dental Board of the United Kingdom took place last month, the votes being counted on June 17th–19th.

(a) Qualified Dentists Practising in England and Wales (2 Seats).

Four candidates were nominated—namely: Mr. W. R. Ackland, L.D.S., M.R.C.S.; Mr. W. H. Dolamore, L.D.S., M.R.C.S.; Mr. W. H. Gilmour, L.D.S.; and Mr. C. F. Rilot, L.D.S., M.R.C.S.

The number of voting papers issued was 5926; deducting dead letters (20) the possible number of voters was 5906; good votes numbered 3207; invalid votes (the larger part on account of failure to sign the identification envelope) 364, and 2335 took no part in the election.

The voting papers were sorted according to the first choices, and then, as the voting for the third place was seen to be so close, a further count was taken. The result was as follows: Ackland, 828; Dolamore, 1032; Gilmour, 679; Rilot, 668; total, 3207. The quota (one more than a third of the whole) was 1070. As no one had obtained the quota Mr. Rilot, having received the least number of votes, was declared defeated, and his votes transferred to the second choices shown on his papers. This produced the following result: Ackland, 925; Dolamore, 1509; Gilmour, 763; non-transferable, 10; total, 3207.

Mr. Dolamore had now obtained the quota, and he was declared to be elected, his surplus votes (439) being transferred to the candidate marked 2 on his papers in such a manner that each received his proper proportion. The result was shown to be: Ackland, 1056; Gilmour, 874; non-transferable, 207; retained for Dolamore's quota, 1070; total, 3207. Mr. Ackland was therefore declared to be elected.

No. of valid votes, 3207. No. of members to be elected, 2.

$$\text{Quota} = \frac{3207}{3} + 1 = 1070.$$

Names of candidates.	First count.	Second count.		Third count.	
	Votes polled by each candidate.	Transfer of Rilot's votes.	Result.	Transfer of Dolamore's surplus.	Result.
ACKLAND ..	828	+ 97	925	+131	1056
DOLAMORE ..	1032	+477	1509	—439	1070
Gilmour.. ..	679	+ 84	763	+111	874
Rilot	668	—668	—	—	—
Non-transferable papers ..	—	+ 10	10	+197	207
Totals.. ..	3207	—	3207	—	3207

(b) Qualified Dentists Practising in Scotland (1 Seat).

Two candidates were nominated—namely: Mr. W. Guy, L.D.S., F.R.C.S., and Mr. J. W. A. McGowan, L.D.S.

The number of voting papers issued was 925; deducting dead letters (5) the possible number of voters was 920; good votes numbered 660, invalid votes 60, and 200 took no part in the election.

The result was as follows: McGowan (elected), 301; Guy, 209.

(c) Qualified Dentists Practising in Ireland (1 Seat).

Two candidates were nominated—namely: Mr. J. Malone, L.D.S., and Mr. E. L. Sheridan, L.D.S., F.R.C.S.

The number of voting papers issued was 296 and there were no dead letters; good votes numbered 196, invalid votes 13, and 87 took no part in the election. The result was as follows: Sheridan (elected), 124; Malone 72.

(d) Dentists, 1921 (2 Seats).

Four candidates were nominated—namely: Mr. W. F. Bowen (Bolton), Mr. F. Butterfield (Lytham, Lancs.); Mr. A. H. Condry (Birmingham), and Mr. W. L. Edwards (Gloucester).

The number of voting papers issued was 7222; deducting dead letters (16) the possible number of voters was 7206; good votes numbered 3787 (4178); invalid votes (the larger part again on account of failure to sign the identification envelope) 399, and 3020 took no part in the election.

The voting papers were sorted according to the first choices, the result being as follows: Bowen, 855; Butterfield, 1820; Condry, 281; Edwards, 831. The quota (one more than a third of the whole) was 1263.

Mr. Butterfield, having obtained more than the quota, was declared to be elected, and his surplus votes (557) were transferred to the second choices. For this purpose all Mr. Butterfield's papers were re-examined, counted, and transferred in such a way that each candidate named as a second choice received the same proportionate share.

The result after the transfer of Mr. Butterfield's surplus was: Bowen, 1159; Condry, 419; Edwards, 946; quota retained for Butterfield, 1263; total, 3787.

As none of the other candidates had yet obtained the quota Condry was declared defeated and his votes transferred according to the preference, where expressed, to Bowen or Edwards. The result of this transfer was: Bowen, 1355; Edwards, 1117; non-transferable, 52; quota retained for Butterfield, 1263; total 3787. Mr. Bowen was therefore declared to be elected.

No. of valid votes, 3787. No. of members to be elected, 2.

$$\text{Quota} = \frac{3787}{3} + 1 = 1263.$$

Names of candidates.	First count.	Second count.		Third count.	
	Votes polled by each candidate.	Transfer of Butterfield's surplus.	Result.	Transfer of Condry's votes.	Result.
BOWEN	855	+304	1159	+196	1355
BUTTERFIELD ..	1820	—557	1263	—	1263
Condry	281	+138	419	—419	—
Edwards ..	831	+115	946	+171	1117
Non-transferable papers ..	—	—	—	+52	52
Totals.. ..	3787	—	3787	—	3787

Comments.

The total percentage of the electorate who took part in the election was 60·55 per cent., as compared with 64·49 in 1924. It was shown in this election, as in 1924, that it is not good policy to refrain from recording the order of preference for all the candidates. Those who recorded only their first choice took no part in the election of the candidate when it came to taking further counts, and their papers merely became "non-transferable." The sorting and counting of votes, and the necessary calculations were carried out under the direction of Mr. A. J. Gray, of the Proportional Representation Society.

Correspondence.

"Audi alteram partem."

THE MECHANISM OF FILARIAL PERIODICITY.

To the Editor of THE LANCET.

SIR,—The thoughtful and stimulating article by Colonel Clayton Lane on the mechanism of filarial periodicity in your issue of June 22nd has once more raised interest, at a most appropriate time, in this mysterious phenomenon. As Colonel Lane has done me honour by frequently referring to my own contributions on the subject (made some 17 years ago), I have thought it appropriate that I should set down some of my own views. There is nothing that I regret so much in my work on filariasis in Fiji that, apart from making certain observations on the lack of periodicity of the Fijian microfilaria and tracing its development in its appropriate intermediary host, I was unable to finally determine the exact mechanism of periodicity, except to assume (as had Manson in his original discovery) that this habit was an adaptation to the peculiarities of the mosquito host. This conclusion, which at that time appeared tenable on purely biological grounds, is not, as Colonel Lane has shown, so simple as it at first sight appeared to be. Colonel Lane sums up in favour of simultaneous cyclical parturition on the part of the female filaria as the cause of periodicity—that is to say, he assumes that in the case of the nocturnal *F. bancrofti*, the embryos are emitted by the parent worm into the blood stream during the night time, while in the non-periodic *F. bancrofti*, of Fiji and of Oceania in general, the embryos filter into the blood during the whole of the 24 hours, and that daily enormous numbers of microfilariæ are destroyed in and disposed of by the human body. In order that this supposition should fit in with the facts so far as they are known, we must credit each female *F. bancrofti* with extensive powers of fecundity. It is the only explanation at present forthcoming which will even roughly correspond with the known facts; but in order to explain the very large numbers of microfilariæ which may be found in the peripheral circulation of an individual, it is necessary to know the total volume of blood in the peripheral circulation on the surface of the body to which microfilariæ have access. This is an extremely difficult matter to ascertain accurately, and, even if we can do so roughly, there remains the uncertainty of the proportion of microfilariæ in the larger blood vessels.

As Fülleborn[1] states, it is readily understood that microfilariæ are held up in the smaller terminal capillaries, especially during their periodic appearances, but that they are more generally distributed throughout the larger arteries and veins also appears probable. Mackenzie and others have attempted to reckon out the total numbers of microfilariæ present in the blood of an average infected case as 40 to 50 millions, but these are mere guesses. I have had the assistance of Dr. W. K. Blackie in endeavouring to calculate out the amount of blood present in the peripheral circulation of an adult, 6 ft. in height, of 11 st. 6 lb. 12 oz. in weight, and with a surface area of 1·9 square metres. Assuming the blood volume to be 5 litres, the amount in the peripheral circulation would be 203 c.cm. I have frequently recorded in my work in Fiji counts of over 500 microfilariæ to every 20 c.mm. of blood, or one microfilaria to every 20,000 red blood corpuscles. On this basis of reckoning, in the skin and subcutaneous tissue to a depth of 2 mm., there are contained no less than 6,575,000 microfilariæ. I have no means of ascertaining accurately the number of fecund and mature

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[1] Fülleborn, F.: Filariosen des Menschen, Hand. d. Path. Mikro-org., 1929, p. 1103.

F. bancrofti present in a filariated individual at the one time. From such autopsies as I have been able to perform I should not place it at a figure higher than 20, which, if the periodic daily destruction of microfilariæ takes place, would credit a single female *F. bancrofti* with the power of producing some 328,000 embryos daily. Whether this is possible or not I do not think we are in a position to say. That certain helminths are prodigal in their reproductive capacity is well known, but I doubt whether there are any figures of the reproductive capacity in nematodes which would compare with these. As Clayton Lane suggests, some method of comparison might be obtained by a more minute study of allied species, such as the filariæ of birds of which the adults can be found and counted with greater certainty in the body than can the human species. Once only have I had the opportunity of watching the female *F. bancrofti* in the act of parturition, and this was, of course, under artificial conditions in a watch-glass in normal saline solution. The embryos emerged from the vulva in an unending stream, but it was impossible at the time for me to even estimate their numbers. I have hitherto hesitated in accepting the cyclical parturition theory, mainly on account of the only properly conducted experiments on the longevity of microfilariæ in the blood which were carried out by Fülleborn and which placed the life span of microfilaria repens of the dog, apart from the adult, at about two years. It may be, as Colonel Lane suggests, there was some flaw which vitiated the experiment. If his supposition of the daily destruction of millions of microfilariæ in the human body is correct, there must be some method of the disposal of their remains. One would expect that some evident pathological lesions would be produced. But this does not appear to be so. The fact remains that, from a clinical standpoint, those individuals with the highest microfilariæ count show fewest signs of what is generally understood as filarial disease. On Clayton Lane's hypothesis this would really indicate that the parent filariæ are located in some situation favourable to the uninterrupted passage of microfilariæ into the blood stream.

How can this question be determined? As far as is at present known there is no experimental animal in whose blood microfilaria bancrofti can survive. There only remains man himself, so that I would suggest that no great difficulty should be experienced in injecting a sufficient number of live M. bancrofti into a suitable volunteer in this country, so that by these means its life span could be determined and the conditions of Fülleborn's experiment reproduced. On the analogy of the embryos of other parasitic helminths it would be unbiological for the life span of microfilariæ in the blood stream to be a long one.

My mind is somewhat exercised to know how to fit in all the known facts with the theory of cyclical parturition. Let us recapitulate what they are: there are two varieties of *F. bancrofti* in man, morphologically indistinguishable from one another, each possessing a distinct geographical distribution, producing identical embryos, one with nocturnal periodicity, the other exhibiting no periodicity, developing in different species of mosquito intermediary hosts, and maintaining a different habitat in the human body. The latter is a point upon which insufficient emphasis has been laid. In the nocturnal *F. bancrofti* infections, the adults appear to live in the main lymphatic trunks in the neighbourhood of the thoracic duct, whence, presumably, they can pour an uninterrupted stream of embryos into the blood stream; in other words, they maintain a central location. Hence manifestations of disease brought about by lymphatic obstruction of the main trunk, such as chyluria, are associated with the nocturnally periodic *F. bancrofti*. On the other hand, the non-periodic *F. bancrofti* of Oceania inhabits the lymphatic glands, epididymis, tunica vaginalis, and perhaps the organs of the body. *It maintains a peripheral distribution.* Hence the filarial diseases produced are mainly those of enlarged lymphatic glands and the obstruction they give rise to. Chyluria is *completely* absent and elephantiasis of the forearm, extremely rare in other regions, is common and is due to the infestation of the epitrochlear glands by adult filariæ. How would this fit in with the theory of cyclical parturition? I can conceive that it does so by the fact that the embryos produced in the substance of the lymphatic glands have a much more complicated and circuitous route to pursue before they reach the blood stream which they enter by a constant trickle and thence appear in the peripheral blood capillaries in equal numbers both by day and by night. The next question which naturally arises is, how can one reconcile cyclical parturition with the inversion of periodicity in the nocturnal *F. bancrofti* by altering the sleeping habits of the host, as first shown by Mackenzie and afterwards confirmed by Manson? This is only explicable by the supposition that there is some substance in the blood of the sleeping host which has a stimulating effect upon the reproductive organs of the female parturient filaria. But how can that be reconciled with the diametrically opposite case of the diurnal *Loa loa* in which the embryos appear in the same vast numbers in the peripheral blood stream during the hours of daylight? Are we to suppose that in this instance this hypothetical chemical stimulant has the opposite effect? And how is it that the periodicity of the diurnal microfilaria loa cannot be (easily at any rate) upset, though as Külz has demonstrated,[2] this upset of periodicity during the voyage from West Africa to North America actually takes place?

Another difficulty I find in envisaging the entry of the microfilaria loa into the blood stream. How exactly is this brought about, except through the lymph channels? As far as we know, the adults of *Loa loa* live in the connective tissues, but the parturient female must have direct access to the lymph stream before her embryos can enter the blood. Again, in connexion with this last parasite: how can we reconcile the remarkable observations made by Manson and confirmed by myself that subsequent to the date of known infection by *Loa loa* a period of six to seven years may elapse before the entrance of the embryos into the blood takes place. It is inconceivable that it is necessary for this long period before the adult *Loa loa* becomes mature. Rather may we explain it on the supposition that the female or females of *Loa loa* find themselves in a position from which the embryos are unable to find their way into the blood; and it is while they are searching for a suitable breeding ground that they emit the embryos into the connective tissues and cause those curious "Calabar swellings," which may be said to resemble the lesions brought about by the infelicitous discharge of guinea-worm embryos into the body. I would therefore appeal for future study to be directed towards solving these crucial questions by a reconsideration of the mechanism of periodicity on a wider scale, by carefully weighing in the balance all the evidence which has been collected, not on the life-history of *F. bancrofti* alone, but also upon other human species.

Since my work on filariasis in Fiji and Ceylon has been completed I have had few opportunities of continuing observations on periodicity. I was, however, able in 1925 to confirm the observations of Külz that capillary constriction causes no diminution in the number of circulating microfilariæ (*Loa loa*). In this instance blood was taken periodically from a finger immersed in ice and the total number compared to that from the unfrozen member of the opposite hand.

More work is required to bear out conclusions based upon the appearance of microfilariæ in the urine. In pure chyluria such few observations as I have made go to show that the filarial embryos are usually dead by the time they appear in the urine, but in hæmatochyluria, where there has been an outpouring of the blood into the chylous urine, I was able to ascertain from observations made on a case of the disease in a Japanese sailor in December, 1923, that numbers of live microfilariæ appeared in the urine passed at night time only and that they maintained a periodicity strictly parallel to that of the finger blood.

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[2] Fülleborn: Loc. cit., p. 1109.

We may take it, then, that periodicity is a beautiful adaptation of nature, much more intricate and certainly not more wonderful than the many familiar adaptations in animal and plant life, of which it is possible to quote many examples. Its elucidation will come when all factors of natural history of the parasitic filaria worms are adequately studied and understood, and we may therefore conclude that there is nothing unbiological in the idea that the female filariæ have certain cyclical and well-defined periods for emptying the uterus of the imprisoned embryos.

I am, Sir, yours faithfully,

PHILIP MANSON-BAHR, M.D., F.R.C.P.

Weymouth-street, W., July 1st, 1929.

RIVERS POLLUTION.

To the Editor of THE LANCET.

SIR,—I am very glad to see that your paper has been giving prominence to the growing evil of river pollution, and it is much to be hoped that you will continue to impress upon your readers the importance of this matter. The apathy of all classes of the public to this national danger is very remarkable, and any newspaper which combats this apathy is doing a service to the country. Pollution not only destroys the amenities of the country and causes enormous *annual loss to agriculture and other industries*, but it diminishes the available water-supply and is a menace to the health of the whole population.

Medical men do not need converting to a belief in the evil effects of pollution but they may not fully realise how widespread the evil is and how rapidly it is growing. For example, the Clerk to the Trent Fishery Board lately stated publicly that in the 5000 square miles over which his Board exercised supervision, there was not a single authority that was dealing adequately with its sewage disposal. This is not an isolated case. It is merely an example of what is happening in almost every part of England. It is to the medical profession, more than to any other class, that those who are alive to the danger will look for support and indeed for leadership in the fight. Not only can medical men as individual missionaries preach a crusade against pollution, but collectively as a body, the profession can use the tremendous weight of its influence to press for amendment in our deplorably defective anti-pollution laws and their equally deplorable administration by our Government Departments.

I am, Sir, yours faithfully,

THOS. W. GOMM,

Hon. Secretary, Pure Rivers Society.

Lincoln's Inn-fields, W.C.2, July 1st, 1929.

BICARBONATE FOR BLACKWATER FEVER.

To the Editor of THE LANCET.

SIR,—I would like to support the statement made by Dr. Chesterman in the last paragraph of his paper (THE LANCET, June 29th, p. 1365) regarding the value of oral administration of bicarbonate of soda solution for blackwater fever. When in Kenya Colony I treated one case of blackwater fever in an Indian child 5 years old by that means. Another case of more practical interest is that of a European man aged 46 years, who had a fourth attack at some gold mines in an inaccessible district where there had been just previously two fatal cases. This man promptly retired to bed and consumed as much bicarbonate of soda in water as he could tolerate. Owing to the condition of the roads in the rainy season, it was 48 hours after the onset before I reached him and by that time hæmoglobin had disappeared from the urine and only slight jaundice remained.

It is well recognised that blackwater fever cases stand movement badly, and often, under tropical conditions, cases would have a better chance treated on the spot by such means than by submitting them to a lengthy and tedious journey to a hospital.

I am, Sir, yours faithfully,

C. P. DONNISON, M.B., B.S. Lond.,

Late Medical Officer, East African Medical Service.

Benfleet, Essex, June 28th, 1929.

A FICTITIOUS INTERVIEW.

To the Editor of THE LANCET.

SIR,—At the last meeting of the Urological Section of the Royal Society of Medicine on June 27th I gave, by invitation, a demonstration of motion and sound pictures of operations, and notice of the forthcoming demonstration was published in your issue of the previous week. There has since appeared in the public press a florid account of this demonstration with personal references to myself and a statement that I am supposed to *have* made at an interview. I am writing to assure my professional colleagues that I have had no communication with the press by word or in writing, and that no interview of any sort has taken place. I am taking steps to have this acknowledged by the journal in question.

I am, Sir, yours faithfully,

JOHN THOMSON-WALKER.

Harley-street, W., July 2nd, 1929.

⁂ A brief account of the demonstration appears under the reports of Medical Societies.—ED. L.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 22ND, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 166 (last week 191); scarlet fever, 1786; diphtheria, 1012; enteric fever, 33; pneumonia, 873; puerperal fever, 47; puerperal pyrexia, 69; cerebro-spinal fever, 9; acute poliomyelitis, 2; acute polio-encephalitis, 2; encephalitis lethargica, 25; continued fever, 1; dysentery, 4; ophthalmia neonatorum, 110. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases *in the Infectious Hospitals of the* Metropolitan Asylums Board on June 26th–29th was as follows:—Small-pox, 239 under treatment, 3 under observation (last week 269 and 10 respectively); scarlet fever, 1304; diphtheria, 1581; enteric fever, 13; measles, 181; whooping-cough, 409; puerperal fever, 29 (plus 6 babies), encephalitis lethargica, 121; "other diseases," 41. At St. Margaret's Hospital there were 10 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 46 (4) from measles, 4 (0) from scarlet fever, 34 (9) from whooping-cough, 20 (0) from diphtheria, 44 (12) from diarrhœa and enteritis under two years, and 22 (2) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 11 deaths from measles, Leeds 4, Nottingham and Sunderland 3 each. Birmingham reported 5 deaths from whooping-cough, Wigan and Manchester 2 each; no other large town more than 1. Birmingham, Liverpool, and Manchester each reported 4 deaths from diarrhœa and Salford 3.

The number of stillbirths reported during the week was 288 (corresponding to a rate of 40 per 1000 total births), including 60 in London.

JENNY LIND HOSPITAL FOR CHILDREN.—On Saturday last Princess Mary opened a new out-patients' block and special departments in this Norwich hospital.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The New Parliament.

The new Parliament was opened on Tuesday, July 2nd. Owing to the recent illness of His Majesty The King, it was not thought advisable to submit him to the strain of a State opening, and the ceremony was therefore performed by Royal Commission. The Lords Commissioners were the Lord Chancellor, the Earl of Kintore, Lord Southborough, Archbishop Lord Davidson, and Lord Denman. The King's speech, which was read in the House of Lords by the Lord Chancellor, stated that while His Majesty regretted that it was not possible to address Parliament in person, he thanked Almighty God that he could look forward with confidence to that complete restoration of health for which the prayers of his people throughout the Empire with a sympathy and affection which called forth his deepest gratitude were offered during the months of his long and serious illness. The Government was at present considering the unanimous report of the independent financial experts appointed to draw up proposals for a complete and definitive settlement of the German reparation problem in preparation for a conference of representatives of the Governments concerned. A settlement of this problem would enable the occupying Powers to proceed with the evacuation of the Rhineland. It was the earnest hope of the Government, in coöperation with the Governments of the Dominions of India and of foreign Powers, to ensure an early reduction of armaments throughout the world. Consultations were taking place regarding the signing of the Optional Clause embodied in the statute of the Permanent Court of International Justice. The question of the resumption of diplomatic relations with the Soviet Government of Russia was also being examined. It would be the foremost endeavour of the Government to deal effectively with the continuing evil of unemployment. Schemes were being prepared for the improvement of the means of transport, for the stimulation of the depressed export trades, for the economic development of the overseas Dependencies, for the improvement of the condition of agriculture, for the encouragement of the fishing industry, and for the improvement of the facilities for the marketing of farm and fishery outputs. Measures were being considered in coöperation with the Dominion Governments to provide greater opportunities for overseas migration. Proposals would be submitted to Parliament in due course dealing with the reorganisation of the coal industry, including hours and other factors and the ownership of minerals. Inquiries would be undertaken immediately in order to discover means to coöperate with the iron and steel and cotton industries to improve their position in the markets of the world. Bills would be introduced for amending and consolidating the existing factory legislation and for giving effect to the obligations entered into in Washington in 1919. Legislation would be undertaken to promote an extensive policy of slum clearance and to make further provision for housing in urban and rural areas. The Government had decided that a time had come to investigate the whole field of legislation relating to the sale and supply of intoxicating liquor and commissioners would be appointed for that purpose. A general survey was proceeding of the various National Insurance and Pension schemes. Meanwhile a Bill was being prepared to amend the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, so as to modify the conditions applicable to certain pensions and to make some increase in the classes of persons entitled to them. A measure would be introduced to remedy the situation created by the Trade Disputes and Trade Unions Act, 1927. At the recent General Election an extended franchise placed in the hands of the whole of the people of adult years the grave responsibility for guarding the well-being of the nation as a constitutional democracy, and the Government proposed to institute an examination of the experiences of the election so that the working of the law relating to Parliamentary elections might be brought into conformity with the new conditions.

Manchester Babies' Hospital.—The annual report shows that last year there were 881 admissions and 316 discharges, and that the mortality was 14·59 per cent. The most numerous cases, amounting to practically one-third of the discharges, were those of chronic dyspepsia; of rickets, which came next, there were 42. Prematurity accounted for the largest number of deaths (12). The number of premature children increases every year; in 1924 it was four, but in 1928 it had risen to 37. It has been decided to immunise against diphtheria all infants whose parents are willing.

Medical News.

University of Birmingham.—At a congregation held on June 29th the following degrees and diplomas were conferred:—

M.D.—W. D. Beck and C. G. Payton.

M.B., Ch.B.—*W. C. Smallwood, †E. G. Abdel-Malek, F. A. d'Abreu, Adele M. Frankland, C. W. Kidson, F. G. Lewis, A. J. Moffett, E. H. Parkinson, H. R. Kalra, Ali Said, Christopher St. Johnston, F. R. Smith, George Steane, K. S. Thom, and Doris I. Wall.

* First class honours. † Second class honours.

Diploma in Dental Surgery.—B. D. Britton.

Application is invited for the Walter Myers travelling scholarship of £300 for research in pathology during the year 1929–30. Particulars will be found in our advertisement columns.

University of Durham.—At a Convocation held on June 27th the following degrees and diplomas were conferred:—

M.D.

Max Coll, O. C. Dobson, John Hare, A. H. Holmes, F. W. Marshall, P. M. Rivaz, Gladys Stableforth, A. J. Watson, and Reginald Wear.

M.B., B.S.

Sydney Adler, J. C. Arthur, W. F. Cross, Kenneth Daniels, C. E. Goldberg, H. W. T. Hall, Wilfred Hall, John Maddison, H. D. Ord, A. R. D. Pattison, J. K. H. Scott, J. B. Tilley, and Nora Walkinshaw.

B.Hy. and D.P.H.

Katherine M. Cellan-Jones, O. C. Dobson, and A. J. Watson.

University of Glasgow.—At a ceremony of graduation on June 28th the folllowing degrees were conferred:—

M.D.—*J. S. Young, Moses Cohen, and J. C. H. Mackenzie.

* With honours.

Queen's University, Belfast.—At recent examinations the following candidates were successful:—

M.D.

*Robert Armstrong, *W. H. Belford, Robert Evans, H. E. Hall, †R. A. G. Hamilton, J. B. Lyle, W. J. M'Cracken, W. A. Scott, and H. A. Warnock.

* With commendation. † Gold medal.

M.Ch.

F. S. Carson.

M.B., B.Ch., B.A.O.

First Class Honours.—W. J. Hamilton, T. B. H. Haslitt.

Second Class Honours.—J. S. Baxter, Hugh Caldwell, Joseph Gray, J. V. Hurford, C. J. Lord, James Montgomery, and D. A. C. Wilson.

Pass.—D. R. Cairns, Mary V. Cox, J. C. Craig, C. T. Denny, Charles Dick, J. M'K. Dundee, Mabel G. Hall, D. B. L. Harris, Margaret L. Irvine, Wilson Johnston, Marcus Killen, J. K. M'Collum, W. C. MacFaul, G. J. M'Gouran, J. A. MacHugh, James M'Master, Eveline M'Mordie, A. H. Montgomery, D. M. Quinn, L. F. Ragbir, J. G. Ryan, Thomas Scott, J. P. Thomson, H. B. C. M. Wallace, and Alexander Woods.

University of Leeds.—At a congregation held on July 1st the degree of Doctor of Science, honoris causa, was conferred on Dr. Thomas Wardrop Griffith, Emeritus Professor of Medicine in the University.

Introducing Dr. Griffith, Prof. Veale spoke of his unbroken and close connexion with the Medical School for 46 years. Appointed professor of anatomy in 1883 at the early age of 26, he had at once brought the School of Anatomy to the front rank, and had identified himself with the interests and development of the Medical School in every direction. The present fine premises were largely due to his efforts, and the University owed him a lasting debt of gratitude for the careful planning and sound construction of this building, which, though now being substantially enlarged, would be a lasting memorial of his efforts. In 1910 Dr. Griffith had become professor of medicine, and as a clinical teacher he had shown the same mastery of style as had distinguished him in anatomical science. As a physician he had added much to the prestige of the school and to medical science. As an authority on cardiology, and more particularly the difficult and recondite problems of cardiac arrhythmia, his fame was surely established by accurate and extensive clinical research. Throughout his career he had been distinguished by a personal integrity of the highest order, and unswerving loyalty to the most honourable traditions and ideals of his profession, and a devotion excelled by none to the school which his scientific attainments had done so much to adorn.

The degree of Doctor of Medicine was conferred on G. R. Baxter.

British Homœopathic Congress.—Prince George and the Lord Mayor of London will welcome the delegates to this congress which is opening at the Connaught Rooms, London, to-day, Friday, July 5th, under the presidency of Dr. Thomas Macklin Dishington. It is stated that some 250 American medical men are attending the congress.

St. Bartholomew's Hospital and College.—The Old Students' annual dinner will be held in the Great Hall of the hospital on Tuesday, Oct. 1st, with Sir Frederick Andrewes in the chair.

Dreadnought Hospital, Greenwich.—The Duke and Duchess of York will open the Devonport Pathological Laboratory and the Devonport Nurses' Home at this hospital at 3 P.M. on Monday, July 15th.

Dr. Jessie Macgregor Prize in Medical Science.—The trustees announce the award of this prize, for the triennial period 1929–31, to Miss Helen M. Russell, F.R.C.P. Edin., for her record of work on malaria in the Vasiliki Valley, Macedonia, during 1928. The prize was founded in 1908 as a memorial to the late Dr. Jessie Maclaren Macgregor, of Edinburgh, and is of the value of £75.

A New Edenbridge Hospital.—Since its opening, eight years ago, the Edenbridge and District War Memorial Hospital has been carried on in a converted house which has become unsuitable owing to its structure and its situation on a noisy motor road. It has therefore been decided to erect, at a cost of £20,000, a new building of 20 beds on a three-acre site presented by Mr. T. A. Mason.

Liverpool Ambulance Service.—Hitherto the voluntary hospitals of Liverpool have possessed no ambulances of their own and have been dependent upon those belonging to the police, which are intended only for the conveyance of street casualties. Now, however, an ambulance has been purchased for £1500 by the Liverpool University Guild of Undergraduates out of the proceeds of the recent "Panto. Day," and is about to be presented to the Merseyside Hospitals Council.

International Congress of Dermatology and Syphilology.—The eighth meeting of this congress will be held at Copenhagen from August 5th to 9th of next year. The three principal subjects of discussion will be the Ætiology and Pathogenesis of Eczema; Immunity, Reinfection, and Superinfection in Syphilis; and Tuberculosis of the Skin and Its Treatment. Further particulars may be had from the Secretary-General, Dr. Svend Lomholt, Raadhuspladsen 45, Copenhagen.

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Royal Medico-Psychological Association.—The eighty-eighth annual meeting of this Association will open on Wednesday, July 10th, at the Westminster City Hall, Charing Cross-road, London, W.C., and will continue on Thursday and Friday at the house of the British Medical Association in Tavistock-square. Prof. J. Shaw Bolton will take the chair at the first meeting, and in the afternoon, after a civic welcome by the Mayor of Westminster, the new President, Dr. Nathan Raw, will be inducted to the chair and will deliver an address entitled Fear: A Sociological Study. The Gaskell Medal and Prize for 1929 is to be presented on Thursday to Dr. Alexander Walk. The annual dinner will be held at the Hotel Metropole, Northumberland-avenue, at 7.15 for 7.30 P.M. on the same day. The proceedings on the two subsequent days will include a visit to Springfield Mental Hospital on Thursday afternoon and a discussion on the report of the Mental Deficiency Committee on Friday morning.

Mr. Arthur Greenwood, the Minister of Health, has appointed Mr. Joseph Compton, M.P., to be his Parliamentary Private Secretary.

South Devon and East Cornwall Hospital.—The first section of the extension scheme of this institution, consisting of a new children's ward, has been opened by the Countess of Mount Edgcumbe.

Ulster Hospital for Women and Children.—Last year the number of admissions to the wards, of out-patients, and out-patients' visits constituted a record, the total exceeding by more than 5000 the figures of the preceding year. The average cost per effective bed was £75 6s. 9½*d.*, and the daily cost of in-patients 4*s.* 1½*d.*

Hospital of St. John of Jerusalem.—The following appointments to the Order have been made:—As officers: Dr. K. F. Lund, Dr. R. C. Robertson, Dr. F. N. Kay Menzies, Major S. J. C. Holden, Dr. B. R. Billings, Dr. A. E. Porter, Major W. H. F. Noble, Dr. A. B. McMaster, Dr. A. L. Macleod, Major F. R. Humphreys, Colonel A. H. Tubby, Lieut.-Colonel G. T. Samman, and Dr. E. Burnet. As serving Brothers: Dr. G. Skeen, Captain H. F. J. Norrie, Dr. J. C. Bekitt, Major W. H. Borrie, Dr. J. Graham, Dr. A. Tennyson-Smith, Dr. K. Mackenzie, and Lieut.-Colonel G. E. Peacock.

University of Liverpool Animals' Hospital.—On June 28th Lord Howard de Walden opened a new hospital at the Liverpool University Veterinary School. It is the first animals' hospital to be conducted in this country by a university, and is primarily intended for research and the *instruction of veterinary students. The building funds have* come from subscribers, one of the chief contributors being Lord Howard de Walden, and from the Development Commissioners, through the Ministry of Agriculture, who have offered £16,000 on a pound-for-pound basis. In addition an annual grant of £2850 will be received.

Royal Medical Benevolent Fund.—At a recent meeting of the Committee 30 grants were made amounting to £912. The following are notes on six of the cases helped by grants and annuities:—

Widow, aged 72, of M.R.C.S., whose husband received an annuity from *this Fund during the last years of his life. On his* death his widow had only the old age pension of £26. Voted £36. Her total income is therefore only £62 a year. Further assistance is being sought for this lady.

Widow, aged 80, of M.R.C.S. and L.S.A. The widow is totally blind. She has an income of £77 a year. The Fund voted £36, making a total income of £113, on which the widow and two daughters have to live. One daughter has to give her full time to looking after her mother owing to her infirmities, the other is trying to find work, but, as she is 47 years of age, has been unable to get employment as a clerk.

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Daughter, aged 70, of M.R.C.S., with a private income of £20 and old age pension of £26. Voted an annuity of £30, making a total of £76.

Daughter, aged 81, of M.D. No private income, only the old age pension of £26. Voted an annuity of £30, making a total income of £56. This lady lives with her niece, a music teacher, who has to keep and maintain her on the above.

Daughter, aged 73, of M.R.C.S. Has only the old age pension of £26. Granted an annuity of £10, making her total income £66.

Subscriptions and donations should be sent to the hon. treasurer of the Fund at 11, Chandos-street, Cavendish-square, London, W. 1.

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Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE NEW PARLIAMENT.

THE new Parliament was opened on Tuesday, July 2nd. Owing to the recent illness of His Majesty The King, it was not thought advisable to submit him to the strain of a State opening, and the ceremony was therefore performed by Royal Commission. The Lords Commissioners were the Lord Chancellor, the Earl of Kintore, Lord Southborough, Archbishop Lord Davidson, and Lord Denman. The King's speech, which was read in the House of Lords by the Lord Chancellor, stated that while His Majesty regretted that it was not possible to address Parliament in person, he thanked Almighty God that he could look forward with confidence to that complete restoration of health for which the prayers of his people throughout the Empire with a sympathy and affection which called forth his deepest gratitude were offered during the months of his long and serious illness. The Government was at present considering the unanimous report of the independent financial experts appointed to draw up proposals for a complete and definitive settlement of the German reparation problem in preparation for a conference of representatives of the Governments concerned. A settlement of this problem would enable the occupying Powers to proceed with the evacuation of the Rhineland. It was the earnest hope of the Government, in coöperation with the Governments of the Dominions of India and of foreign Powers, to ensure an early reduction of armaments throughout the world. Consultations were taking place regarding the signing of the Optional Clause embodied in the statute of the Permanent Court of International Justice. The question of the resumption of diplomatic relations with the Soviet Government of Russia was also being examined. It would be the foremost endeavour of the Government to deal effectively with the continuing evil of unemployment. Schemes were being prepared for the improvement of the means of transport, for the stimulation of the depressed export trades, for the economic development of the overseas Dependencies, for the improvement of the condition of agriculture, for the encouragement of the fishing industry, and for the improvement of the facilities for the marketing of farm and fishery outputs. Measures were being considered in coöperation with the Dominion Governments to provide greater opportunities for overseas migration. Proposals would be submitted to Parliament in due course dealing with the reorganisation of the coal industry, including hours and other factors and the ownership of minerals. Inquiries would be undertaken immediately in order to discover means to coöperate with the iron and steel and cotton industries to improve their position in the markets of the world. Bills would be introduced for amending and consolidating the existing factory legislation and for giving effect to the obligations entered into in Washington in 1919. Legislation would be undertaken to promote an extensive policy of slum clearance and to make further provision for housing in urban and rural areas. The Government had decided that a time had come to investigate the whole field of legislation relating to the sale and supply of intoxicating liquor and commissioners would be appointed for that purpose. A general survey was proceeding of the various National Insurance and Pension schemes. Meanwhile a Bill was being prepared to amend the Widows', Orphans', and Old Age Contributory Pensions Act, 1925, so as to modify the conditions applicable to certain pensions and to make some increase in the classes of persons entitled to them. A measure would be introduced to remedy the situation created by the Trade Disputes and Trade Unions Act, 1927. At the recent General Election an extended franchise placed in the hands of the whole of the people of adult years the grave responsibility for guarding the well-being of the nation as a constitutional democracy, and the Government proposed to institute an examination of the experiences of the election so that the working of the law relating to Parliamentary elections might be brought into conformity with the new conditions.

MANCHESTER BABIES' HOSPITAL.—The annual report shows that last year there were 881 admissions and 316 discharges, and that the mortality was 14·59 per cent. The most numerous cases, amounting to practically one-third of the discharges, were those of chronic dyspepsia; of rickets, which came next, there were 42. Prematurity accounted for the largest number of deaths (12). The number of premature children increases every year; in 1924 it was four, but in 1928 it had risen to 37. It has been decided to immunise against diphtheria all infants whose parents are willing.

Medical News.

UNIVERSITY OF BIRMINGHAM.—At a congregation held on June 29th the following degrees and diplomas were conferred:—

M.D.—W. D. Beck and C. G. Payton.

M.B., Ch.B.—*W. C. Smallwood, †E. G. Abdel-Malek, F. A. d'Abreu, Adele M. Frankland, C. W. Kidson, F. G. Lewis, A. J. Moffett, E. H. Parkinson, H. R. Kalra, Ali Said, Christopher St. Johnston, F. R. Smith, George Steane, K. S. Thom, and Doris I. Wall.

* First class honours. † Second class honours.

Diploma in Dental Surgery.—B. D. Britten.

Application is invited for the Walter Myers travelling scholarship of £300 for research in pathology during the year 1929–30. Particulars will be found in our advertisement columns.

UNIVERSITY OF DURHAM.—At a Convocation held on June 27th the following degrees and diplomas were conferred:—

M.D.

Max Coll, O. C. Dobson, John Hare, A. H. Holmes, F. W. Marshall, P. M. Rivaz, Gladys Stableforth, A. J. Watson, and Reginald Wear.

M.B., B.S.

Sydney Adler, J. C. Arthur, W. F. Cross, Kenneth Daniels, C. E. Goldberg, H. W. T. Hall, Wilfred Hall, John Maddison, H. D. Ord, A. R. D. Pattison, J. K. H. Scott, J. B. Tilley, and Nora Walkinshaw.

B.HY. AND D.P.H.

Katherine M. Cellan-Jones, O. C. Dobson, and A. J. Watson.

UNIVERSITY OF GLASGOW.—At a ceremony of graduation on June 28th the folllowing degrees were conferred:—

M.D.—*J. S. Young, Moses Cohen, and J. C. H. Mackenzie.

* With honours.

QUEEN'S UNIVERSITY, BELFAST.—At recent examinations the following candidates were successful:—

M.D.

*Robert Armstrong, *W. H. Belford, Robert Evans, H. E. Hall, †R. A. G. Hamilton, J. B. Lyle, W. J. M'Cracken, W. A. Scott, and H. A. Warnock.

* With commendation. † Gold medal.

M.Ch.

F. S. Carson.

M.B., B.Ch., B.A.O.

First Class Honours.—W. J. Hamilton, T. B. H. Haslitt.

Second Class Honours.—J. S. Baxter, Hugh Caldwell, Joseph Gray, J. V. Hurford, C. J. Lord, James Montgomery, and D. A. C. Wilson.

Pass.—D. R. Cairns, Mary V. Cox, J. C. Craig, C. T. Denny, Charles Dick, J. M'K. Dundee, Mabel G. Hall, D. B. L. Harris, Margaret L. Irvine, Wilson Johnston, Marcus Killen, J. K. M'Collum, W. C. MacFaul, G. J. M'Gouran, J. A. MacHugh, James M'Master, Eveline M'Mordie, A. H. Montgomery, D. M. Quinn, L. F. Ragbir, J. G. Ryan, Thomas Scott, J. P. Thomson, H. B. C. M. Wallace, and Alexander Woods.

UNIVERSITY OF LEEDS.—At a congregation held on July 1st the degree of Doctor of Science, honoris causa, was conferred on Dr. Thomas Wardrop Griffith, Emeritus Professor of Medicine in the University.

Introducing Dr. Griffith, Prof. Veale spoke of his unbroken and close connexion with the Medical School for 46 years. Appointed professor of anatomy in 1883 at the early age of 26, he had at once brought the School of Anatomy to the front rank, and had identified himself with the interests and development of the Medical School in every direction. The present fine premises were largely due to his efforts, and the University owed him a lasting debt of gratitude for the careful planning and sound construction of this building, which, though now being substantially enlarged, would be a lasting memorial of his efforts. In 1910 Dr. Griffith had become professor of medicine, and as a clinical teacher he had shown the same mastery of style as had distinguished him in anatomical science. As a physician he had added much to the prestige of the school and to medical science. As an authority on cardiology, and more particularly the difficult and recondite problems of cardiac arrhythmia, his fame was surely established by accurate and extensive clinical research. Throughout his career he had been distinguished by a personal integrity of the highest order, and unswerving loyalty to the most honourable traditions and ideals of his profession, and a devotion excelled by none to the school which his scientific attainments had done so much to adorn.

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ASSOCIATION OF SURGEONS' SCHOLARSHIP.—The Association of Surgeons of Great Britain and Ireland invites applications for a surgical scholarship of £350 to be held for one year while the holder pursues some definite line of research or study. Further particulars will be found in our advertisement columns.

ROYAL DUNDEE INSTITUTION FOR THE BLIND.—At the annual meeting of this Institution it was stated that the number of blind employees was now 108, compared with 87 in 1920. The blind workers could not produce enough to enable the directors to make a profit, and therefore the increase in workers meant an increase in the anual deficit. Although the increase in goods sold was £1100, there was a net loss on the industrial account of £735 as compared with £496 last year. The general charity account showed a deficit of £2144 compared with last year's £2245.

HOSPITALS AND MOTORISTS.—Under this title the *Manchester Guardian* on June 29th published a selection of the results of a questionaire sent to voluntary hospital authorities for the purpose of discovering whether the problem of payment for treatment in motor accidents is as acute as some recent hospital reports have suggested. "The answers show," it is stated, "that many institutions are suffering a heavy financial strain; that very few of the patients contribute anything to the cost of their treatment; and that most hospital authorities agree on the necessity for some plan whereby payment should be assured." At the Manchester Royal Infirmary 140 in-patients were received, who spent 2708 days in hospital at a cost to the infirmary of £1196, and the patients' contributions amounted to £152. At Ancoats Hospital the cost to the hospital was £320 and £12 was received as patients' contributions. At the Manchester Victoria Jewish Hospital the cost was estimated at £450 and the cash received in return at only £50. At Oldham Infirmary during 1928 187 patients were treated at a cost of approximately £800 and "the sum received in respect of these patients was negligible." At the Royal Infirmary, Bradford (Yorks), 137 in-patients (who remained 2929 days in hospital) and 229 out-patients were treated at a total cost of £1174 and about £24 was received as contributions from the in-patients. At the Royal Infirmary, Derby, 100 victims of motor accidents were admitted during the year ended May 31st last, the average number of beds occupied during this period being 14. In addition there were a large number of out-patients treated. The cost of treating the in-patients was £1799 and the total contributions received towards their maintenance was £84 8*s*. At Warrington Infirmary £735 was expended in in-patient treatment alone last year and towards this the patients contributed £89. At Leeds General Infirmary 1135 motor accident cases were received. They cost the institution £4307 and towards that sum contributed £167. Much the same replies were received from hospitals at Blackpool, Sunderland, Bury, and other towns to the questionaire of the *Manchester Guardian*.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, July 12th.—8.30 P.M., Continuation of Discussion on Colonel L. W. Harrison's Paper, Review of Experimental Work in Syphilis and its Possible Bearing on Man.

SOCIETY FOR THE STUDY OF INEBRIETY, 19, Park-crescent, Portland-place, W.
TUESDAY, July 9th.—4 P.M., Mr. W. McAdam Eccles: Some Gaps in the Study of Inebriety (Presidential Address), followed by a discussion on the Toxic Effects of Methylated Spirits and Impure Forms of Alcohol, to be opened by Sir William Willcox.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
WEDNESDAY, July 10th.—(At the Westminster City Hall, Charing Cross-road, W.C.), Annual Meeting.
THURSDAY and FRIDAY.—(At the B.M.A. House, Tavistock-square), Annual Meeting continued.

ROYAL SANITARY INSTITUTE.
SATURDAY, July 13th.—Annual Congress opens at Sheffield.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, July 8th, to SATURDAY, July 13th.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Gt. Portland-street, W. Mond. 1.30 to 2.30 P.M., Demonstration by Mr. Laming Evans. 2.30 to 4 P.M., in In-patients and Out-patients Depts. No fee.—LONDON LOCK HOSPITAL, 91, Dean-street, Oxford-street, W. Tues., 3 P.M., Clinical Demonstration by Major Corbett. No fee.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Afternoon course consisting of instruction in Out-patient Dept. Special case demonstrations on Tues. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE: Prince of Wales's General Hospital, Tottenham, N.
MONDAY, July 8th.—2.30 to 5 P.M., Medical, Surgical and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.
WEDNESDAY, July 10th.—4 P.M., Mr. K. J. Acton-Davis: The Surgical Treatment of Rickets, with Illustrative Cases.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
THURSDAY, July 11th.—4.30 P.M., Mr. Claude Mills: Some Interesting Urological Cases with Demonstrations of Pathological Specimens and Radiograms of Same.

Appointments.

GRIFFITHS, J. I., M.B., B.S. Lond., has been appointed Third Asst. M.O. to the Hammersmith Board of Guardians.

MACGLASSON, J., M.B., Ch.B. Edin., Parochial Medical Officer and Vaccinator, Canonbie.

THOMSON, O. S., M.D., Ch.B. Glasg. D.P.H., Part-time Lecturer in Public Health Administration in the University of Belfast.

Certifying Surgeons under the Factory and Workshop Acts: GOODWIN, A. C., M.B., B.Ch. Oxf. (Newport, Isle of Wight); NELSON, H. P., M.B., B.S. Durh. (Brampton, Cumberland); O'SHEA, J. J. M.B., B.Ch. R.U.I. (Chipping Norton); and PRESTON, F., L.R.C.P. Lond., M.R.C.S. (Norwich).

Vacancies.

For further information refer to the advertisement columns.

Association of Surgeons of Great Britain and Ireland.—Surgical Scholarship. £350.
Birmingham and Midland Homœopathic Hospital and Dispensary, Easy-row.—H.S. £150.
Birmingham, Selly Oak Hospital.—Cas. O. At rate of £200.
Birmingham City Mental Deficiency Institution, Coleshill Hall.—Med. Supt. £700.
Birmingham University.—Walter Myers Travelling Studentship £300.
Bombay Goculdas Tejpal Hospital.—Hon. Surgeon.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Bristol Royal Infirmary.—Sen. Res. M.O. £200. Also Res. H.S.'s. to Special Departments. At rate of £60. Res. Cas. H.S. and Dental H.S. At rate of £80 each.
Burton-on-Trent General Infirmary.—H.S. £150.
Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.
Cardiff, Welsh National School of Medicine.—Jun. Asst. in Med. Unit. £500. Jun. Asst. in Surg. Unit. £350. Also Asst. Lecturer in Pathology. £500.
Cardiff Royal Infirmary.—Four H.S.'s and three H.P.'S. Each at rate of £50.
Chester Royal Infirmary.—H.S. and Cas. O. £120.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Asst. Laryngologist.
Colne Borough.—M.O.H., &c. £800.
Dreadnought Hospital, Greenwich.—Asst. Radiologist. 50 gns.
Durham County Hospital.—Jun. H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.
Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.
Glasgow, Hawkhead Asylum.—Asst. M.O. £275.
Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. £100.
Hospital for Consumption, &c., Brompton, S.W.—H.P. At rate of £50.
Hull Maternity Home and Infants' Hospital, Hedon-road.—Res. M.O. £450.
Ilford Emergency Hospital.—Sen. and Jun. H.S.'s. £110 and £100 respectively.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. At rate of £120.
Jewish Maternity Hospital, Underwood-street, E.—Res. M.O. At rate of £50.
Liverpool Open-Air Hospital for Children, Leasowe.—Jun. Res. M.O. At rate of £200.
Lowestoft and North Suffolk Hospital.—H.S. £120.
Macclesfield General Infirmary.—Res. H.S. £180.
Maidstone, West Kent General Hospital.—Hon. Anæsthetist.
Manchester, Ancoats Hospital.—Res. M.O. £150.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.
Middlesex County Council.—Tuberculosis M.O. £750.
National Hospital, Queen-square, W.C.—Pathologist. £200.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Res. Med. Asst. £350.
Nigeria, West African Medical Staff.—Pathologists. Each £500.
Nottingham General Hospital.—Two H.S.'s for Special Depts. Each at rate of £150.
Oswestry, Shropshire Orthopaedic Hospital.—H.S. £200.
Plaistow Fever Hospital, E.—Second Asst. M.O. £300.
Preston and County of Lancaster, Queen Victoria Royal Infirmary.—H.P. £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P.
Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Radiologist.
Rhondda U.D.C.—Asst. M.O.H., &c. £600.
Romford Isolation Hospital, Rush Green.—Med. Supt. £750.
Rotherham Hospital.—Sen. H.S. £200.
Royal Army Medical Corps.—25 Commissions.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.
St. Albans, Napsbury Mental Hospital.—Jun. Asst. M.O. £185.
St. John's Hospital, Lewisham, S.E.—Two Res. House Appts. Each at rate of £100.
St. Leonards-on-Sea, Buchanan Hospital.—Locum Tenens H.S. At rate of £250.
St. Mary's Hospital for Women and Children, Plaistow, E.—Clinical Asst.
Sheffield Children's Hospital.—Jun. H.S. £100.
Sheffield Royal Hospital.—Res. Ophth. H.S. At rate of £50.
Sheffield Royal Infirmary.—Surg. Reg. £200. Also Asst. Cas. O. H.S., Ophth. H.S., and Asst. Ophth. H.S. Each at rate of £80.
Sleaford, Kesteven Mental Hospital.—Med. Supt. £700.
South Africa, Bloemfontein Hospital.—Sister for X Ray and Electrical Dept. £100.
Stafford, Staffordshire General Infirmary.—H.S. At rate of £200.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £160. Also H.S. to Ophthalmic and Aural Depts. At rate of £150.
Swansea Hospital.—H.S. £150.
Tunbridge Wells and Counties General Hospital.—H.S. £160.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Jun. H.P. At rate of £100.
West London Hospital, Hammersmith, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100. Also Res. Anæs. At rate of £100.
Willesden General Hospital, N.W.—Refraction Assistant. 50 gns.
Winchester, Royal Hampshire County Hospital.—Res. H.S. £150.
Woolwich and District War Memorial Hospital, Shooters-hill, S.E.—H.P. and H.S. Each at rate of £125.
The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Callington (Cornwall) and at Felixstowe (Suffolk).

Births, Marriages, and Deaths.

BIRTHS.

BUTLER.—On June 25th, to Florence (*née* Jordan), the wife of Dr. M. F. Butler, of Beckenham-road, Beckenham, of a daughter.

HILLMAN.—On June 28th, at Bentinck-street, W., the wife of Oscar Stanley Hillman, M.B., F.R.C.S., Wilson-grove, Southsea, of a daughter.

SHAW.—On June 22nd, at a nursing home in London, the wife of Dr. F. R. S. Shaw, M.B., M.C., Tuz Khurmatu, Iraq, of a son.

THOMSON.—On June 28th, at Lavington, Barnet, Herts, the wife of Dr. N. Gray Thomson, of a daughter.

MARRIAGES.

FRANCE—CORKERY.—On June 26th, at St. Augustine's, London, Robert Scoular France, M.B., Ch.B., to Marjorie Griffin Courtenay, daughter of the late Colonel W. A. Corkery, Indian Medical Service, and of Mrs. Corkery, Ael-y-Bryn, Merthyr Vale, Glamorgan.

DEATHS.

HENDERSON.—On June 23rd, at Allister Cottage, Inverness, Lieut.-Colonel George Henderson, M.D., F.L.S., F.R.G.S., late I.M.S. (H.E.I.C.S.), in his 93rd year.

LEAPINGWELL.—On June 25th, Edward Jodrell Leapingwell, M.B., of Apsley Guise, aged 80 years.

MOXHAM.—On June 27th, at Aldborough, Marcus Camplin Moxham, M.R.C.S., L.R.C.P., L.S.A.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£3	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	3	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

DISEASES OF THE JEWS.

IN opening a symposium on Some Diseases of the Jewish Race at the London Jewish Hospital Medical Society on June 13th, with Dr. A. GOODMAN LEVY in the chair, Sir HUMPHRY ROLLESTON said that diseases had been described as racial diseases of the Jews for no better reason than that the first recorded cases happened to have occurred among Jews. Such was the case with the condition known as dystonia musculorum deformans, or Oppenheim's disease. But there were diseases which if they did not appear exclusively among Jews were said to occur more frequently among them—e.g., thrombo-angiitis obliterans. It had recently been suggested that this disease was on the decrease among Jews and on the increase among Gentiles, and it was possible that the stress laid in the past on the racial nature of this affection had led to its being overlooked when it occurred among Gentiles. According to Telford and Stopford the alleged racial character of this disease was the result of a "topographical" accident. It was said by some that its course in Jews was earlier and more severe than in Gentiles, but the opposite view had also been advanced. On the question of amaurotic familial idiocy it must be pointed out that there was a series of allied conditions of which amaurotic familial idiocy and retinitis pigmentosa were the extremes, the first occurring early in life among Jews and the latter coming on much later in the case of both Jews and non-Jews. Both obesity and diabetes were relatively common in Jews, and it had been suggested by Joslin that Jews got diabetes because they were fat, and they were fat because of dietetic excess. But it must be remembered that Gaucher's and Niemann's diseases, which were disturbances of fat metabolism, were probably more frequent among Jews. Acromegaly had also been said to be more common among Jews, and anterior lobe pituitarism as a feature of the Jewish race was compatible with Keith's contention that the special effects of pituitary activity were best seen in the Caucasian type. That Gaucher's disease was regarded as being specially common among Jews was probably due to the accident that it had been extensively investigated at the Mount Sinai Hospital. Niemann's disease, which was probably a more severe type of Gaucher's disease, seemed to be more frequent among Jews—if one could argue from the 15 cases reported. It probably exemplified the rule suggested by the relationship of amaurotic familial idiocy and retinitis pigmentosa—namely, that in the Jewish race there was a constitutional factor which determined an earlier onset and a more severe form of certain diseases. On the incidence of cancer, the recent work of Sourasky had shown that whilst the total cancer mortality among Jews corresponded fairly with that of the countries in which they resided, there were some differences in the distribution of these growths, but that these differences were probably due to the mode of life led by Jews rather than to a racial factor. There appeared to be a definite resistance to tuberculous infection among Jews, which was perhaps to be explained partly by the infrequency of alcoholism among them.

Mr. A. H. LEVY pointed out that it was wrong to regard amaurotic familial idiocy as a specifically Jewish disease. Juvenile and adolescent cerebro-macular degeneration were generally looked on as being allied to amaurotic familial idiocy, but in his opinion were not at all allied. Mr. Levy touched on the question of the alleged greater frequency of glaucoma among Jews, which he could not substantiate from his experience, and on the incidence of cataract, which was probably not disappearing so rapidly among Jews as it seemed to be doing in the general population.

Cancer and Tubercle.

Mr. M. SOURASKY said that the fact which emerged from a recent investigation was that Jews as a race were neither immune from cancer nor specially prone to it. The statistics of six European capitals with large Jewish populations had been scrutinised, and in each of them the incidence of cancer among Jews followed closely that obtaining among their neighbours. On the whole there was a closer relationship between the Jews and non-Jews of any particular city than between the Jews of different cities. But apparently Jews had a definitely different incidence of cancer of the various organs from that of their neighbours.

Among Jews cancer of the generative organs and of the mouth seemed to be less common and that of the gastro-intestinal tract more so than among non-Jews. There were, however, established ætiological factors operating in the Jewish community capable of explaining these differences without assuming the operation of a problematic racial factor—immunity or predisposition, as the case might be. Thus the well-known association of cancer of the tongue with chronic inflammation of this organ, which was so often of syphilitic origin, adequately explained the low incidence of cancer of the tongue in Jews, as syphilis was decidedly less common—and was still less common in the past—among them than among non-Jews. Not a single case of penile cancer had been recorded for Jews, whilst the disease accounted for about 1 to 2 per cent. of all cancer deaths among non-Jewish men. As for cancer of the breast, the incidence in Jewish women varied in different cities, being sometimes lower, sometimes a little higher than that for the rest of the population. In London the incidence among the poor Jews was lower than that among the wealthy. It was pointed out that among the richer Jews there were more unmarried women, the marriages were later, and the birth-rate was lower, all factors held to favour breast cancer. The remarkably low incidence of uterine cancer (one-third to one-half the number occurring in the rest of the population) might be attributable to the observance of the Mosaic system of hygiene, and it was of interest to note that this form of cancer appeared to be increasing in the Jewish community.

Dr. J. Burnford remarked upon the extreme rarity of any specifically racial diseases, whether of Jews or of other races. The topography of disease was not so much a question of racial predisposition and immunity as one of environment. Theoretically speaking there was a better case for racial immunity than for predisposition. Natural selection was more likely to produce a group of people resistant to certain affections than one which was specially prone to particular diseases, and racial diseases had a way of evaporating into thin air when they were carefully investigated. It was generally assumed that diabetes was very common amongst Jews; in the speaker's experience this had not been very noticeable.

Dr. W. M. Feldman said that the mortality-rate from tuberculosis was lower among Jews than among Gentiles, which was to be explained by the fact that the disease was less fatal among them. This could be seen from the greater number of Jews who responded favourably to treatment. In Dr. Feldman's opinion the explanation was probably that Jews acquired immunity from frequent exposure during childhood to mild doses of tuberculosis, being especially prone to this on account of the greater frequency of the disease among Jews, its milder character, and the greater degree of overcrowding. The greater care Jews bestowed on their infants and their greater sobriety probably also counted. The absence of drunkenness among Jews might be due to the fact that Jews usually took some food with their drink (thus unintentionally delaying the absorption of alcohol into the blood) and by the deterrent effect of public opinion, which in Jewish communities ostracised the drunken.

Eyesight.

Mr. A. Sourasky said that in a recent investigation 1040 Jewish boys were examined as regards eyesight in a group of Jewish evening schools in the East End of London, and 600 non-Jewish boys in London County Council schools in the same district. The tests showed that the percentage of Jewish boys with visual defect was 43·2 as against only 21·7 of the non-Jewish. The conclusion often drawn from this, that the extra hours of evening study in Jewish classes were responsible for this grievous condition, was unjustified. Children at the age of 5 and 6 who had not yet reached school age, and therefore could not be influenced by school-life, showed a similar amount of visual defect to that found at the school-leaving age, between 12 and 14. It was found on an investigation of defects seen among 516 Jewish and 892 non-Jewish children that the proportion of long-sighted and short-sighted was such as to suggest that among Jewish children short sight was twice as frequent as among non-Jewish. At the same time the tests led to the detection of very striking differences in the kind of long-sight observed among Jewish children. One type, "low hypermetropia," was found to be more common in Jewish children than the other forms of long sight, and this was not the case with non-Jewish children. The predisposition to short sight in Jewish children and the greater incidence among Jews would appear to be the concomitant of the fact that the anthropological characteristics of the eyes of Jews were such as to leave little margin between the normal and the myopic. Hence slight disturbances were more likely to result in myopia in Jewish children than in the non-Jewish.

Dr. J. Brander remarked on the earlier onset of dementia præcox among Jews.

In the subsequent discussion Dr. F. Parkes Weber said that in his opinion thrombo-angiitis obliterans was a disease with an economic basis rather than a racial one. Dr. Bernard Myers held that many Jewish characteristics could be explained on the basis of endocrine disturbances.

Dr. D. Nabarro and Dr. N. Pines spoke on arteriosclerosis and Dr. H. Gainsborough on the infrequency of syphilis in the older Jews.

A vote of thanks to Sir Humphry Rolleston was moved by Dr. L. Mandel.

BOOKS ON CHILD CARE.

The issue in all countries of numerous books on the care of infants and children is an interesting sign that mothers, and not only educated mothers, are abandoning tradition alone as a guide to nurture and are seeking help from science. A manifestation of this spirit in this country is the popularity of Baby Week, now being held in London for the thirteenth successive year. Reports of conferences and lectures stimulate women concerned with the rearing of children to seek further information and advice on choice of popular books is often sought from the family doctor. Among those produced recently three written by medical men deserve attention. "The Care of the Child," by Dr. Alton Goldbloom (New York: Longmans, Green and Co. Pp. 240. $1.50) is designed especially to act as a guide to perplexed mothers, and to provide them with up-to-date knowledge on the feeding and management of small children. In selecting the points to be discussed the author has been guided by the questions which have most frequently been put to him in the past. The normal limits of growth, development, and activity are well defined, and all that advice which deals with nursing and general management is admirable. The section on artificial feeding is rather more open to criticism. The statement appears that "the group of dried milks, and unsweetened condensed milks, are quite as satisfactory as ordinary milk"; those who do not believe this to be true would prefer that the perplexed mother should not see it set out so dogmatically. The chapter on diets of older children is a particularly useful one, a clear idea being given not only of the articles of food which are suitable, but of the quantities. "The Essentials of Infant Feeding" is the title of an excellent little book by Dr. E. A. Barton, of which a second edition has now appeared. (London: H. K. Lewis. Pp. 79. 3*s.* 6*d.*) This book provides an admirably clear introduction to the subject of infant feeding which would not be beyond the grasp of the educated mother, though it is adequate for the medical student. The teaching is well up to date. In the second edition complementary replaces supplementary feeding as the method of choice in mixed feeding, and recent views on vitamins have been included. "The Child's Diet" (H. K. Lewis. 3*s.*) is also a book which may safely be put in the hands of parents. This little book was originally designed by Dr. J. Sadler Curgenven for the use of his own patients and has now reached its third edition. It deals with the feeding of normal infants and children, and with diet in a few common nutritional disorders. It is written simply, and conveys throughout the impression of the writer's extensive practical experience. For the artificial feeding of infants comparatively simple dilutions are recommended; the actual details of preparation of the mixtures are not very clearly explained. The chapter on the feeding of older children is perhaps the best part of the book, and the closing chapter containing nursery recipes should also be of great assistance to mothers.

Rather more elementary in treatment are two little books, by Mrs. J. Langton Hewer, which have achieved great popularity. One, which is hardly more than a pamphlet, "The Baby of To-day" (Bristol: John Wright and Sons. Pp. 32. 4*d.*) is intended for those beginning to study creche work, girl guides, and the like, and provides sound teaching in concise form on the essentials of baby management, mental and physical. Rather surprisingly, long clothes are still recommended for the young baby, and the sample tables of food suggest that a child of 18 months should have none but minced meat, though the value of hard, crusty food is emphasised. The longer book, of 186 pages, entitled "Our Baby," and issued at 2*s.* 6*d.* by the same publishers, first appeared in 1891, and this year reached its nineteenth edition. It is addressed to mothers and nurses, and has for some ten years past served as the standard text-book for students taking the advanced examinations of the National Association for the Prevention of Infant Mortality. "Our Baby" is essentially a text-book, its 186 pages covering the ground connected with pregnancy, and such varied aspects of infant hygiene and care as feeding (natural and artificial), clothing, exercise and sleep, nursery life, and mental and moral training. Further chapters give an outline of minor troubles and ailments, accidents, and illnesses to which the young child is prone, with a section on nursery remedies and a final chapter on "Baby in the Tropics." The paramount importance of fresh air in the nursery is emphasised throughout the book, and also the fact that draughts may often be abolished by opening the window wider as easily as by shutting it. Dietitians will not all endorse the teaching that pasteurisation of milk does not kill disease germs and is not to be recommended. The book contains an immense amount of sane instruction and, with its 36 illustrations and numerous headings, presents an attractive appearance. Finally we may mention "A Handbook for Mothers," by C. Phyllis Armitage. (London: John Bale, Sons and Danielsson. Pp. 124. 2*s.*). The first three sections of this little book, devoted respectively to "Pregnancy," "The Infant" and "The Child," are characterised by optimism born of common sense. The author is at pains to impress upon the mother the strong probability that she and her baby are normal, average people, and that good health and moderate progress, though less interesting to the neighbours than sensational excursions, are matters for pride and not for regret. At the same time, individuality must be allowed for, and a mother must be prepared, on occasion, to supersede an ideal theory by an intelligent sense of proportion, and not to suffer undue heart-burnings if the baby next door sleeps longer or gains weight more rapidly than her own. The book is designed especially for use by mothers who may be far from medical help, and Parts IV. and V., dealing with "Ailments of Infancy and Childhood" and "Infectious Diseases" include directions as to the use of certain drugs and forms of treatment unusual in a volume of this nature. A few of these instructions tend to be somewhat dogmatic. But, on the whole, the advice offered is thoroughly sound. A short appendix describes the use of some simple antiseptics and gives directions for first-aid and for the application of fomentations and enemata, together with a few useful recipes. The handbook is to be commended, as Dr. Quin Lennane, medical officer of health of Battersea, says in his foreword, for its "conciseness, simplicity of language, and avoidance of technical nomenclature."

A TUBERCLE-FREE HERD.

ADDRESSING a party of visitors to the Edinburgh Corporation dairy farm at Colinton Mains, Mr. A. Gofton, Chief Veterinary Officer for Edinburgh, lately gave a valuable account of the steps which have been taken there to secure that the cattle shall be free from tuberculosis.

He explained that the herd which had been formed under his regulation at Colinton Mains existed for one purpose only—namely, to supply milk of the best quality to the children in the City Infectious Disease Hospital. Up to a certain point the Corporation had run the herd on the usual stall-fed principle, and it took a great deal of persuasion before it was ultimately decided to embark on the policy of tubercle-free herd, with all the equipment necessary for producing milk of the best quality. When the decision to change over was reached two questions had to be considered. The first was the provision of the basal stock of tubercle-free cows, and the other was the alteration of the buildings to get the abundance of light and fresh air necessary for maintaining the health of the herd. At the change-over they ceased to buy cows in the ordinary way in the open market. At that time they had 27 head of cattle which were subjected to the tuberculin test, and of these 18 were positive and 9 negative. The 18 were removed from the herd and were disposed of for slaughter as soon as possible. The remaining nine were put into one byre, and the new purchases were put into another byre, the nine non-reactors being sold when they became dry.

The stock at the present time, said Mr. Gofton, consisted of 82 cows. Beginning in the spring of last year they bought as far as they could from tubercle-free herds. They then got heifers which had been grazing out in the open all their days, and never housed, and they had those which were selected tested. That principle proved to be sound, because they had found on subsequent tests that those young heifers had stood up to the test. In building up their herd they had to avoid the introduction of contagious abortion, and therefore, at a very early stage, they subjected all the cows to a blood test for evidence of this infection. They found two, which were at once segregated, and were disposed of where they would be able to do no harm. Further tests were now being made, and he was hoping to be able to say that this troublesome disease had now been eliminated.

Their aim had been to establish an Ayrshire herd, and it was vital that they should breed their own stock and replenish the herd by heifers of their own breeding. They were retaining only the Ayrshire calves, and ultimately these would take the place of the few Friesian, cross, and shorthorn cows that were in the herd. The 65 cows in milk in all stages of lactation were yielding 170 gallons of milk, or an average of 2½ per cow per day. Official recording was begun in the beginning of this year and since then 40 cows had been officially recorded, giving an average of 4 per cent. butter fat. Their output to the hospital was almost 152 gallons per day, the reminder of the total production of 170 gallons going to the workers and for calf-feeding.

Mr. Gofton's account of this farm deserves careful study, for it is important that milk supplied to an infectious disease hospital should be free from tuberculous infection, to which children suffering from scarlet fever, measles, and the other exanthems are especially susceptible. Colinton Hospital includes beds and shelters for cases of non-pulmonary tuberculosis, and it would obviously be absurd to provide these with milk which was likely to be infected.

MENTAL HANDICAPS IN LITERATURE.

A BOOK purporting to deal with some of the medico-psychological influences which tend to modify or handicap individuals in their literary efforts should find eager readers. One of the well known Mental Handicap series,[1] attractively written by Dr. E. M. Cox, is devoted to this subject, and will be welcomed by those who have a taste for inquiry into the medical histories of great writers. The book is divided into eight chapters, of which as many as five are devoted to heredity, alcohol and other narcotics, poverty and affluence, the effect of epochal conditions, and toxæmic conditions. These headings suggest physiological rather than mental handicaps, though it is obviously true that such factors must influence the minds of writers. The author cites Poe and Chatterton as furnishing striking examples of the influence of heredity and environment on literary work and output, and it is true that both men came of neurotic stock. But it is at least probable that but for this stock neither might have written anything above the level of mediocrity. Of the opium-takers, Shelley, Coleridge, De Quincey, Francis Thompson, and Poe are quoted as having consumed narcotics, mostly opium, with profound results upon their works, both in quality and quantity. Coleridge died at the age of 62, and at one time he is said to have consumed two quarts of laudanum a day. Dr. Cox raises the interesting question as to whether the laudanum of the early nineteenth century had as great an alkaloid content as that of the present day.

The chapter on the effect of epochal conditions is one of the best in the book. The author has some happy hits at the literary tendencies of the modernist school. In them, he says, "we find violence exploited to the limits of mental endurance, and, in what is called poetry, we find crudity in expression, distortion in imagination, and often a distressing ignorance of the real value of words, their origins, their significance, and their use." Dr. Cox ascribes these tendencies in part to the ten-year failure to control adolescence after 1914, and believes that much of this violence will subside, and that a recognition of literary culture *as something more than a mere defiance of tradition* must take place. Of modern psychological views there is little to be found in these pages. Beyond a brief reference to the "inferiority complex," and "neurasthenia," there is no attempt to make more than a superficial analysis of mental handicaps. After all, the reasons for a man being a literary genius and an alcoholic may be the same. The fierce repressive paternal influence in the childhood of the Brontës had more to do with their gloomy brilliance than had any physiological factor. The author himself agrees that the presence of a neurotic strain in the character may itself produce a special intellectual development, and lay the foundation of success in literary work. This view promises more psychology and less physiology, a promise which is not fulfilled; but the little book is likely to stimulate the interest of a wide circle of readers.

BROWN *v.* WHITE BREAD.

To the Editor of THE LANCET.

SIR,—In a recent issue (June 15th, p. 1261) you dealt with the report on the Carbohydrate Value of Foods, issued by the Medical Research Council. This report inquires, "In time of need is it a *national* economy to feed wholemeal bread instead of white? . . . The answer depends on how efficiently the milled off bran can be utilised—e.g., for animal nutrition. . . . It depends upon the coarseness of the bran left with the meal and the amount of it."

The proper answer to this inquiry is given in the Report of the Food (War) Committee of the Royal Society on Digestibility of Breads. In response to a memorial from the Bread and Food Reform League, the Food (War) Committee of the Royal Society carried out important investigations at the Universities of Cambridge, Glasgow, and London bearing upon the effect of raising the scale of extraction of wheat to 90 per cent. and to obtain information as to how far the economical use of the national diet would be affected by changes in the milling standard. The researches made show that bread made from meal ground so that it could *all* pass through a 10-inch mesh wire sieve could be utilised by almost everyone. The bread used was well made, was submitted to clerical and strenuous workers, to women and children—and met with general approval. The important investigations undertaken by the Food (War) Committee of the Royal Society proved, the Report states, that by increasing the extraction of wheat from 80 to 90 per cent., there would be a gain of energy available for man "equivalent to an increase of about

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[1] Mental Handicaps in Literature. By Edwin Marion Cox, M.D. With foreword by Theo. B. Hyslop, M.D., F.R.S.E. London: Baillière, Tindall, and Cox, 1929. Pp. 93. 3s. 6d.

1,700,000 calories of energy on the wheat milled each year in this country before the war or enough to extend the cereal supply of energy for more than one month." There would also be a gain of protein "equivalent to an increase of about 90,000 tons of protein on the wheat milled each year in the country."

Calories are, however, a very inadequate gauge of food and nutrition and apt to be misleading. This report from the Royal Society does not deal with the fact that wheat contains essential vitamins and organised mineral substances extracted from wheat in the manufacture of white flour. Digestion experiments show that these phosphates can be assimilated when the meal is finely ground. White flour is an imperfect food deprived of elements necessary for the maintenance of life. Birds fed on it and water have died, whilst those fed on wholemeal and water remained strong and healthy.

The report on Digestibility of Breads, however, enabled the Food (War) Committee to advise the Government to introduce a war bread of 90 per cent. extraction. It was often very badly made, but the nation was thus saved from what the late Mr. Bonar Law stated was the greatest peril encountered during the war—namely, starvation from enemy submarines.

I am, Sir, yours faithfully,
MAY YATES,
Founder and Hon. Secretary, The Bread and Food Reform League.

37, Essex-street, London, W.C.

MEDICINE IN WARTIME.[1]

THE Fourth International Congress of Military Medicine and Pharmacy was held in Warsaw in 1927. A summary of the important conclusions reached, and an account of the hospitable entertainments arranged by the Polish hosts has been set out in a small book which reached us this summer, when the fifth Congress was held in London. The decisions of the Congress are reported at length. In 1927 evacuation of wounded by air took a prominent place in the discussions, and as regarded evacuation generally the Congress decided that only if the high command had in advance fully acquainted the medical staff with its hopes and intentions could the best work be done for the wounded after a battle. As regards epidemic influenza, the best way of limiting an epidemic was thought to be in prompt diagnosis and immediate isolation; staffs of hospitals should be masked. To lessen the serious sequelæ of head wounds it was of first importance to secure that they should heal by first intention. Damage after arsenobenzol injections was thought generally due to unwise selection of the particular drug employed; only those thoroughly understood and approved, and with an arsenic content between 19 and 20 per cent., should be used. This matter was discussed by commissioned pharmacists of continental nations, no officers of similar rank and experience being present from the United States or Great Britain. The dental services took part for the first time in the fourth Congress. This record of an important Congress is in convenient form, and provides a readily available index to the extensive official reports that will be found in the greater libraries.

WOODHALL SPA.

THE Alexandra Hospital is this year supplementing its 34 beds for spa treatment by adding rooms for Plombières douches and for electrical treatment, as well as increasing the accommodation for its nurses. The bathing establishment was kept open throughout last winter for the first time, and the number of patients resorting to its bromo-iodine water has necessitated the provision, adjacent to the Bath House, of a hostel for those more advanced cases who at first find difficulty in reaching the hydropathic and electric treatment rooms, or who require definite nursing care. The need for fuller investigation is being met by the equipment of a pathological department, able to deal with disorders of metabolism, diabetes and the like, for which in this area no means for special treatment exist.

COUVADE.[2]

THE origin is unknown of the curious old custom, known as couvade, which still survives in some parts of the world: there the father lies in after the birth of a child instead of the mother, undergoes dietetic treatment, and receives the congratulations of the family friends. Mr. Dawson sets out the details of a religious rite practised in Cyprus and Ireland, which seems to have the couvade custom as an underlying feature, and proceeds to collect evidence that this custom is known in Europe, Africa, Asia, the Islands, and America. The last part of the book deals with the geographical distribution more fully. The author states that "the recorded localities in which couvade is, or has been, practised correspond to a remarkable degree with those associated with megalithic monuments and with customs usually connected with what has conveniently been called the heliolithic culture-complex, a complex comprising many curious customs and beliefs, amongst which may be specially mentioned sun-worship, mummification, ear-piercing, tattooing, and cranial deformation." Butler appears to have been misled by a story of Marco Polo when he alluded to the couvade in Hudibras:—"For though Chineses go to bed, and lie in, in their ladies' stead"—for the Chinese do not practise couvade, though it occurs in Japan. Incidentally, the reference to Hudibras given by Mr. Dawson (iii., canto i, 70) does not correspond with the lineation in our own copy of that work, where the lines are 707 and 708. The book is well got up, and there is a valuable bibliography; the frontispiece, which curiously enough is taken from a late Chinese manuscript on loan to the Victoria and Albert Museum, shows the couvade. It would be interesting to learn whether the subject was ever made the decorative theme on oriental china such as plates or utensils.

A HEALTH PROPAGANDA.

AMONG the good work which is being done by the Health and Cleanliness Council is the distribution of literature in coöperation with health societies, local authorities and other organisations, forming health propaganda. Last year the Council sent some 5,000,000 of its various booklets and leaflets to 2300 districts in England and Wales, while their publication, "Health and Cleanliness" is used as a text-book by teachers in many schools. The latest publication of the Council is a fairy tale, "On the Arch of the Rainbow," written by Mary Tyreman, its purpose being to inculcate in the minds of children the health value of soap and water and the need for smoke prevention. The book is attractively written and illustrated, and the Health and Cleanliness Council is prepared to distribute from the office, 5, Tavistock-square, London, W.C., a number of copies without charge to teachers, Girl Guide captains, and others interested in the teaching of hygiene among children.

THE NATION AND ITS FOOD.

THE production and distribution of food of the best quality at the very lowest possible price must benefit the community as a whole. People cannot be educated to choose the best kinds of food on which to maintain themselves and their families if such food is beyond their purchasing power. The actual price paid by a consumer for his comestibles includes, of course, the costs of transportation and retailing, and in many foodstuffs these are appreciably greater than the total costs of production. Dr. Addison discusses in a pamphlet[1] recently issued various ways in which the price of food might be reduced. He refuses to believe in the present system, under which we are told that it costs as much to retail a side of beef as it does to rear and feed the animal for three years, and that the expense of transporting and selling a cabbage is two or three times as great as that of cultivating it. If the nation does not deliberately take steps to devise a more rational system of production and marketing, Dr. Addison forsees that our food-supplies will shortly be controlled by huge combines of first-rate business men operating for profit, who will be in a position to dictate the price of all our essential articles of food. He sees no reason why the nation, with its experience of food control during the Great War, should not establish a National Marketing Board which would be furnished with a monopoly of the power of import and the sole right of purchasing for import. One of its main functions would be to keep prices steady for reasonable periods, as far as possible, with the object of encouraging production. It would trade as a responsible business organisation, presenting audited balance sheets to Parliament, and would aim at operating without incurring loss or accumulating profits. The scheme sketched out represents the nationalisation of our food-supplies, and even Dr. Addison suggests that it would be necessary to introduce it gradually, while experience in working out the details is being obtained. Those opposed to any form of nationalisation will obviously disagree with all of the suggested proposals. Nevertheless the fundamental principle of securing the ability of the poorer members of the community to purchase adequate quantities of such protective foods as are at present only too often beyond their means, cannot but be regarded with sympathy.

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[1] Report on the Fourth International Congress of Military Medicine and Pharmacy: Warsaw, Poland, 1927. By W. S. Bainbridge, Commander, M.C.-F., U.S. Naval Reserve. The Collegiate Press, Menasha, Wisconsin, U.S.A. Pp. 248.

[2] The Custom of Couvade. By Warren R. Dawson, F.R.S.E. Manchester University Press. 1929. Pp. 118. 7s. 6d.

[1] The Nation and Its Food. By the Rt. Hon. C. Addison, M.D., F.R.C.S. London: Ernest Benn, Ltd. 1929. Pp. 32. 6d.

Lectures

ON THE

PHYSIOLOGY OF GLYCOGEN

AND THE

RÔLE OF INSULIN AND EPINEPHRINE IN CARBOHYDRATE METABOLISM.

Delivered at the London Hospital

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LECTURE II.*—(PART I.)

THE RÔLE OF INSULIN AND OTHER HORMONES IN THE CONTROL OF CARBOHYDRATE METABOLISM: KNOWLEDGE GAINED BY STUDYING DIABETES.

SINCE insulin removes all the symptoms of diabetes it might be expected that an examination of the disturbances which cause them would reveal the nature of the action of this hormone. Let us in the first place, therefore, see to what extent this expectation has been realised. The symptoms of diabetes are so numerous that it is necessary for our purpose to decide which are fundamental, or primary, and which are merely secondary. Hyperglycæmia and glycosuria are certainly secondary and ketonæmia is also probably so, since it develops late. This leaves: (1) The low R.Q. (respiratory quotient) and its failure to become raised when carbohydrate is ingested; (2) the decrease of glycogen in the liver; and (3) excessive gluconeogenesis, as the primary symptoms. It has been customary to regard the first of these, the low and stationary R.Q., even during ingestion of carbohydrate, as evidence of a failure on the part of the organism to oxidise this foodstuff. Indeed, this is considered by many as the fundamental cause of the other symptoms, especially since, besides the low quotient, it has sometimes been possible, either on dogs rendered diabetic by complete removal of the pancreas or on these and other animals manifesting some of the symptoms of this disease as a result of repeated injections of phlorhidzin, to recover ingested glucose completely in the urine, and to observe a fixed daily ratio between the amounts of glucose and of nitrogen excreted in fasting or in meat-fed animals. Recent work, however, has failed to show that these results are always obtained, and since this greatly lessens their value as *proofs* we must examine them more fully.

IS OXIDATION OF SUGAR DEPRESSED IN DIABETES?

When glucose is given to either depancreatised or phlorhidzined dogs it *causes an immediate increase* in the amount excreted by the urine, and if we could assume that no change occurred in the endogenous metabolism it would be legitimate to compute the amount of unused glucose excreted by subtracting, *from the total glucose excretion following ingestion of* the sugar, that of a previous period of equal duration. But the nitrogen excretion usually declines decidedly as a result of the ingestion, so that, in order to allow for the lesser amount of glucose which this indicates *must be coming from protein metabolism, the sub*traction has to be made from a value which is obtained by multiplying the nitrogen excretion of the ingestion period by the D/N ratio of the previous period. Following the ingestion of moderate quantities *of glucose both in depancreatised and in phlorhidzin*-poisoned dogs a tolerable balance between the amounts ingested and excreted in excess is sometimes obtained under these conditions, but this result cannot be accepted as proof of the inability of the tissues to utilise the glucose, for if this were the case then no change should occur in protein metabolism. The method of calculation allows for this change, and nevertheless the results are supposed to prove that the glucose is not utilised. But, quite apart from this obvious fallacy, the actual results often fail to show close correspondence, either when they are thus calculated or when they are taken as a simple balance between intake of sugar and the excess which is excreted.

The Significance of the R.Q. in Diabetes.

This brings us to a consideration of the significance of the supposed fixity of the R.Q. as evidence of the inability of the organism to oxidise carbohydrate. In phlorhidzined dogs it is now known, through work *emanating from Lusk's laboratory, that the R.Q.* may rise considerably when sugar is fed, especially in divided quantities at intervals of an hour or two apart and, when allowance is made for the larger amount of carbohydrate which this shows is being *metabolised, the excess excreted may actually* exceed the amount taken. It must be remembered, however, that such animals are not truly diabetic, because they still can secrete insulin from the intact pancreas, and the variable effects which have been observed following the ingestion of sugar may depend on variations in the internal secretion of insulin. It is important, therefore, to consider the effects of ingestion of sugar in depancreatised dogs which are truly diabetic, inasmuch as there can be no internal secretion of insulin. When moderate amounts (20–40 g.) are given to such animals at one time there is seldom any effect on the quotient and most of the sugar can be recovered in the urine, but some preliminary experiments by de Peucier have shown that administration of sugar in divided quantities may cause the quotient to become raised *and a considerable proportion of the amount* ingested may fail of recovery in the urine. Hédon [24] has also reported numerous observations in which the R.Q. in depancreatised dogs rose considerably above the "diabetic" level of 0·707 at later stages after the withdrawal of insulin.

Neither in phlorhidzin-poisoned animals nor in depancreatised ones, therefore, does the behaviour of the R.Q., or the increase in sugar excretion following the ingestion of sugar, justify the claim that the organism has entirely lost the power to oxidise carbohydrate. There is, moreover, evidence to show that the diabetic organism can utilise the blood-sugar at a rate which is not demonstrably less than that in normal animals. Let me, very briefly, cite this evidence. When the abdominal viscera are removed in an anæsthetised dog or a decapitate cat the blood-sugar falls rapidly, and the speed at which it does so is apparently the same in a diabetic (depancreatised) animal as in a normal one (Macleod and Pearce,[25] Burn and Dale, &c.). Objection may be taken to these experiments on the ground that the fall in blood-sugar level in both normal and diabetic animals is somewhat irregular. This irregularity did not occur in the experiments of Markowitz, in which the liver alone was removed, in dogs, after making provision so that the blood could get from the posterior parts of the body to the heart independently of the inferior vena cava and portal vein. During the survival of the animal under these conditions the blood-sugar steadily falls, and it does at about the same rate in diabetic (depancreatised) as in normal animals, when allowance is made for the initially higher level of blood-sugar in the former

But, although *diabetes causes no significant change* in the rate at which sugar migrates from the blood into the muscles, this does not necessarily mean that the sugar has been equally well oxidised in both cases. We must be careful to distinguish between utilisation and oxidation. *Indeed there is evidence to show that* the diabetic tissues have lost something of their oxidative power. Thus, by measurement of the respiratory exchange from hour to hour, Markowitz found that the R.Q. behaved in the same manner immediately *after hepatectomy in diabetic* as compared with normal animals, but that it showed a difference later on. In both normal and diabetic animals the quotient to start with stood at between 0·85 and 0·90, but whereas intravenous injection of glucose, to compensate for the rapidly developing hypoglycæmia, caused the quotient to rise to unity in the normal animal, it failed to affect it in the diabetic (Table VII.). There was also a difference in the behaviour of the calorie expenditure; in the normal animal this became markedly raised by giving sugar, but it was unaffected in the diabetic. We can suggest no cause for these differences unless it be related to the lingering presence of insulin in the tissues of the normal animals. In other words, the blood-sugar and muscle glycogen originally present in both conditions may be directly utilised by the muscles, but glucose from without be utilisable only in the presence of insulin still remaining in the normal tissues.

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* Lecture I. appeared last week and Part II. of Lecture II. will appear in a coming issue.

TABLE VII.

Time and condition.	Calories per kg. per hr.	R.Q.	Remarks.
Non-diabetic.			
9.40 A.M. .. .. Hepatectomy completed.	—	—	Wt. 7·8 kg.
10.15–10.30 .. .. Recovered from anæsthetic; put in cabinet.	—	—	Blood-sugar 0·074 %.
11–12	2·00	0·869	Animal quiet.
12.10 P.M. .. .. Removed.	—	—	Hypoglycæmic symp. Blood sugar, 0·052 %. Glucose injected; prompt recovery. Animal replaced in cabinet.
12.50–1.50	2·14	0·990	Animal quiet.
1.50–2.50	2·25	0·987	
2.50–3.50	2·43	0·936	
3.50–4.50	2·32	0·902	
6	—	—	Blood-sugar 0·100 %. Animal in good condition.
Diabetic.			
9–9.40 .. .. .. Hepatectomy completed and put in cabinet.	—	—	Wt. 12 kg. Depancreatised 2 days prev.
10–11	2·65	0·857	Very quiet.
11–12	2·63	0·886	
12–1	2·28	0·887	
1–2	2·05	0·855	Convulsions at end of period.
2.5 .. .. .. Removed.	—	—	Blood-sugar 0·054 %. Glucose injected; recovery.
2.35–3.35	1·70	0·831	Quiet.
3.35–4.35	1·63	0·851	Unconscious part of time.
5.30	—	—	Blood-sugar 0·042 %.

Objection may be taken to all of these experiments on the ground that the gases of the blood were not measured at the same time as the respiratory exchange. This objection would seem to be justified in light of the experiments of Verzar, Murlin, and Kramer, and, more recently, of Kilborn,[30] who have shown that the CO_2 content and the CO_2-combining power both decline markedly following evisceration, mainly because of relative over-ventilation of the blood in the lungs and a consequent blowing-off of CO_2. Indeed, the last-mentioned worker has shown that if precautions be taken to prevent the fall in CO_2 content—by breathing air with about 2 per cent. CO_2—the R.Q. does not become raised by evisceration. But it is unlikely that these results on eviscerated animals, which are either under anæsthesia or are decapitated, apply in the case of an animal in which the liver alone is removed, and the respiratory centre is intact. Moreover, there is a significant difference in the behaviour of the quotient in the two conditions, for it steadily rises from hour to hour after evisceration, whereas it falls after hepatectomy. There is therefore no reason to suppose that the rise in R.Q. following hepatectomy is due to any other cause than a change in the type of metabolism. In intact animals the quotient is the algebraic sum of a very low quotient contributed by the liver, because gluconeogenesis occurs mainly here, and a high one contributed by the muscles, where carbohydrate oxidation is the predominant process. That the quotient does not actually rise to unity after hepatectomy merely means that the muscles themselves possess some powers of gluconeogenesis. These become suppressed entirely when there is a plethora of carbohydrate in the presence of insulin.

Muscular Exercise in Diabetes.

To return to our main question—namely, is oxidation of carbohydrate seriously depressed in diabetes, there still remain two further types of experimental evidence to be considered. The first relates to the behaviour of the respiratory exchange following increased muscular activity, in normal as compared with diabetic (depancreatised) animals. It was found by Chaikoff and Macleod,[21] who induced greater muscular activity by exposing the animals to cold, that there is no difference between normal and diabetic animals. The consumption of oxygen in both cases usually became more than doubled during the first hour following exposure to cold, and the R.Q. rose as decidedly in the diabetic as in the normal animals. The results of these experiments are shown in Table VIII.

TABLE VIII.

Dog No. and weight in kg.	Respiratory exchange.					Excess R.Q. of first ¼ hr.
	Resting*	Shivering.				
		First ¼ hr.	Second ¼ hr.	Second hr.	Third hr.	
	O_2 c.cm. per hour and respiratory quotient.					
16 (6·6)	5,125 (0·71)	12,478 (0·70)	7,900 (0·73)	13,958 (0·69)	10,704 (0·69)	0·68
17 (6·0)	3,116 (0·71)	[illegible],706 (0·93)	6,088 (0·76)	—	5,409 (0·75)	1·2
17A (5·4)	3,742 (0·69)	5,742 (0·83)	6,508 (0·86)	5,473 (0·72)	5,530 (0·69)	1·09
19 (11·5)	5,030 (0·70)	7,484 (0·79)	8,708 (0·71)	9,048 (0·67)	8,726 (0·73)	0·97
Diabetic.						
1^{1} (4·0)	3,583 (0·69)	7,484 (0·76)	8,112 (0·70)	7,351 (0·71)	6,633 (0·69)	0·88
1^{2} (4·9)	3,794 (0·70)	8,706 (0·77)	8,784 (0·72)	7,722 (0·71)	7,859 (0·69)	0·82
1^{3} (5·6)	4,292 (0·68)	11,028 (0·73)	10,658 (0·67)	8,649 (0·69)	7,238 (0·69)	0·75
9^{1} (4·0)	2,391 (0·70)	4,094 (0·85)	4,144 (0·83)	3,931 (0·84)	3,664 (0·83)	1·05
9^{2} (3·9)	2,653 (0·68)	3,852 (0·66)	3,844 (0·72)	4,211 (0·70)	4,173 (0·70)	—
11 (8·0)	3,957 (0·68)	9,201 (0·83)†	—	9,882 (0·76)	8,136 (0·70)	—
14 (5·6)	4,851 (0·70)	8,382 (0·77)	6,688 (0·72)	6,183 (0·71)	6,270 (0·69)	0·85
18^{1} (7·6)	4,057 (0·69)	5,904 (0·82)	7,666 (0·65)	7,635 (0·66)	5,782 (0·75)	1·09
18^{2} (7·0)	3,730 (0·68)	6,338 (0·73)	5,788 (0·72)	5,945 (0·69)	5,663 (0·70)	0·80

* Average of four hour observations. † 1 hour observation.
Note.—The weight of the dog and the respiratory quotient are shown in parentheses.

Heart-lung Preparation.

The second type of evidence is obtained from observations on the respiratory exchange in the heart-lung preparation. Notwithstanding the considerable experimental difficulties which are encountered in experiments of this type it has been established that the R.Q. is about 0·85 for the heart of normal (fed) dogs, but is much lower (about 0·7) for diabetic ones, and that whereas the quotient becomes raised somewhat (to 0·9) by adding glucose to the perfusion fluid in the case of normal hearts this does not occur when diabetic hearts are used. But these results do not furnish conclusive evidence that the diabetic heart had lost the power to oxidise carbohydrate because, as Starling and Evans [32] point out, profound modifications in tissue metabolism may serve to mask a moderate carbohydrate combustion. Moreover, it must be borne in mind that the heart is a mechanism of a somewhat different type from the skeletal muscles, as is evidenced by its power of prolonged beating when perfused with oxygenated artificial plasma, the formation of glycogen in it during starvation and in diabetes, and the peculiar behaviour of lactic acid.

We would sum up all this evidence as showing that the diabetic musculature still retains the power to oxidise carbohydrate, and if some of it may indicate an enfeeblement this is probably secondary to some other metabolic disturbance which interferes either with the preparation of the carbohydrate for combustion or with its derivation from other foodstuffs. We cannot therefore explain the action of insulin by stating that it directly stimulates the oxidation of carbohydrate.

DECREASED LIVER GLYCOGEN IN DIABETES.

What, then, is the *fundamental metabolic fault* in diabetes? What, in other words, is it that insulin controls so as to prevent this disease? Two other disturbances remain to be discussed—great reduction of the amount of glycogen in the liver and excessive gluconeogenesis. With regard to the former, although it is a striking fact that only traces of glycogen can be found in the liver of diabetic dogs, even after feeding with sugar, yet it is, I think, most important to remember that glycogen is seldom if ever entirely absent. We have always been able to detect its presence in the liver even after there has been total diabetes for several days, but it is possible that all traces might disappear if depancreatised animals were kept until they were moribund, and it is said that there is complete absence in phlorhidzin poisoning. The fact that some glycogen usually remains, however, indicates that the glycogenic function is not abolished. The glycogen found after death merely represents what is left over as the result of the action during life of two opposing processes, one of which—glycogenolysis—proceeds in the normal animal somewhat slower than the other—glycogenesis, whereas in diabetes the former process almost keeps pace with the latter, so that only a trace of glycogen is left over.

INCREASED GLUCONEOGENESIS IN DIABETES.

The evidence for the occurrence of excessive gluconeogenesis in diabetes is that large quantities of sugar continue to be excreted by a fasting animal long after all the carbohydrate which was stored in the body before the diabetes set in has been exhausted. Thus between the third and fifth days after the withdrawal of insulin and food from a well-nourished, depancreatised dog weighing 8·6 kg., as much as 52·7 g. of glucose were excreted. At this time there is not more than 1·2 g. of glycogen in the liver and possibly a total of 3·5 g. in the muscles, an amount which, in toto, is insufficient to furnish the energy required for living for more than an hour or so, let alone the sugar which is excreted. If, as is the present-day teaching, carbohydrate is the fuel which alone can be used by muscle for the production of energy, we must conclude that in the diabetic organism the process of gluconeogenesis, by which protein and fat are converted into glucose, is proceeding so actively that it provides an excess of carbohydrate which appears in the urine as glucose.

Gluconeogenesis is no doubt mainly a function of the liver, but it may also occur in the muscles themselves, as is evidenced by the fact that the R.Q. of diabetic animals after hepatectomy is well below unity (0·9). I have pointed this out in previous lectures,[23] and since then Cori and Cori,[24] basing their conclusions partly on work of their own and partly on that of Krogh and Lindhard, have drawn a distinction between the hepatic and the muscular processes of gluconeogenesis. They believe that glucose is a necessary product of the process in the liver, but is not so in that occurring in the muscles, and they assume that it is only the glucose produced in the liver which is excreted in diabetes. If we make the further assumption that the muscles cannot use this sugar, such a view is compatible with the known fact that the amount of glucose excreted daily by a fasting diabetic animal is tolerably constant, and it would explain why the blood-sugar apparently falls after hepatectomy as quickly in a depancreatised as in a normal animal. At the same time it implies that the muscles in diabetes have lost their power to oxidise the sugar brought to them by the blood, although they still retain that of forming glycogen. There is much to be said in favour of these views, and they are opposed to that which supposes that the diabetic animal derives most of its energy by a direct oxidation of fatty acid and of protein. This is the orthodox view, and it is based on the supposed constancy of the D/N ratio and the R.Q. in animals under the influence of phlorhidzin. As we have pointed out elsewhere, neither of these values is actually fixed in depancreatised animals.

But for our present purpose the important conclusion arrived at is that gluconeogenesis is proceeding excessively in the liver, where, also, deposition of glycogen has become reduced to a very low level. To what extent these two processes are linked together cannot be stated. It would be simplest to imagine that glycogen is formed in the liver in an inverse ratio to gluconeogenesis from protein and fat, the maximal deposition occurring when, in a normal animal, carbohydrate is being absorbed from the intestine and the least, in a diabetic one in which, owing to the absence of insulin, gluconeogenesis is at its maximum. *This view is not incompatible with the known fact* that glycogen accumulates somewhat in the liver during starvation in normal animals, for here it may be derived from lactic acid coming from the muscles, where it is derived from glycogen produced there by gluconeogenesis. It is, however, difficult to reconcile this view with the continued large deposition of glycogen and the excessive gluconeogenesis caused by epinephrine. We will discuss this question further at a later stage. Meanwhile the important thing to remember is that administration of insulin to the diabetic animal immediately causes glycogen to appear in the liver, not only when carbohydrate is also fed to the animal, but also without it (Cori). The question is whether the excessive gluconeogenesis is also checked. It is usually concluded that it is so since the nitrogen excretion becomes lessened, but otherwise there is no direct evidence to support this view. The behaviour of the R.Q. is often cited as further proof. This rises shortly after insulin is given. In a fasting, diabetic animal this cannot be dependent simply upon more *carbohydrate being burned since* there is, as we have seen, very little available carbohydrate and, as a matter of fact, more becomes deposited as a result of insulin. Hence the change in the quotient must depend on relatively less oxygen being required for gluconeogenesis, and since the actual oxygen consumption does not fall it is usually assumed that, pari passu with the lesser gluconeogenesis, there is an increased combustion of carbohydrate. The interpretation of changes in R.Q. is, however, very difficult, so many *factors* being involved.

Although the rise in R.Q. following insulin is compatible with the view that gluconeogenesis has become lessened it is no proof that this is actually the case. It is indeed impossible to get direct evidence that insulin inhibits gluconeogenesis. The most recent experiments are those of Burn and Marks,[25] who have used the artificially perfused, excised liver. They found that the total carbohydrate of liver and perfusion fluid became markedly increased as the perfusion proceeded, but was not affected by adding insulin to the *perfusion fluid*.

It is impossible in the light of present knowledge to decide what really is the primary metabolic fault in diabetes, and therefore to say how insulin acts in preventing this disease. It certainly cannot do so merely because it inhibits excessive gluconeogenesis in the liver, as was the view put forward several years ago by Laufberger.[26] If such were the case then insulin should fail to lower the blood-sugar in hepatectomised and eviscerated animals, but it quickly lowers it, as was first shown by Mann and Magath. If gluconeogenesis also occurs in muscle Laufberger's view might hold.

Striking as may be the effects of insulin on the metabolism of depancreatised animals their investigation has taught us really very little regarding the fundamental nature of its action, and the chief reason for this failure is the necessarily limited number of experiments that can be done, the dog being the only laboratory animal suitable for pancreatectomy. If more could be learned concerning the quantitative behaviour of glycogen in the liver and muscles at various stages following administration of insulin to fasting, and to sugar-fed, diabetic animals, and the changes in glycogen formation compared with those in respiratory metabolism and in the relative concentrations of sugar and lactic acid in the blood entering and leaving the liver and muscles, great strides forward could, I am sure, be taken. On account of these difficulties the problem of how insulin acts has mainly been attacked by observations on the effects produced by injecting it into normal animals, especially rabbits, rats, and mice.

EFFECT OF INSULIN ON NORMAL ANIMALS.

In such experiments, however, it has at the outset to be recognised that we are dealing with a condition that is essentially different from that which is set up by giving insulin to diabetic animals. The insulin we inject in the latter case restores to normal a completely disorganised metabolism and any excess is probably quickly destroyed or excreted, whereas in normal animals it distorts the whole of metabolism by overstimulating certain phases of it. The excess causes some parts of the metabolic machinery to go too quickly or too slowly for other parts upon which it has no influence. Such disorganisation may lead to the accumulation of intermediary products of metabolism having a detrimental influence on the working of the machine as a whole. It may be because of a mechanism of this type that those toxic products accumulate which are responsible for the symptoms of hypoglycæmia and here I may refer to the work of Hynd, who suggests that accumulation of a substance called "glucosone" is responsible.

Increased Glycogen Formation and Carbohydrate Combustion.

In the light of the results obtained by insulin on depancreatised dogs, it was natural to expect that increased glycogen formation and increased oxidation of carbohydrate would together account for the disappearance of blood-sugar following injection of this hormone into normal animals. But it was impossible to demonstrate that this occurred; on the contrary, it was found that the glycogen of the muscles and of the liver actually diminished after insulin, and, although the respiratory quotient often changed so as to indicate a relatively increased combustion of carbohydrate, this did not always occur (in rabbits and dogs) until after the blood-sugar had completed its initial fall. In small animals, such as rats and mice, moreover, although the quotient might rise there was an absolute decline in carbohydrate metabolism and when glucose was given along with the insulin, it seemed impossible to account for the disappearing sugar by increased glycogen formation and increased carbohydrate utilisation. These results suggested the possibility that some hitherto unidentified intermediary product of carbohydrate metabolism was accumulating, and attempts were made, by chemical examination of the muscles and liver, to reveal its presence. The plan adopted in these experiments was to compare the amounts of glycogen, lactic acid, free sugar and lactacidogen in the liver and muscles of normal rabbits and of rabbits previously injected with insulin and sugar. It was found that less rather than more of each of these substances was formed in the injected animals. This result in itself would not, however, be inconsonant with the idea that some unknown substance had accumulated—for all of the bodies mentioned might have been used to form it—but if this were carbohydrate in nature, its presence should be revealed by an increase in the total sugar set free by hydrolysis, with acid, of the tissues (liver and muscles) of the insulin-treated animals. But the results of such experiments proved to be entirely unsatisfactory, partly because of their irregularity and partly also because of lack of knowledge as to what really happens when extracts of tissues containing proteins, as well as various extractives, are subjected to acid hydrolysis. When hydrolysis is performed with deproteinised tissue extracts the reducing power, originally small, is only slightly increased, and there is no difference between normal tissues and those removed from insulin-treated animals.

This failure to demonstrate the formation of an intermediary substance revived consideration of the possibility that, after all, insulin acts on normal animals, either in the same way as on diabetic ones—namely, by causing more glycogen to be formed, by increased carbohydrate combustion, and by suppressing the new formation of carbohydrates (Best, Dale, Hoet and Marks)—or, more simply, by merely stimulating glycogen formation and carbohydrate combustion (Lesser, Bissinger et al, and Cori and Cori). Each of these three groups of workers have performed experiments in which an endeavour has been made to compare, on the one hand, the amount of extra sugar disappearing as a result of insulin action, and, on the other, the increase in carbohydrate combustion—as calculated from the respiratory exchange—and the increase in glycogen deposition—as found either by analysis of the entire animal or of a supposedly representative fraction of it. Although I consider these experiments a very great advance over those performed by myself and my various co-workers, especially since they open a new avenue of approach to the investigation of the problems of carbohydrate metabolism, there are, nevertheless, several possible sources of inaccuracy in them, and I hope it will not be taken amiss if I take this opportunity to indicate some of these.

Experiments on Mice.

The first researches were those commenced in 1923 by the late E. J. Lesser, of Mannheim, and his collaborators, Issekutz, Bissinger, MacGrath, &c.[38] Mice were used, and in the first observations it was found that when insulin was injected along with sugar it caused more to disappear from the entire animal than when sugar alone was injected. In the absence of sugar injections, it was also found that insulin caused the total reducing substance (reckoned as glucose) plus the glycogen to become less in the animal. Thus MacGrath found an average of 54 mg. glucose and 63 mg. glycogen per 100 g. in untreated mice, and 26 mg. glucose and 57 mg. glycogen in others injected 30 minutes previously with insulin. The chief reduction was therefore in the tissue glucose and in all only 34 mg. of carbohydrate had to be accounted for—an amount which was inadequate to raise the R.Q. beyond the limits of experimental error. This made it impossible, by respiratory analysis, to determine whether all of the lost carbohydrate had been oxidised, so that the experiments were repeated with the difference that glucose was injected along with the insulin. The results showed a very close correspondence between the glucose which actually disappeared from the body and the amount which could be accounted for by respiratory analysis. It was noted also that glycogen synthesis was only moderately increased by the insulin injections. The authors point out that estimation of the extractable reducing substance as glucose may be fallacious and that substances having a lower reducing power, such as hexose phosphate esters, might have been formed in their experiments. Lesser, nevertheless, concluded from his researches that insulin acts by accelerating the oxidation of glucose and its synthesis to glycogen, and taking into consideration the work of others, as well as his own, he further concluded that it is in the voluntary muscles that this acceleration occurs.

Experiments on Eviscerated Spinal Preparation.

We will next consider the evidence of Best, Dale, Hoet, and Marks.[11] This was obtained from experiments on an eviscerated spinal preparation (cat), in which *the total loss of glucose* was calculated from: (1) the actual amount of glucose infused; (2) the *decrease in blood-sugar*; (3) *the decrease in the* "free sugar" of the muscles; and (4) the sugar added to the blood stream from the liver—as found from the decrease in the total carbohydrate (glycogen and "free sugar") of this organ; and the *carbohydrate utilised* from (1) the increase in the glycogen of the muscles, and (2) the increase in oxygen consumption. An almost exact balance was obtained between sugar disappearing, on the one hand, and that accountable for by increased oxygen consumption and glycogen formation, on the other hand, and the authors drew the conclusion that "the glucose which disappears from an eviscerated spinal preparation under the action of insulin is equal to the sum of the glycogen deposited in the muscles and the glucose-equivalent of the oxygen absorbed." I do not think that this conclusion should be accepted as final because of the following possible sources of error in the experiments:—

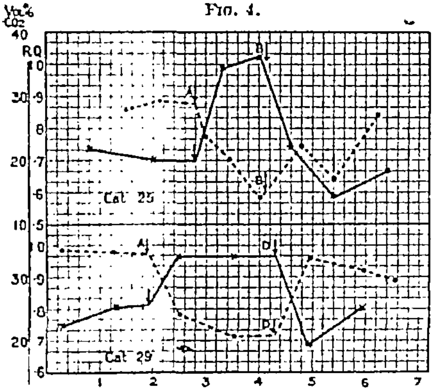
(1) *The decrease in the free sugar of the muscles* was determined by measurement of the reducing power (Hagedorn-Jensen method) of a watery solution of the residue obtained by evaporation of an alcoholic extract of muscle, after treating it with colloidal iron. The values found for different muscles of one leg of a spinal cat averaged 0·22 per cent. and no significant change occurred after leaving the preparation at body temperature for five and a half hours. The authors express doubt as to whether this is really "free sugar," but they believe, since the experiments are comparative ones and glucose "the only muscle constituent likely to vary significantly under the conditions of the experiment," that it is justifiable to consider a change in reducing power as due to glucose. After insulin they found that this free sugar declines in percentage and when allowance is made for the mass of all the muscles "a much larger contribution (is made) to the total of glucose lost than does the larger fall in the blood-sugar percentage" (bracketed words mine). Thus, in a cat weighing 3·725 kg. 0·42 g. glucose was calculated as being lost from the blood (the percentage falling from 0·27 to 0·088) and 1·44 g. from the muscles (the average percentage in four muscles falling from 0·202 to 0·182). Obviously, therefore, this is an important item on the credit side of the account, and it amounts, in two other experiments that are recorded, to 0·060 g. and 0·200 g. (the glucose infused being 3·250 g. and 4·80 g. respectively) and to 0·120 g. in another, in which the glucose infused, 1·080 g., was insufficient to prevent hypoglycæmia from developing. These figures show that the correction for free sugar varied greatly in the different observations and they raise the question whether, even with the reservations made by the authors, the figures can be taken at their face value. While there is no pretence that the reducing power gives a correct estimate of glucose present in the extracts, yet it is assumed, since the blood-sugar was being artificially maintained at a high level (which, however, was not the case in the third experiment referred to above), that the change in reducing power would represent a change in sugar to the same degree as a similar change is taken to represent one in blood-sugar percentage. Then again, Simpson and Macleod and Cori and Cori, using somewhat similar methods for estimating the free sugar of muscle in the rabbit and rat, have not found that insulin does lower the percentage of free sugar. With these points in view the risk involved in multiplying the actual changes found by a large factor are perhaps even more considerable than the authors imagine.

(2) *The sugar added to the blood stream from the liver* is allowed for by determination of the total of free sugar and glycogen in samples of liver removed at different stages of the experiment. It was found in a control experiment without insulin that the total loss of carbohydrate from the liver during a period of 50 minutes plus the sugar injected almost corresponded to the glucose equivalent of the oxygen meanwhile used, without there being any change in muscle glycogen. This result seems to justify the correction, but it appears to me doubtful whether the percentage of carbohydrate in a small portion will invariably represent that present in the liver as a whole. Since there was practically no circulation in the organ, it is not likely that the sugar in various portions of it would drain to an equal extent into the cava blood.

Coming now to the other side of the balance sheet the glycogen deposited in the entire musculature is computed by multiplying the average percentage found in four muscles of the hind limb by the estimated weight of all the muscles. The reliability of this method is fully discussed in a paper by Best, Hoet, and Marks[11] and certain of its possible sources of inaccuracy are pointed out. But there are several curious properties of the eviscerated preparation which seem to me to indicate that it does not behave like the muscles of an intact animal. In the first place, as I have pointed out elsewhere, it is difficult to reconcile the constancy in glycogen in the muscles over several hours in preparations not injected with insulin with the current hypothesis that the immediate fuel used for the production of muscular energy is glycogen. The energy production in these preparations, which was at the rate of about 2 calories per kg. an hour, was apparently not dependent on glycogen, since this was the same at the beginning as at the end of the experiment, or if it was dependent on glycogen then we have to imagine that in each of the muscles just as much glycogen was being built up out of blood-sugar as was disappearing during the course of the experiment. The other alternative is that the fuel used was blood-sugar itself. The amount of sugar which analysis showed to be disappearing from the blood itself was far from adequate to account for the energy produced, but, when the sugar that was considered to be leaking into the systemic circulation from the liver was added to this, a sufficient amount was found to be provided in one of the experiments of Best, Dale, Hoet, and Marks. In either case there is something mysterious about the energy metabolism of the spinal preparation.

Even were these sources of error overcome there remains a more serious one, and this depends on the assumption that each 750 c.cm. of oxygen retained by the preparation corresponds to the oxidation of

FIG. 4.



The interrupted lines represent CO_2 in blood (volumes per cent.), and the continuous lines represent the respiratory quotient. A = eviscerated. B = lessened ventilation. D = breathing expired air. Time in hours.

1 g. of glucose. This would be the glucose equivalent of oxygen if the respiratory quotient stood at 1·0, but it is not permissible, in the light of Kilborn's experiments, to assume that this was so. Kilborn [30] in confirmation of earlier work by Vérzar and others, found that the rise in the R.Q. which follows evisceration is dependent partly on the appearance of lactic acid and partly on the relative over-ventilation of the preparation. This causes a blowing-off of CO_2 from the blood and tissues, as evidenced by a marked fall in the CO_2 of the blood, thus making it unsafe to assume that because the quotient was unity carbohydrate combustion was alone occurring in the eviscerated preparations. As a matter of fact Kilborn found that he could cause the R.Q. to return to about its original low level either by reducing the respiratory volume or by adding CO_2 to the inspired air as shown in Fig. 4. Of course, there is the possibility since there was a very high percentage of blood-sugar in the preparations used by Burn and Dale and Best et al—which was not the case in those used by Kilborn—that the metabolism may have been one exclusively of carbohydrate. In this connexion it is only fair to point out that Markowitz found in a dog from which the liver had been removed that whereas the R.Q. stood at about 0·9 to start with, it rose practically to unity when glucose was injected. There is no doubt that insulin sooner or later increases the rate of oxygen consumption, not only in decapitate, eviscerated preparations, but also in normal animals, and since the R.Q. rises somewhat in the latter it is doubtless correct to conclude that relatively more carbohydrate is being oxidised, but it is impossible to calculate the extent to which this is occurring without knowing in how far the R.Q. is being affected by a mere over-ventilation of the blood and tissues.

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THE DEVELOPMENT OF PULMONARY TUBERCULOSIS,

WITH SPECIAL REFERENCE TO "EARLY INFILTRATION."

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IN no disease is it more important to establish the diagnosis early than in pulmonary tuberculosis; to this end much literature has been produced by many authors. The disease has usually been described as being of a slow insidious onset, the chief symptoms of which are cough (often most marked in the mornings), hæmoptysis, indefinite malaise, night-sweats, an intermittent low-grade pyrexia, and a progressive loss of weight. In the early stages the disease-process has been supposed to be confined to the apical region of the affected lung, the lesion at first being very small in size and in the course of time gradually spreading to involve more and more of the lung. The literature on the subject leads to the conclusion that physical signs in the early stages are extremely variable and difficult to establish, and that they are to be found in the apical region of the affected lung. Various authors lay particular stress on some percussion or auscultatory finding which, in their opinion, is almost diagnostic. The radiological findings reported as early manifestations are almost as variable and elusive as the physical signs. The sputum in the earliest cases (closed cases) is said to be negative when examined for tubercle bacillus.

"*Early Infiltration.*"

During recent years, on the Continent, particularly in France and Germany, a great deal of evidence has been adduced to suggest that the old teaching that the development of pulmonary tuberculosis is a slow, insidious process is erroneous and that, as a matter of fact, the disease has a comparatively acute onset. Assmann,[1] Redecker,[2] Lydtin,[3] Fassbender,[4] Braeuning,[5] Kayer-Petersen,[6] Ulrici,[7] Gran,[8] Rist and Amenille,[9] Frischbier and Bechmann [10] have reported series of cases in which the disease has been characterised by the following phenomena.

1. The onset is definite and often acute.
2. The lesion is usually situated in the infraclavicular region, but may be in the mid-zone or basal area.
3. The skiagrams show a very definite, characteristic picture.

To these cases Redecker gave the name "early infiltration." (*Frühinfiltrat.*)

The following series of cases from the City of London Hospital for Diseases of the Heart and Lungs are illustrations of "early infiltration."

CASE 1.—A man, aged 28, had been quite well until two weeks before *admission, when he noticed a cough,* and a few days before admission he had had a hæmoptysis of half a drachm. He was well nourished with a good colour. His temperature was 99·4°F. The only physical sign was an occasional crepitation after coughing in the left second space. The family history was negative. The sputum was T.B. positive.

CASE 2.—A youth, aged 18, had pain in the left axilla one month before admission, and cough started. After a few days the axillary pain disappeared, and cough continued. He was rather pale, but his general condition was good. There was slight impairment of note, and post-tussic crepitation in the left axilla, the temperature during the first two weeks in hospital not rising above 99·8°. The sputum was T.B. positive. The skiagram showed in the left infraclavicular region an area of infiltration which had reached the size of a large orange.

CASE 3.—A man, aged 26, developed cough one month before admission. One day before admission he had a hæmoptysis of two ounces. He was pale, but his general condition was good. There was slight impairment of percussion note over the left second and third spaces and crepitation beneath the right clavicle. There was no alteration in the breath sounds. Pyrexia was remittent up to 101°. The sputum was T.B. positive. The patient had been in close contact with an open case. Skiagrams show a definite infiltration in the right axillary region.

CASE 4.—A girl of 19, three weeks before admission had "influenza"—i.e., cough, feverishness, and malaise. These symptoms continued until admission. She had been examined nine months before as a tuberculous contact, and no physical signs had been found. Two brothers were suffering from pulmonary tuberculosis. She was well nourished with a good colour. There was an impaired percussion note in the left axilla and left interscapular region. Crepitations were heard in these regions. She showed intermittent pyrexia up to 100° during the first *two* weeks in hospital. The sputum was T.B. positive. The skiagram shows an area of infiltration in the left axillary region.

CASE 5.—A man, aged 28, had had "influenza" nine weeks before admission. Cough continued up to the time of admission. The general condition was good. There was an impaired percussion note over the right apical region and crepitation in this region in front and behind. The sputum was T.B. positive, and there was intermittent pyrexia up to 100°. There was no family history. Skiagrams show a large area of infiltration extending from the clavicle to the third intercostal space.

CASE 6.—A girl, aged 14½ years, had an acute cold in the head three months before admission. Cough and malaise developed later, and she lost a little weight. She was a pale, ill-looking girl, but well nourished. There was an impaired percussion note and crepitations in the right infraclavicular region, and a temperature ranging up to 99·8°. The sputum was T.B. positive. Skiagrams show an area of infiltration, which is proceeding to cavitation, in the right infraclavicular region.

CASE 7.—A man, aged 23, 28 days before admission had "influenza." He was in bed for a few days and returned to business after 14 days. He was examined by the medical officer of his firm, who sent him to hospital for investigation. His general condition was excellent, but the percussion note was impaired, crepitations were heard below the right clavicle, and the sputum was T.B. positive. There was no history of contact. Skiagrams show a large area of infiltration in the right infraclavicular region.

CASE 8.—A girl of 19, two months before admission had a "feverish cold." She showed crepitation over the right upper lobe in front and her sputum was T.B. positive.

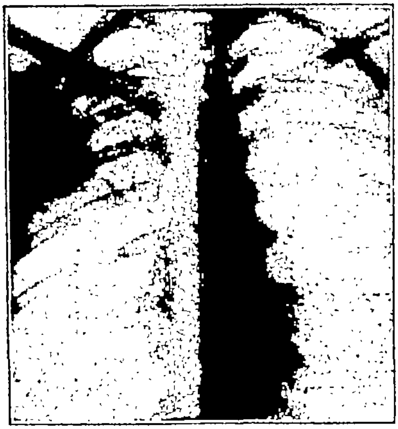
There was no history of contact. Fig. 1 shows a large area of infiltration.

The salient points in these cases are:—

1. The onset is definite, often with an acute febrile illness which may be misdiagnosed as "influenza." (Lydtin, Fassbender, and Braeuning stress the possibility of the confusion which may arise between influenza and these cases.)

2. The physical signs are present below the clavicle, usually in the second or third space, or in the upper part of the axilla, the only constant physical sign being crepitations.

FIG. 1.



Radiographic appearances in Case 8.

3. The definite radiological appearance is of an area of infiltration, which varies in size from 2 to 10 cm. or more in diameter, the area of infiltration being situated in the infraclavicular or axillary region.

4. The general condition of most of the patients is extremely good.

It might be suggested that the lesion here described is the acute broncho-pneumonic phthisis which has long been known as a clinical picture, but that is not so. In the first place, the patient with acute broncho-pneumonic phthisis is extremely ill, while the patient with "early infiltration" is not. The skiagram of "early infiltration" in the stage described is very different from that of acute broncho-pneumonic phthisis, but if the early infiltration has advanced to evolve the greater portion of the lobe, then the skiagrams may be similar. Lastly, acute broncho-pneumonic phthisis is usually fatal, while early infiltration is seldom fatal and often, when treated, improves and heals (Assmann, Redecker, Lydtin, Ulrici).

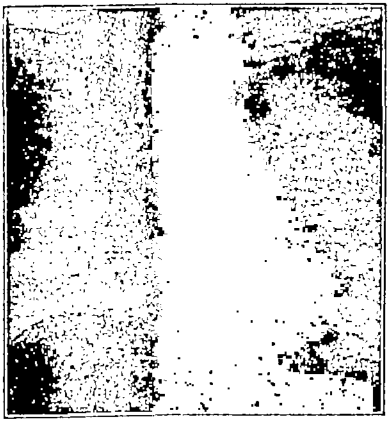
On the other hand, it might be suggested that "early infiltrations" are a particular type of pulmonary tuberculosis and have no bearing on the development of phthisis. Cases of early infiltration have been observed over a period of time and many have been seen to progress to a picture which is indistinguishable from phthisis (Redecker, Frischbier and Bechmann, Morlock[11]). It is not my intention to describe the various courses which early infiltration is known to take (a full account is given by Lydtin, Redecker, and Morlock), but to show the importance of recognising this lesion as the beginning of pulmonary tuberculosis.

The question may be asked: if "early infiltration" is really the beginning of pulmonary tuberculosis, why is it not seen more often? In the first place, like every other clinical picture in medicine, until the condition is known it is not looked for; but since the condition was first described by Assmann many series have been reported. In reviewing the skiagrams of some four hundred cases which have been treated at the City of London Hospital in the past two years, I was able to find just over fifty cases which had undoubtedly started as an early infiltration. Secondly, it must be remembered that early infiltration is a transitory lesion. In a few weeks it may spread to involve the apical region as well or it may heal in a few months to leave only a scar. If it has spread to involve the apical region before the case has come under observation, it is impossible to say if the lesion started in the apical region and spread down, or if it started as an infraclavicular "early infiltration" and progressed to the apical region.

CASE 9.—A woman, aged 25 years, three months before admission, after the birth of a child, had noticed a cough and felt ill. Cough and malaise continued up to the time of admission. Her general condition was fair. There was an impaired percussion note over the right apex in front and behind the infraclavicular region, crepitations in these areas, with slight intermittent pyrexia. There was no family history. Fig. 2 shows a lesion involving the right apical and infraclavicular regions.

When a case has reached this stage, is there any evidence to suggest which of the two processes have been at work: (*a*) early infiltration with its rapid spread or (*b*) the slowly progressive lesion, spreading from the apical region? If the latter process is the cause it would be reasonable to expect that the patient would give a history of cough and malaise extending over a considerable time. Yet in the majority of cases of this extent the patient only gives a short history (8–12 weeks). The clinician, because he believes pulmonary tuberculosis to be a slowly progressive disease, discredits the patient's history and ante-dates the commencement of the infection, although it is well recognised that as large an area of lung can be involved in a broncho-pneumonic spread in as short a period—e.g., the broncho-pneumonic spread in the "sound lung" in case treated with artificial pneumothorax (Landreth and Morlock[12]). Therefore, it seems reasonable to suggest that, in those cases which give a short history, the initial lesion may have been this rapidly-spreading "early infiltration" which has spread to involve the apical region. Over a period of seven years

FIG. 2.



Radiographic appearances in Case 9.

Braeuning, Lydtin, Redecker and Walter, and Kayer-Petersen, followed up series of "apical phthisis," some treated, others untreated.

—	Cases.	Progressive.	Per cent.
Braeuning	165	12	7·2
Lydtin..	450	31	7·0
Redecker and Walker	144	8	7·0
Kayer-Petersen ..	679	51	7·6
Total	1438	102	7·0

These figures show that only 7 per cent. of "apical phthises" became progressive pulmonary tuberculosis. This suggests that the spread from the apical region is uncommon. So far there are no figures to show how often "early infiltration" spreads to involve the apical region, but the facts known—i.e., (1) that the early infiltration is a rapidly progressing lesion, and (2) that many cases of extensive unilateral pulmonary tuberculosis give a short history—suggest that these cases have started as an "early infiltration," which is usually found in the infraclavicular region.

My best thanks are due to the honorary staff of the City of London Hospital for Diseases of the Heart and Lungs, for their kind permission to use these notes and diagrams of their cases.

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"EPIDEMIC HICCUP."

By A. SALUSBURY MACNALTY, M.D. OXF., M.R.C.P. LOND.,

A MEDICAL OFFICER OF THE MINISTRY OF HEALTH.

THE occurrence of a number of cases of epidemic hiccup in this country during the first two months of the present year may make the following communication of interest, inasmuch as the malady is of comparatively recent recognition and perplexing to those who encounter it for the first time.

Symptomatology.—On Jan. 31st, 1929, at the request of Dr. Crewdson Thomas, I saw A. B., aged 57, a retired Army officer.

On Jan. 25th, after a journey to Liverpool, he contracted a cold and felt feverish and ill. He went to his office in the city on the 28th, but returned home at midday with a temperature of 100·2° F. Dr. Thomas saw him and ordered him to bed. On the following day the patient began to hiccup. The hiccuping was almost incessant; at intervals short intermissions occurred in which the patient lay back on his pillow in an exhausted condition. The attack lasted two and a half days and left the victim extremely weak. The pulse was slow, 56; the knee-jerks slightly exaggerated. There were no other signs on physical examination, except those of nasopharyngeal catarrh which rapidly cleared. The patient informed me that he had suffered from a similar attack, but of slighter severity, seven years previously.

This is a description of a fairly typical case of epidemic hiccup. The illness begins with a mild feverish attack of nasopharyngeal catarrh which may simulate "influenza" or a "cold in the head." There is usually some elevation of temperature and the pulse-rate is slowed. From 25 to 48 hours after the onset the patient is suddenly seized with a persistent rhythmic hiccup which continues incessantly all day, interferes with talking and eating, occasionally causes vomiting, and ceases only when the patient succeeds in obtaining sleep. The cerebro-spinal fluid is normal. The illness is usually mild although its subjects naturally suffer much inconvenience and some mental anxiety. The duration is usually from 24 hours to two or three days; the attack may last as long as a week, and Economo has described an exceptional case which endured for a whole month, the patient having only a few hours' respite each day. The nasopharyngeal catarrh subsides with the cessation of the characteristic attacks of hiccup. As a rule, there is complete recovery from the attack and an absence of complications or sequelæ. Courtois Suffit, however, in 1920 had under observation a patient suffering solely from hiccup who died in 48 hours.

One may fairly describe a case as one of "epidemic hiccup" from its clinical characters, just as one may diagnose a case of "epidemic encephalitis" without necessarily having evidence, in the particular instance, of a chain of infection, or even of the incidence of other similar cases in the neighbourhood. The conception of epidemic hiccup, epidemiologically, is similar to that of various epidemic diseases of the nervous system; thus while associated groups of cases or definite epidemics sometimes come to light, the ordinary train of evidence is that only here and there does the widespread infecting agent find an individual who reacts with an unmistakable illness manifested by a characteristic syndrome. Alternatively, the agent may infect the individual with such a massive dose, or in such a special manner, that the characteristic illness is produced. In other words, for every definite and characteristic case there is a large and indeterminate number of people who receive and carry the infection without themselves suffering noticeably, or at all.

This epidemiological concept results from the experience of previous appearances of epidemic hiccup, as well as of apparently "sporadic" cases.

Previous Appearances of Epidemic Hiccup.—In the autumn of 1919 small outbreaks of illness occurred in Egypt, Austria, Italy, Germany, and Canada in which hiccup, sometimes associated with fever, was the predominant symptom. An outbreak occurred in Vienna in January, 1920, and was described by Economo.[1] In the same month small epidemics were seen also in France[2] and in Switzerland. In December epidemic hiccup was common in Paris, and it was estimated that there were 5000 cases in the city. Railliet saw 130 cases in November and December in Rheims, and an epidemic which is said to have affected 500 persons occurred in the Bernese Jura in December and January, 1921. The disease was made notifiable in Switzerland, where 64 cases were notified. A few cases were reported in Canada, Australia, the United States, Denmark, and Norway.

In December, 1920, the disease was first noted in England, in London, Birmingham, Maidenhead, Oxford, Abingdon, and elsewhere. On behalf of the Ministry of Health I inquired into a group of 12 cases which occurred among the out-patients at Charing Cross Hospital.[3] None of these cases returned for treatment, which suggested that the attack was not one of long duration.

Since 1920 attacks of epidemic hiccup have occurred in the winter months of the year. In the first quarter of 1924, when encephalitis lethargica was prevalent, epidemic hiccup was widespread.

Age and Sex.—No complete statistical figures are available, but clinical experience and published reports lead one to the belief that males over 40 years of age are usually the subjects of the malady. In the Rheims outbreak it was definitely stated that children were not affected.

Infectivity.—Epidemic hiccup is an infectious disease although the degree of infectivity is not high. In two instances in Paris two bank clerks occupying the same desk were almost simultaneously affected. In the London outbreak of 1920 the casualty medical officer of Charing Cross Hospital apparently contracted the disease from his patients. Several instances of multiple cases of epidemic hiccup in households were seen in 1921.

Relation to Encephalitis Lethargica.—Economo[1] recorded hiccup as a complication of encephalitis lethargica in 1917, and I noted it in five of my series of cases in 1918.[5] About a month after the first appearance of epidemic hiccup in Vienna (1919–20) a myoclonic form of encephalitis was seen in which clonic convulsions and hiccup were followed by choreic movements. Economo wrote at that date:—

> "It is not possible to say that the epidemic of hiccup was already a precursor of this encephalitis with a particular localisation in the region of the phrenic vagus, but future observations on the possible relationship will be worth noting."

Staehelin[6] reporting on an epidemic at Gerlafingen in Switzerland, states that the sequence of events was first an epidemic of transitory ocular paralyses, then an epidemic of hiccup, and finally many cases of epidemic encephalitis. From observations on French cases Dufour,[7] Renard and Netter[8] definitely considered that epidemic hiccup is a masked form of encephalitis lethargica.

The English experience is in accordance with this view. The late Dr. Farrar reported the following instance of probable association between epidemic hiccup and encephalitis lethargica at Birmingham.

> "Mr. P., senior, aged 65, visited his son, Mr. G. P., aged 30, on Dec. 16th, 1920. Between Dec. 20th and 25th, Mr. P., senior, had a violent paroxysmal hiccup which lasted a week and left him quite exhausted. On Dec. 27th—i.e., 11 days after seeing his father—Mr. G. P. developed typical encephalitis lethargica with myoclonic twitchings, but no hiccup. On Jan. 6th, 1921, Mr. G. P. was visited by his brother, Captain P., and assisted to fit a water-bed. A few days later Captain P. had a severe attack of hiccup lasting for four days."

In the widespread epidemic of encephalitis lethargica in 1921, in which 5039 cases with 1410 deaths were recorded in England and Wales, epidemic hiccup was also widely prevalent and was seen in definite association, for instance in the same household, with encephalitis lethargica. Sir John Robertson, then medical officer of health for Birmingham, from his experience in the Birmingham epidemic, was strongly of opinion that epidemic hiccup may be a symptom of encephalitis of a mild type. There is therefore good reason in view of the cumulative evidence for regarding epidemic hiccup as a mild or frustrated form of encephalitis lethargica. If the identity of the two forms of disease is accepted, although the illness is temporarily exhausting and distressing, the speedy recovery and the absence of after-effects decidedly make epidemic hiccup the form of encephalitis lethargica which it is most desirable to suffer from.

Diagnosis.—The causes of persistent hiccup are manifold, but the association of hiccup of sudden onset with an elevation of temperature, antecedent nasopharyngeal catarrh, and frequently a slowed pulse-rate makes the disease usually quite recognisable. Subdiaphragmatic conditions, pleural and phrenic irritation by new growths, and central causes have to be excluded. Of central causes the persistent hiccup of uræmia and that due to cerebral irritation set up by a tumour or hæmorrhage may be instanced. It must not be forgotten that epidemic hiccup is most likely to be mistaken for the hiccup which is a pure functional manifestation, especially when the patient is a nervous individual.

Treatment.—C. F. T. East[9] gives a long list of remedies for persistent hiccup. In practice it is usually found that epidemic hiccup must run its course, and that attention has to be devoted to making the patient as comfortable as possible, and to assuring him that the attack, although troublesome, is not dangerous and will be of short duration.

In the severe cases the patient should be confined to bed. Sedatives, such as bromides, may be given; and occasionally relief is experienced when belladonna or cajuput oil is administered; if the paroxysms of hiccuping greatly distress the patient and prevent him from sleeping, morphia combined with atropine may be efficacious in steering him through the illness.

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Clinical and Laboratory Notes.

A CONGENITAL SOLITARY KIDNEY.

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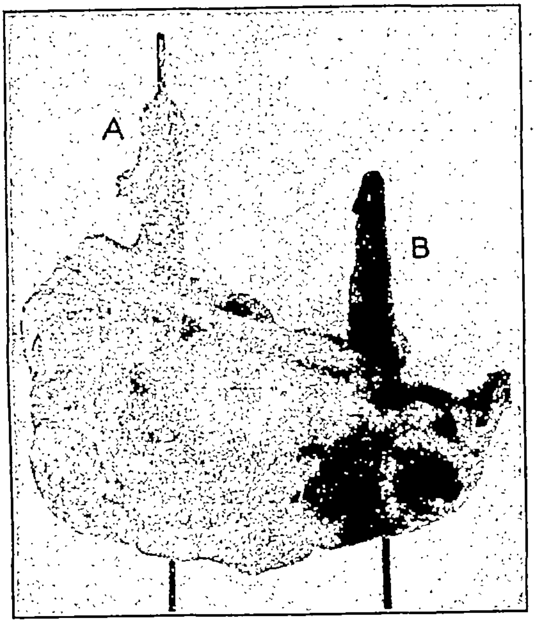
Congenital absence of one kidney is uncommon, the incidence at autopsy being about 1 in 1610 cases, according to the most recent figures of Campbell.[1] About 400 cases have been reported in all; 280 were described before 1910, since when Anders[2] has added 61, Eisendrath[3] 25, and Campbell[1] 9. The condition is generally found at post-mortem examination, but 31 clinical cases have been collected, only some of which have been confirmed by subsequent autopsy. In Campbell's series the youngest patient was 5 days, and the oldest 60 years of age.

The single kidney is most often the right, and its form varies little from the normal except when it is ectopic. It is often hypertrophic, sometimes normal in size, and in about 5 per cent. of cases very small.[4] The course and ending of the ureter of the solitary kidney may vary from the normal; in some cases it opens in the midline of the bladder, and, rarely, crosses the midline to end in the opposite side of the bladder (Eisendrath). The ureter on the opposite side to the one where the solitary kidney is situated is generally absent, but may vary from a shallow pouch or cul-de-sac to one which is patent for about half the length of the normal ureter. Among 61 cases, Anders[2] found a more or less patent ureter in 10; Winter[5] found this in 18 cases out of 237; and Eisendrath quotes three cases in which the ureter was patent for 1 cm., 8 cm., and 3 cm. respectively, and also Thevenot's case where it was patent for 15·2 cm.—i.e., for half its normal length. Instead of the rudimentary ureter ending at the normal ureteral orifice, however, abnormal extra-vesical endings may be met with. Papin[6] quotes five cases in which there was reduplication of the pelves and ureters of the solitary kidney. The adrenal is sometimes absent on the involved side. Various associated genital defects are occasionally met with—for example, unilateral absence of seminal vesicle or vas deferens, abnormality or absence of uterus, or rudimentary development of vagina. The solitary organ is said to be specially liable to be attacked by disease. Hannay and Young reported a case of carcinoma of a solitary kidney.[7]

The fact that the condition is rarely discovered before death, especially by exploratory laparotomy, prompts me to record this additional case, which has features of much interest.

The Case Described.

A married woman, aged 26 years, was admitted to the Royal Alexandra Infirmary, Paisley, under the care of Mr. Hugh Donald, and complained of severe pain of 24 hours' duration in the right side of the abdomen. She stated that five days before admission she had had an attack of shivering, felt out of sorts, and had some pain and tenderness in her "appendix region." She remained in bed and the pain passed off until the onset of the severe attack, which compelled her to send for the family doctor, who diagnosed the condition as "appendix abscess." For about six years previously she had had occasional attacks of right-sided pain, accompanied by nausea and vomiting, and always relieved by lying down. For as long as she could remember she had had frequency of micturition, but had never complained of it.



Interior of the bladder with probes in the ureteric orifices. A = right ureter. B = left ureter (blind).

On admission her temperature was 103·8° F., pulse-rate 144, and respiration-rate 24. A large tumour was definitely palpable and tender to the right of the umbilicus, and extended from about an inch above the umbilicus to almost the level of the anterior superior iliac spine. There was very great tenderness over McBurney's point. Examination of urine showed a specific gravity of 1018, a neutral reaction, and the presence of distinct albumin, pus, and blood. The diagnosis of large appendix abscess was questioned, but it was decided to do a laparotomy. The abdomen was opened through a right rectus incision, and the tumour was found to be a large distended right kidney sac. The left kidney was then sought—a comparatively easy procedure through this incision—but to our great surprise could not be found. Its absence was corroborated by the assistant surgeon. The right renal pelvis was aspirated at two separate points but no purulent fluid was obtained. It was not deemed advisable to interfere further, and the abdomen was closed.

In the succeeding 24 hours the patient passed 4 oz. of urine, and in the next day 6 oz. Forty-eight hours after operation she was catheterised, but no urine was obtained from the bladder, and there was complete anuria until death, which occurred 66 hours after operation. Two hours before death 1¼ oz. of pus was passed per urethram. Post-mortem, catheterisation failed to find urine in the bladder. The post-operation urine was examined by the pathologist to the infirmary, Dr. M. B. Hannay, who also conducted the post-mortem examination.

Report on urine.—Amber, very turbid, alkaline, specific gravity 1010. A very large amount of albumin (1·8 per cent.) is present. The cell deposit is very large in amount and consists of pus. Microscopically, in addition to pus, there are frequent red blood cells and a few epithelial cells and micro-organisms. A Gram film shows numerous coliform bacilli, and culture gives a growth of *Bacillus coli*.

Post-mortem report.—The right kidney weighs 23 oz., and is displaced downwards. It measures 6½ by 3 by 2¾ in., and is thus greatly enlarged (normal is about 4 by 2½ by 1¼ in.). It is very soft, and shows areas of congestion. The renal pelvis is much dilated, to the size of a hen's egg, and contains pus. The walls are not noticeably thickened. The right ureter is thin-walled and dilated below. At the upper end, which is of the normal width, there is a kink caused by the dropping of the enlarged kidney. There is no trace of the left kidney. The left ureter ends blindly, 2½ in. (6·3 cm.) from the bladder. There is no scar in the left loin. Both adrenals are present and normal. There are no genital defects. The cause of death is acute cystitis and pyelonephritis.

The photograph shows the interior of the bladder with probes in the ureteral orifices, the one on the left side passing up the right ureter, which has been cut across, and the one on the right side lying in the blindly ending rudimentary left ureter.

Comment.

The only case found in the literature resembling this is that of Winter,[5] in which the pre-operative findings were "sudden onset, large right abdominal tumour, and no cystoscopy. Exploratory operation revealed a large cystic kidney, which was removed. Autopsy five days after operation revealed a left ureter 8 cm. long, ending normally below, but blindly above. The left kidney was absent."

There are six instances in the literature, quoted by Eisendrath,[3] of congenital single kidney in which nephrectomy was performed on the solitary kidney, unwittingly, for tumour, severe renal infection, or tuberculosis.

My case is a warning to all who contemplate any kind of surgical interference in renal disease without catheterisation of the ureters. The possibility of *unilateral kidney should be kept in the forefront of a* surgeon's thoughts when called to perform a nephrectomy, especially when the loin incision is employed. It should be a rule never to remove a kidney without previously having made certain of the presence of a second and, apart from opening the abdominal cavity, the only method is by pyelography. This is Galbraith's[8] view, and he adds that cystoscopy showing the normal excretion of indigo-carmine from a normally placed ureter may be fallacious. Russell Howard[9] states that if one kidney is absent the opening of the ureter into the bladder is also absent, and the condition may be recognised on cystoscopic examination. This is erroneous, as is the similar statement of Thomson and Miles[10] that congenital absence of one kidney presents, on cystoscopic examination, only one ureteral orifice.

The appearance of two normally situated ureteral orifices on cystoscopy is not necessarily indicative of the presence of two kidneys, as my case of patent rudimentary ureter emphasises.

I wish to thank Mr. Hugh Donald for permission to publish this case, and Dr. Mary B. Hannay, to whom I am indebted for the pathological reports and photograph.

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HYPOPYON ULCER OF THE CORNEA.

A BRIEF REVIEW OF ONE HUNDRED CONSECUTIVE CASES.

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THE object of this article is threefold: (*a*) To impress on the practitioner that any corneal ulcer with pus in the anterior chamber is threatening an eye; (*b*) to supply figures for comparison with new methods of treatment; and (*c*) to commend early opening of the anterior chamber by a special incision.

These ulcers vary much in severity in different countries and in different parts of the same country. Of my cases 60 were miners working below ground;

these represent a type generally severe. In only one case—and he not a miner—was a foreign body present in the ulcer. I have not known such an ulcer to follow extraction of a foreign body in our casualty department where we deal with some 2800 foreign bodies per annum. Nine cases were women; only one was a child, aged 2, which cleared well with lotion and atropine only. Several cases presenting late or in debilitated or aged persons were doomed from the start, but these have been included, though for statistical purposes they are not of much value. The 100 cases range over six years and all were hospital cases.

Methods of Treatment.

Treatment has varied somewhat, but the following methods have been tried out and are now more or less stereotyped as follows: (*a*) Rest in bed, as flat on the back as possible, for at least 5 days and often for 15. Too early assumption of the erect posture, and too prompt dismissal from the ward, has been too often followed by recurrence. (*b*) Atropine drops and frequent lustrations even to the intensive half-hourly method recently advocated, if this can be carried out. (*c*) A search is made for septic foci elsewhere—e.g., teeth and tear sac—and, if possible, these are dealt with. (*d*) Carbolisation with pure carbolic unless the cornea is deeply infiltrated. If the case is only seen after the fifth day this often does more harm than good. Actual cautery, even by chauffage, I have found to produce a very dense but soft scar; but I confess to not having adopted the carefully graduated method of Mr. Edgar Stevenson, of Liverpool. (*e*) General tonic treatment, and more recently sodium salicylate intravenously. (*f*) Section. As it is more especially this last I wish to advocate, I shall briefly describe my method.

Under (local anæsthetic) cocaine a small keratome incision just inside the limbus is made in lower part of the cornea into the anterior chamber. A modified Usher's spatula is then introduced, and on to it with a special semi-circular knife (like an old-fashioned vaccination lancet) a vertical incision is made through the corneal substance, thus completing an inverted T. *Both instruments are made by Messrs. Down Bros. and* Weiss and Son. The first incision is best done facing the patient, the second from behind. Thus the lens is protected and complete control of the eye obtained by the spatula. The second incision may require two or three to and fro movements of the knife, but may be done by one sweep from centre to periphery. The advantage of this incision is not only its completeness but its accessibility for subsequent tappings if deemed necessary. The point of the crossing is easily made out even weeks after, and I have with the greatest ease broken in with a blunt instrument 12 days after the original incision. Evacuation of the pus is not essential; it sometimes flows freely, at others is sticky and thick. It should not perhaps be left in the wound as it is then likely to act as a wick to introduce infection. One, two, or more subsequent tappings at intervals of two or three days may be indicated.

Results of Early Section.

Results of treatment may be considered statistically, but if so, great reserves must be made as there are many varying factors.[1] Thus 63 of my cases were sectioned, but I do not advocate section in every case, though I have never regretted an early section. *And the fact that of 37 cases not sectioned 30 did* well—result "good" or "fair"—does not prove anything against section, because most of these cases were of a mild type. Of the 37 non-sectioned cases 27 were good, 3 were fair, 7 were bad, and none was "lost." Six of the bad were cautery cases which perforated.

My sectioned cases fall into two groups—(*a*) those done before the fourteenth day from the date of onset, usually a trauma; (*b*) those on the fifteenth day or later. Of (*a*) 3 were lost, 11 bad, 5 fair, 14 good, total 33. Of (*b*) 6 were lost, 12 bad, 5 fair, 7 good, total 30. *Thus 9 eyes out of the 100 were lost*; but statistics of removal depend largely on the personal factor. I endeavour to retain an eye if it has only P.L. (perception of light) and is not painful. Unsightliness does not weigh heavily.

The better results of the early-sectioned cases are enhanced by a closer study of the failures, but space does not allow of that here. In two of these latter *the damage seemed to be done by a plastic iritis quite* different from the simpler cyclitic hypopyon. All other methods of treatment seem ineffectual in such cases, and section is the only means I know of that has in one or two caused definite arrest of the process, even when done late.

But the time factor is not everything. Some cases, for example, show very extensive or deep ulcer only three or four days after onset; these are virulent, but many of these may be saved by prompt section. On the other hand, a fair proportion of late cases that had run a mild but chronic course were sectioned after all other means had failed, and this brought about definite arrest with a good visual or scar result.

The terror of the Guthrie-Saemisch section with its adherent iris is done away with by this innocuous yet efficient section. An adherent iris is a rarity and usually due to an error in technique or the presence of a plastic iritis that would have blocked the pupil in any case. In only five cases of the series did lens opacity result. In two of these the patient jibbed badly, and it is possible that with the dilated pupil of atropine the point of the keratome may have touched the lens. I think, however, that the presence of semi-solid pus lying for weeks, it may be, on a segment of iris and lens, may in itself, apart from any error in technique, cause some localised lens opacity that may later involve the whole lens.

Finally, I would urge that it is not on account of plus tension that section is undertaken. Renewal of aqueous is the vital necessity. A by-effect may be the lowered corneal tension allowing healing lymph to pass more freely through the corneal tissue. The two flaps of the section have at times been noted as definitely œdematous. Plus tension may occur, but in my experience is a late phenomenon. Two of my obstinate cases had a definitely minus tension—one was sectioned, the other not; both did well.

Can one, then, lay down a definite line of treatment in hypopyon ulcer? I am afraid not. The cases are polymorphic. Space does not permit a closer analysis of types. No allusion has been made, for instance, to the diplobacillary type to which two in my series seemed to belong. Whether localised ultra-violet rays will replace present methods remains to be seen. London and Toronto statistics of hypopyon ulcer must be accepted with caution. A total of 48 "good" results in these 100 cases, of which 21 were sectioned and 27 not, may or may not be regarded as satisfactory.

AN UNCOMMON ABDOMINAL CYST IN A YOUNG CHILD.

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The comparative rarity of cysts of the omentum encourages me to record a case which has recently passed through my hands. The only detailed account of omental cysts I have been able to find is in Keen's "Surgery" (Vol. IV., pp. 632 and 633). Here it is stated that cysts of the omentum are most frequently seen in children under 10 years of age, 50 per cent. being under 10, and 65 per cent. under 20 years of age; 75 per cent. of cases occur in females.

The patient was a healthy boy of 4, who had had an uneventful medical history. His parents were both healthy, and he had been perfectly fit until a fortnight before I saw him. His mother had then observed a swelling of the lower abdomen which had rapidly increased in size, and she had called in Dr. Hugh John of Llangennech to see him. While attended by Dr. John, the boy had complained of vague abdominal discomfort. On one or two occasions there had been a rise of temperature to 100° F., and on one occasion a little blood had been passed in the urine.

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[1] Results from the visual and scarring point of view may be tabulated as: "good" = 6/6 to 6/18 or very slight scar; "fair" = 6/18 to 6/60 with denser scar; "bad" = less than 6/60 or very dense scar; and "loss of eye" cases.

Dr. John asked me to see the boy with him on April 7th. I found a slightly-built, well-nourished boy, who complained of slight abdominal discomfort. The abdomen was much swollen in the lower part. The pulse and temperature were normal. A hard tumour was felt, filling the abdomen below the umbilicus. The bladder was empty, and there was a distinct gap between the tumour and the pubes. The tumour seemed to fill up the pelvis. There was no distension of the abdominal veins. In view of the rapid growth it was thought that the condition might be due to a malignant growth of the kidney (particularly in view of the history of hæmaturia on one occasion). Encysted tuberculous ascites was also considered, as were retroperitoneal growth and various congenital cystic conditions. Laparotomy was advised and later performed under general anæsthesia.

The abdomen was opened by a mid-line incision, extending from the umbilicus to the pubes. On opening the peritoneum a large mass was seen, adherent by very easily separated adhesions to the peritoneum of the anterior abdominal wall. After separating the adhesions, the tumour was found firmly adherent to the omentum. The attached omentum was clamped and ligated, and the tumour found almost completely to fill the pelvis. So slight were the adhesions to the peritoneum of the pelvic floor that during the process of examining the posterior attachments of the growth the tumour separated away completely from them, leaving a few very small bleeding points, none of which needed ligation. The abdomen was closed and the wound healed by primary union, the patient leaving hospital 12 days later.

The tumour was about the size of the head of a six-months-old child. It was polycystic, and attached to it were several smaller cysts. All the cysts were opened and were found to contain a clear substance, of the consistency of jelly which had only partially set, and a certain amount of fluid like blood serum. There was no blood. The cyst wall was sent to Dr. S. C. Dyke, consulting pathologist, the Royal Hospital, Wolverhampton, who has sent me the following report:—

"The portion of cyst wall consists of fibrous tissue only. This fibrous tissue is very dense in some parts; in others the cells are vegetative in type and show evidence of rapid recent growth. The fibrous tissue contains well-formed blood-vessels and some included groups of fat cells. Inflammatory cells are present but not in very large numbers, certainly not in sufficiently large numbers to suggest an inflammatory origin for the cyst. These cells are of all types: polymorphonuclear leucocytes, eosinophiles, and plasma cells. There are also a few collections of large mononuclear cells apparently derived from the lining of the omentum. I think it is possible to say with certainty that this cyst is not neoplastic, and there appears to be no reason why it should recur after having been completely removed. It can only be described as an omental cyst. Such cysts are rare but they do occur. On preliminary examination of the specimen my first impression was that you had sent me the wall of an hydatid cyst. The specimen would pass as the ectocyst, but there is no trace of endocyst. This lies under the ectocyst and is translucent and gelatinous. I presume that I am justified in believing that no such endocyst existed. I think you are justified in telling the relatives that it will not recur. Certainly it is not malignant."

The chief interest in this case lies in the fact that the condition is rare, and does not seem to attract the attention it should in the differential diagnosis of abdominal tumours in children. In the case described there was no endocyst, and it will be interesting, in view of Dr. Dyke's report, to follow the future medical history of this child. The condition can, I think, only be diagnosed definitely by laparotomy, but it seems to me one which must be thought of in the diagnosis of abdominal swellings in children.

BIRMINGHAM HOSPITAL SATURDAY FUND.—During the first half of the present year 4500 employees of 285 contributing firms have joined the Fund, and £20,000 has been handed to the contributory scheme as against £15,000 for the corresponding quarter last year. The convalescent home accommodation of the Fund is so seriously overtaxed that there is a waiting-list of 1146 cases. There is still a debt of about £27,000 upon the building fund of the Tyn-y-Coed Home, and a large number of firms are subscribing an additional penny per head per week towards reducing it.

Medical Societies.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

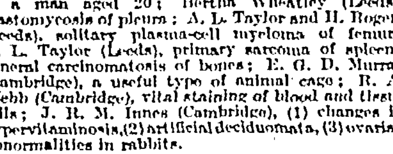
A MEETING was held in the new institute of pathology in Tennis Court-road, Cambridge, on July 5th and 6th, with Prof. H. R. DEAN, Master of Trinity Hall, in the chair.

C. H. Whittle (Cambridge) in the course of many tests of pneumococci on mice had found that about 2 per cent. of the animals developed a pneumococcal otitis media with rotary and other movements and might die from a secondary pneumococcal septicæmia.—A. D. Gardner (Oxford) had watched the multiplication of the tubercle bacillus and found that it followed ordinary lines; he saw nothing suggestive of a granule phase or any complicated life-history.—F. W. Andrewes (London) noted that a few strains of hæmolytic streptococci actively fermented starch and gave an elegant demonstration of the reaction.—T. J. Mackie, D. G. S. McLachlan, and E. J. N. Anderson (Edinburgh) had isolated the tetanus bacillus from a specimen of catgut supposed to be implicated in an outbreak of post-operative tetanus. Catgut artificially contaminated with spores infects guinea-pigs experimentally, the spores washed off it do not, nor do spores injected into the neighbourhood of implanted catgut. Sublethal doses of *B. welchii* make tetanus spores effective and exposure of animals to cold eight weeks after inoculation of spores may determine a fatal tetanus.—C. H. Andrewes (London) showed that virus III. developed the characteristic inclusion bodies in cultures of rabbit testis and with the same technique showed that the resistance of immunised animals depended on the blood plasma rather than the tissue cells.—S. P. Bedson (London) proved that it was possible to immunise guinea-pigs against herpes and cause the production of neutralising antibody in the blood by formalin-killed virus.—J. Craigie and W. J. Tulloch (Dundee) showed how specific and valuable was the flocculation test (rabbit immune serum and extracts of vesicles) in the differential diagnosis of small-pox and that it could not well be due to contaminating bacteria as has been supposed.—H. R. Dean, N. E. Goldsworthy, and C. TenBroeck (Cambridge) discussed the technical difficulties in measuring the rate of disappearance of horse serum injected into the blood of rabbits.—W. W. C. Topley and G. S. Wilson (London) starting with Schütze's discovery that *B. pseudotuberculosis* and *B. aertrycke* had a common O heat-stable antigen failed to protect mice against *aertrycke* with pseudotubercle vaccines but got passive protection with immune rabbit sera.—J. Craigie (Dundee) detailed his experiments on the flagella and somatic antigens of the typhoid bacillus.—J. Gordon (Leeds) found that dyes of the congo-red group interfered with hæmolysis and bacteriolysis.—E. G. D. Murray (Cambridge) dealt with the technique of standardising dysentery antitoxin.—C. H. Browning and R. Gulbrausen (Glasgow) showed how the immunity developed by the stimulation of dead parasites was a factor in the curing of trypanosome infections by chemotherapeutic agents.—W. T. Hillier (Birmingham) described the determination of red cell fragility and its application in the differential diagnosis of jaundices.—J. Davidson (Edinburgh) examined the action of senecifoline (from ragwort) on the rat's liver: it causes hæmorrhage, acute necrosis, proliferation of kupffer cells, and finally in surviving animals fibrosis and cirrhosis.—J. H. Dible (Liverpool) showed that the amount of fat which accumulates in the liver during starvation depends on the abundance of storage fat in the body.—W. Cramer (London) detailed further experiments showing how the development of one tar cancer tends to inhibit the appearance of another.—T. Hare (London) described a case of spondylitis deformans in a dog associated with advanced general arterio-sclerosis and discussed the possibility of the primary periarticular lesions being due to arteriolar damage.—Norah H. Schuster (London) dealt with the classification of lung tumours especially with the possibility of recognising those arising in the alveoli.—H. L. Sheehan (Manchester) described a remarkable cystic tumour of the liver in a child, including connective tissue, epithelial tubes, and striped muscle, and concluded that it was a mesoblastic hamartoma in which both mesenchyme and mesothelium were represented.—J. Braxton Hicks (London) described a congenital deficiency of the œsophagus and a case in which more than 300 cysticercus cysts were found in the brain.—Among the demonstrations were the following: R. H. Morley, acute miliary tuberculosis in an infant of six weeks with older lesions in the liver suggesting intra-uterine infection; A. N. Drury (Cambridge), a substance isolated from normal heart muscle which causes experimental heart-block; E. W. Hurst (London), lesions of experimental poliomyelitis in monkeys; C. H. Whittle (Cambridge), cor bovinum in a man aged 20; Bertha Wheatley (Leeds), blastomycosis of pleura; A. L. Taylor and H. Rogers (Leeds), solitary plasma-cell myeloma of femur; A. L. Taylor (Leeds), primary sarcoma of spleen; general carcinomatosis of bones; E. G. D. Murray (Cambridge), a useful type of animal cage; R. A. Webb (Cambridge), vital staining of blood and tissue cells; J. R. M. Innes (Cambridge), (1) changes in hypervitaminosis, (2) artificial deciduomata, (3) ovarian abnormalities in rabbits.

New Inventions.

A BONE-RETAINING CLAMP.

THE instrument here illustrated is intended for use in operations upon oblique fractures of long bones, especially the femur and the humerus. The fragments are manipulated into perfect coaptation in the usual way, with long bone-holding forceps, and the encircling clamp is then applied. If the fracture be of the long, oblique variety, two can be used, and retention is then perfect without the need of any other intervention by means of forceps, &c. The clamp has been devised to overcome some of the difficulties that are commonly met in the use of existing types. It is often found that the handles of these clamps are very much in the way in the wound; either they have to be released in order to get the plate into position or, as they can only be applied in one plane, they are not suitable for use in many cases of oblique fracture. The new clamp, the handle of which is detachable, occupies very little space in the wound and it can be applied at almost any angle, according to the direction of the fracture. Even when one only can be used, it so far steadies the fragments that they can be held firmly in position by one assistant with very little effort.



The clamp is made of stainless steel, in two sizes, by Messrs. Allen and Hanburys, Ltd., Wigmore-street, *London*, W.

ALAN H. TODD, M.S. Lond., F.R.C.S. Eng.

OXFORD OPHTHALMOLOGICAL CONGRESS.

DISCUSSION AT THE ANNUAL MEETING.

THE sixteenth annual meeting of this Congress was held at Oxford from July 4th to 6th, with Mr. A. BERNARD CHIDLAND, the Master, presiding. It was very largely attended.

On Thursday, after a short address of welcome by the Master, a discussion on

Diseases of the Lacrymal Apparatus

was introduced by Prof. JOSEPH MELLER (Vienna). In the course of his paper he discussed the frequency with which stenosis led to epiphora. Examination of a large number of cadavers, he said, showed that the lacrymal canaliculi were normal in only 80 per cent. It could be stated that most lacrymal passages were more or less diseased, but without conjunctivitis. Most of the subjects of diseased passages were women. X rays afforded the first means of satisfactorily seeing the normal and pathological conditions of the sac in the living person. Often, too, X rays would give an indication of the kind of operation required. Radium applied to a tuberculous condition of the tear sac gave very successful results, so that operation was rendered unnecessary. Many ophthalmologists made the mistake of regarding epiphora as synonymous with stenosis of the lacrymal duct. Slitting of the canaliculi was now less often performed than formerly; and in all cases the operator must avoid slitting the canaliculus as far as the canthus. For dilatation of the tear-duct the permanent probe treatment seemed to have been abandoned.

Turning to the local treatment of chronic dacryocystitis with more or less copious secretion Prof. Meller said the condition could occasionally be favourably influenced, even cured, by medical means. Silver nitrate in ¼ per cent. solution, applied with the syringe, seemed best. Tincture of iodine had been used for the purpose, but it caused considerable irritation of the conjunctiva. After a properly performed extirpation of the sac, the epiphora, which before the operation was copious, almost always became so slight that the majority of the patients made no further complaint of it. If, however, a small particle of mucous membrane was left behind, lacrymation continued, and might be as severe as before the operation. There had been a good deal of discussion as to whether, after the canaliculi had been slit in Toti's operation, the normal conveyance of tears was or was not restored. It was now recognised that intact canaliculi were not absolutely essential. Notwithstanding slit canaliculi, the epiphora ceased completely after the operation. Koller's trans-septal procedure had increased the view of the field of operation, so that every step of it was carried out under visual control. The operation was performed painlessly under local anæsthesia, and the results were excellent, even in elderly people. Prof. Meller advised ophthalmic surgeons, in cases of dacryocystitis in which operative interference was indicated, to extirpate the sac; a good extirpation was, he said, better than a poor dacryocystorhinostomy.

Mr. J. S. FRASER (Edinburgh) treated the subject from the standpoint of the rhinologist, entitling his paper Intranasal Dacryocystotomy. His contribution was based upon 99 patients, 90 of whom had a diseased condition on one side only. The total number of operations done on them was 108. Most of them had already been seen by an ophthalmic surgeon before they came to him. In 80 of the cases he was able to keep track of the patients subsequently, and 67 of them were regarded as completely successful—i.e., there was no recurrence of swelling in the tear sac, no pus could be squeezed out, and the eye did not water. The patients' only comment was that occasionally when they blew their noses they blew their eyes also. The most successful results were obtained in cases in which there was a definite collection of muco-purulent fluid in the tear sac. If he had tried to get patients to undergo operation two or three times doubtless he would have obtained a better figure than 75 per cent. of cures.

Mr. T. HARRISON BUTLER (Birmingham) said he did not use a retractor when operating on these cases. He had had only four or five cases of troublesome epiphora after operating, and in most of them, on reopening the cavity, he had found a relic of mucous membrane. On removing this, the epiphora ceased. A very serious possible complication was ulceration of the cornea from accidental injury during the operation. He related two such cases.

Mr. E. D. D. DAVIS (London) gave a short review of the subject from the rhinological point of view, instancing cases in illustration, and demonstrating a series of slides.

Dr. S. H. BROWNING (London) spoke as a bacteriologist. He had a good word to say for optochin in pneumococcal infections, which were common in the lacrymal sac; this remedy must, however, be used freshly prepared and with discrimination. He referred to the frequency with which streptothrix infections of the canaliculi existed and were missed. Patients who had these infections usually were found to have to do with horses, and the infection was probably derived from dried horse manure.

Mr. D. LEIGHTON DAVIES (Cardiff) said he did not regard a patient who had had West's operation done on him as cured unless he was well three months afterwards. Though it could be guaranteed that every patient would go out of hospital cured a month or so later contraction of the scar might set in; 24 of 38 of his cases since 1912 had been permanently cured. There was a group of cases in which no complaint of epiphora was made afterwards, but in which fluid could not be got through into the nose. These he did not regard as complete cures, and he had not included them as such. Toti's operation was, he considered, best suited for young people; he had ceased to do it on patients aged 58 years and over, as they were liable to hæmorrhages.

Mr. A. GREENE (Norwich) referred to the occurrence of epiphora without ascertainable cause, and asked whether excision of the lacrymal gland was frequently suitable for these. He did not think the nose operation was satisfactory for a diseased lacrymal sac.

On Friday the Doyne Memorial Lecture was delivered by Miss IDA MANN (London), under the title

Some Observations on the Vascularisation of the Vertebrate Eye.

The arrangement of the intra-ocular blood-vessels showed many remarkable variations, she said, in different species of vertebrates. If the subject was studied from the point of view of comparative embryology, it became possible, by investigating stages of development common to several dissimilar species, to arrive at a classification of adult types based on their mode of production. This classification did not entirely correspond with the usual classification of the vertebrates. Although in most animals one type of ocular vascularisation corresponded with one class of vertebrates, yet there were many instances of overlapping (as when the lower reptiles showed amphibian characteristics) and of convergence, in which a similar structure was found in two entirely unrelated species, for example, in snakes and in rodents. So far as was known, these exceptions could not be correlated with similarity in other respects, except, possibly, with similarity of visual acuity. For the purposes of discussion, Miss Mann divided the ocular vessels into three sets: those of the choroid, of the retina, and of the iris. In this lecture the choroidal vessels were not considered in detail. She showed that the variations in the retinal and iridic vessels depended, developmentally, upon modifications of the proximal and of the distal end respectively of the hyaloid artery, which was present in all vertebrates at some embryonic stage. Its proximal end might undergo four possible modifications, and these produced the four main types of retinal vascularisation. (1) Complete atrophy of the vessel produced an avascular retina nourished entirely by the choroid. (2) Vascularisation of the epithelial cells on the optic disc produced a pecten, a structure typical of the birds. (3) Branching of the hyaloid proximally in the vitreous produced a membrana vasculosa retinæ. (4) Branching of the hyaloid proximally in the retina produced the arteria centralis retinæ of the primates.

It could be shown that the presence of a pupillary membrane during development had a marked influence on the definitive iris pattern. Those mammals which possessed it showed, in adult life, two types of circulation in the iris: a direct arterio-venous anastomosis in the superficial layers, and a capillary circulation in the deeper parts. Animals not possessing a pupillary membrane showed only the capillary system, and in them, too, there was a much greater range of iris pattern.

Slit-lamp appearances of the iris in a variety of lower animals were shown. A very wide range of modification was possible, not only in pigmentation but also in the number and arrangement of the main arteries and veins, and in the width and richness of the capillary plexus.

Dr. T. A. POOLE (Washington) read a paper on the Effects of Disease of the Paranasal Sinuses upon the Fixation Point; Mr. N. C. RIDLEY (Leicester) one on an Unusual Complication of Hodgkin's Disease; and Mr. E. N. HUGHES (Liverpool) one on the Structure of the Vitreous. Colonel H. HERBERT (Brighton) contributed a paper on the Cement Substance of the Intra-ocular Muscles and Glaucoma.

A discussion on

Ocular Manifestations Found in Head Injuries

was opened by Mr. HUGH CAIRNS (London). In the past, he said, undue attention had been paid to the fracture of the skull which often followed a blow on the head. It was true that certain of the ocular manifestations of head injury, such as damage to the optic and abducens nerves, were produced by the fracture, but, as a general rule, the important element of a head injury was not the fracture of the skull, but the injury to the underlying brain.

The greatest surgical problem was to know which cases would benefit by operation. Some patients would inevitably die soon after the injury—such cases being seen in greater numbers as the speed at which people travelled increased. In other cases it was soon evident, after the concussion had passed off, that the injury was comparatively mild, and that with suitable conservative treatment the patient would recover. There remained a third group, in which the outcome was for a time uncertain. These comprised cases in which, after recovery from the initial unconsciousness and concussion, there was either a relapse into coma or alternating periods of stupor and lucidity; and cases in which concussion did not occur, and unconsciousness only came on at an interval of hours or days after the accident. In this group the symptoms were usually due to a rise of intracranial pressure as a result of intracranial hæmorrhage, or œdema of the injured brain, or disturbance of the circulation of the cerebro-spinal fluid. It was often very difficult to decide which were the cases that would benefit by operation. In arriving at a decision about this the patient's state of unconsciousness was the most useful guide. A blow on the head tended to damage the brain not only at the site of the impact, but also at other places, especially at the opposite side of the brain.

Slight blurring of the discs, continued Mr. Cairns, could be seen in many cases which at operation showed a large blood-clot, severe cerebral œdema, or a collection of cerebro-spinal fluid in the subdural space. In 80 cases of head injury which he had seen in civil life there were only seven of definite papillœdema. Another cause for the appearance of papillœdema after head injury was the collection of cerebrospinal fluid, often mixed with blood, in the subdural space. When papillœdema was present the patient should have operative treatment, even though at the time he might be relatively free from symptoms. A well-planned decompression would give the patient a much better chance of avoiding the chronic ill-health which otherwise so often followed head injury. Lateral deviation of the head and eyes towards the injured side was very important as indicating the side of the main lesion. Great reliance could also be placed on dilatation and fixity of one pupil as indicating that the major cerebral lesion was on the same side of the body. This sign was particularly valuable when other neurological evidence seemed to indicate that the lesion was on the opposite side. The whole subject of pupillary reactions in head injuries was very complicated, and was worthy of close investigation. Mydriatics and morphia should never be used in cases of head injury.

Mr. Cairns went on to deal with injuries to the geniculo-calcarine pathway, remarking that the occipital lobe was frequently damaged in head injuries. Except in perforating injuries, however, the damage was superficial and tended to be limited to the occipital pole and the outer aspect of the occipital pole, thus sparing the greater part of the visual area. This might, he suggested, explain the fact that homonymous defects of the visual fields were only rarely observed in head injuries in civil practice. Inability to read words and letters and to recognise objects, though visual acuity was good, was observed not infrequently in association with intracranial tumours, and in vascular disease and penetrating injuries of the brain. Injuries of the fibre-tracts and nuclei which controlled movements of the eyes seemed to be rare, at least in cases of head injury which recovered from the immediate effects of the injury.

Finally, the speaker dealt with disturbances of vision in persistent cerebral contusion. Some patients, after a blow on the head, perhaps only of slight degree, suffered from persistent headache and attacks of dizziness, these attacks being brought on or aggravated by exertion. As neurological examination was negative, there was a tendency to regard the condition as functional. He suggested, however, that the basis was an unresolved cerebral contusion. Most of these patients had subjective visual disturbance, with an ache behind the eyes, sometimes with photophobia.

Mr. CHARLES GOULDEN dealt with the subject from the ophthalmological aspect. He began by referring to Mr. Bathe Rawling's Hunterian Lectures of 1904 on Fracture of the Skull, which shed valuable light, he said, on several problems, and laid down principles of diagnosis whereby the probable course of fracture could be predicted if the site of the blow was known. 60 to 70 per cent. of cases of fracture of the base were shown to be due to direct violence applied to the neighbourhood of the base of the skull, whereas 30 to 40 per cent. of basal fractures were due to radiation from fractures of the vault. The path which a fracture of the base might take was largely determined by the various fissures and foramina of the base. Rawling had shown that a fracture involving the optic canal might occur in any fracture of the skull, and such a fracture was more probable when the injury to the head was in the neighbourhood of the orbit. In a certain number the result was partial or total primary optic atrophy, the lesion being in nearly all cases unilateral. After a blow on the head, usually near the orbit—perhaps not sufficiently severe to cause unconsciousness—the eye on the side of the injury was blind. The pupil was dilated and inactive, there was no perception of light, and the ophthalmoscope revealed no pathological signs. After an interval of two to six weeks the appearance of primary optic atrophy was found with normal blood-vessels. In fracture of the middle fossa there might be injury to the optic chiasma, due to laceration by a fragment of bone, crushing or compression, and the optic tracts were exposed to some similar injury. Such injuries would lead to defects in the visual fields; and cases had been reported of bitemporal hemianopia, presumably due to laceration of the chiasma in its inner part. There might be total blindness in one eye and temporal hemianopia in the other.

Mr. Goulden drew attention to the value of the pupillary reactions in cases of injury to the optic nerve in fracture of the skull. Reflex iridoplegia had been observed after injury to the skull. The other nerves liable to injury in fracture of the base were the oculomotor, the trochlear, the trigeminal, the abducens, and the facial. The nerve most commonly involved was the abducens, with consequent paralysis of the external rectus. The oculomotor nerve was only rarely affected. In fractures involving the sphenoidal fissure there might be a complete internal and external ophthalmoplegia, but in that event there was usually an involvement of the other nerves which passed along the cavernous sinus and through the sphenoidal fissure. The fifth nerve was rarely affected in fractures of the base of the skull. The facial was that most involved in these accidents; Boehm found it involved in 22 per cent. of cases of fractured base. The internal carotid artery was most liable to injury at the point where it crossed the line of fracture from one middle fossa to the other.

A number of other papers were read during the Congress, and an exhibition of ophthalmic instruments and other exhibits was held.

MATERNITY AND CHILD WELFARE.

FIFTH ENGLISH-SPEAKING CONFERENCE.

LONDON, JULY 2ND–4TH, 1929.

A CONFERENCE organised on behalf of the National Council for Maternity and Child Welfare by the National Association for the Prevention of Infant Mortality in coöperation with the M. & C.W. Group of the Society of Medical Officers of Health was held last week at Friends House, Euston-road, London, N.W. Brief notice has already been given to the opening session which dealt with the welfare of the child between 1 and 5 years.

Presidential Address.

In his encouraging and inspiring presidential address, unavoidably postponed until the third day of the conference, the Minister of Health, Mr. ARTHUR GREENWOOD, welcomed the overseas visitors and expressed his good wishes for the success of Dame Janet Campbell's forthcoming visit to Australia. He went on to refer to the progress made in the reduction of infant mortality and to the great possibilities of further progress. There were still black spots and we did not get a hundred per cent. value from existing regulations. We must look backward to the mother and forward to the school-child. Maternal mortality was a most obstinate problem and for its defeat a new holy war in a real crusading spirit was needed. Education would gradually overcome reluctance to attend antenatal centres. They must have widespread vision and a long distance and comprehensive programme. It was futile to leave the child alone when a half-finished product and, without being grandmotherly or grandfatherly, they needed to exercise constant watching care from birth to death to ensure the best citizenship. Most children were born normal, and the problem was how to keep them so. He hoped to be able to do something to improve the status of the midwife and to leave his mark on the public health service. He had the highest regard for voluntary workers. There was not enough of such work. Enthusiasm was reborn at every such conference as theirs.

MATERNAL MORBIDITY.

A whole day was devoted to the consideration of various aspects of this subject, the morning session being presided over by Prof. A. Louise McIlroy, D.B.E., and the afternoon by Surgeon J. S. Boggess, representing the U.S.A. Government.

Maternity Nursing.

This discussion brought out unanimity among the speakers and the auditors that every woman should be attended at her confinement by a well-trained midwife and that such midwives should have an improved status and a higher remuneration, so that better educated women may be attracted to the profession and that those who adopt it may be in a position to devote a greater knowledge and more time to each case. It follows that in many or most cases the midwives will have to be subsidised, or the maternity benefit will need to be increased and more carefully allocated; and that the handy woman will have to disappear as a midwifery attendant but may join the ranks of the home helpers.

Several speakers referred to the higher status of midwives in Sweden, where they have been recognised since 1700. In Sweden the maternal mortality is only half what it is in this country, and the Swedish midwives undergo a much more complete training, including a course in pædiatrics.

Dame **JANET CAMPBELL** pointed out that only an adequately trained woman was able to note in the interests of both mother and child the slightest departure from the normal, and that the visiting midwife can do much to avert disaster if she is able to devote more knowledge and time to her cases. The best way, she said, of getting rid of the handy woman is to make the services of a midwife easily obtainable by all patients needing maternity nursing. The problem was mainly an economic one. By encouraging the midwife we could get better nursing and relegate the untrained woman to her proper function as a home help.

Dr. J. S. **FAIRBAIRN** agreed that nursing attendance on confinements should be restricted to certificated midwives and emphasised the points that the experienced midwife of the right type was successful in obtaining a maximum of normal deliveries and normal lactations and in securing surgical cleanliness during the puerperium, and was in a position to make reliable reports to the doctor as to the progress of both mother and baby. Till every mother, Dr. Fairbairn concluded, had a certified midwife to nurse her and the handy woman and all inferiorly trained nurses were wiped out, puerperal morbidity would continue more rife than it should be.

Miss E. **DOUBLEDAY** (College of Nursing), in approaching the subject from the nursing point of view, was in entire agreement with the two previous speakers, and gave in some detail a description of the many functions and duties of a midwife which called for expert knowledge. The medical profession, she said, must insist that maternity nursing be only done by certified midwives. She concluded with a plea for the education of the public as to the need for improved maternity nursing both for those who can and for those who cannot pay.

Other points made in the discussion were—that at 30*s.* a case a midwife cannot earn an adequate income, that hospital extern departments are reluctant to undertake the nursing of abortions, and that there is a real danger to the patient if the midwifery attendants suffer from catarrhal symptoms, especially in times of epidemics.

In replying on the discussion, Miss **DOUBLEDAY** said that the local authority had power to pay for the services of a maternity nurse and she expressed her opinion that extern cases should be nursed by the hospital staff and that the payment of a separate fee for antenatal work would be a retrograde step.—Dame **JANET** agreed that the nursing of miscarriages was neglected. She also stressed the point that the working-class woman cannot pay an adequate fee, and that greater facility for the provision of trained maternity nurses is a more effective method of getting rid of the handy woman than penalisation.

Home Helps.

In addition to doctor and midwife someone is needed to look after the domestic comfort of the household if the mother is to enjoy the physical rest and peace of mind which she requires. Miss F. E. **WRIGHT**, assistant superintendent of health visitors, described the Birmingham scheme for supplying home helps at charges diminishing in proportion to the family income; and at the same time deplored the small use made of this service up to the present. Forty home helps were employed in the city and attended 404 cases during 1928, whilst the number of births was 17,222. The payment made to the home helps was 5*s.* a day (from 8 A.M. to about 6 P.M.) and she is expected to provide her own food.

Dr. S. G. **MOORE** said that Huddersfield provided free home helps and Dr. **FRANK ROBINSON** could not understand why they received so few applications for home helps under their Cambridgeshire scheme.

Mrs. **BLAKE** (Crewkerne) said her authority only contributed towards a home help if a maternity nurse had been engaged.

The Question of Abortion.

In this discussion there was general recognition of the fact that criminal abortion is very largely on the increase in most countries, and that it is a very common cause of fatal puerperal sepsis. There are no statistics available in this country but appalling statistics are available from Germany. As it is agreed that spontaneous abortion does not usually lead to sepsis or a fatal result, and as therapeutic induced labour in skilled hands only exceptionally gives rise to fatalities, it may be inferred that, practically speaking, every case of sepsis or death following abortion is due to criminal abortion.

Dr. **COMYNS BERKELEY**, in opening the discussion, said there had been no improvement in the death-rate from childbirth or puerperal sepsis in the last 20 years. He described the essentials for an improved medical service: better educated doctors and midwives; more hospital beds; antenatal centres linked up with a consulting antenatal centre preferably at a hospital, &c.; and he laid especial stress on the need for educating the public as to the required remedies. Midwifery was the worst paid profession in the world. He pointed out that legitimate induction of labour was not dangerous. Criminal abortion was greatly on the increase and a common cause of sepsis.

Miss **SUSAN MUSSON** (general secretary, National Council for the Unmarried Mother and Her Child) spoke as to the widespread prevalence of the sale of drugs as abortifacients. Her Council could speak from the knowledge of nearly 8000 cases in the past ten years. The death-rate from childbirth among unmarried mothers was twice as high as among married. In their case department they listened to astounding stories of the pills, powders, and potions which had been advised and administered. Their most dangerous enemy was the retail shop which sold "pills for ladies," "female pills," or "pills to remove irregularities." Trade by correspondence was very common, though the Advertising Association had recently persuaded the press to refuse such advertisements. Unfortunately, the firms which supplied abortifacients, or supposed abortifacients, also dealt largely in birth control accessories, and abortifacient drugs were supplied through advertisements which purported to deal *only* with birth control. There was a loophole in the law as to the sale of lead preparations, in that lead plaster made by machinery was excluded and she had been informed by a leading gynæcologist that a woman could buy for a penny enough diachylon plaster to poison herself, cause abortion, and leave her a mental and physical wreck. The Home Office should be pressed to deal with this matter. Miss Musson's conclusion was that public opinion must be educated to deal less hardly with the unmarried mother in order that she may shun these so-called remedies, which endanger the life of herself and her child.

Mr. F. E. Scrase, F.R.C.S. (M.O.H., Hampstead), described the scheme for a panel of consultant gynæcologists and obstetricians which was working satisfactorily in his borough.

Dr. Dorothy R. Mendenhall (U.S. Children's Bureau) read a paper on maternal mortality in the U.S.A., and gave statistics as to the variations of the maternal death-rate between one State and another and among the white and coloured populations. The latter were largely attended by untrained midwives. A study by the Bureau extending over a two-year period, not quite completed, indicated that deaths following abortion contributed largely to maternal mortality and particularly that from sepsis. In the discussion it was pointed out that the recent increase of criminal abortion was very largely among married women (one speaker referred to a wife who had performed abortion on herself seven times), and the advocates of birth control claimed this as a cogent reason for giving sound advice as to contraceptive methods.

Other points made were: that women taking drugs will not attend antenatal centres; that there is no hospital treatment for abortions, and consequently no adequate education of medical students in the treatment of abortion.

Special V.D. Clinics.

A whole session was allotted to a discussion on the holding of special venereal disease clinics for women and children in connexion with maternity and child welfare departments. The main points emerging were: the need for a better linking up of all the medical services for the discovery of venereal disease with a view to securing special treatment in well-equipped premises with no label attached to them, and particularly the devising of methods which make it easy for the pregnant woman to secure early treatment; and also the need for combating the greatly exaggerated view held by both the medical profession and the public as to the risk of contagion.

In his introductory remarks Mr. E. B. Turner, F.R.C.S. (Chairman of the Executive Committee, British Social Hygiene Council), voiced the anxiety of his Council to see all maternity and child welfare centres equipped with facilities and means for diagnosis, and the establishment of special clinics at unlabelled premises for the treatment of married women.

Dr. David Lees (V.D. Medical Officer, Edinburgh) said that 60 per cent. of these diseases were not acquired through illicit sexual intercourse. The amount of gonorrhœa under treatment had increased but we were not yet treating anything like all of it. Gynæcological hospitals, children's hospitals, maternity hospitals, and maternity and child welfare centres were not used as they might be in their schemes. The last named should at least have the means of diagnosis. The labelling of discharges in pregnancy as venereal should be avoided. A centralised control of their schemes was very important. Health visitors were not at present educated for following up V.D. cases. With ordinary care there was no danger from contagion or cross-infection in hospitals. In new general hospitals there should be first-class equipment and service for dealing with venereal diseases. There should be no labelling and the same waiting-room should be used for different purposes at different hours.

Dr. Violet Russell (V.D. Medical Officer, Guy's Hospital) favoured treatment for pregnant women at maternity centres. There should be proper facilities for diagnosis and a consultant available at all centres. Special difficulties arose from the attempt to transfer pregnant women from the centres to the V.D. centres for treatment, and, in order to secure the desired result, everything must be made easy and pleasant for the pregnant woman. Children with congenital disease and their mothers, when not pregnant, could be treated at the V.D. clinics. She had met with cases of gonorrhœal vulvitis in girls spread by unhygienic w.c. seats, and advocated the use of seats such as those used on the Continent. As the result of five years' experience at the antenatal clinic, they had found 5 per cent. with a positive Wassermann reaction. Diagnosis was often difficult clinically and the patient was frequently unaware of her complaint. The medical officer of the antenatal clinic should not wholly let his patient go but should call in the V.D. officer to carry out the special treatment. Lock hospitals should be abolished. Their great aim should be to secure the antenatal examination of every pregnant woman and the early treatment of every syphilitic so found.

Dr. Norah I. Wattie (Assistant V.D. Medical Officer, Glasgow) thought that antenatal supervision in Scotland was now extended to about 50 per cent. of pregnant women. She alluded to the difficulties in the diagnosis of gonorrhœa and advocated several examinations. Treatment was provided in Glasgow at the centres but cases requiring daily treatment received such at the V.D. clinic, while still attending once a week at the centre. This compromise worked satisfactorily.

Dr. Naylor Barlow (M.O.H., Wallasey) complained that the Ministry had recently refused to give consent to the establishment of a first-class composite clinic, including V.D. in Wallasey.

Dr. D. Brewer (M.O.H., Swindon) said that suspects should not be sent to the V.D. clinics. He would like to see the special treatment carried out by special officers at a general clinic as proposed at Wallasey.

Miss Musson advocated the treatment of expectant mothers at maternity hospitals.

Dr. P. S. Blaker (Dudley) stated that they had appointed a new V.D. officer to do antenatal and other work with facilities for immediate diagnosis at the centres, thus linking up the V.D. with the M. & C.W. work.

In reply, Dr. Lees expressed his opinion that gonorrhœa was not a cause of puerperal septicæmia but rather of a sapræmia arising about the tenth to the fourteenth day. Antenatal work diminished the risk of septicæmia. Any child born with a syphilitic rash in a maternity hospital was a reflection on our schemes and meant failure to secure antenatal supervision and early treatment. He spoke approvingly of the great increase of suspects at their clinics in Edinburgh. Linking up well-equipped premises for the work, and a juster appreciation of the real risk of contagion were both very necessary. As these diseases were so frequently not acquired "venereally," he preferred to call a spade a spade and to talk about gonorrhœa and syphilis rather than venereal disease.

Work of Guy's Hospital.—The annual report of this great institution shows that in 1928 11,000 in-patients and 120,000 out-patients were treated at a cost of £180,000; out-patients made 517,000 attendances. The income from endowments was £60,567, but the annual subscriptions amounted only to £6,000. The downward movement of the rate of mortality which for three years had remained stationary at 6·6 per cent., has been resumed, and last year was 6·2 per cent. There has been a remarkable growth of confidence in the venereal diseases clinic. In 1924, its first year as a whole time clinic, the attendances numbered 21,700; in 1928 they were 61,148. The percentage of cases discharged as cured shows a marked upward curve. A new departure is the allotting of four beds to cases requiring extensive or special types of dental treatment. In the State examinations Guy's nurses were notably successful, only four out of 78 failing in the preliminary, and two out of 64 in the final. At the close of the year the total number of available beds was 640.

Reviews and Notices of Books.

A TEXT-BOOK OF PULMONARY TUBERCULOSIS FOR STUDENTS.

By R. C. WINGFIELD, M.B. Oxf., F.R.C.P. Lond., Medical Superintendent. Brompton Hospital Sanatorium, Frimley. London: Constable and Co., Ltd. 1929. Pp. 401. 31*s.* 6*d.*

THIS book is clearly written and full of information which will be appreciated not only by the student but also by tuberculosis officers and others interested in consumption. The first few chapters deal with epidemiology and the effect of the tubercle bacillus on the tissues, and here we are in the realm of debate, but the author's arguments are well expressed, and his summing up of the experimental work and views of different authors is lucid and convincing. He emphasises the fact that tuberculosis in the adult is practically confined to a chronic disease of the lungs and cannot be compared to tuberculosis in the infant, where the manifestations of the infection are so different that they produce quite another type of disease. The decline in mortality is ascribed to urbanisation, which, though leading to a preliminary rise in the death-rate, is followed by a fall as the succeeding selected generation, immunised by the infantile infection, reaches adult age. The adult is relatively immune, but if an old lesion (not of necessity in the lung) becomes active or reinfection takes place at a time when immunity happens to be at a low ebb the bacilli may multiply and be carried to the lungs in sufficient numbers to cause phthisis.

There is a very full account of methods of physical examination, but the reader is warned that physical signs no longer hold the " pride of place in the equipment of the chest specialist " as in days gone by. The thorax is by no means built to pattern, and, therefore, even in health, sounds heard on auscultation or percussion will vary, and what is normal in one may be abnormal in another. The importance of a careful and thorough physical examination is admitted, but in most cases symptoms and other means of examination point to a true diagnosis before the appearance of physical signs, and the old habit of giving a clean bill of health because no signs are detected is fortunately passing away. The author rightly emphasises the fact that it is not enough to say " this patient is infected with tubercle bacilli," but one must also go on to say whether the symptoms are or are not due to that infection. In Chapter IX., which deals with classification and assessment, it is clearly explained that although pulmonary tuberculosis is one disease, yet it is a disease of many phases, each requiring different treatment.

The last eight chapters are devoted to treatment, and it is most refreshing to find so much space given to such an important subject. The reader is warned to shun the extremist, and the author himself keeps an open mind. For example, he does not regard tuberculin as a really valuable method of treatment, yet he devotes a whole chapter to a fair discussion of its possibilities and limitations. The description of sanatorium treatment is of special interest for the purpose of the treatment is made clear, and one can therefore understand why certain patients are unsuitable and others obtain great benefit. The chief criticism of the sanatorium system is that it fails with advanced cases, but, after all, its main object is to prevent mild cases from becoming advanced. Many a life is thrown away by waiting for the patient to pass from the early and curable into the later and incurable stage before advising sanatorium treatment. We agree with the author that the physician who bewails the results of sanatorium treatment among his patients is oftentimes but bewailing his own inefficiency. The technique of the simpler laboratory methods are described in a brief appendix, and the book concludes with a useful index.

A text-book on tuberculosis was wanted. This one can be thoroughly recommended to all interested in tuberculosis, not only as a text-book but also as a work of reference.

HANDBOOK OF CLINICAL CHEMICAL PATHOLOGY.

By FRANK SCOTT FOWWEATHER, M.D., M.Sc., D.P.H., F.I.C., Lecturer in Chemical Pathology, University of Leeds. With a foreword by Sir BERKELEY MOYNIHAN. London: J. and A. Churchill. 1929. Pp. 216. 8*s.* 6*d.*

IT is obvious that the study, by means of chemical analyses, of the fluctuations and alterations of the body's functions has thrown considerable light on the mechanism of disease, and in this field the subject of chemical pathology has surely still more to give to us. Its chief interest to the medical profession appears to be on a somewhat lower plane, for the demand for new and practical methods of diagnosis by means of what are usually described as " laboratory tests " is insatiable. In an age when most of us are afraid of not being up to date these tests are much in vogue; and the author of this book, realising the inherent dangers of such a situation, has set out to describe how, when, and why they should be carried out. It is not a laboratory manual, and all details of the actual methods of analyses have therefore been avoided. The investigation of renal function, liver function, gastric function, and so on are dealt with on conventional lines in a simple manner which should be useful to the student. Apart from the description and discussion of diagnostic tests there are other chapters devoted to some of the recent advances which have been made in medicine. In these are described the vitamins and deficiency diseases, basal metabolism, anoxæmia, acid-base balance, and the toxæmias of pregnancy.

There is no information in the book which is not already available elsewhere, for the most part in the series on Recent Advances issued by the same publishers. But Dr. Fowweather presents it clearly and concisely and has produced a useful guide to the subject. The chief disappointment of the book is that the reader is left in considerable doubt as to the value of some of the tests. We exclude from this criticism the chapters on the investigation of pancreatic and intestinal conditions where definite pronouncements are made on the uselessness of many tests and on the value of others. The experience of the Leeds school, which has such a high reputation for surgery, on the value of chemical tests for the diagnosis of cancer and ulcer of the stomach, would have been interesting. Tests for occult blood in the fæces are highly esteemed in some places and neglected elsewhere. For these very reasons, perhaps, the author has been content to describe some of the tests and to leave their assessment an open question.

THE TROUBLED CONSCIENCE AND THE INSANE MIND.

By CHARLES BLONDEL, Professor of Psychology in the University of Strasbourg. With an introduction by F. G. CROOKSHANK, M.D., F.R.C.P. London: Kegan Paul, Trench, Trübner and Co., Ltd. Pp. 91. 2*s.* 6*d.*

THIS little volume is one of the Psyche Miniature Series, and will prove of very genuine interest to psychiatrists, and to the general reader with a taste for philosophical study. It is not quite clear who is responsible for the admirable translation from French into English, but Dr. Crookshank provides an introduction in which he gives a résumé of the psychological conceptions behind Prof. Blondel's essay. The translation is so good that the reader would forget that the essay was originally written in French but for the constant use of the term " delirium," not only in the usual English sense of the word, but also as a synonym for " psychosis."

The book is an attempt to explain the irrational and dissociated behaviour and language of the insane.

The author points out that the speech of insane persons ceases to be language, since it fails to make their meaning clear, either to others or to themselves. This fact the writer attributes to a fundamental difference between the experience of the insane as compared with the sane. Dr. Blondel insists that full consciousness in the normal must consist of two parts, and that for normal consciousness a certain separation takes place, similar to the pouring off of one liquid from another. Healthy minds select only those experiences which are identified with collective experience and find ready linguistic expression. Those sensations and feelings attributed to the viscera and the activities of the vegetative nervous system (cenesthesia) remain on the fringe of consciousness, and have no place in language. Dr. Blondel supposes that the insane mind, with its feelings of depersonalisation and obvious disorder of expression, is due to the invasion of normal consciousness by cenesthesia, with consequent failure on the part of the patient to find adequate verbal expression for his experience.

These brief sentences give but a meagre idea of the purpose of the essay in which the reader will find material help in clarifying his ideas of the relationships between body and mind. There is but little reference to Freudian conceptions; in a sense the book may be regarded as an attempt to place the conception of the unconscious on an organic basis. The influence of cenesthesia in the normal mind is perhaps underrated by Dr. Blondel. It is obvious that the work owes much to the writings of Derkheim and Bergson.

The Excitability of Muscle.

Handbuch der Biologischen Arbeitsmethoden—Methoden zum Studium der Funktionen der Einzelnen Organe des Tierischen Organismus. Abt. V. Teil 5A, Heft 5. Berlin: Urban and Schwarzenberg. 1929.

THIS section of Abderhalden's "Handbuch" contains a detailed account of Lapicque's methods of measuring excitability, translated from the French of Henri Laugier. Theoretical considerations are discussed only in so far as they are needed to make the applications of the methods intelligible. The section includes also an essay on the measurement of tone, and one on the methods used in the investigations on plain muscle. Both these give adequate descriptions of current practice, but the bibliographies reveal a degree of "insularity" which is commoner perhaps in continental than in English writers. While this engenders a doubt as to the comprehensiveness of the authors' erudition, it hardly reduces the interest for readers in this country.

Cancer.

A Practical Résumé of the Subject for General Practitioners. By G. JEANNENEY, Professor in the Faculty of Medicine, Surgeon to the Hospitals of Bordeaux. Translated by JOHN GIBSON, *M.C.*, M.A., M.D.; and JOHN H. WATSON, M.B., B.S., F.R.C.S. London: H. K. Lewis and Co., Ltd. 1929. With 33 illustrations. Pp. 186. 7*s*. 6*d*.

THE object of this little book, as stated in the foreword, is to recall to the practitioner as shortly as possible the elements of the diagnosis of cancer at its onset in order to ensure early treatment. Consideration is therefore given only to the clinical aspects of the disease. The author says that he has endeavoured "to emphasise facts which will be true in ten years' time—except in the case of treatment—for clinical manifestations do not change." He proceeds, however, to make a statement which is not true to-day and will not be true ten years hence—namely, that there are cancer houses and cancer villages. The discussion of the pathology of the condition is inadequate. The book consists mainly of a brief account of the clinical symptoms of the disease in the different organs for the purpose of providing help in diagnosis. This is followed by a short account of treatment—surgical and radiological. In so far as the carrying out of these forms of treatment is not within the province of the practitioner, this section might well have been curtailed to provide more space for one of the most difficult tasks which a practitioner has to face—the medical treatment of cancer in its final stages. This subject is dismissed in two pages. The book does not contain any information which might not be found in any good text-book on surgery. The translation is well done.

Kraemer's Scientific and Applied Pharmacognosy.

Third edition. By an Editorial Committee consisting of Editor-in-Chief, EDWIN L. NEWCOMB, P.D., Ph.M., Phar.D., Secretary National Wholesale Druggists' Association; and Co-Editors, LEASURE K. DARBAKER, Phar.D., Professor of Histological Pharmacognosy, University of Pittsburgh; EARL B. FISCHER, B.S., Professor of Pharmaceutical Botany and Pharmacognosy, University of Minnesota; EDMUND N. GATHERCOAL, Ph.G., Professor of Pharmacognosy, University of Illinois. London: Chapman and Hall, Ltd. Pp. 893. 37*s*. 6*d*.

IF to the medical man of to-day pharmacognosy or the recognition of drugs and the study of crude materials is a subject of little interest, it is because the competition associated with the commercial development of pharmacy has led to an almost embarrassing supply of purified and standardised products from which he can choose the one most suitable for his purpose. The intensive study of crude drugs now lies more in the domain of applied botany and chemistry than of medicine, but the doctor should be able to recognise some of the more commonly employed preparations and to know something of their properties. He will find these, as well as rare preparations, well described in this book, written by the late Henry Kraemer in 1910, which reached a second edition in 1920, and has now, after the death of the author, been revised for a third edition by an editorial committee, four of the best known pharmacognoscists in the United States. The general plan of the text has been retained, the statements relating to morphology have been checked, and information concerning the constituents of drugs has been critically reviewed and revised in the light of recent research. The chapters on commercial starches and on bacterial remedies have been entirely rewritten, and numerous minor alterations have been made with a view to increasing the accuracy and value of the work. A new key for the analysis of powdered drugs by means of the microscope has been introduced. The book, we anticipate, will continue to be of great assistance as a text-book for students of pharmacy, and as a work of reference for botanists, chemists, food and drug analysts, and pharmacologists. The lay reader should not accept as strictly accurate some of the brief statements regarding the general action and therapeutic uses of drugs, which the editorial board has introduced into this edition.

Popular Books on Food and Health.

Food. By ROBERT MCCARRISON, C.I.E., M.D., D.Sc., LL.D., F.R.C.P., Director of Nutritional Research, Pasteur Institute, Coonoor, S. India. Madras: Macmillan and Co., Ltd. 1928. Pp. 115. 1*s*.

Good Health. By IAN S. THOMSON, M.A., M.D., D.P.H. With a foreword by Sir ARTHUR KEITH, M.D., LL.D., F.R.S. London: Longmans, Green and Co. 1929. Pp. 122. 3*s*. 6*d*.

THE number of popular books on health is very large, but the quality of most of them is poor. These two volumes, however, show how much sound information can be given in simple language by an expert at exposition. Col. McCarrison's book is intended as a primer for use in schools, colleges, welfare centres, boy scout and girl guide organisations in India, where nutrition is one of the most pressing problems of the day. If the young people can be taught what to eat and why to eat it, a great step will have been taken towards improving the health of the nation. The author makes his instruction interesting by supplying concrete details. He builds his description of the component parts of food round a "food star" and takes the child by easy stages from air, sunlight, and water right through to vitamin D. He discusses the foodstuffs in common use and points out the faults of Indian diets and of Anglo-Indian and European diets in India and shows how these could all be rectified. The effect of diet on the teeth and the physiology of the gastro-intestinal tract are described, also the amount and balance of foodstuffs required in a perfect diet. There are just over a hundred pages in this little book, but the instruction is given in concentrated form without padding, and it can be recommended as a model of its kind.

Dr. Thomson's book is extremely well written. The author is the son of Prof. J. Arthur Thomson whose popular writings have a wide and appreciative public and has evidently inherited the rare gift of presenting a difficult subject in a clear way without becoming sensational or sentimental. Moreover, he is free from fads and as far as possible presents facts in such a way that the reader may make his own judgments. There are 20 chapters in his book and none of them is dull. He begins with the infant, with a throw-back to bring in antenatal influences, and then deals with such subjects as digestion, ductless glands, mental diseases in separate sections, arranged on no very definite plan. Dr. Thomson has included some useful chapters on subjects not generally discussed in books of this type, such as State medicine and patent medicines. The book is essentially a pleasant collection of essays which medical men as well as laymen will read with pleasure.

THE ORGANISATION OF AN OPERATING THEATRE.

Organisation und Ordnungsgemässer Betrieb des Operationssaals. Von Prof. Dr. MAX KAPPIS, Hanover. Leipzig: Georg Thieme. Pp. 119. M.4.8.

THIS little volume gives an accurate and detailed description of all the technical requirements of the operating theatre, and should be invaluable to those who have to organise this highly specialised branch of technical surgery. Not only is the equipment of a theatre fully described, but most precise details are given as to the best methods for the sterilising of all materials, the preparation of catgut, and of every solution that the surgeon can possibly require. No such elaborate handbook has been published in English, and we hope that Prof. Kappis will earn the gratitude of English surgeons by arranging for its translation.

TROPICAL NURSING.

A Handbook for Nurses and Others going Abroad. By A. L. GREGG, M.D., M.Ch., D.T.M. & H. Lond. With a foreword by the Hon. Sir ARTHUR STANLEY. London: Cassell and Co., Ltd. 1929. Pp. 199. 6s.

THIS little book does pioneer work in giving to the nurse trained at home and going abroad for the first time a guide which should enable her to keep her health and to cope with strange and new emergencies till medical help arrives. It deals first with personal hygiene, and next, in a section which fills most of its pages, with a series of diseases which are important in different parts of the tropics. For example, in beri-beri great emphasis is laid on the need of extreme care to avoid all risk of blame for a sudden heart failure; any relaxation of the vigilance advised in the book should be allowed only by doctor's orders. Blackwater, cholera, the dysenteries, malaria, sprue, yellow fever, and worm infections, to name a few only, are well considered. But the anthelmintic dosage for intestinal infections is perhaps higher than seems wise in a book destined for nurses, the author holding 1 drachm as the equivalent of 3 c.cm. of carbon tetrachloride, though a table of weights and measures at the end of the book supplies the proper ratio. This valuable section is followed by another on the techniques used for blood examination and transfusion, for bowel lavage and the test-meal, and for intramuscular and intravenous injections. There is also a note on the care of the eyes and a glossary of medical terms which will be particularly valuable for those laymen who, the author reasonably hopes, will find useful material in its pages. The nurse trained in the tropics, as so many now are, will also glean from it much to help and interest her.

DENTAL ANATOMY.

Classroom and Laboratory Quiz Compend. By W. C. STILLSON, D.D.S., Associate Professor of Dental Anatomy, Western Reserve University, Dental School. London and Philadelphia: W. B. Saunders Company, Ltd. 1929. Pp. 280. 10s.

IN America the coaching class is picturesquely called the quiz class. But while the method of question and answer is well adapted to put the student on his mettle and enable the teacher to assess his knowledge, we are doubtful whether the method when applied to revision or cram books is satisfactory even from the standpoint of helping the student to pass his examination. This book consists of a large number of brief questions with brief answers, many of them so trivial and obvious that even the student ridden with the obsession that every examiner is out to trap him, could not but know the correct reply. Dental anatomy if properly taught can be quite an interesting subject, but no one reading through this dreary compilation could possibly believe this.

JOURNALS.

THE INDIAN JOURNAL OF MEDICAL RESEARCH for April, 1929, Vol. XV., No. 4, contains some 29 contributions.—N. H. Fairley continues his studies on sprue with F. Jasudasan, and shows that the complement reaction in sprue with *Monilia psilosis* vaccine is of no value.—B. N. Chatterjee and E. W. H. Cruickshank have studied the comparative histology of the spleen in various vertebrates and the effect of iron on the hæmogenic organs.—L. E. Napier has two comparative papers on Urea Stibamine and Stibamine Glucoside.—R. N. Chopra and S. G. Choudhury write on the causation of the formol-gel reaction in kala-azar and physical properties of different blood sera.—C. G. Pandit, S. R. Pandit, and Seetharama Iyer on the Adhesion Phenomenon in Filariasis and on a new species of Filaria Worm in Birds.—T. C. Boyd and A. C. Roy describe some Biochemical Aspects of Chyluria.—A. D. Stewart and S. C. Ghosal have investigated the germicidal action of the activated sludge process.—S. Khan and M. N. Agarwal have studied the Duration of Life in the Vibrios in the Ganges and Jumna River Water.—S. D. S. Greval writes on the Kahn, Microkahn, and Wassermann Reactions in a study of 2066 cases.—V. T. Korke believes he has discovered *Filaria malayi* in India.—J. Cunningham describes a new Technique for Handling Infected Monkeys.—Clive Newcomb has a paper on the Composition of Vesical Calculi in India.—P. J. Barraud continues his revision of the Culicine Mosquitoes of India.—R. B. Lloyd, L. E. Napier, and S. N. Paul believe that the serological observations are useful in the control of the treatment of kala-azar.—H. W. Mulligan has studied the reticulo-endothelial system in malaria.—R. Row has made observations on malarial parasites grown aerobically in simple cultures with special reference to the evolution and degeneration of crescents.—T. N. S. Raghavachari and S. Y. Ganepati describe observations on the water of the Red Hills Lake at Madras.

THE LANCET.

LONDON: SATURDAY, JULY 13, 1929.

THE ORTHOPÆDIC CONGRESS.

A RECENT feature in our science has been the velopment of orthopædic surgery, arising out of e need for increased knowledge and perfection of hnique felt when the war brought into all the spitals of Europe an influx of mutilated men. very nation then felt alike the responsibility curred, and the Congress held last week in London hen the Orthopædic Associations of America and his country sat in joint session, has demonstrated he many directions in which orthopædics have dvanced and demonstrated also, alas! how much emains to be done if many crippling and painful onditions are to be removed or mitigated.

The programme of the Congress had this interesting ide—it revealed a pre-occupation with common esions which should encourage the family doctor. The ubjects discussed were of wide practical interest to he profession as a whole, and nearly every speaker howed that without the coöperation of the general practitioner the efforts to improve the end-results of treatment would be fruitless. To secure bony union in intracapsular fractures of the neck of the femur; to diagnose at the earliest possible moment congenital dislocation of the hip, which becomes such a serious deformity when neglected; to shorten and simplify the course of chronic sepsis in bones; to deal with those very common and tedious cases of low back pain—all these are problems which confront the practitioner daily, and their solution depends largely on the rules which the specialist is able to formulate for his guidance. But the orthopædic surgeons are powerless to test new theories or to assess the value of practical measures based on mechanical principles without enlisting the practitioners' interest. Nothing is more likely to ensure such coöperation than the conviction that not only the fractured femur and the victim of anterior poliomyelitis, but the man with an intractable pain in the lower part of his back is the subject of scientific consideration. The communications submitted were of high merit. Among the most illuminating was the address on the basic principles involved in the treatment of the common spinal conditions as well as in the functions of the viscera, in which Dr. J. E. GOLDTHWAIT demonstrated the anatomical, physiological, and pathological data on which is based the whole system of posture training for which his name is famous. The most entertaining was the film, built up on the lines made familiar by the antics of "Felix the Cat," in which Dr. WILLIS CAMPBELL demonstrated his operation for foot-drop, leaving a most vivid impression of the essential stages of the operation. The most depressing were the group of communications dealing with fracture of the neck of the femur, since most surgeons using different methods gave statistics showing non-union in 30 per cent. of cases, some confessing to a rate as high as 45 per cent. Dr. ROYAL WHITMAN, whose claims to a much higher record of success are well substantiated, admitted that his patients are specially selected. The treatment of open septic wounds after cleansing without suture by a light dressing of gauze soaked in paraffin, according to the method of Dr. WINNETT ORR, is likely to be tried by some at least of those who were obviously impressed by the results obtained. If the same measure of success is achieved in other hands this conference will be remembered for the initiation of a change of great importance in surgical methods.

What may be called, in a wide grouping, orthopædic cases, while alike in their main results, are so widely separated in their various origins that the family doctor, the general surgeon, and the specialist have in a great majority of instances their combined parts to play. Not only is there no line of demarcation between general and orthopædic surgery, but any of the procedures adopted may depend for their correctness and suitability of treatment upon the knowledge and discrimination of the family practitioner as displayed in early diagnosis and wise preventive care. Orthopædic surgery must be based on general surgery, and must recognise and practise the principles of treatment covering the widest field of surgery; thinking in terms of function mainly must not limit the general view. And this was the general message delivered at the sessions of the Orthopædic Congress.

PREVENTABLE BLINDNESS.

AT the present time it is impossible to say with any exactitude what proportion of blindness is due to causes which may fairly be called preventable, but we can point to certain forms of blindness which would have been prevented if known precautions had been taken. In a recent Richard Middlemore lecture,[1] Mr. W. H. FULFORD EALES puts first and foremost cases due to ophthalmia neonatorum. Statistics show that rather more than 5 per cent. of the totally blind owe their blindness to this cause. Among children the proportion is, of course, far higher, as none of the causes of blindness that appear first in adult life affects them. The problem of prevention is threefold. A great majority of the severe cases of ophthalmia neonatorum have their origin in gonorrhœa and infection of the mother with the gonococcus is preventable. Secondly, the responsibility lies with the doctor or midwife, for it has been abundantly proved that when effective precautions are taken at the birth of the infant the eyes are not infected. Thirdly, the public authority should provide facilities for these necessary precautions, and ensure that they are within the reach of all women at the time of their confinement. The next cause of preventable blindness discussed by Mr. EALES is phlyctenular disease. The incidence of what is technically termed blindness from this cause is, it is true, trifling. On the other hand, the number of those who suffer throughout their lives from seriously impaired vision resulting from phlyctenular keratitis is by no means inconsiderable. Since this disease hardly ever reaches a very serious stage except among the poorer classes, and is undoubtedly connected with bad feeding, absence of sunlight, and overcrowding, it may be said that the main responsibility for this disease lies in the social conditions of our country, and especially of our large towns. Yet it would be a mistake to attribute the whole responsibility to social conditions. It has often been remarked that the Jews, even in the poorest quarters of London, are remarkably free from phlyctenular disease. There may be some racial immunity, but the probable reason is the more nutritious diet, especially in regard to fatty foods, usually enjoyed by Jewish children as compared with other children of the hospital class. The third in order of Mr. Eales's causes of preventable blindness —also mainly affecting children—is interstitial keratitis, a disease due to congenital syphilis. Here, too, the primary responsibility belongs to the parent from whom the disease is transmitted, but the State also has assumed partial responsibility, and by means of its venereal clinics can do, and is doing, much to lessen the incidence of the disease. Mr. Eales quotes Mr. Lindsay Rea to show that the actual treatment of the infected children themselves by antisyphilitic injections can do far more to induce a cure than is sometimes assumed, so that here some of the responsibility lies with the ophthalmic surgeon. Since interstitial keratitis is only one of several syphilitic conditions which cause blindness, whether in children or adults, it would perhaps be better to enumerate syphilis itself as one of the main causes of preventable blindness. The remaining three of Mr. Eales's classes are of traumatic origin, whether it be the blindness directly due to injury, as in perforating wounds of the eyeball, sympathetic ophthalmia, or serpiginous ulcer of the cornea. A considerable proportion of industrial injuries to the eye could no doubt be prevented if workmen at trades dangerous in this respect could be induced to wear efficient goggles. How difficult it is to get this carried out was shown by Mr. Bernard Cridland in a paper[2] read at the recent Congress of the Ophthalmological Society. Of the cases attending hospital for treatment of minor eye injuries, in 70 per cent. he found that no protection had been provided; in 19 per cent. protection was supplied, but not used; and in 11 per cent. protection, although used, was ineffective. Sympathetic ophthalmia is now extremely rare, but it must always be prominent in the mind of the ophthalmic surgeon to whom the main responsibility belongs of diagnosing the condition, with or without the aid of the slit lamp, and making the momentous decision as to when it is safe to allow a patient to retain an injured eye possessing sight and when it is necessary to recommend excision. Serpiginous ulcers also result from injuries to the cornea, often so slight as to be deemed trivial by the patient. The danger lies in the infection of a simple abrasion by the pneumococcus which is apt to be present in the discharge from an infected lacrymal sac. Here the chief necessity is timely and correct treatment, for this form of ulcer, inefficiently treated, may quickly render the whole cornea opaque. At present we are not able to look upon glaucoma and senile cataract as preventable, though blindness from these causes may to a great extent be prevented by early diagnosis and treatment in the one case and timely operation in the other. There remain congenital defects and familiar diseases such as retinitis pigmentosa, and blindness due to septic infection causing cyclitis. The last-named might also be classed as preventable.

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[1] Birmingham Medical Review, June, 1929.

SANOCRYSIN.

So many cures for pulmonary tuberculosis have been advocated, have had their day and have ceased to cure, that scepticism about the value of any new remedy and pessimism about the possibility of the discovery of any effective means for treating the disease have become all too prevalent. Tuberculosis may itself be a dying disease, but it still remains one of the commonest and in its results one of the most tragic of all diseases. If our efforts to save the consumptive are often doomed to failure we can still do something to alleviate suffering and to prolong life. It is now universally recognised that, when the disease is unilateral, treatment by artificial pneumothorax should always be considered and usually undertaken. If an effective collapse of the diseased lung can be secured, hope of a complete recovery may be entertained. Unfortunately adhesions prevent complete deflation in the majority of the cases of unilateral disease. Further, bilateral disease is frequently present when the consumptive first presents himself for treatment. Despite the failures of the past we cannot lightly dismiss any new form of treatment which is applicable to cases of bilateral disease and which may therefore be employed when collapse therapy is impossible. The claim for consideration is also strengthened if such treatment by diminishing disease in one lung may enable us to apply artificial pneumothorax to the other. Both these merits have been claimed for the thiosulphate of gold and sodium introduced by Mollgaard under the name of sanocrysin.

Sanocrysin has now had an extensive trial at home and abroad. Its advocates have in the main been cautious in their claims for its efficacy, but there is a consensus of opinion that its action is often beneficial and sometimes strikingly successful. It should also be noted that its chief successes have been obtained in cases of active disease of the so-called exudative type. And these are the forms which, if bilateral, are least influenced by any other form of therapy. Sanocrysin thus differs from tuberculin, a remedy advocated principally in the treatment of the chronic types of disease in which the natural defences of the body often suffice to keep the enemy at bay, whatever form of treatment is applied. Léon Bernard and Charles Mayer,[1] in a recently published article, give an account of their experience in the treatment of 142 cases of acute febrile disease. They claim favourable results in 43 per cent. of the cases as shown by defervescence, gain in weight, improvement in general condition, and some diminution in physical signs. The clinical improvement was correlated with a change in the radiographic appearances, in some cases denser shadows proving the development of a beneficial sclerosis. In others there was noted a lessening of the extent of the diseased areas or even a diminution in the size of cavities. The improvement noted in patients treated with sanocrysin was far greater than that observed in comparable cases not so treated. In the latter spontaneous arrest of acute symptoms was obtained in less than 5 per cent. of the cases treated in the Laënnec Hospital, in contrast with the figure of 43 per cent. for the sanocrysin series. In many instances subsequent relapses occurred, and though permanent benefit was obtained in others, no claim is made for a definite cure.

Used in conjunction with collapse therapy sanocrysin has something more to its credit. When there is bilateral disease sanocrysin may, in the words of

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[2] Brit. Jour. Ophth., 1929, p. 308.

[1] Presse Médicale, May 29th, 1929, p. 705.

FREDERICK HEAF,[2] just "turn the balance from a bad to a favourable result." Thus L. S. T. BURRELL[3] was able to report improvement in five out of six cases of acute disease of this type, tubercle bacilli being abolished from the sputum in four cases. The experience of many other workers has been similar to that of those quoted. The selection of cases suitable for sanocrysin calls for nice discrimination, and the drug must perhaps be regarded as unsuitable for use in general practice. Apart from the minor difficulties inseparable from intravenous therapy, toxic symptoms may arise as the result of metallic poisoning and close observation of patients under treatment is essential. In the past severe dermatitis, nephritis, and gastro-intestinal inflammation have been caused by too frequent administration or too large a dose. Wider experience has diminished the number of accidents of this kind, and with correct dosage complications of any kind are rare.

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THE BRITISH EMPIRE CANCER CAMPAIGN.

THE sixth annual report of the British Empire Cancer Campaign[4] contains an account of the work being done in various institutions subsidised by the central organisation, and also records the achievements of committees in the provinces and in the overseas dominions affiliated to the campaign. Moreover, individuals in receipt of grants are given the opportunity of detailing the efforts made during the year, whether or not these have yet been recorded in scientific journals. An editorial survey (pp. 9 to 18) of the work in progress is illuminating, and would be even more useful another year if it included page references to indicate where the work is more fully described, especially since the place where one looks for an index of subjects and names has been allocated to a list of subscribers to the Fund.

The range of activities is wide, for all possible avenues of approach to this most baffling medical problem are being explored under the auspices of the Campaign. *In some institutions the field of inquiry* is deliberately limited, the whole of the grant available from the Campaign funds being concentrated on one branch of research. For example, at St. Bartholomew's Hospital, the Marie Curie Hospital, and the Westminster Hospital scientific and statistical studies of radium therapy are being subsidised, at St. Mark's Hospital precancerous conditions in the rectum. At other places, for example the Middlesex Hospital, the attack is more general, three departments being drawn into the battle. In the pathological department attention has been devoted to tissue culture; the virus theory of cancer; the artificial production of tumours; resistance to tumour growth, and the problems of immunity. In the biochemical department methods of sero-diagnosis of malignant disease have been tested (with negative results); the examination of therapeutic substances has been undertaken; and the metabolism of tumour cells has been studied, especially the abnormal carbohydrate metabolism which is a property of malignant tissues. In the radiological department the three main investigations have been the differential action of X and gamma rays, the limiting intensities of radiation influencing tumour growths, and the general physiological reactions caused by penetrating radiation.

At the Cancer Hospital much attention has been concentrated on the elaboration of new carcinogenic agents and on experimental therapy. Since experience has shown that therapeutic results obtained in transplanted tumours are often inapplicable to spontaneous growths, a strain of mice has been obtained which have a high incidence of mammary cancer. The success reported last summer to the International Conference on Cancer organised by the Campaign (see THE LANCET, 1928, ii., 173) in the production of a chicken sarcoma from injection of normal pancreas could not be repeated, and it is believed that similar failure has attended the efforts of the other experimenters who produced sarcoma from virus-free material. The technique involved in work on the Rous sarcoma is so intricate that no conclusions can fairly be drawn from isolated experiments, and it will be remembered that neither Dr. A. LEITCH nor Dr. J. B. MURPHY made any claims when recording their curious results. The premature and embarrassing clamour with which these were greeted is an indication of the intense desire of the public to hear news of good progress in cancer research. 'Organisations formed to promote research are faced with the dilemma that any hint of optimism is exaggerated by this desire, while when the cautious tone appropriate to reports of unconfirmed work, however stimulating, is adopted, the public is not impressed with the need for funds. The need is, however, urgent. The total amount of money spent by the Campaign during the past year on research work is approximately £24,000. While the expenditure is steadily increasing, the income from donations and subscriptions is not. Strong local committees, such as those established in Yorkshire, Lancashire, Cheshire and North Wales, Nottinghamshire and Birmingham are creating much interest, and are most valuable assets, but a large proportion of the funds collected in any of these districts is retained for the local research centres. Doctors are in a position to stimulate generous gifts by explaining the need for caution in presenting results and by *interpreting to their lay friends the sober yet hopeful* messages contained in this report.

Annotations.

"Ne quid nimis."

THE KING.

THE King's departure for Sandringham was fixed for Monday last, but in the morning its postponement was announced and an explanatory statement was issued over the signatures of Sir Stanley Hewett, Dr. Henry Martyn, Sir Hugh Rigby, and Lord Dawson. After giving the reassuring news that His Majesty was not *fatigued* by the Thanksgiving Service on the *previous* day, and that his general health was good, they stated that "the condition of the sinus in the right side of the chest has not made satisfactory progress," and that a further examination with X rays was proposed. The last radiological investigation, undertaken not quite four weeks *ago*, revealed one or two minute sequestra in the abscess *cavity* which had *formed* at the site of the rib-resection *performed* in December. Fresh radiograms have now been taken by Dr. Graham Hodgson, but it is *not* yet clear whether further local treatment will prove necessary, and until this doubt is resolved the King naturally prefers to remain within easy reach of his medical advisers. In any case there is fortunately no reason for renewal of anxiety.

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[2] Tubercle, July, 1929, p. 449.

[3] Ibid., p. 454.

[4] Presented at the annual meeting held at the House of Lords on July 8th, 1929.

THE FOURTH IMPERIAL SOCIAL HYGIENE CONGRESS.

THIS Congress, which was organised by the British Social Hygiene Council, was formally opened on Monday in the Livingstone Hall, under the presidency of the Marquess of Linlithgow. The problem of venereal disease being international as well as national, it was fitting that such bodies as the League of Red Cross Societies, the League of Nations, and the International Labour Office should be represented, and the presence of representatives of the Dominions and Colonies testified to the importance attached by them to the campaign against venereal disease. It became evident early in the Congress that the British Social Hygiene Council has established an extraordinarily close liaison with even the most remote corners of the Empire, and the large number of delegates from India was plain evidence of the interest taken in venereal disease in that country. International and Imperial congresses are usually rather impersonal affairs; they suffer from an atmosphere of austerity which the efforts of the most human of chairmen seldom succeed in mitigating. On this occasion, however, the meeting seemed more like a gathering of a clan, whose members were already well known to each other, than a formal congress, and the discussions which followed the papers revealed—one might almost say betrayed—a frankness to be found more often in the bosom of a family than in the precincts of a public building. The chairman's request to the press towards the end of the first meeting that it should withdraw in order to encourage freedom of speech did not, when the Congress was left to itself, yield a crop of candid and lurid speeches. Not a bit of it. Evidently the time has passed when the men and women engaged in the campaign against venereal disease feel that they must maintain a genteel silence, "yea even from good words," and some of the questions put to those who had read papers were as fearless as they were searching. Perhaps the most interesting of these questions was raised by a woman who asked: "What, in your opinion, is the effect of preventive outfits on the morals of the young men on whom they are bestowed?" It was not a question easy to answer offhand, and the person to whom it was addressed evidently thought that discretion was the better part of valour. But later in the same meeting the chairman, Mr. E. B. Turner, when summing up the main features of the discussion, took up the challenge of this question, answering it in unequivocal terms. To give point to his opinion he told the Congress of a young officer who had contracted syphilis and who believed the preventive outfit, giving him the thought that he was safe, had induced him to let himself go. At the meeting on Tuesday morning the discussion largely resolved itself into an advocacy, by speakers north of the Tweed, of compulsory measures in connexion with treatment. Some account of the proceedings will be given in a later issue.

THE CRESCENDO MURMUR OF MITRAL STENOSIS.

THE hypothesis that the crescendo murmur in mitral stenosis is attributable to auricular systole has been generally accepted since Mackenzie drew attention to the characteristic alteration which takes place in the physical signs when auricular fibrillation supervenes. Occasionally, however, even in the presence of fibrillation, the obstructive murmur appears to have a definitely crescendo character. Mackenzie himself referred to such cases, and put forward a tentative suggestion that in them the murmur was produced in a different way—namely, by slight regurgitation at the mitral orifice. This explanation is unsatisfactory, and on reconsidering the whole question Eggleston[1] comes to the conclusion that the apparent crescendo character of the murmur is an aural illusion, depending on the accentuation of the first heart sound. As many previous workers have pointed out, when the heart-rate is slow the obstructive murmur in fibrillation terminates before the end of diastole, and is then diminuendo in character. When, however, two heart cycles follow one another in rapid succession, the murmur fills the whole of diastole, and is continuous with the first heart sound. It is only under these circumstances that it appears to have a crescendo character.

DENTAL SURGEON'S LIABILITY FOR WATER-SUPPLY.

IT seems a little ridiculous that a dental surgeon should be liable to a special charge for water-supply in respect of the water used at the chair in his consulting-room. The Manchester Corporation has, however, recently succeeded in a claim of this kind. The legal position varies in different districts since water-supply is mostly governed by a special Act of local application. The undertakers are usually required to supply houses with domestic water at a charge depending on the rateable value of the premises, and are usually allowed to supply water *for trade and non-domestic purposes on such terms* and conditions as they think fit—normally by meter at special rates. In 1863 the Waterworks Clauses Act gathered up in one convenient code a set of model clauses which are often incorporated in local legislation about water-supply. Section 12 of the 1863 Act explains that "domestic purposes" do not include water-supply for cattle or horses or washing carriages or horses where the carriages or horses are kept for sale or hire, or supply for any trade, manufacture, or business, or for watering gardens or for fountains or any ornamental purpose. But, as already stated, the law in a particular town depends upon the local Acts which operate in that area, and, even when the Acts are studied, the principles are not too easy to apply. If the courts are asked to distinguish between water-supply for domestic purposes and water-supply for a trade, business or profession, what test are they to apply? Even if a trade or business is carried on in a house, the persons in the house must be entitled to water for domestic purposes. It is not enough, said Lord Dunedin in Metropolitan Water Board *v.* Avery, to argue that a trade is carried on in the premises or that the people who use water on the premises only go there because a trade is carried on. The test is the purpose for which the water is used, not the character of the premises. Lord Dunedin rejected the alternative test, which would suggest that every use of water, however domestic in its nature, which appears as a step (however insignificant) in a trade operation, must be use of water for a trade and therefore not for domestic purposes. In Avery's case the Metropolitan Water Board admitted that they did not charge public-houses at more than the domestic rate, though the nature of the business must involve constant washing of mugs and glasses. It would be absurd, said Lord Dunedin, if a shopkeeper could not even wet a sponge to clean dusty goods without being liable for water at a trade rate. The true test, therefore, is not whether water is used in the course of the trade, but whether the use is in its nature domestic or not.

In the recent Manchester case, the plaintiff corporation contended that the dental surgeon, using the water in the course of his practice, was carrying on a trade or business within the meaning of the local Acts applicable, alternatively that the water used at the dentist's chair was used for other than domestic purposes. Mr. Justice Eve ruled against the corporation on the second of these alternatives, but decided in favour of the corporation upon the construction of the language of the special Manchester Corporation Waterworks Acts because one of those Acts provided that the corporation need not supply any dwelling-house with water

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[1] Eggleston, Cary: Amer. Jour. Med. Sci., 1929, clxxvii., 153.

themselves indications for operation in the early stage of the disease; and he furthermore believes that, in spite of radical exenteration of the mastoid, early operation offers no guarantee against late complications. On the other hand, Prof. Haymann regards the outlook as very different when the acute stage of the middle-ear inflammation has passed and there are symptoms pointing to localisation of suppuration in the mastoid. Here the prospect of recovery without operation is much less and the danger of endocranial complications very much greater. An exact time-limit is impossible to fix, but he considers that the period when mastoid symptoms acquire a serious aspect is somewhere after the second week from the onset of the acute middle-ear inflammation. Again, the persistence of a profuse creamy purulent discharge, lasting, say, six weeks, is an indication for operation in the absence of all other symptoms. He draws attention to the group of cases in which all symptoms are absent except that the membrana tympani remains somewhat thickened and the diminution of hearing persists; in these cases, usually due to infection by *Streptococcus mucosus*, extensive bone disease is often found at operation, particularly where the patient is over 40 years of age. Prof. Haymann supports his conclusions by statistics of 791 cases of acute otitis treated on these principles. Among them there were 25 deaths attributable to disease of the ear, and of these 7 were in patients brought to hospital in an advanced stage of neglected disease. These results are so good that his contention deserves the careful consideration of otologists.

THE HEALTH OF THE NAVY.

As the Statistical Report of the Health of the Navy for 1927 has now appeared [1] it can be stated that the illness and mortality-rates per 1000 in the three Services in that year were as follows: Navy, cases 479·05, deaths 2·15; Army, cases 467·7, deaths 2·42; Air Force, cases 467·8, deaths 4·15. The Navy health report provides evidence of considerable improvement, for it claims the lowest death-rate from all causes yet recorded, and a death-rate from disease (1·36) equal to the lowest, which was in 1925. The death-rate from injury (0·76) is notably low, being about a quarter of that of the British seamen in the merchant marine in the same year. There were in the Navy in 1927 92,230 men, and, as we have stated, the incidence of disease and injury per 1000 was 479·05. There were more numerous cases of influenza and respiratory diseases than in the previous year, but many fewer of the infectious fevers, and it is notable that there were 36 fewer cases of tubercle of the lung (151 in all). Invaliding was less at 13·8 per 1000 (18·12 in 1926), the chief causes being errors of refraction 234, ear disease 199, and tubercle of the lung 159. For refusing surgical operations only 37 were this year invalided, 10 fewer than in 1926, which shows the increasing confidence of the men in their medical officers. Deaths were also reduced to 2·15 (from 3·18 in 1926), the chief causes of death being drowning 27, injuries 25, and tubercle 20. Enteric fever cases were slightly increased to 18 (2 deaths); one of the cases was that of a medical officer who contracted paratyphoid in a laboratory. Influenza (2562 cases with 1 death) attacked chiefly the Home Station, the incidence there being three times as great as in the fleets abroad. Pneumonia and rheumatic fever slightly increased. Pulmonary tuberculosis again decreased, and especially at ages above 25. Under 25 the tuberculous cases invalided were 62 this year as compared with 67 last year; over 25 they were 97 as against 114. Ages are classified this year in five-year groups, as they should be in all such statistics if the figures are to be readily compared with those published by other organisations. But why are the "cases" in Table III. (p. 12) given as 143, and in Tables I. and II. as 151, as also on p. 72? Last year they were 187 everywhere. Tubercle of the lung shows more cases in the "service afloat" (1·7) than on the Home Station (1·45); its incidence on ships' cooks is remarkable (4·45). Cases of venereal disease have slightly decreased; local disinfection with calomel cream and mercuric iodide soap is always available, recreation is encouraged, and warnings are seriously given. The period of treatment for gonorrhœa has decreased by two days per case. More dental officers were available, so more teeth were conserved—63,716 against 58,527. We miss in these brief statistical reports the often interesting stories of medical officers about their experiences—so noticeable a feature in the past—but we are this year given account of an outbreak of beri-beri in a sloop doing an extended tour in the Persian Gulf in summer. Four Europeans and four natives were affected. Fresh vegetables could not be procured, there was little fruit, and much of the food came out of tins. Disinfection was carried out weekly, unpolished rice was issued, dried peas were soaked for 48 hours before cooking (it is not stated that they were allowed to germinate), and yeast was given. Only teetotallers were affected, and only the local beer is mentioned as having had a possibly curative influence on the disease. It will be recalled by students of naval medicine that fresh vegetables and beer are supposed to have maintained the health of Lord Hawke's fleet in 1759 before the Battle of Quiberon Bay Among the cases then spoken of as scurvy were there perhaps some that were really unrecognised beri-beri? Much research work was done in 1927 at the Royal Naval Medical School, Greenwich, on oxygen analysis, swimming-bath water, regeneration of air in submarines, and vaccines; also what is described as "a lot of laborious" experiments on the testing of disinfectants. The Marines at headquarters are still excluded from the summary of the total force (pp. 13 and 72), but their invalids are included on pp. 20–23. There is still no sanitary report on the cadets at Dartmouth, and we are sorry to see that the price of the Report has been raised.

"WITHIN THE RANGE OF MEDICAL SERVICE."

AN inquiry has been held at Manchester upon the question whether treatment of varicose veins in the leg by intravenous injection of a sclerosing solution is within the range of medical service as set out in Article 43 of the Medical Benefit Consolidated Regulations of 1928. This treatment was administered in May, 1928, to a female insured person by her panel doctor of Manchester, and both the local insurance committee and the local medical committee were in agreement in holding the view that it was outside the range of medical service. The matter being referred to the Minister of Health, Mr. E. H. Tindal Atkinson (Barrister-at-Law), Dr. E. Collingwood Andrews, and Dr. Alexander Forbes were asked to inquire and report. For the purposes of this inquiry the treatment is thus briefly described.

> The vein is punctured by a hypodermic needle attached to a syringe and into the vein is injected a pre-determined quantity of sclerosing solution. The solution has the effect of forming an adherent clot in the vein which ultimately results in obliteration. A number of injections may be necessary in accordance with the length of the vein requiring treatment. Particular care has to be exercised to avoid the entry of air into the vein and to ensure that the solution shall pass only into the vein and not round it or into the adjoining tissues. The most ordinary solutions in use are sodium salicylate and urethane and quinine and urethane.

No question was raised as to the possession by the panel doctor of special skill qualifying him to administer the treatment and the referees assumed that he did in fact possess such special skill. On behalf of the Minister it was contended: (1) That the operation is not difficult or dangerous. (2) That as compared with the taking of blood for the Wassermann test the operation can as certainly be regarded as within the range of medical service. (3) That knowledge of the technique can be acquired from text-books and requires no particular training either in the actual administration of the treatment or in the judgment requisite to decide on the advisability of its use. (4) That the treatment, while admittedly modern, has become so well known that any ordinary practitioner should in a proper case be prepared to adopt it. (5) That the risks of any adverse effects are negligible in the light of statistical knowledge. On behalf of the insurance and panel committees it was contended: (1) That a considerable degree of skill is required at least equal to that necessary for the injection of salvarsan or its substitutes, particularly also where ulceration is present. (2) That at the present time there has not existed sufficient experience of the treatment and its results to justify its inclusion in the range of medical service. (3) That there are many contra-indications against the treatment—e.g., it is dangerous in the case of a pregnant woman or in certain cases where heart disease or high blood pressure is present or in the case of patients who have some idiosyncrasy to quinine or salicylate. (4) That the standard of skill in the Manchester locality is such that the treatment may fairly be regarded as special and not of such a character that it should be carried out by the ordinary insurance doctor. (5) That statistical knowledge as to after-effects is not sufficiently established.

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[1] H.M. Stationery Office. 1929. Pp. 147. 5s.

The referees found for the Minister. While admitting that injection treatment of varicose veins is modern, they note that it is now practised with success in a very large number of cases. The technique is not difficult and any panel doctor should be able to decide whether the patient is a fit subject for the treatment. There may be no substantial difference in the actual technique of the two injections, but the referees thought the possible risks attendant upon salvarsan treatment to be such as to render it not fairly comparable with injection for varicose veins. Two of the referees, however, felt that when the treatment was actually applied in Manchester in May, 1928, it might then have been regarded as in an experimental stage, although this was no longer true at the time of the inquiry.

THE AMERICAN COLLEGE OF SURGEONS.

THE nineteenth annual Clinical Congress of the American College of Surgeons will be held in Chicago on Oct. 14th and the four following days under the presidency of Dr. Franklin Martin. All departments of surgery—general surgery, gynæcology and obstetrics, and the main special branches of surgical practice—are represented in the programme, and demonstrations will be given in the laboratories attached to the hospitals and schools of the four great universities of the city, the Northwestern University, the University of Chicago, the University of Illinois, and the Loyola University. On the first day of the session the President-elect, Dr. Merritte Ireland, Surg.-Gen. U.S.M.C., will be inducted into office and deliver the annual address, after which Mr. D. P. D. Wilkie will deliver the Murphy Oration.

An important feature of the meeting will be the Hospital Conference, in connexion with which great efforts have been made to present short papers and practical demonstrations dealing with many questions of hospital efficiency, and it is hoped that round-table discussions on the various problems will be of service not only to the scientific staffs of the institutions, but to hospital trustees, boards of management, and directorates. The Conference will open as soon as the College is in session, its proceedings taking place in the grand ballroom of the Stevens Hotel, where the general headquarters of the Congress will be established.

Attendance at the Congress [illegible] to a number that can be comfortably [illegible] in their groups at the various clinics, [illegible] be necessary for visitors to register in advance their intention to be present. The executive body in Chicago has for chairman Dr. L. Kretschmer, and secretary Dr. Loyal Davis.

COMPOUND COMPOSITE ODONTOMES.

THE study of odontomes is one of the most fascinating branches of dental pathology. Mr. A. T. Pitts has recently described to the Royal Society of Medicine[1] three of those rare types known as compound composite odontomes which, under Sir John Bland-Sutton's classification, were called compound follicular odontomes. The first case occurred in a boy aged 15, and the odontome was found in the region of the right upper canine and the adjoining premolars. It appeared as a hard irregular swelling about the size of a filbert nut. Clinical examination, even with the aid of a radiogram, did not enable Mr. Pitts to determine whether it was a complex or a compound composite odontome. At the operation, however, 18 separate denticles were discovered. No definite capsule could be found surrounding the whole tumour; but some of the denticles appear to have had an investing membrane, whilst others were embedded in fibrous tissue. One of the calcified masses contained enamel, dentine, and cement. The dentine was well formed; but the enamel, as so often happens when it is found under pathological conditions, was granular. In another denticle, from which a section was obtained, no cement was found. The largest piece consisted of four or five denticles fused together in an irregular mass. In all of the larger denticles radiograms showed evidence of the presence of a pulp canal. The second case was that of a boy aged 3 years and 8 months, who presented a hard rounded swelling in the region of the right upper deciduous incisors which had failed to erupt. A mass of nine denticles could be seen in the radiogram; and, in this case, a correct diagnosis was made before the operation. The missing deciduous central and lateral incisors were in close relation to the denticles which were enclosed within a capsule and the latter was continuous with the tooth sac of the first deciduous incisor. The permanent incisors were lying above the swelling. The largest denticle consisted of a trituberculur crown with a single stunted root. The other denticles resembled conical teeth. The third case occurred in a boy aged 14, and this presented six supernumerary teeth in the left upper first premolar region. The boy gave a history of having himself removed four supernumerary teeth from the same region, previous to his visit to a dental surgeon for treatment.

It is a moot point whether this last case should be classed with odontomes at all. Many pathologists would not have placed it here. But the line of demarcation between abnormally formed teeth and odontomes is by no means clearly defined. Long ago, Albrecht taught that tumours are malformations, and that it is not always possible to distinguish new growth from development. Prof. G. W. Nicholson also regards tumours as aborted organs. Mr. Pitts himself puts forward several suggestions. First, he raises the question of the possibility of odontomes erupting like ordinary teeth. There seems to be no reason why they should not do so, provided the conditions correspond with those which are essential for the eruption of a tooth. Undoubtedly, many odontomes do pass through this process; but others remain embedded within the jaw, or only become exfoliated as a result of suppuration and necrosis of the overlying bone. When the epithelial remnants of the tooth band (which Mr. Warwick James has described as the determining factor in directing the tooth to its final position in the jaw) remain in their correct relationship, the odontome may erupt like a tooth. But the aberration which leads to the formation of a tooth tumour often involves these epithelial structures; and then, if the becomes exposed to the surface it may be a process of exfoliation rather than one of eruption. Mr. Pitts also refers to the manner in which one type of odontome may blend with another type. Many pathologists who have investigated these tumours recognise this fact and it is this which makes the classification of some cases very difficult. In his first case four or five denticles were fused together in one mass, but so long as the minute structures of denticles are not inextricably mixed up with one another there is no reason for considering this mass to be a *complex* composite odontome. Some years ago Bland-Sutton described the case of a woman who "spat out" a mass, consisting of dental tissues fused together, which appeared to be a collection of independent denticles united by cement and might well be included under the group called compound composite odontomes, rather than under the complex composite odontomes. On the other hand, some of the individual denticles contained within a compound composite odontome may be of the complex composite variety. With regard to the third point which Mr. Pitts raises on these cases, it seems evident that an odontome may arise from the original tooth band; or may be due to an aberration of the deciduous or the permanent tooth germ, or to that of a supernumerary tooth. Very few compound composite odontomes have been fully recorded, and all who are interested in the study of odontomes must feel grateful to Mr. Pitts for the very careful manner in which he has described these cases.

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[1] Proceedings of the R.S.M., 1929.

XIIITH INTERNATIONAL OPHTHALMOLOGICAL CONGRESS.

It will be timely to remind any who propose to attend this Congress, which will be held at Amsterdam from Sept. 5th to Sept. 13th, that if they will send their subscriptions now it will greatly facilitate the work of the National Committee. We learn that 700 members have already been enrolled and that 232 communications, covering all branches of ophthalmology, have been promised. It is certain, therefore, that those who find themselves unable to be at the meetings will find it extremely useful to possess the Transactions, which promise to form a compendium of recent work in ophthalmology. So those who cannot go to Amsterdam will reap a real advantage by becoming members of the Congress, when they will be supplied with a copy of the Transactions as soon as they appear. The subscriptions (25 Dutch florins = £2 2*s.* English money) should be sent to Dr. H. M. Roelofsz, Director of the Incassobank, Heerengracht 531, Amsterdam.

On the recommendation of the Minister of Health, the King has been pleased to appoint Dr. Bedford Pierce to be a temporary Commissioner of the Board of Control.

Lord Dawson has been re-elected President of the Royal Society of Medicine for another year The hon treasurers for the year 1929–30 are Dr. A. M. H. Gray and Mr. W. Girling Ball; the hon. secretaries Mr. E. K. Martin and Dr. George Riddoch; the hon. librarians Dr. William Bulloch, F.R.S., and Mr. H. W. Carson; and the hon. editors Dr. Hugh Thursfield and Mr. J. Swift Joly.

Sir Albert Levy has set aside £250,000 to form a fund for the support of hospitals and other charitable objects. The whole of this sum, plus interest, will be distributed "in 25 yearly instalments," the total amounting to about £400,000, of which £100,000 has already been allocated for hospital purposes. A division of one twenty-fifth part of the capital and income will be made on May 1st and Nov. 1st of each year, and communications may be addressed to the secretary of the Albert Levy Benevolent Fund at 5, St. James's-place, London, S.W.1. Sir Albert is treasurer of the Royal Free Hospital, to which he has lately made two gifts of £50,000 each.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXVII.

CHARTS OF FRACTIONAL TEST-MEALS.

Part II.*—Abnormal Curves.

Charts Showing High Acidity.

In Fig. 3 and Fig. 4 are given examples of typical charts showing high acidity. It will be seen that in both of them there are *at least* two readings of free HCl above 50. When this is encountered it is always true to say that the case is *probably* from a pathological subject, although, as was noted last week, such a chart is occasionally encountered in a healthy person. Fig. 3 shows a rapidly rising curve of acidity with rapid emptying of the stomach, which is more frequently encountered in cases of duodenal or juxtapyloric peptic ulcer than in any other condition. It is, therefore, correct for the pathologist to report that the chart is suggestive of such a condition. It must be emphasised that neither this nor any other type of chart can ever be conclusive evidence of the presence of an ulcer.

Fig. 4 differs from the preceding one in that the curve of acid (both free and total) rises slowly without perhaps reaching such a high concentration as in the last condition. It is typical of what is sometimes called the "climbing curve"—i.e., there is no drop in the acid in the later stages, probably because spasm or obstruction of the pylorus is preventing the free regurgitation of alkali through the duodenum. Such a chart is characteristic of many cases of gastric and juxtapyloric ulcer, and suggests that without such a degree of irritability of the stomach as is present in cases producing Fig. 3 there is some impediment to the pyloric outlet.

In Fig. 5 is shown a chart of the "Plateau" type which is characteristic of pyloric obstruction. Such a chart would be prolonged for three hours or longer, depending on the patience of the subject and observer, and if the stomach is completely emptied at 2½ hours, the amount of contents recovered at that moment will probably considerably exceed 100 c.cm. Such a chart is diagnostic of pyloric obstruction, and it will further be noted that in such cases the concentration of HCl is seldom so high as in the cases discussed previously, and that there is a greater disparity between the curves of free and total acidity owing to the presence of organic acids resulting from fermentation.

Low Acid Charts.

Fig. 6 is a typical example of complete achlorhydria of the "benign" type. There is complete absence of HCl and total acidity is also low. Emptying is usually rapid and may be very rapid. It would be beyond the scope of the present article to discuss at length all the possible interpretations or causes of such a chart, but the following points must be emphasised:—

1. It occurs in about 5 per cent. of normal healthy men.
2. It is present in probably every case of pernicious anæmia.
3. It is occasionally, but somewhat uncommonly, present in cases of cancer of the stomach.

Apart from such cases of complete achlorhydria, cases are sometimes met with in which there is a trace of free HCl at one or two readings only. Great hesitation must be observed before considering any such chart as indicative of a pathological condition. It is a very common finding in perfectly healthy people who are nervous or who have been upset by

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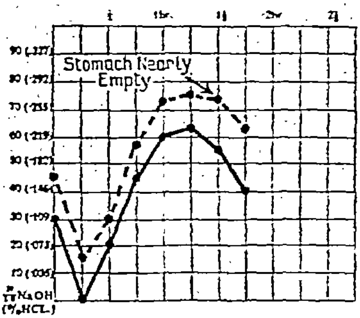
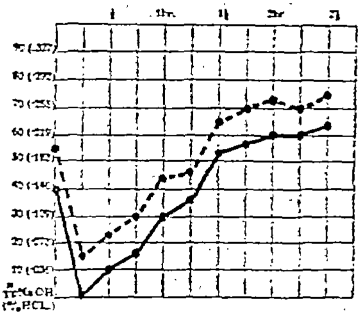
* Part I., on the Interpretation of Charts of Fractional Test-meals, appeared last week.

FIG. 3.



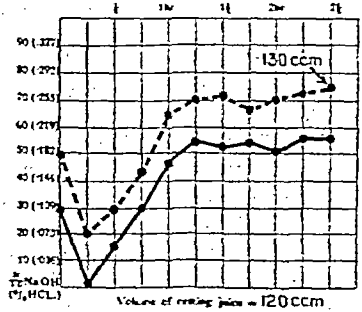
Showing a rapidly rising curve of high acidity, suggestive of duodenal or juxta pyloric peptic ulcer.

FIG. 4.



Showing a slowly rising curve of high acidity, suggestive of some impediment to the pyloric outlet.

FIG. 5.



The "plateau" type of curve, characteristic of pyloric obstruction.

FIG. 6.

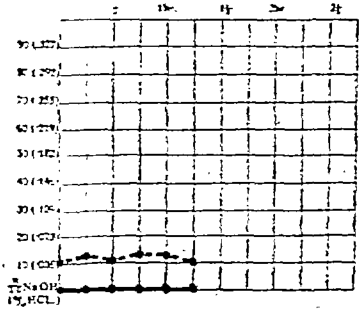
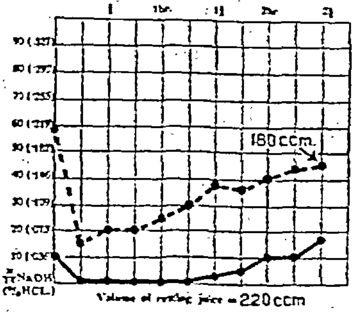


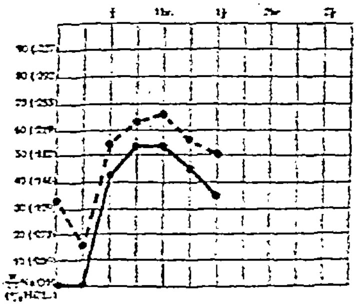
Chart typical of complete achlorhydria.

FIG. 7.



Showing very low free HCl but a considerable concentration of total acidity.

FIG. 8.



Showing free secretion of acid with rather rapid emptying.

the difficulty of swallowing the stomach-tube. In my opinion the most that can ever be said of such a chart is that it suggests some interference with the proper secretion of gastric juice. The laboratory worker is never justified in proceeding to give reasons for such an interference, which may be congenital, acquired, organic, or functional. Further, it may be said that such a result should be obtained on more than one examination before it is accepted as a constant finding in any subject.

Charts Found in Cases of Gastric Carcinoma.

Gastric analysis finds perhaps its most useful application in the diagnosis of cancer of the stomach. Reference to the text-books reveals a diversity of opinion as to what the findings are in cases of this disease. This is due to the fact that gastric cancer does not give a constant picture either to the clinician, the radiologist, or the laboratory worker, it being a disease the manifestations of which vary according to the nature and exact situation of the neoplasm. Small growths obstructing the pylorus will necessarily produce an entirely different picture from diffuse growths of the body of the stomach, and the leather-bottle stomach, now generally accepted as malignant, will give a picture to the analyst entirely different from that seen with a growth which is discharging a profuse mucoid secretion.

Controversy with regard to the findings of gastric analysis of cases of carcinoma of the stomach usually centres round the question whether or not free HCl is found. It may be said at once that this criterion is of little diagnostic value, as from 40–60 per cent. of cases of gastric carcinoma will show a certain amount of free HCl if proper precautions are taken for demonstrating it. A second point which has occasioned much controversy is the significance of the presence of lactic acid. Nothing dogmatic can yet be stated on the subject beyond the fact that lactic acid is not invariably present in cases of cancer of the stomach, and is occasionally present in cases without any malignant disease.

To proceed from these facts to the assumption that gastric analysis is of no diagnostic value in cancer of the stomach is a profound mistake, gastric carcinoma being capable of detection by this method probably in as great a proportion of cases as when X ray examination alone is made.

The following are, in my opinion, the most frequently occurring types of chart encountered in this condition:—

1. The "benign" achylia described above and illustrated in Fig. 6. In cases of carcinoma of the stomach, this chart will differ from that seen with pernicious anæmia, owing to the fact that (*a*) blood tends to be present in the fasting juice and in later specimens, (*b*) a profuse secretion of mucus is often found, and (*c*) emptying is not, as a rule, as rapid as in cases of true benign achylia.

2. Charts showing low or absent free HCl, but a considerable concentration of total acidity. An example of this type of chart is given in Fig. 7. The fasting stomach content in such cases is nearly always abundant, often foul, and frequently contains partly digested food. It can be made more obvious by giving the patient one or two charcoal biscuits to eat late in the evening prior to examination. Fragments of charcoal are then demonstrable when the stomach is emptied on the following morning. It is frequently almost impossible to empty the fasting stomach in these cases, and the high total acidity with absence of free HCl in subsequent specimens is due to the fact that the meal has been swallowed into a stomach which still contains stagnant contents. It is owing to the fact that such contents have not been washed clear of the gastric mucosa that the test-meal fails to provoke a secretion of HCl after it is swallowed. Food, often partly digested, is frequently present in all specimens. The whole chart is really a picture of gross pyloric obstruction, a condition which is almost invariably the result of a new growth in that region.

3. Fig. 8 is taken from a case of cancer of the stomach in a young patient. It shows a free secretion of acid with rather rapid emptying, and by itself gives no clue to the diagnosis. It will, however, be observed that in the fasting stomach the contents show no free HCl, but a relatively high total acidity; in actual fact 40 c.cm. of fluid containing much mucus, altered blood, and fragments of charcoal, and having a foul smell, constituted this fasting stomach specimen and enabled a diagnosis to be made with some certitude. Without constituting a characteristic group as regards the shape of the curve, cases of this type are characteristic of an appreciable percentage of examples of cancer of the stomach and illustrate the importance of warning the observer in advance of the diagnosis which it is sought to confirm, as only by this means may the necessary data be obtainable.

General Conclusions.

It is hoped that study of what has been written above will convince the reader that whilst fractional gastric analysis is by no means the short-cut to definite diagnosis which it has been imagined to be in certain quarters, it is, if carefully carried out, an extremely valuable aid to the diagnostician. It differs from the majority of laboratory procedures in that it is essentially an inexact method from which conclusions can only be drawn by paying attention, not to chemical accuracy alone, but also to careful technique in the collection of the specimens and critical moderation in the interpretation of results. In my view, fractional gastric analysis should be a *clinical* more than a laboratory method of examination. It involves the expenditure of a considerable amount of time by both the patient and the observer, and it is only when both parties are prepared to make this sacrifice that valuable results can be obtained with any frequency.

T. IZOD BENNETT, M.D., F.R.C.P. Lond.,
Physician to Out-patients, Middlesex Hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. F. G. Goble is placed on the Retd. List with rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. A. C. H. Gray to be Bt.-Col.

Maj. C. M. Drew to be Bt. Lt.-Col.

Maj. N. Cantlie is placed on the half-pay list on account of ill-health.

ARMY DENTAL CORPS.

Capt. W. R. Wotton to be Maj.

TERRITORIAL ARMY.

Maj. J. Ramsay to be Lt.-Col. and to comd. 12th (2nd Western) Gen. Hosp.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. (Bt. Col.) D. Dougal from Active List, to be Lt.-Col. (Bt. Col.).

ROYAL AIR FORCE.

Group Capt. J. McIntyre to be Air Commodore.

Wing Comdr. J. MacGregor to be Group Capt.

Squadron Leader P. M. Keane to be Wing Comdr.

Flight Lts. J. K. R. Landells and E. D. D. Dickson to be Squadron Leaders.

Flight Lt. E. E. Isaac to be Hon. Squadron Leader.

INDIAN MEDICAL SERVICE.

Maj. Mohamed Abdur Rahman to be Lt.-Col.

COLONIAL MEDICAL SERVICES.

The following appointments have been made: Dr. C. J. Boyd, Medical Officer, Federated Malay States; Dr. W. G. MacNaughton, District Medical Officer, Fiji; Dr. H. A. MacMillan, Medical Officer, Kenya; and Mr. L. L. Burton, Colonial Surgeon, St. Helena.

Special Articles.

THE FUTURE OF MEDICAL PRACTICE.

AN ADDRESS BY LORD DAWSON.

IN the course of an address delivered when distributing prizes to students at the London Hospital Medical College on June 28th, Lord Dawson said:—

It is only natural that you should be dazzled by the fascinating unfolding of all that radium is telling us, following as it does upon the steady progress of discovery in biochemistry, in radiology and other sciences; but the very dazzle of this discovery has dangers, because I would remind you that you are going to be men of action; you are going to come in contact with the sick, and all the results have to be judged by the criteria of the bedside. In order to learn disease as it affects mankind you must study mankind. Disease is not a standardised product; for, thank heaven, man preserves his individuality in sickness as well as in health; otherwise it would be an uncommonly dull world to live in. Therefore, if you are taking a history and are not a little bored at the tedium, and inclined to say "Why cannot the Lab. do this for us?" my urging to you is "Don't." Take the trouble. For every moment of it you will be rewarded. There you are learning how symptoms vary and what they stand for, not only in the abstract, but in *that* patient. You are gaining insight and perception and not only knowledge but understanding, and you are thinking of life not in terms of remedies but in terms of healing.

Now I come to what I think must interest you all most—namely, the future. That is the direction in which all eyes should look, for we live in an astonishingly interesting world which is going to show great changes. I would beg of you not to listen to the croakers who can be heard all around. The people who croak are those who are mistaking change for decadence. The great need of England to-day, as I see it, is that young men and women should think, and, having thought, help to direct the course of the nation. That is true of the profession of medicine as it is of other walks of life. The teaching of medicine in Britain to-day is very well done, but we do not give the world a very good opportunity of seeing that it is well done. If visitors come they see, but we do not put our goods much in the shop window—perhaps not enough. For research we are rich in brains, and increasingly rich in opportunity. All schools and universities are fully alive to the importance of the extension of knowledge; and I would like to say here that in the coördinating of effort and for encouragement we owe a tribute to the Medical Research Council.

It is to the field of general practice that we need to pay attention, for it would be a sorry day for any country were general practitioners to become weak in their work or their influence. *This is now a danger* in certain countries of the world.

The practitioner is one of our protectors against the "stunt" specialist. Only the other day an American lady said to me, "If I get an acute sore-throat I have no one to tell me what to do with it. Three specialists come in one after the other; one with a laryngoscope, the next to take my blood, and the third to take a culture, and by the time they all report I am either better or dead."

Again, it is to the interests of the community to identify the practitioner with the health of the people and to give him this career.

I will put *certain questions* to you. *Is it not a* fact that practice is becoming grouped around occupations and social needs, and less located in the home? The needs of the expectant mother, care of the child, the treatment of tubercle, are all examples of the classification of practice round needs. The uprising of medical and welfare services in the hives of industry is a striking development which deserves the attention of all doctors who have their lives in front of them. Think what these places offer. They are provided with clinics, with hospitals, and even with laboratories. There they look at the workpeople, and test their fitness for this or that kind of work, thereby not only securing better output, but saving an unjust burden being put upon the backs of men whose physique is unsuited to bear it. You have only to go through the wards of this hospital, and time and time again you see a poor man about 40 or 50, nothing else wrong with him but this—and a grave wrong it is—that he has been a blacksmith or a lighterman when nature meant him to be a tailor. That fitting as regards employment—fitting the round peg into the round hole—is a duty that should come under the mantle of the medical profession.

Further, is it not plain that more clinic and hospital provision is needed? You cannot afford to allow this question to rest. By a recent Act of Parliament the local authorities throughout this land are taking on a new chapter in their work and responsibilities in regard to the sick. They have the power to found clinics and hospitals. I wish to put this before you: Clinics and hospitals must not only be thought of in terms of great teaching institutions like this. They are required everywhere—though varying in size and the simplicity and complexity of their functions—and to some of them general practitioners should have access. Thus there would follow what we want to see: fewer visits and better opportunities for good work at each visit.

I beg of you, therefore, to give these questions your careful attention, and to see to it that in the shaping of the health policy of this country regard is had to them. It is said that the problem of general practice, *in its relation to hospital provision and the* problem of how to treat patients of limited means, has been solved in Germany and the United States. I tell you it has not been solved anywhere. It remains for this country to do so, but success in that direction will depend upon the vigour and the worth of the younger medical men who are coming to the fore. By the securing of better opportunities, by responsible contact with the health organisation of local government, I think you will find that the centre of gravity of your work will move towards prevention and early diagnosis, and that you will rise up as the interpreters of health to the people.

MEDICAL PRACTITIONERS AND MOTORISTS.—In our last issue (p. 50) we referred to the *Manchester Guardian's* recent questionaire on payments to hospitals by motorists injured in road accidents. The same newspaper has since published replies received from medical men practising in or near Manchester showing "that the skilled attention which the general practitioner gives to victims of motor accidents too often goes unrewarded and even unacknowledged." One writer reports having treated 13 cases without receiving any fee. Another says that he is seldom paid by casual persons involved in motor or motor-cycle accidents. Moreover, *it is not usually worth while to take action to* compel payment, for it would cost as much as the actual cost of treatment. Another doctor finds that when the patient is not one of his own clients payment for services rendered is frequently very difficult to obtain, especially from motor-cyclists, who are often uninsured against accident. The same experience applies to all casual street accidents, however caused. Additional replies from hospitals include one from the Royal Infirmary, Glasgow, where during 1928 the number of in-patients treated suffering from motor accidents was 601 and the average cost per patient was £7 16*s*. and out-patients treated numbered 608. No charge was made for these cases, and very little was contributed by any injured person voluntarily. The infirmary suffers from having to treat these accidents to the amount of approximately £1600 per annum. The number of motor accidents admitted to the Cardiff Infirmary in 1928 was 233, and the total number of days in hospital was 1169. The amount contributed was only £138 and the total cost to the infirmary calculated at 8*s*. a day was £1067.

THE BRITISH AND AMERICAN ORTHOPÆDIC ASSOCIATIONS.

THE British and American Orthopædic Associations held a joint meeting in London during the first week in July.

The meeting was largely attended, many notable orthopædic surgeons contributing papers and taking part in the discussions. The proceedings in London opened on July 4th, when Prof. E. W. **HEY GROVES**, President of the British Orthopædic Association, took the chair and introduced Dr. **FRED ALBEE**, who gave an address as President of the American Orthopædic Association. He referred to high-speed tools in bone surgery and dealt at some length with the anatomical, physiological, and pathological principles on which their use is based. The Robert Jones Medal was presented to Mr. E. P. Brockman for an essay on Club-foot, after which Prof. E. W. Hey Groves (Bristol) resigned his place to Dr. Albee while he himself opened the discussion on

Treatment of Fractures of the Neck of the Femur.

Prof. **HEY GROVES** said that the most likely sources of error in treating these cases were: (1) to suppose that spontaneous impaction was adequate on the strength of X ray evidence alone, since this evidence is often fallacious; (2) to attempt reduction in elderly patients before the initial shock had passed off; (3) to take it for granted that such fractures are uncommon in the young and do not carry the risk of non-union early in life; (4) to think that it is not worth while reducing the fracture and splinting it adequately in old patients. He then asked those about to take part in the discussion to answer the two questions: What are the end-results of the methods in present use; and what are the best methods, and if more than one, when is each most applicable?

Dr. **ROYAL WHITMAN** (New York), the originator of the abduction treatment which is now recognised all over the world as the best conservative method, followed Prof. Hey Groves and pointed out that his own cases are largely selected ones, so that his statistics could not be regarded as typical. In answer to a question, he said he could only remember one case of non-union among all those he had treated, and his cases included persons up to 86 years of age. He showed lantern slides illustrating his method and deprecated the modifications introduced by various surgeons, who have overlooked the importance of its details. He stressed particularly the need for traction on the limb, to draw it out to the same length as the sound one, before any abduction was attempted, and also of maintaining full internal rotation and of making the abduction exactly equal to the maximum obtainable on the sound side. This implied that the limbs must be held symmetrical until the end of the application of the plaster. He insisted on the value of team-work and showed a photo of an old lady to whom he had applied the plaster-spica in 7½ minutes under ethylene anæsthesia. His routine was to keep the patients in bed for one month, with frequent changes to the prone position and attention to the skin of the back under the plaster. He then allowed them up on crutches in the plaster for another two months. At the end of three months from the application of the plaster, it was bivalved and two or three months careful physiotherapy was given with re-education of the muscles and mobilization of the joints in recumbency; finally, a walking-splint was used till the end of the first nine to twelve months from the accident, under which time firm union could not be expected.

Dr. P. D. **WILSON** (Boston) demonstrated a steel nail with cutting triangular shaft, which Dr. Smith-Peterson had designed and had used for several years to secure fixation of these fractures. He advocated early open operation in all cases in view of the high percentage of cases of non-union even with the best conservative methods, and he stressed the danger of permanent stiffness of the knee after use of the long Whitman spica.

Sir **ROBERT JONES** (Liverpool), while recognising the excellent results obtained by those who advocated surgical intervention, emphasised the importance of standardising and popularising some conservative method which was applicable under the less favourable conditions met with by general practitioners and surgeons in country areas, for only so would the general level of results improve.

Dr. **ALBEE**, Dr. **WILLIS CAMPBELL** (Memphis), and Mr. **BLUNDELL BANKART** (London) referred to the poor blood-supply of the head of the femur in producing non-union even under the best treatment. Other speakers deprecated the lack of any uniform plan of treatment of these cases in our big general hospitals, where some cases are splinted for a week or two only, which is obviously inadequate, while others are kept in plaster many months, with no attention to the condition of the muscles or joints and no supporting apparatus when the plaster is removed from the limb. It emerged from the discussion and the statistics presented by a number of speakers that, even with the best methods known at present, non-union is to be expected in about 30 per cent. of cases; some speakers placed it as high as 45 per cent. All those who advocated surgical intervention agreed that it was essential to expose the site of fracture and reduce the displacement before attempting to insert any fixation material.

In summing up, Dr. **ALBEE** emphasised the advantages of his method of using an accurately fitted screw of living, autogenous, vascular bone and quoted experiments which showed that the boiled beef-bone was not well tolerated. Prof. **HEY GROVES** in reply said that the advocates of steel and live bone-screws produced arguments which cancelled one another and he remained convinced of the virtues of his simple and speedy method with the beef-bone screw.

In the afternoon Prof. V. **PUTTI** (Bologna) gave a short paper on the

Early Diagnosis and Treatment of Congenital Dislocation of the Hip.

This paper was illustrated with radiograms of single and double dislocations in infants under one year, including one a day old, and also illustrations of the abduction cushion, by which he has gradually secured reduction in six to twelve months without any forcible manipulation. He dwelt particularly on the chief points in the X ray diagnosis—i.e., shelving of the roof of the acetabulum, absence, or poor development, of the bony nucleus of the femoral head, and increase of the distance between the upper end of the femur and the floor of the acetabulum, even when the neck is not raised above Shelton's line. As regards clinical diagnosis in infants under one year of age, he held that the medical practitioner ought to be at least as observant as the mother, who often noticed inequality of the skin folds on the inner side of the thighs; asymmetry of the outline of the hip regions on the two sides; deepening of the groin hollow; shortening of one limb; and possibly undue mobility of one hip, or its limitation by tight adductors. The presence of any of these features demanded an X ray examination. Prof. Putti remarked how satisfactory in bringing early cases to light had been the intensive propaganda undertaken in Italy among practitioners, nurses, and midwives, and the compulsory training of medical students in orthopædics.

Treatment of Common Spinal Conditions.

Dr. J. E. **GOLDTHWAIT** (Boston) gave an address on the Basic Principles involved in the Treatment of Common Spinal Conditions as well as in the Function of the Viscera. In the short time allowed him he covered all the main features of the subject, including the influence of bodily types on the production of sprains and the significance of anatomical variations in relation to symptoms, these variations being illustrated by radiograms as well as drawings of many anatomical specimens. He also discussed the mechanics of the circulation and respiration, which he illustrated by fluoroscopic tracings of the movements of the diaphragm under different bodily conditions. He pleaded for a thorough examination of the whole patient stripped in cases with symptoms referred to the spine or abdomen, and for thorough X ray examination of the chest, including heart and diaphragm, as well as vertebræ.

On July 5th a discussion on

Reconstructive Surgery in Paralytic Deformities of the Leg

opened with a paper by Dr. MELVIN HENDERSON (Mayo Clinic), which was read in his absence by Dr. BRUCE GILL (Philadelphia). The communication supplied an interesting review of the methods which have been successively used to try to give stability to a lower limb in which paralysis of one or more muscles has upset the normal balance and led to poor function, with or without deformity. Dr. Henderson's figures of the varieties of operation and their results in 105 cases during the four-year period 1924–28 showed that the total percentage of operations was diminishing, as the result of more efficient early treatment, while the proportion of arthrodesis to other methods was steadily rising. [Both these features were noticeable also in most of the other statistics presented.] The essential message of Dr. Melvin Henderson's experience was that if once the delicate muscle balance of the normal lower limb is permanently disturbed, it cannot be restored by any rearrangement of the remaining muscles, nor can gravity be resisted for long by slings of artificial material or even of paralysed tendons; it is necessary to resist the progress of deformity by fusing the three main joints of the tarsus—i.e., the sub-astragaloid, astragalo-scaphoid, and calcaneocuboid—while certain cases demand removal of the whole scaphoid and displacement of the lower part of the foot backward on the astragalus, so as to shorten the part of its axis in front of the leg bones. Most of the subsequent speakers agreed with him that in suitable cases the transplantation of active tendons, or the use of paralysed ones as slings are a valuable supplement to the arthrodesis operation. With judicious selection of cases about 90 per cent. of good functioning feet can be obtained by the method.

Mr. LAMING EVANS (London) gave an interesting review of the progress of surgical treatment of paralyses in the lower limbs. He dwelt at some length on the *management of cases of complete, or almost* complete, paralysis of the quadriceps, stating that a transplanted biceps, an antagonist of the quadriceps during movement, can never be got to extend a flexed knee against gravity, whereas the sartorius, a synergic muscle, can do so. Subsequent speakers pointed out that the object of the transplant was to steady the knee-joint during standing, in which function the quadriceps and hamstrings normally contract simultaneously and, therefore, the transplant might very well restore balance; Dr. Royal Whitman, a staunch advocate of the transplanting operation, finds that it does so in all properly selected cases. All speakers condemned arthrodesis of the knee for a flail knee in childhood, though it was agreed that the operation might have its use for certain adults in special occupations. Mr. Laming Evans also referred to the risks of gangrene and shock in attempts to correct completely by operation severe flexion deformities of the hip and knee; these should be straightened gradually by apparatus after the operation. He found transplantation of the toe extensors into the metatarsal heads for clawing a disappointing operation, as have many other surgeons, and he advised in preference astragalectomy by Whitman's method, which with care and a wise selection of cases he found to give excellent results.—Dr. WHITMAN himself then spoke in support of his operation.—Dr. F. R. OBER (Boston) next emphasised some points which make for success in tendon transplantation operations, and referred to the need for combining them with arthrodesis in many cases.—Dr. L. MAYER (New York) showed an ingenious cardboard model illustrating all the stages of such an operation on a foot.

Dr. LE MESURIER (Toronto) gave some interesting facts about his work with Gallie on tendon-slings, and pointed out that slipping of the tendon is likely to occur if its smooth surface is not scraped away, and that union is best in cancellous bone. He said that the pioneers of the method have now abandoned it for drop-foot and valgus deformities, since the sling is unable to resist gravity, but it is still found useful for some varus conditions, as gravity helps to maintain their correction; it is also useful as a temporary measure in young children, whose bones are not yet developed sufficiently for arthrodesis. Most speakers agreed that the fusion operations gave the best results when done late, though it was mentioned that adults may complain of persistent pain after the operation, whereas this is practically unknown in children.

Dr. WALLACE COLE (St. Paul, Minn.) gave some interesting statistics on a series of 224 foot arthrodesis operations; only two had failed to secure bony union, while only 11 had required further operation; 80 per cent. had given excellent results. He showed clear diagrams of the principles of the chief types of operation in use and in his later cases was tending to favour the three-joint arthrodesis.—Mr. NAUGHTON DUNN (Birmingham), one of the pioneers of this type of operation, pointed out the danger of getting part of the correction of the equinus by downward angulation at the mid-tarsal joint, which gave a persistently painful foot. A number of speakers supported from their experience the practice of stabilising the foot by some type of bone operation before tackling the muscles themselves.

Clinical demonstrations were given at St. Bartholomew's, *Guy's, King's College, and St. Thomas's* Hospitals, and a visit was paid to Alton.

The morning of July 6th was occupied by a series of short papers, each of which represented a great amount of careful clinical work and research.

Disabilities from Low Back Derangement.

Dr. ELLIOTT BRACKETT (Boston) read a paper on the Treatment of Disabilities Resulting from Low Back Derangement, illustrated by lantern slides. Dr. Brackett pleaded for study and treatment of the lower part of the back with its three critical joints of the sacro-iliac and lumbo-sacral junctions *as one mechanism*, because it was impossible for a lesion of any one of the three to occur without altering the strain on the other two. He asked for further study to elucidate the mechanism of the production of pain in the region, which is by no means clear, and pointed out that there are no absolutely characteristic symptoms for each different lesion in this region; pathological conditions may give the same clinical picture as strain. He also asked for a careful study of the systemic condition of each patient and for a critical estimation of the relative importance of various factors in different cases. Among the factors to be weighed were trauma (strain of subluxation); anatomical abnormalities of the spine, such as sacralisation of the fifth lumbar vertebræ, a horizontal position of the sacrum, or abnormalities of the articular facets and of the laminæ and the presence of pathological processes such as tuberculosis or rheumatoid and osteo-arthritis. Finally the lesion in one or all of the three joints had to be localised. As regards anatomical variations Dr. Brackett dismissed sacralisation of the fifth lumbar as of no clinical significance; but he regarded a horizontal position of the sacrum as a factor making for constant, abnormal strain on ligaments and muscles and therefore of serious import. He reminded his audience that normally none of the joints in question allow much movement, but that they act as shock-absorbers. In the normal attitude of good posture, such as Dr. Goldthwait had demonstrated to them two days before, the shocks were reduced to a minimum, whereas alterations in the mechanical balance at once increased the strain on structures, and as soon as it became more than they were designed to meet symptoms arose. It was necessary to find out by careful X ray examination whether anatomical peculiarities were present, then to consider whether they had any effect in increasing the strain on the joints, and finally to treat this region, and indeed the whole body balance, as one mechanism.—Dr. A. **Steindler** (Iowa) emphasised this point.—Dr. T. D. **Adams** (Boston) remarked that the anatomical abnormality had existed from birth, whereas the symptoms came on late, so that they were likely to be due to some superadded pathological condition.—Dr. **Brackett**, in reply, said that he considered that the patient with an abnormal bone condition was likely to be slower in recovering and more subject to relapse, because he started with a smaller margin of safe reserve.

"No Dressing" Treatment.

Dr. **Winnett Orr** (Lincoln, Nebr.) next gave an interesting paper on the details of his "no dressing" treatment of infections of bones and joints. He said that the method was based on the principles originally laid down by the British pioneers, Hunter, Hilton and Lister, whereas modern surgery with its fomentations, irrigations, drainage-tubes, and frequent changes of dressings had got away from Lister's original and valuable technique, as well as from the application of rest which was so necessary to healing tissues. He illustrated his paper by lantern slides of cases showing remarkable results from his method, in a case of neglected osteomyelitis of the upper end of the femur, a compound fracture of the ankle in a very heavy, flabby subject, and two compound fractures of the shaft of the femur, one of which was septic and ununited after it had been plated at another hospital. In all these cases skiagrams were shown demonstrating good bony union and photographs of the patients proved the wounds healed or superficial and the general condition excellent. These and many others had been treated by the method of widely opening all septic cavities, cleaning them out with iodine and alcohol, and packing with gauze saturated in paraffin, which provided at once pressure and drainage; firm dry dressings were then applied without any stitching of the wound, and finally a plaster hip spica in any lesion of the lower limb. If one hip was affected, both were included in the plaster, so as to give absolute fixation of the joints in the affected region. No dressing was done under four weeks and often not till eight weeks, when the plaster and dressing were both changed under anæsthesia in the operating theatre. With this treatment, Dr. Orr said, the temperature falls, pain goes, and toxæmia diminishes within a few days of the initial drainage and splinting. In his view the failures of our present methods of treating acute and chronic bone sepsis are due to: (1) an inadequate primary operation, by which he did not imply that one should open indiscriminately into healthy bone areas when draining osteomyelitis; (2) failure of subsequent immobilisation, both by inadequate splinting and frequent interference; (3) secondary infection during repeated dressings under conditions not providing for absolute asepsis.

Prof. **Hey Groves**, in closing the discussion, said that Dr. Orr's paper would have read like a fairy tale, so revolutionary was his method, but his personality and lantern slides were so convincing that surgeons would feel bound to give his method an extensive trial. He asked the profession to differentiate between the two great groups of cases, which led to chronic bone sepsis—i.e., soiled compound fractures, which it was well known could be disinfected by careful operative technique, and the group of late osteomyelitis, which was septicæmic in character and allowed of no primary sterilisation.

It was evident from Dr. Orr's paper and from the remarks of the surgeons who followed him and have used his method with increasing success, that, as with other innovations which have proved useful, attention to the minutest details is necessary in order to achieve results similar to those of the originator.

An Operation to Check Drop-Foot.

Dr. **Willis Campbell** (Memphis, Tenn.) next gave a cinematographic demonstration of his operation for forming a pyramidal bone spur at the back of the os calcis in order to check drop-foot, and also of patients walking well after the operation. Excellent radiograms were also shown. Dr. Campbell pointed out that most of the cases needed a three-joint arthrodesis of the foot combined with the spur, for which the necessary bone could be got from the slices taken from the tarsal bones. He found the results to be best when the spur was united both to astragalus and os calcis, and when it had a blunt apex which would not fracture.

Mr. R. **Ollerenshaw** (Manchester) showed radiograms of a series of successful cases in which he had employed Dr. Campbell's method.

Dr. **Steindler** next read a paper on the

Compensation Treatment of Scoliosis,

in which he pointed out that the methods used by him were not very different from those formerly used in the so-called corrective treatment. His aims, however, were very different, for it was his object to imitate nature in producing gradually a restoration of the body balance by compensatory curves placed close to the pathological curve, which, though it tended to be reduced by absorption in these secondary curves, could not be abolished entirely in structural cases. Dr. Steindler showed an interesting series of results of treatment in which the severity of the lesion prevented any dramatic cure, but the patients were maintaining their corrected stance over periods of four years and more, with or without a brace. He pointed out that, although the fusion operation might be called for in certain paralytic cases, it should never be performed until the maximum possible compensation had been attained, otherwise the strain on the fused area would be excessive and fracture would occur. Dr. Steindler laid stress on the point that in scoliosis the bone lesion is secondary and the failure of muscle-balance primary, and therefore the aim of treatment should be re-education of muscles under the most favourable conditions—e.g., recumbency or support from a brace. He objected to the traction methods because they gave the muscles no time for compensation. He considered that about 50 per cent. of the cases that came to a surgeon were suitable for this method, which takes about four years for its completion. The unsuitable cases included the very severe paralytic ones and also congenital and rachitic patients.—Dr. **Brackett** drew attention to the importance of educating the patient to know when he is in the correct position, so that instinctive retention of this position might develop.

Pre-hallux as a Cause of Flat-Foot.

The final paper of the session was contributed by Dr. F. C. **Kidner** (Detroit) on the Pre-hallux as a cause of Flat-Foot. He showed skiagrams with this accessory scaphoid present in various stages of development, and described the cases in which flat-foot and an abnormal insertion with loss of power of the tibialis posticus accompanied the bone abnormality. His patients were cured by insertion of the tendon into the under surface of the scaphoid and retention in plaster for six weeks fully inverted.

Dr. D. P. **Willard** (Philadelphia) reported some similar cases.

A RECEPTION AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

On the evening of July 4th, a reception was given at the Royal College of Surgeons of England, when the President and Lady Moynihan received a large company of guests in the Museum Hall. Sir Arthur Keith, the Conservator of the Hunterian Museum, then gave a demonstration with the epidiascope of museum specimens illustrating healing and disease in prehistoric times. In a deliberately colloquial manner he spoke of the primitive origins of surgery, pointing out that the oldest known pathological specimen in the world was of an orthopædic nature, inasmuch as the femur of the famous Java man exhibited excellent manifestations of myositis ossificans. But the main part of his amusing address centred round the wonderful specimens of early Egyptian osteology—specimens which were delved from the cemeteries submerged during the construction of the Assouan dam. And here he paid a warm tribute to Prof. Elliot Smith's studies of anthropology, directed alike to Egyptian relics, the art of mummification, and the early history of civilisation.

The introduction of music formed an innovation in College receptions, for in the hall of the College the Marguerite Wortham Orchestra rendered an excellent musical programme. The museum, the conservator's offices, and the Council room were thrown open for the exhibition to the visitors of the Hunterian relics, and recently added preparations of special interest to orthopædic surgeons. The portraits by Reynolds, Lawrence, Romney, Hogarth, and other masters provoked admiration in the Council room, while in the library refreshments were served throughout the evening.

THE DINNER.

The members of the joint meeting dined together at the Café Royal, London, on the evening July 5th, Sir Robert Jones presiding and a very large company being present, including, by special invitation, King Manoel of Portugal.

The Chairman, having given the loyal toasts of His Majesty the King and the President of the United States, called upon Prof. E. W. Hey Groves to propose the toast of the American Orthopædic Association. Prof. Hey Groves first rendered the tribute of British orthopædists to American colleagues for an immense stimulus received in their work from America at the outbreak of the war, a stimulus for which they still had remained grateful. Comparing to-day the orthopædic work in the two countries, in regard to institutions, he said, whether special or attached to general hospitals, one main difference between the countries must be alluded to—apparently in America the workers had no money problems whatever. The need for money being stated it arrived in America, but in this country voluntary institutions have to beg for their bread, while there are other difficulties than pecuniary ones placed in the way of research, for example, the activities of quacks. Of these, the speaker admitted, America also had their quota, indeed such was their supply that they exported them. In conclusion he said that the links of union between America and England forged during the war would hold and the chain would grow stronger. He coupled the toast to which he was speaking especially with the name of the President of the American Orthopædic Association, Dr. Fred Albee, whom he thought of as "a contriver of jig-saw puzzles," but he wished to mention two other prominent orthopædists whose personal connexion with the joint meetings must have impressed everyone, namely, Dr. Royal Whitman, whom he described as "though no longer young in years, yet a storm centre of debate and an admirable examinee," and Dr. J. E. Goldthwait, who was a "wonderful combination of wide knowledge and special technique."

Dr. GOLDTHWAIT interposed here by request and read a telegram which in the early stages of the war had been received in America from the British authorities containing an urgent request for six base hospitals and 20 orthopædic surgeons. The material and the men were immediately dispatched, said Dr. Goldthwait, who pointed out that, while it was a special honour to orthopædic surgery that the first surgical service to be required was orthopædic, the circumstances of the telegram established the American in-comers in an impregnable position from the very beginning, and in that position those 20 orthopædic surgeons, with their entourage, were maintained by two Governments.

Dr. ALBEE, disclaiming any intention of making a long speech, echoed Prof. Hey Groves's words as to the stimulation which the orthopædic surgeons of each country had received from the common direction of their interests and objects. In personal reference to the Chairman he said that 21 years ago he had worked with Sir Robert Jones at Liverpool, and could testify to the wide influence which he had exercised for good over orthopædic surgery throughout the world, and he considered that this influence was much advanced by the able and sympathetic manner in which he had always taught his subject. Dr. Albee closed by alluding to the value of such international meetings as they were now holding, and reflected that the long journeys which had to be undertaken might be of considerable use. Despite the inevitable trials and fatigues of the journey from America to England, he said that the members of the American Association had during its course acquired a valuable knowledge of each other and had thus added to their ability to derive benefit from a confrontation with their British colleagues. He then read the following resolution, which was passed at the Executive Session of the American Association on July 5th:—

> "The American Orthopædic Association, in Executive Session assembled, takes this opportunity of expressing to British Orthopædic Association its appreciation for its gracious hospitality and its lavish expression of good fellowship. Closely bound by every kind of human tie to our British colleagues, we express the hope that this delightful meeting may be the forerunner of other similar happy reunions, and that we may anticipate an early opportunity of greeting our British colleagues in a similar way in the United States. May this resolution serve as the means of carrying a truly fraternal message of gratitude."

Sir ROBERT JONES proposed the health of King Manoel, who was so closely associated with the orthopædic work undertaken during the war at Shepherd's Bush. King Manoel, he said, had not only been a valuable friend from practical and social points of view, but in many ways the idea of curative workshops might be attributed to his invention. He spoke of the cheery and unaffected friendship which King Manoel had displayed while at Shepherd's Bush with the staff, working out the methods of treating the injured and mutilated.

KING MANOEL, in reply, thanked Sir Robert Jones, Dr. Goldthwait and many of his friends in the room, both British and American, for their recollection of the humble worker who during the period of the war tried to do the best that circumstances permitted to him for the mitigation of sufferers. Although, he said, he could no longer be considered to have any direct or practical connexion with orthopædic surgery, the friendly bond between the workers in that specialty and himself would always remain as a recollection and a solace.

Sir ROBERT JONES then proposed the health of the guests, coupling the toast with the name of the Editor of THE LANCET.

Sir SQUIRE SPRIGGE returned thanks briefly, when Dr. GOLDTHWAIT proposed the health of the Chairman in terms of which the audience showed their approval by drinking Sir Robert Jones's health with musical honours.

TUBERCULOSIS ASSOCIATION.

ANNUAL PROVINCIAL MEETING, CAMBRIDGE, JUNE 27TH–29TH.

(Continued from p. 40.)

III. THE CORRELATION OF X RAY FINDINGS IN PULMONARY TUBERCULOSIS WITH THE SYMPTOMS AND PHYSICAL SIGNS.

Dr. J. WATT (Godalming) being in the chair,

Dr. A. E. BARCLAY (Cambridge) dealt with the physical nature of X rays; the causation of the shadows seen in a radiogram of the chest; the voltage, the type of tube, the character of the radiations, and the distance at which a chest radiogram should be taken. Standard conditions, he said, were essential, but most radiologists are troubled by such fundamental things as big variations in town main voltages. Such variations play havoc with standardisation, particularly in the use of hot cathode tubes, where a slight change in the heating filament made so much difference in the quality of the rays. Longer distances were now used in chest work, giving less distortion of the picture and more definition. The best type of film should show no detail in the bones of the thorax. Stereoscopy as a routine measure was not particularly valuable. Screening of the chest before taking a film was invaluable, because it gave information as to the movements of the diaphragm, and to the presence of localised areas of deficient air entry. The shadows at the root of the lung were caused mainly by the blood in the pulmonary vessels. Again, there was not so much air at the roots, and on this account the shadows are denser. Personally he was inclined to lay little or no stress on relatively slight increases in the root shadows, provided that there was nothing else to arouse suspicion. Two points which made him take notice were an area of suspected defective air entry, especially if the root shadow seemed to be particularly enlarged towards this area and secondly, any alteration in the nature of the movements of the diaphragm. These features could only be seen on screen examination. The irregular branched *striæ* spreading out from the root were, in his opinion, due almost entirely to blood-vessels.

It was, of course, in the detection of early pulmonary tuberculosis that X ray examination was of the greatest importance. Advanced disease was usually quite patent clinically, yet frequently more extensive disease was found radiographically than the clinical signs led one to suspect. But, on the other hand, there was a certain percentage of cases in which the radiogram showed no disease when the clinical evidence of its presence was quite strong. The obvious and plausible explanation of the failures in the clinical signs of disease was that the disease was deep-seated, whereas physical examination was more concerned with superficial changes. But why certain cases should fail to give radiographic evidence was not so easy of explanation. Radiographic evidence was naturally confined to macroscopic changes, and if only a few alveoli were affected we were not likely to detect the change. The typical woolly mottling of a tuberculous focus represented not only the disease itself, but a surrounding region filled with the exudate of reaction. He suggested that, in these cases where the radiogram failed to reveal any change, the reaction was deficient. In spite of these exceptions, his faith in the value of an entirely negative X ray examination conducted by a careful radiologist was very high. Radiologists were not justified in calling a shadow tuberculous except on the ground of experience. Exactly the same appearance could be produced by any other low grade localised infection with an inflammatory reaction about it. He held very strongly that the radiographic and clinical examinations should be conducted by different observers. The clinician and the radiologist together would arrive at an opinion that would be neither a clinical nor an X ray diagnosis, but something that really mattered—i.e., *the* diagnosis. It was only by team-work that we could make progress.

Dr. S. VERE PEARSON (Mundesley) said that the subject was a wide one and could not easily be covered briefly. Great advances had been made in recent years but there was still much to learn. He recommended a study of the writings of Wessler and Jaches, Alexander and Beekmann, and the publications of Dr. Kenneth Dunham. He thought there was a tendency to-day to over-emphasise the practical deductions to be drawn from X ray findings in pulmonary tuberculosis. After all the symptoms of a patient were more important than either ordinary physical signs or X ray pictures. It was most important, too, to realise that good and constant standards must be set up in making films of chests, because it was easy, if a radiologist were really clever in altering the circumstances of exposure of a chest, even to produce the picture of a cure attained in a few minutes! He thought this subject of the co-relation of X ray findings with symptoms and physical signs might best be illustrated by him by showing some slides of chests where there was an exceptional correlation one way or the other. It was well known, for example, that severe laryngeal cases and cases complicated by chronic alcoholism often had paucity of ordinary physical signs in the chest, yet X rays revealed extensive disease. He then showed amongst other slides (1) a picture of a very big apical cavity in the case of a man who had been repeatedly examined over many weeks without ever finding any of the ordinary signs of excavation. (2) A couple of slides showing what appeared from X ray examination to be a severe and extensive case compared to one of a much slighter nature; but when the symptoms were compared the former had no fever or other severe symptoms, whereas as in the latter case it was necessary to keep the patient in bed for months and the severity of the illness was great. (3) Two films of the same chest at an interval of nine months looking almost exactly the same, yet from emaciation and feverishness the patient had in the interval progressed to decent body-weight and capability for walking exercise up to ten miles a day. (4) A slide which showed a recent lesion in the left lower lobe producing relapse, which lesion was unsuspected before the X ray film was taken, which saved the patient from having a right-sided artificial pneumothorax attempted, and some other slides where the physical signs were described and were somewhat unusual in their correlation to the X ray appearance or the clinical condition.

Dr. G. T. HEBERT (London) said there could be no two opinions concerning the value of X ray examination to the clinician. Unsatisfactory films, it was true, were unreliable and misleading, but for the purposes of the discussion we must assume that first-class apparatus and technique were used. If X ray findings always agreed with the results of ordinary clinical examination they would be of no service to the clinician. When confronted with a doubtful case of tuberculosis the physician had to make up his mind on four problems—viz., the presence or not of tuberculosis, its extent and character, its activity and the prognosis. In the correlation of X ray findings with physical signs all cases could be divided into four groups: (1) When symptoms and signs were negative and X ray findings negative. This group was usually a large one, and included most of the contact cases. (2) When symptoms and signs were negative and X ray findings positive. If X ray examination was carried out as a routine in this group of cases it would probably be found now and then that one which the clinician would have passed over as non-tuberculous showed a definite radiological lesion. (3) When symptoms and signs were suggestive but the X ray findings positive. Most patients with pulmonary tuberculosis had passed the incipient stage when they first presented themselves. They could be diagnosed with a fair degree of certainty by symptoms, signs, and sputum examination, and for the purposes of diagnosis a radiogram was unnecessary. If sputum examination were negative a positive X ray examination would confirm the diagnosis. (4) When symptoms and signs were suggestive of tuberculosis but the X ray findings negative. It was possible for definite tuberculosis, proved by more than one positive sputum examination, to exist without definite X ray changes, but such instances were very uncommon. Hæmoptysis, pleural effusion, and spontaneous pneumothorax were presumably tuberculous manifestations, but in a considerable percentage of these cases no radiological evidence of disease in the lungs was discoverable. He pointed out that in the non-tuberculous chronic interstitial fibrosis, the abnormal physical signs were usually very marked, whereas the radiogram frequently showed little or nothing wrong. This contrast in the signs and X ray picture he considered to be proof of the non-tuberculous character of the lesion. In tuberculosis the radiogram provided very good evidence of the extent of the lesion. As a rule the disease was more extensive than the physical signs indicated. In regard to activity of the disease, radiological examination was not of much value. It was true that active lesions had certain characteristics, but these were often obscured when active and old foci were intermingled, and on the whole the question of activity was better decided on purely clinical grounds. Concerning the question of prognosis by means of the radiogram, if the condition of the patient was good, he liked to see well-developed mottling. On the other hand, when symptoms, signs, and pyrexia were prominent features but X ray examination showed relatively little, he inferred that the prognosis was bad.

In summing up he made the following points: (1) The clinician would derive most benefit from X ray examination in the province of diagnosis. (2) It was often useful in excluding tuberculosis as well as for confirming clinical evidence which was not quite strong enough to be conclusive. (3) It was essential in cases of initial hæmoptysis, after an idiopathic pleural effusion, or spontaneous pneumothorax, in cases of probable laryngeal tuberculosis, and in some cases of non-pulmonary tuberculosis. (4) It was essential before artificial pneumothorax treatment was commenced and at intervals during the treatment. (5) It often helped in other cases when, for instance, symptoms were severe and the signs slight, or vice versa. (6) It was liable to be misleading when it showed a generalised lesion or indefinite when a homogeneous opacity was present which might be due either to fluid or consolidation. (7) Every clinician should study the X ray films of his cases, because it was only by experience that the significance of X ray findings be discovered and their help utilised to the best advantage.

Discussion.

The CHAIRMAN agreed that while radiograms were useful, they were not infallible. The clinician and the radiologist should work together.

Dr. ERNEST WARD (Paignton) spoke of the variations in the ability of radiologists to take good chest films. He asked what was the significance of pleural rings and cart-wheel shadows.

Dr. GEORGE JESSEL (Lancashire) said it was most valuable to compare X ray findings and physical signs with autopsies, and in this respect the large hospitals had a great advantage over the tuberculosis officer. He thought that diagnosis had not become more accurate in recent years but that there had been a great increase in interest and that treatment on the whole was better. He uttered a warning against depending too much on radiology and neglecting the symptoms and physical signs.

Dr. W. STOBIE (Oxford) was of the opinion that the interpretation of the films should be left to the clinician. Radiograms were part and parcel of our diagnostic equipment, but he thought that all these questions about the correlation of physical signs were highly speculative in the absence of autopsies. He maintained that it was impossible to make a prognosis from a radiogram.

Dr. W. ARNOTT DICKSON, Dr. W. H. DICKINSON, and Dr. F. A. L. HAMMOND also took part.

IV. GAS POISONING AND GUNSHOT WOUNDS OF THE CHEST IN RELATION TO TUBERCULOSIS.

Dr. F. W. BURTON-FANNING (Norwich) *being in the chair*,

Surgeon-Commander A. FAIRLEY (Chemical Warfare Research Department, Porton) spoke on the after-effects of war gassing in relation to the incidence of tuberculosis, on which he said his mind was still open. The clinical side came under the Ministry of Pensions. With much that had been published on the matter in other countries, his department found itself in general agreement. Owing to the fact that warfare gas was a surprise weapon introduced against modern rules of warfare, it had received a vast amount of unfavourable press attention throughout the world. As a result, gas was being blamed for more dire iniquities than had ever before been associated with any war weapon. It was credited for many ailments for which it was in no way responsible. This was borne out by the fact that in the American Army there were only 70,552 gas casualties, but the number of applications for compensation greatly exceeded that number. A Board of American medical officers had examined over two thousand cases claiming disability from gas poisoning. They concluded that gas victims, irrespective of the type of gas used and the severity of attack sustained, showed no marked predisposition to active pulmonary tuberculosis, or to reactivation of a healed or quiescent pulmonary lesion. Further, gas victims presented little evidence of material destruction of lung tissue. French, German, and Swiss authorities had issued reports with similar conclusions.

In the differential diagnosis of pulmonary tuberculosis from the late effects of gas poisoning, Hawes of Boston had stressed that a general appearance of robust health associated with marked symptoms was against tuberculosis, that the lung complications resulting from gas poisoning were usually basal and not apical, and that, following gas poisoning there was apt to be a marked increase in nervous symptoms of every kind. In order to trace any connexion between war gassing and tuberculous or any other disability it was of fundamental importance that the record of war gassing should be unimpeachable.

Dr. G. BASIL PRICE (Ministry of Pensions) dealt with the incidence of pulmonary tuberculosis both after gas poisoning and gunshot wounds of the chest. He was able to show that a marked contrast as to the incidence of tuberculosis existed between the two types of case—viz., that whereas tuberculosis was a rare sequel of gas poisoning, in gunshot wounds of the chest it formed a small but definite percentage which was likely to increase as time went on. During a detailed review of the literature he quoted Sergent's conclusions in 1925 that gassing by itself did not provoke tuberculosis; that where tuberculosis followed gassing, active or latent tuberculosis must have been present; and that if at a later date gassing was followed by tuberculosis, the occurrence was accidental. Dr. Price found in a series of 200 cases in which there had been a definite history of gas poisoning only nine were diagnosed as pulmonary tuberculosis. Of these nine cases in only two was there a probability that the condition was directly caused by the gassing. In a series of 50 cases of wounds of the chest he found pulmonary tuberculosis in 37 of them. The tuberculosis was regarded as a direct sequel of the trauma in 20 cases. He concluded that whereas gassing is unimportant in the later development of pulmonary tuberculosis, in gunshot injuries of the chest (of all types, surface and penetrating), tuberculosis develops later in a small but appreciable percentage. He considered that surface injuries not involving the thoracic cage did not appear to be an ætiological factor in the onset of tuberculosis. When the pulmonary tissue had been definitely injured, and especially when a foreign body was retained in or near the damaged area, activation of tubercle might occur even after a prolonged period.

Discussion.

Dr. A. SANDISON (Ministry of Pensions) said that the mystery of tuberculosis had been increased. The results quoted by Dr. Price were somewhat unexpected, as we now found that it was probably an advantage to have been gassed. The paper showed the value of continuity of records. He supposed that the Ministry of Pensions possessed the most complete health records of a section of the community than had elsewhere been collected. Statistics made from such records were certainly of great value. He pointed out that there was a great increase in the diagnosis of tuberculosis just after the war mainly on account of the possibility of a pension being obtained.

Dr. PEARSON gave some additional details about a case, to which Dr. Price had referred, of œsophageal stricture said to be a sequel to gas poisoning.

Dr. NEVILLE COX (Brighton) asked what proportion of cases with foreign bodies in the lung had received a final award. He thought that it would be of great advantage if these cases could be sent to the tuberculosis officers for purposes of observation.

Dr. JESSEL said that in 1920 he had been asked to work out the connexion between tuberculosis and gas poisoning. In 1281 pulmonary cases he found a small percentage, similar to that stated by Dr. Price, had developed tuberculosis following gas poisoning.

Dr. W. ARNOTT DICKSON (Gloucestershire) said that there now seemed to be three almost sure preventives of tuberculosis—viz., gassing, enlarged tonsils, and delicacy in childhood.

Dr. T. ELLIOTT (Shropshire), after quoting the work of the Henry Phipps' Institute on the question of latent tuberculosis, asked whether or not it was possible that the trauma to the lung opened up a latent lesion instead of causing a fresh onset of the disease.

The CHAIRMAN was interested in the question of laryngitis following gassing, and instanced a case of mustard gas poisoning, followed by aphonia and dyspnœa. A diagnosis of tuberculous laryngitis was made, and the patient was found later to have pulmonary tuberculosis. He gave some figures of patients in Kelling Sanatorium with tuberculosis following gassing and wounds of the chest, and inquired whether it was a fact that the nature of the foreign body played a part in the development of tuberculosis. It was possible that rounded smooth foreign bodies were less harmful than those consisting of roughened angular fragments.

Replies.

Commander FAIRLEY thought that œsophageal stricture was an unlikely sequel to gas poisoning. In experimental work in animals fed on gas-impregnated water no lesion had been found in the œsophagus. A concentration of gas sufficient to cause ulceration of the stomach was quite without effect on the œsophagus. He did not think it was possible to have food impregnated with a concentration of gas sufficient to cause poisoning and in any case it would be extremely unpalatable.

Dr. PRICE said that the men who had received a final award would come to the tuberculosis officer if they became worse. He had found few primary laryngeal complications following gassing, and in any case tuberculous laryngitis was usually associated with advanced pulmonary tuberculosis.

NEW CANCER HOSPITAL FOR MANCHESTER.—It is stated that a new Manchester hospital for the treatment of cancer and for research is to be provided by uniting the Christie (Cancer) Hospital and the Radium Institute on the site of Groombridge House, Withington.

NATIONAL HEALTH INSURANCE.

WORKING OF THE ACTS IN SCOTLAND.

THE tenth annual report of the Scottish Board of Health, which appeared recently,[1] contains a careful study of the working of the National Health Insurance system up to the end of the year 1928, when the Board was superseded by the new Department of Health for Scotland. The summary, which covers a period of ten years, deals with the work of the approved societies, the insurance committees, the Board's inspectors, and the district medical officers, who correspond to the regional medical staff in England and Wales.

APPROVED SOCIETIES.

A reduction in contribution income for 1928 was due to the lowering of the insurable age limit on June 2nd from 70 to 65 years. The state of the several industries is reflected in the sale of insurance stamps, which has dropped in varying degree according to the extent to which their members belonged to the depressed trades. Nevertheless, as in England and Wales, the expenditure on benefits was maintained at a high level. The actual cost of sickness and disablement benefits in Scotland increased from £1,293,000 in 1921 to a peak of £2,021,000 in 1927, falling to £1,750,000 in 1928, when the figure of 1928 would have been still lower had not the disablement benefit kept up, especially in the case of men, the rise in the cost of disablement pointing to an increase either in the number of claimants or in the average duration of the claims. The claims of women are in excess of those of men and there is a movement to separate the two funds for the purposes of valuation.

Elimination of bad claims is the duty of the district medical officers who advise and assist insurance practitioners in counteracting the effect of lax certification, and also help the societies in the selection of cases for reference. As in England and Wales, it has been found that some societies have adopted an arbitrary basis of selection which results in a clogging of the machinery.

The special concession made to genuinely unemployed persons whereby despite their inability to contribute they remain entitled to cash benefits at the minimum rate was continued during the year 1927–28. For this purpose societies received some of the unclaimed money in the stamp sales account and the grants will be more generous in future. In the terms of the amending Act of 1928 such arrears will be entirely excused and will involve no reduction whatever in the cash benefits provided the insured person is able to satisfy his society that he has really been available for employment of an insurable nature, but unable to obtain it. The Ministry of Labour have now arranged to stamp the cards of such persons at the exchanges during each week of unemployment.

Additional Benefits.—The funds allocated to dental benefit were found inadequate to meet the demands, and in many societies the grants had to be reduced from 100 to 75 per cent. of the cost of extractions and conservative treatment, while half the cost of dentures was reimbursed. The amount of money available was further curtailed by the fact that part of the 1928 moneys allocated had been used in the previous year. The amount of money spent on other forms of additional benefit was small. Certain benefits which ceased to operate at the end of the year included medical attendance on dependents and payment of disablement allowance to members not totally incapable of work. Power given by the 1924 Act to expend money on such benefits without approval was repealed in favour of new provisions which enable societies to expend moneys on bona-fide charitable objects, subject to the approval of the Board.

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[1] H.M. Stat. Office. Cmd. 3304. 6s.

The increased number of references to the district medical officers indicates the increasing popularity of this service. Just as these officers were allowed to advise the societies with regard to the kind of cases to be referred, so they were employed to interview and advise practitioners on the question of certification. An addition to their numbers was under consideration at the end of the year. Of the 38,834 cases referred to them over 22,800 were examined and of these 8487 (or 37 per cent.) were found capable of work. Compared with the experience in England and Wales this seems a high percentage.

Of the total number of references only 1·3 per cent. came from practitioners themselves—regrettable enough although a development in this practice would no doubt require an increase in staff.

INSURANCE COMMITTEES.

The administrative expenditure of these committees was estimated at £49,000. Nine or ten committees required additional credits to balance their accounts. The index registers of the Scottish Committees were cleared in 1926. All known inflation had been removed from them by Oct. 1st, 1927, but effect had still to be given to notifications then being received intimating loss of title to medical benefit at the end of that year. Medical lists were not reduced until the end of 1927.

Special mileage to the amount of £325 was granted to practitioners whose journeys were rendered more difficult by the closing for reconstruction of certain main roads.

During the year 18 complaints were lodged by insured persons or approved societies against insurance practitioners. Six of these involved alleged breaches of the certification rules, four were charges of alleged neglect, seven complaints involved charges of demanding fees from insured persons, and one was a case of an irregularity in causing an insured person to transfer to the practitioner's list. Fines of £5 and £25 were imposed in two cases for irregularities in certification. In a third case in which a lay assistant had been allowed to give certificates the practitioner's list was reduced to 1200. For charging an insured person a fee and raising an action in court to recover it one practitioner was fined £50. For failing to provide proper surgery accommodation fines of £10, £25, and £50 were imposed by insurance committees; in two of the cases the penalty was reconsidered on appeal. Five practitioners were reported by district medical officers for failure to return to them the reports on insured persons referred for *examination*, penalties of £20, £10 and one guinea being imposed. Two practitioners were fined for failing to return medical cards to their committees.

Drug Fund.—Expenditure followed much the same lines as in England and Wales; a peak was reached in 1924, when the amount expended averaged 2*s.* 1*d.* per insured person in the country. The amount has come down steadily since then to reach 1*s.* 10½*d.* last year. A central checking bureau in Glasgow keeps a control on prescribing. In the course of the year panel committees in 10 areas recommended a surcharge in the case of 40 practitioners, and a sum of £267 14*s.* was recovered from them and repaid to the drug fund. In three cases the practitioners appealed, but the committee's findings were upheld. A scheme has been instituted for the testing of drugs and appliances, and insurance committees have been asked to furnish a detailed report of their results.

A sum of £46,000 was allocated to the special mileage and necessitous districts fund, of which £3500 was disbursed centrally for the improvement of the medical service in sparsely populated areas. The remainder went in subsidies to practitioners in isolated single-practice areas for maintenance of telephones, outlying surgeries, provision of ambulance service and grants to attend post-graduate courses.

New regulations were made for exempt persons whereby their title to medical benefit was prolonged. This right is of considerable value because so long as an exempt person remains entitled to medical benefit he is deemed to be insured for widows' and orphans' pensions purposes. An arrangement was made during the year with the Ministry of Labour whereby 1106 claims were referred to the Scottish Board of Health for investigation. Under the provisions of the Unemployed Insurance Act, 1927, it is now possible for a person to claim exemption who is employed in a seasonal occupation which does not ordinarily last for more than 18 weeks in any year, and who is during the rest of the year not ordinarily employed in an insurable occupation. This ground for exemption was a boon to seasonal fishworkers.

Various provisions in the 1928 Act necessitated new regulations. For example, shore fishermen required to be compulsorily insured from Jan. 1st, 1929. A special order was made excluding from insurance those shore fishermen engaged in ventures where the catch is not sold, but is divided among them in kind. The order provided that the cost of contributions payable may be deducted from the gross earnings of the vessel before the share-out among the men takes place. The 1928 Act also made provision for the compulsory insurance of persons who contract to perform work of a manual character for the purpose of the trade or business of another person, and special orders were made to provide for such cases.

During the year 61 employers were prosecuted for non-payment of insurance and pensions contributions. Conviction followed in 40 cases.

INSURANCE INSPECTORS.

Unemployment due to trade depression did not loom so large in Scotland as in other parts of the kingdom. The increase in the insured unemployed was 1·38 per cent. as compared with 5·27 per cent. for the whole of Great Britain and Northern Ireland. The grave unemployment figures in the heavy industries are not due only to the war; the exhaustion of ironstone in Scotland has led to the necessity of importing raw material and the output of the iron and steel industry has been reduced. This reacted on coal mining, and in Lanarkshire during 1928 78 pits employing 3218 men were permanently shut down.

Emigration is responsible for the depletion in the ranks of skilled workmen. From 1921–26 the net emigration from Scotland was 40,852, from England and Wales 59,770; in 1913 the figures were 8188 for Scotland and 27,050 from England and Wales. The figures are serious because they represent the younger and more vigorous workmen. New industries are being developed such as artificial silk, rubber tyre and paper manufacture, but these gains are small in comparison with the losses.

In Scotland the future is likely to impose a rather severe strain upon the insurance scheme in regard to both contribution income and benefit expenditure. Bad trade increases the difficulties in collecting contributions and encourages evasion of payment on the part of employers. On the other hand, the advent of the contributory pensions scheme has effectively increased the employer's interest in and readiness to pay contributions.

The special difficulties of investigation into claims show no sign of diminishing, nor is it proving easier to determine the applicant's age for pension purposes. One man stated that he was 26 when he "first played fitba' for the Hibs"; another remembered that when he was 9 years old he suffered imprisonment for 14 days for stealing apples. But the pensions scheme in conjunction with the Insurance Act has proved a very real boon; even to men in poor-law institutions it has been welcomed as a means of freedom. The substantial benefits of the joint scheme are to-day firmly fixed in the public mind.

DISTRICT MEDICAL OFFICERS.

The experiences of these officers are very similar to those of the regional medical officers in England and Wales. The number of references for women was disproportionate to that for men; 47 per cent. of men referred were found incapable and 53 capable of work, whereas in women referred 32 per cent. were found incapable and 68 capable.

An analysis of 5000 consecutive cases (2378 men and 2622 women) referred in Glasgow was made with a view to determining the female factor. Unemployment figures did not affect the numbers. The cases were grouped in age-periods. In the 16–35 group (by far the largest) married women comprised 46·5 and single women 53·5 per cent. Of the married women 73 and of the single women 71 per cent. were found capable of work. The three outstanding diseases given on the certificate were anæmia, pregnancy, and post-puerperal debility; the percentage found capable of work was 82, 40, and 89 respectively. In the 36–45 group 71 per cent. of the married and 55 per cent. of the single women were found capable.

Bronchitis in this period was one of the main causes of incapacity, but it was evident that the certifying practitioner's opinion was based more on symptoms than on physical signs. The same applies to rheumatism. In the 46–50 group 60 per cent. of the married and 50 per cent. of the single women were found capable. Rheumatism and bronchitis formed 46 per cent. of the references. Of the cases certified as rheumatism 72 per cent. were found capable and again it seems that subjective symptoms were given undue weight. Few cases of cardiac disease were referred; they amounted only to 4 per cent. of the whole and were all found incapable. It was evident that, after middle age at least, the married woman is not a good proposition from the health insurance point of view.

Attention is called in the report to the vague certification used by practitioners. Based as it is on symptoms, it follows inevitably that insured patients are fit for work when they declare themselves to be so and the recipients tend to control expenditure. Accurate certification, it is remarked, must be the foundation on which any medical insurance is based.

An interesting series of investigations was made into cases of anæmia and of albuminuria. In the former it was found advisable to use the Haldane method, 80 per cent. being taken as the standard for men and 75 per cent. for women. On this standard incapacity due to anæmia was present in only 13 per cent. The results suggest the futility of trying to ascertain the presence of anæmia without a hæmoglobin examination.

In the cases of albuminuria the efficiency of the kidney was estimated by the urea-concentration test. In the absence of other abnormal signs, those with a concentration above 2 per cent. were regarded as capable of ordinary work. Œdema and high blood pressure were considered to incapacitate even though the concentration was above this level. Below 2 per cent. most of the cases were regarded as incapable. The test enabled the medical officers to certify 30 per cent. of the cases of albuminuria as fit for work.

The problem of industrial rheumatism is touched on in the report and certain conclusions are reached:

1. That it is advisable to give wide publicity to the necessity for prolonged rest treatment in rheumatic fever.
2. That mitral stenosis should be treated in cardiac wards pending the establishment of compensation.
3. That focal infection should be universally looked for and treated.
4. That the presence of focal infection and age-incidence form a convenient classification for the commencement of preventive measures in cases of industrial rheumatism.
5. That convalescent homes should be not only places for rest, recreation, and general tonic treatment, but should administer the more specific tonic treatment of ultra-violet rays, massage, and radiant heat.

MEDICINE AND THE LAW.

The Croydon Inquests: Action by the High Court.

WHILE the time has not yet arrived for summarising the series of inquests in the Croydon arsenic cases, one step—the quashing of an inquest held on Mr. Edmund Creighton Duff in April of last year and the ordering of a fresh inquest—may be described. If the High Court of Justice interferes with a coroner's jurisdiction, it is usually an indication of some default on the coroner's part. Section 6 of the Coroners Act, 1887, for instance, contemplates that the High Court will order an inquest if a coroner refuses or neglects to hold an inquest which ought to be held. The same Section also authorises the High Court to order a fresh inquest if satisfied that such a course is necessary or desirable, because at the original investigation there was fraud, rejection of evidence, irregularity of proceedings, insufficiency of inquiry, or otherwise. The amending Act of 1926 explained Section 6 as meaning that the High Court could also act whenever satisfied that, in the interests of justice, a fresh inquest was necessary or desirable "by reason of the discovery of new facts or evidence." As is made clear in the latest edition of Jervis on Coroners, the effect of the amendment is that an order by the High Court for a fresh inquest can now be invited by the coroner himself, and is not to be deemed as stigmatising him for some default. The Attorney-General, in asking for a new inquest upon Mr. Duff, was careful to place on record the fact that he was not moving against the wishes of the coroner, but at his request. The verdict on June 1st, 1928, was that Mr. Duff died from natural causes. Dr. Elwell, who attended Mr. Duff, had been puzzled about the cause of death, and had brought the facts to the notice of the coroner, suggesting that the symptoms might indicate some form of ptomaine poisoning. On analysis of certain organs, the public analyst failed to ascertain the presence of poison. In the absence of evidence accounting for the death, Dr. Brontë expressed the view at the inquest that death was due to myocarditis, though puzzled by the vomiting and other symptoms. After the verdict of death from natural causes in June of last year the following facts occurred. Miss Vera Sidney, Mr. Duff's sister-in-law, died in February last, and Mrs. Sidney, her mother, in March. Inquests in both cases produced evidence of arsenical poisoning, and in May Mr. Duff's body was exhumed on Home Office order with resultant indications of traces of arsenic. Without entering into these facts, the Lord Chief Justice said sufficient evidence had come to light since the original inquest to justify the order applied for. The Court, therefore, made absolute a rule for a writ of certiorari for removing the former inquest into the High Court; having by this ancient machinery got the inquest into its own hands, the Court quashed it and ordered a new inquest. Mrs. Duff, the widow, wrote a letter to the press, published in the *Times* of July 2nd, expressing the natural feelings of a wife in regard to the body of her husband not only examined post mortem, but also subsequently exhumed for further examination. She wrote in consequence of reading an announcement that "a second exhumation of Mr. E. C. Duff is being considered"; she protested that the second examination should have been absolutely thorough, and that "it should not be possible in a Christian country that the body of a good and decent citizen should be treated in such a cruel and casual way because two or three Home Office experts disagree, presumably about the decimal quantities of the drugs found in him over a year after his death." "Even savages," she added, "respect their dead." Later in the day on which the letter appeared, Scotland Yard issued a brief official statement that there was no ground for the suggestion that any further exhumation of Mr. Duff's remains would be required by the police. The sympathy, which must always be felt for the relatives during inquiries of this nature, will not be withheld from Mr. Duff's widow. Perhaps the most reassuring feature of the whole story hitherto has been the fact that the action taken by Mr. Duff's medical attendant upon the doubtful symptoms which accompanied the final illness ensured the opportunity for judicial inquiry at the time.

The Prosecution of Col. Kynaston.

The police-court proceedings against Lieut.-Colonel J. W. Kynaston have ended in a victory for him on one point and a defeat (unaccompanied by serious consequences) on another. At the further hearing of the summons against him at Marlborough-street police-court on July 2nd the ground was considerably cleared. The defendant, it will be recalled, is charged with wilfully and falsely pretending to be a doctor of medicine, and wilfully and falsely using the title of "M.R.C.S. Eng." contrary to the Medical Acts. Mr. G. D. Roberts, for the prosecution, explained that he was not saying a word against Col. Kynaston's honour. The prosecution did not impute fraud, and did not ask for a large penalty. The view of the prosecution was that the General Medical Council, as head of the medical profession, was the judge of the standards of professional honour, and had statutory power to strike persons off the Medical Register if certain conduct was found proved. Rightly or wrongly, the General Medical Council, in 1922, found certain conduct by Col. Kynaston proved, and struck him off the Register. The use of the title "doctor," coupled with medical practice, must (said Mr. Roberts) amount to a representation that the defendant was a doctor of medicine. The Royal College of Surgeons had taken away his diploma; consequently Col. Kynaston was not entitled to use the description "M.R.C.S." Col. Kynaston's case, on the other hand, is that his name was illegally removed from the Register for reasons described in THE LANCET lately (June 29th, p. 1370) in connexion with his application for a mandamus. If the law courts will not allow the merits or legality of that removal to be reopened or questioned, then Col. Kynaston maintains that no medical man is obliged to register, that he himself had never claimed to be on the Register, that he has been a doctor for 20 years, and in the common and popular sense of the word he is still a "doctor," no matter though his name has been removed from the Register or though the Royal College of Surgeons has automatically (and, as he maintains, unlawfully) deprived him of his diploma upon such removal. Mr. Cancellor, the magistrate, gave his decision on July 9th. He found—presumably as a question of fact—that the defendant did not wilfully and falsely pretend to be a doctor of medicine; the summons on this point was therefore dismissed. He also found that the defendant did commit a breach of the statute by continuing to use the letters "M.R.C.S."; but he dismissed the summons under the Probation of Offenders Act with a serious caution and warning that persistence in publishing his advertisement would make the defendant liable to serious penalties. The magistrate was for various reasons reluctant to record a conviction against him.

Dr. Bell's Acquittal.

The re-trial of Dr. H. W. Bell, of Oakley-street, Chelsea, on the charge of manslaughter, and of having performed an illegal operation upon Miss Kathleen Kelly, ended on July 2nd, in a verdict of "Not Guilty," on both counts. The previous proceedings, when the jury disagreed, were summarised in THE LANCET of June 15th, p. 1273. In the course of the recent re-hearing before Mr. Justice Swift, at the Central Criminal Court, Sir Henry Curtis Bennett, appearing for the defence, emphasised Dr. Bell's high reputation. Dr. Bell, he said, had merely made an examination of the young woman, which he was perfectly entitled to make, and which was perfectly lawful; he advised that she should go into a nursing home, where she could be properly looked after. Dr. Bell gave evidence after counsel's opening speech for the defence, and the jury returned their verdict of acquittal without leaving the jury box.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A PROPOSED MILK BILL.

Dr. E. F. Stephenson, chief medical adviser of the Department of Local Government and Public Health, in a press interview a few days ago, gave information about a milk Bill which the Government intends shortly to introduce. Early last year an inter-departmental committee furnished a report which contained several recommendations for the improvement of the milk-supply of the country. It is on these recommendations that the provisions of the Bill are based. Dr. Stephenson states that the Bill aims at the production of clean milk—not the cleansing of dirty milk—by enforcing strict supervision of the cow, the dairy, and the distribution. To secure these ends a wider interpretation will be given to the words "milk" and "dairy," and the registration of all persons carrying on the trade of dairymen, in addition to the registration of premises, will be made mandatory. It has been shown that clean milk can be produced without any great capital expenditure in altering byres, and that *method*, rather than buildings, determines its hygienic properties. The production of clean milk is not difficult. Dr. Stephenson draws attention to the educative work that has been done by various voluntary organisations, and to the steps that have been taken by his Department to persuade local sanitary authorities to enforce existing laws and regulations. He points out that the Dairies, Cowsheds and Milkshops Order of 1908 is somewhat out of date. The Regulations under the new legislation will not alone deal with the lighting, ventilation, cleansing, drainage, and water-supply of the dairy, but will secure a more thorough supervision, inspection, and examination of dairy cows, the proper grooming of animals, personal cleanliness of milkers and distributors, the cooling of milk, and its conveyance and distribution in sterilised vessels and utensils. Furthermore, the grading of milk and the use of special designations will be authorised, and misleading terms prohibited. The bacteriological examination of milk will be a guarantee to the purchaser of a high quality article, and a protection to the honest vendor against unfair competition. Drastic penalties against selling dirty milk will be enforced. The use of preservatives in milk was prohibited by an Order which came into operation in October last.

Much has already been done, Dr. Stephenson remarks, to prevent the spread of the acute specific fevers through the medium of milk, and the records of the Saorstat compare favourably now with those of other countries as regards milk-borne infection. The Bill now to be introduced enables a medical officer of health to stop the sale of milk if there is epidemiological or other evidence that it is the vehicle of infection. The safeguards relied on in the Bill for the protection of the public against bovine infection are: (1) inspection and examination, (2) tuberculin test, (3) bacteriological examination. The higher grade milk proposed under the Bill must be produced from cows which have passed the tuberculin test and a clinical examination.

He adds that the placing of the Bill amongst the Statutes of the State is a matter of little account in proportion to the spirit with which it is administered. The appointment of a county medical officer of health in every county is essential to attain the objects in view under the present measure. "Success can only be achieved by steady, firm, and uniform administration exercised by a whole-time trained sanitarian. The necessity for these officers is now well recognised, and their appointment is being pressed."

MOUNT VERNON HOSPITAL: STAFF APPOINTMENTS. Mr. Geoffrey Keynes and Mr. Stanford Cade have been appointed surgeons, Lady Barrett and Dr. Malcolm Donaldson gynæcologists to the hospital.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1928 statistics of one borough and one urban district:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	*Heart disease.*	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Ilford .. .. (113,500)	15·8	8·4	0·63	1·26	1·1	1·7	45/24	22	4·0
Edmonton U.D. (73,027)	18·2	9·9	0·87	1·21	1·7	1·4	69/–	37	3·0

Ilford.

Dr. A. H. G. Burton says that the year 1928 was characterised by a heavy incidence of infectious diseases. The attack rate for scarlet fever and diphtheria was the highest for the past five years. There was a small outbreak of paratyphoid fever and small-pox occurred on one occasion. There were 25 cases of paratyphoid, 10 of which occurred in April. The cases continued cropping up at intervals until November. All possible sources of food infection were investigated with no result, and Dr. Burton had no reason to trace the cases to infected cream, which was considered to be the cause of the London epidemic. None of the cases proved fatal. There was one case of small-pox in an unvaccinated girl of 14 and another Ilford resident developed small-pox outside the borough. Both cases were of the mild type and in neither case was the origin discovered. The much-needed cubicle wards at the isolation hospital have been completed. One is a new block consisting of four wards on each side of the duty room with glass partitions and an operating theatre at one end. Another block of obsolete pattern has been converted so as to provide eight cubicles.

The open-air school has been completed and Dr. Burton points out that in the majority of cases new schools cannot be built on open-air lines and that a further advantage of the open-air school is that delicate children unfitted for ordinary school life can be educated together and receive special care, observation, and treatment. Two needs of the school medical service are an increase of the dental staff and the provision of a complete orthopædic scheme. An immunisation scheme against diphtheria has been under consideration and the Ministry have pointed out that such a scheme would not be eligible for a grant under the maternity and child welfare regulations. Scarlet fever has been, on the whole, of a more severe type and has shown a tendency to involve the mastoid bone. Nine per cent. of the cases of scarlet fever developed middle-ear disease and six cases of mastoiditis occurred. In the previous year 5 per cent. of the scarlet fever cases developed middle-ear disease and there was no case of mastoiditis. Antenatal work makes progress. The number of first attendances at the clinics was 198 in 1921 and has gradually increased to 653 in 1928. The number of women admitted to the maternity home has increased from 139 in 1919 to 481 in 1928, and all the patients admitted, who are to be attended by a midwife, are examined at the antenatal clinic.

During 1928 all the new houses built, numbering 877, were private enterprise subsidy houses and the only two notices served for overcrowding were complied with.

Edmonton.

Dr. H. W. Harding says that the housing problem in this urban district is not solved in spite of the efforts of the council. On the one hand are folk living under sordid conditions and quite contented. On the other there are families living under conditions of overcrowding which must sap the vitality of the strongest. Rents are high and so-called furnished rooms are let at an exorbitant figure. The interior of overcrowded houses rapidly becomes dilapidated and the sanitary inspectors have difficulty in deciding as to which defects the owner of the house should be held responsible for. Of the 676 new houses 186 were subsidy houses erected by the local authority and 24 were subsidy houses erected by private enterprise. An unusual occurrence was a plague of flying beetles, which began in one part of the district early in May. The beetles (*Harpalus ruficorius*) swarmed in myriads against the backs of neighbouring houses from fields in which a good crop of potatoes was raised. The trouble lasted about two months and various disinfectants were tried without apparent benefit. On the advice of the Ministry, the farmer planted his land with wheat, which would stand heavy rolling, the idea being to crush any beetles which remained in the ground. Up to April, 1929, there had been no signs of recurrence. It has been suggested that these beetles, which are carnivorous in habit, had made a wholesale migration owing to the exhaustion of their natural food.

The day nursery, which is at present run privately, has been offered to the council and Dr. Harding suggests that a new child welfare centre might be erected on the site, as the present centre is inadequate. Early in 1927 an arrangement was made with the guardians for the treatment of cases of rickets, marasmus, &c., at the North Middlesex Hospital by ultra-violet rays at a charge of 1*s*. per exposure. Dr. Harding complains that out of 128 patients sent to the hospital for this special treatment during 1928, 78 discontinued treatment contrary to medical advice.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 29TH, 1929.

Notifications.—The following cases of infectious diseases were notified during the week:—Small-pox, 160 (last week, 166); scarlet fever, 1830; diphtheria, 965; enteric fever, 56; pneumonia, 850; puerperal fever, 37; puerperal pyrexia, 85; cerebro-spinal fever, 12; acute poliomyelitis, 2; encephalitis lethargica, 30; dysentery, 5; ophthalmia neonatorum, 128. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on July 2nd–3rd was as follows:—Small-pox, 106 under treatment, 8 under observation (last week 230 and 3 respectively); scarlet fever, 1314; diphtheria, 1635; enteric fever, 10; measles, 211; whooping-cough, 470; puerperal fever, 28 (plus 6 babies); encephalitis lethargica, 124; "other diseases," 35. At St. Margaret's Hospital there were 19 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 34 (7) from measles, 4 (1) from scarlet fever, 35 (13) from whooping-cough, 21 (3) from diphtheria, 89 (7) from diarrhœa and enteritis under two years, and 27 (2) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 6 deaths from measles; no other great town more than 2. Five deaths from whooping-cough were reported from Leeds and 3 from Birmingham. The highest figures for diarrhœa were 4 deaths each from Liverpool and Manchester, 3 from Birmingham. Four deaths from small-pox are now reported for the month of May from areas outside the great towns. These have been assigned as follows:—2 to Gravesend (Kent), 1 each to Bentley-with-Arksey (Yorks W.R.), and Leigh (Lancs).

The number of stillbirths reported during the week was 294 (corresponding to a rate of 42 per 1000 total births), including 54 in London.

Obituary.

JOHN MITCHELL BRUCE, C.V.O., M.D. LOND., F.R.C.P. LOND., LL.D. ABERD.,

CONSULTING PHYSICIAN, CHARING CROSS AND BROMPTON HOSPITALS.

WE regret to announce the death of Dr. Mitchell Bruce, which occurred at his house in Harley-street on Sunday, July 7th, in the eighty-fourth year of his age.

John Mitchell Bruce was born at Keig, Inverurie, and was educated primarily at the local grammar school, whence he proceeded to the University of Aberdeen, where he graduated M.A. in his twenty-first year. Having decided to study medicine he joined the Middlesex Hospital in 1866 with the intention of graduating in medicine at the University of London. He was a highly successful student both at the hospital and in the examinations for the medical degree of the University, gaining honours, gold medals, and scholarships in several subjects. He graduated in 1870 and proceeded two years later to the M.D. degree, in which year he also obtained the M.R.C.P. Lond. He had in the meantime attended post-graduate classes in special pathology at various centres abroad, especially at Vienna, and on return to England he continued these studies under Burdon-Sanderson and Klein. So that when in 1871 he was appointed lecturer on physiology and pathology at the Charing Cross Hospital medical school, after a brief period as resident at the Aberdeen Royal Infirmary, he was unusually well-equipped for his duties. With Charing Cross Hospital he was connected for over fifty years, for in 1872 he was elected assistant physician; ten years later he became full physician and served with notable success as dean of the medical school; he held his active post until 1904, when he was elected consulting physician. He was for a time physician to the East London Children's Hospital, and for a longer period to the Brompton Hospital for Consumption and Diseases of the Chest, and in the general and the special hospitals he made a distinguished mark as clinician and teacher. His classes at Charing Cross Hospital were held to turn out some of the best trained students in the metropolis, while his demonstrations to the residents at Brompton and to occasional post-graduate workers, especially in the out-patient department, were remarkable for their clearness and practical value.

DR. MITCHELL BRUCE.

In particular reference to his educational work at Charing Cross Hospital one closely associated with the institution writes: "At the close of the last century the medical teaching at Charing Cross Hospital reached a very high level, and was considered equal to the very best in London. This was due to the energy and ability of T. H. Green and John Mitchell Bruce, whose lectures and clinics were attended by a crowd of students from other hospitals. Their teaching was very dissimilar: Green seized on fundamental points and impressed them on the students' minds by constant reiteration; Bruce attracted the student by illustrating his point with vivid descriptions of patients in the hospital. In other respects their methods were different. Green's chief weapon was sarcasm, and after ten minutes' examination many a student has vowed never to enter his ward again, but came again, finding the discipline salutary. Bruce's weapon, on the other hand, was kindness. He seized on the student's trifling knowledge, gave him praise, excused his mistakes, encouraged him to fresh efforts. And this came from Bruce's kindness of heart, which was always evident. To be a student at Charing Cross Hospital was to have Bruce as a friend for life, for his kindness was always manifest. Further he spent infinite pains to give comfort to his patients, while he refused ever to be hurried in the discharge of his duties and would never undertake a consultation unless he was absolutely sure of having time to do his duty by his patient. His name will always be cherished at Charing Cross with deep affection as a wise administrator, a great teacher, and a good friend."

During a large period of his time of office at Charing Cross he lectured upon materia medica and therapeutics and as a result he wrote his well-known work on the subject of which the ten editions have been appearing steadily since 1884, it being stated that 70,000 copies have been sold. Something the same large and merited popularity was achieved by Mitchell Bruce's well-known book on treatment, "The Principles of Treatment and their Applications in Practical Medicine." A treatise of this kind was exactly wanted at the date when it was issued—viz., 1900—for much of the therapeutical teaching in the medical literature of the time was purely symptomatic or empirical, while bedside instruction on treatment was, with notable exceptions, brief, at any rate by comparison with the dissertations on morbid appearances. Mitchell Bruce assumed no therapeutical laws, but tried to find them in the facts of ætiology, pathological anatomy, and clinical characters. These he examined in order to obtain lines of treatment, and the sound logic of the method was immediately recognised by readers whose large number was steadily maintained for subsequent editions.

Dr. Mitchell Bruce had a long and honourable connexion with the Royal College of Physicians of London. He was elected a Fellow in 1878, served on the Council, and became Senior Censor in 1911. This year he delivered the Lumleian Lectures of the College, taking as his subject cardiovascular degeneration. In 1913 he was Harveian orator when in an able dissertation he traced the influence of Harvey's work in the development of our knowledge respecting infection and immunity. The Lectures and the Oration were published in THE LANCET at the date of their delivery. Mitchell Bruce was a past President of the Medical Society of London, and later of the Section of Medicine of the Royal Society of Medicine. He was also at different times editor of the *Practitioner* and co-editor of Quain's "Dictionary of Medicine," where he wrote the sections upon certain forms of heart disease and upon acute and chronic rheumatism. As an editor he brought a clear and well-informed mind to bear upon all his work. It was natural that he should be in request as an examiner, and the universities of Cambridge, London, and Manchester, and the English Conjoint Board all availed themselves of his services in this capacity. Hence at the summit of his career he was an exceedingly busy man, for alongside of his hospital, educational, and literary work he conducted for many years a large consulting practice. The University of Aberdeen made him LL.D., the Royal College of Physicians of Ireland gave him their honorary Fellowship, and in 1919 he was created C.V.O.

Our portrait, by Messrs. Elliot and Fry, depicts him at the age of 60 and at a time when he was an accepted leader of British medicine as a general consultant.

Correspondence.

"Audi alteram partem."

THROMBO-ANGIITIS OBLITERANS.

To the Editor of THE LANCET.

SIR,—In your account of the discussion on Diseases of the Jewish Race at the London Jewish Hospital Medical Society on June 13th (THE LANCET, July 6th, pp. 51, 52), I am reported as saying that in my opinion thrombo-angiitis obliterans was a disease with an economic basis rather than a racial one. May I be allowed to correct this misunderstanding and at the same time to make some remarks on the subject. I certainly did say that some of the Jewish patients had had hardships to pass through in their early life—imperfect nourishment perhaps, qualitatively or quantitatively, in some cases—and that the affected individuals were nearly all of the poorer classes, as were also the subjects of the disease in China and Japan. What, however, I chiefly urged was that there was a constitutional basis of some kind which favoured the development of the disease and which seemed not to be specially connected with the endocrine glands, though it was remarkable, I pointed out, how little evidence there was of any familial incidence.

I would here suggest that the constitutional congenital-developmental factor in question may be of the nature of a primary defect in the walls of the blood-vessels of the limbs, sometimes manifested by definite hypoplasia. Indeed, in cases of intermittent claudication in one or both legs, whether in Hebrew or other individuals of early middle age, a question sometimes arises as to whether the symptoms may not be the result of arterial hypoplasia without any actual thrombo-angiitis obliterans.

The lower limbs may be chiefly affected because, as a rule, they are subjected to more muscular strain than the upper ones; if nicotine is an exciting cause, it should be remembered that more nicotine must pass through the blood-vessels of the parts that are most functionally exercised. The immunity of females may be partly explained by the abuse of nicotine having been as yet very rare amongst Hebrew women of the poorer classes and possibly by there having been less muscular exercise involving the lower limbs. But there may also be some other unknown factor to account for the sex-immunity, which appears to be almost as remarkable as in hæmophilia.—I am, Sir, yours faithfully,

London, W., July 7th, 1929. F. PARKES WEBER.

LOSS OF APPETITE IN CHILDHOOD.

To the Editor of THE LANCET.

SIR,—I was delighted with your annotation (p. 32) under the above heading, and I hope that Dr. Joseph Garland's article may be reprinted in this country in extenso, for it is not easy to get hold of the New England Journal of Medicine. Everything you quote needs saying, and saying vigorously, to every parent troubled with fickleness of their children's appetites. I [illegible]d one thing to the statement, "Where [illegible] rise . . ." [viz., a child's resenting [illegible] breast to bottle, from bottle to [illegible]id, from known to unknown] [illegible]ntial to ensure firmness in [illegible] of mother and nurse, even [illegible] days' misery for all con- [illegible] that the "two or three days' misery" may result in a lifelong dislike of a food and that, necessary as it may be at the time of weaning, it may be avoided later by a little guile and common sense.

Every "modern" baby is brought up to take cod-liver oil and tomato or orange juice, and from nine months sieved greens. The flavours of these can be used to get babies to take pretty well what you will thereafter. Even a bread-and-butter pudding may be "got down," *horribile dictu*, with the help of cod-liver oil. Gradually the flavouring can be cut down, and the child will eat the new food with avidity. A new food and not a new dislike will have been added to the child's repertoire without the two or three days' misery.

I fear that this note may be considered more fitting for a mothercraft journal than the pages of THE LANCET, for the point may appear trivial. But I make it because I have seen little in my study of diet and dietetics which leads me to believe that dietitians realise that our tastes in food may all be acquired tastes and have to be learnt (and taught). Pavlov has shown that even so typical a carnivore as the dog has to be taught to eat meat. Stefánsson had to teach his Eskimo dogs to eat game. Is it too great a jump to assume (when the assumption is backed by observation) that human beings have to learn to eat every new food put before them? "Education" consists in superimposing first of all a conditioned reflex upon an unconditioned reflex, and then conditioned reflex after conditioned reflex upon that. With foods the final stage of education is that a new food should awaken gustatory reflexes and not anorexia.

The practical outcome is: lay your basis of acquired tastes early and anorexia of "unknown origin" is unlikely to trouble you. The theoretical outcome is, alas, a scepticism extending to the whole of modern dietetics.—I am, Sir, yours faithfully,

Potters Bar, July 7th, 1929. V. H. MOTTRAM.

SHEWRY *v.* MAYBURY: A JUROR'S REFLECTIONS.

To the Editor of THE LANCET.

SIR,—I have been sent a marked copy of THE LANCET commenting on the singular trial and verdict which will be known to posterity as Shewry *v.* Maybury. Now that the trial is all over, I should like to call your attention to a letter, which I copy from the *Times* of June 25th, and which, as a juror, I should like to endorse. I imagine it has the assent of most of the other jurors. The letter, which can only be a reference to the case, though it does not allude to it by name, is as follows:—

> *Technical Evidence.*
>
> "As one of the special jurors who have sat during seven days listening to the evidence of a recent trial so fully reported in your columns, may I make a suggestion of public import? Of the handling of the case and the result naturally I say nothing. But if medical cases are brought before juries, is it right that a Judge and a special jury should listen day after day to the evidence of experts and hyper-experts, when much or most of it contradicts the rest? Counsel were labouring among technical terms which they did not always understand or know how to pronounce. Would it not be right one day to elect medical referees, to whom cases of disputed fees or alleged negligence could be brought to be settled in a friendly way if possible or, if brought into court, reduced first to nutshell form by impartial medical referees? "I am, &c.,
>
> "SPECIAL JUROR."

Well, these are my sentiments, and further I can say in regard to your interesting article that I was one of the majority in the jury, who were unwilling that after eight years a case should be brought up against Dr. Maybury. Moreover, in spite of my sympathy for the mother in this case, I now suffer from a distinct feeling that Dr. Maybury did not get justice *on the evidence*. It is an uncomfortable feeling, and I am glad to get it off my conscience. Of the reasons why the jury disagreed I cannot say any-

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

M.D.

Helen M. Duvall, W. H. Evans, W. M. Frazer, L. S. Goldman, J. C. McFarland, and F. Murgatroyd.

M.B. AND CH.B. WITH HONOURS.

New Regulations.—Class I.: L. Findlay, T. N. A. Jeffcoate, J. Libman, H. J. Partington. Class II.: D. A. Jones, and J. A. Martinez.

Old Regulations.—Class I.: R. K. Bowes. Class II.: W. W. Gerrard, and J. M. Leggate.

FINAL EXAMINATION FOR M.B. AND CH.B.

Part B. (*New Regulations*)—A. H. Barzilay, M. J. Bennett-Jones, A. T. Halton, J. C. Hill, G. A. C. Lynch, C. L. Pratt, C. K. Sconce, E. B. Whittingham, and J. P. Woodward.

Part III. (*Old Regulations*).—S. Alstead, R. J. Doyle, R. A. Furniss, J. N. Parrington, Muriel S. Roberts, N. W. Roberts, J. L. A. Webster, and J. Williamson.

Part A (*N.R.*)—L. G. Anderson, Marjorie E. Birch, A. Blumfield, C. G. Burgess, G. W. Causey, W. N. Chalmers, J. W. Cheetham, D. H. Collins, A. Curtis, P. P. Fox, D. O. Hughes, V. S. Hughes-Davies, A. T. Jones, R. P. Kemp, F. R. Kitchin, E. W. Malcomson, J. L. Mewton, W. J. Poole, M. Solomon, Honora J. Twomey, T. P. Twomey, and R. Wright.

Part I. (*O.R.*)—E. H. Williams.

Part II. (*O.R.*)—R. G. Walker and E. H. Williams.

DIPLOMA IN PUBLIC HEALTH.

Part I.—R. L. Corlett, R. W. Eldridge, A. B. Follows, Susan H. Gilchrist, and E. Hulme.

Part II.—Kathleen Edgecombe, R. R. Evans, Bridget M. O. Gordon, F. C. S. Hinsbeeck, J. S. Logan, and F. L. Smith.

DIPLOMA IN TROPICAL HYGIENE.

G. D. Drury, N. D. Fraser, J. A. L. Innes, and C. Ramdeholl.

The Ethel Boyce Fellowship in Gynæcology of the University of Liverpool has been awarded to Dr. Gwyneth Griffith; the John W. Garrett International Fellowship in Bacteriology to Dr. Muriel Barton Hall; the Robert Gee Fellowship in Human Anatomy to Dr. R. Doyle; the Holt Fellowship in Physiology to Dr. J. H. Follows; the Johnstone Colonial Fellowship in Biochemistry to Dr. R. W. Brookfield; the Lady Jones Research Fellowship in Orthopædic Surgery to Dr. B. L. McFarland; the John Rankin Fellowship in Anatomy to Dr. J. M. Leggate; and the Thelwall Thomas Fellowship in Surgical Pathology to Dr. E. W. Jones. The Samuels Memorial Scholarships have been awarded as follows: Medicine, Dr. S. P. Meadows; Surgery, Dr. J. C. Ross; Obstetrics and Gynæcology, Dr. M. M. Datnow. The University Graduate Scholar in Medicine is Honora J. Twomey.

THE Parliamentary Secretary to the Ministry of Health, Miss Susan Lawrence, M.P., has appointed Miss Ellen Wilkinson, M.P., to be her Parliamentary Private Secretary.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The forty-seventh annual dinner of this society was held at the Trocadero Restaurant, London, on July 4th, Dr. Harold Sanguinetti, the President, being in the chair. The toast of "The Society" was proposed in a racy and amusing speech by Mr. Ivor Back, who indicated two kinds of useful meetings for such a society as the West London. One would be a discussion of a common topic about which everyone knew something; the other a discourse from someone who knew everything about an uncommon topic. In his reply, Dr. Sanguinetti related the story of the Society, one of whose aims when founded in 1882, was to promote friendly intercourse and good fellowship among medical men in the area. It was its practice to choose a president in rotation from among surgeons, physicians, and general practitioners, and this year he was occupying the chair as a general practitioner. Their membership, which had reached 650 or more before the war, was still not far short of that number. Even during the war the meetings had been well attended, for their members had been deeply stirred by the marvellous successes of medicine and surgery on the field, and by the problems of maintaining the health of the civilian population at home. Women had since 1924 been admitted into membership. Dr. Julius Burnford proposed "The Guests" in a discourse which traced the origin of hospitality from the time of the cave-man onwards. Sir Nigel Playfair, in reply, admitted that he was the son and grandson of medical men, adding, "I am not quite so lay as I look," and giving a telling example of inherited medical talent. Dr. F. G. Crookshank, speaking as a secretary of 25 years ago, recalled the days when there were giants in the land, and warmly espoused the policy of stimulating the interest of general practitioners in clinical discussions. Dr. F. J. McCann proposed "Kindred Medical Societies," to which Dr. Walter Carr and Dr. Ernest Young replied. "The Chairman" was proposed by Dr. Arthur Saunders, who told how the life of a general practitioner might be combined with a real love of education and a flair for literary effort. During the evening Mr. Herbert Collings entertained the company most entertainingly.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—It is hoped that a course in gastroenterology will be held from July 22nd to 26th at the Prince of Wales's Hospital, Tottenham, in conjunction with the North Middlesex Hospital. Those interested are asked to communicate with the Fellowship. From July 29th to August 24th there will be a course in urology at the All Saints' Hospital, Vauxhall Bridge-road, occupying afternoons and evenings. A course in diseases of children will be held at the Queen's Hospital for Children, Bethnal Green, from August 12th to 24th, and an all-day intensive course in medicine and surgery at the Queen Mary's Hospital, Stratford, from August 26th to Sept. 7th. A general course of attendance at the clinical practice of some 40 London hospitals continues throughout the year and may be begun at any time. Details of clinics are provided and the post-graduate is left free to arrange his time-table. Copies of syllabuses and further information may be had from the Secretary of the Fellowship, 1, Wimpole-street, London, W.1.

LONDON HOSPITAL MEDICAL COLLEGE: *Prize-giving.*—Lieut.-Colonel W. M. Pryor, chairman of the College Board, presided on June 28th at the presentation of prizes and certificates to students of the college and dental school by Lord Dawson of Penn, Extra Physician to the hospital. Prof. William Wright, the Dean, said he thought the past year would long be famous in the annals of the hospital and college for the very large number of honours which had fallen to them. In appreciation of services rendered during the King's illness, Lord Dawson had been made a member of the Privy Council, Sir Hugh Rigby had been created a baronet, Dr. Robert Stanton Woods had been knighted, whilst Nurse Black and Nurse Davies had been admitted to Membership of the Order of the British Empire and had been awarded the Royal Red Cross. Among other honours received by active members of the hospital, a knighthood had been conferred on Sir William Paulin, the treasurer, and the Matron, Miss Beatrice Monk, had been created C.B.E. Of former members of the staff of the college, Dr. Chalmers Mitchell, F.R.S., had been knighted; Dr. T. W. Twort had been elected a Fellow of the Royal Society; Prof. J. J. R. Macleod, F.R.S., had been appointed Regius Professor of Physiology at Aberdeen; and Prof. F. Wood-Jones had been invited to occupy the chair of anatomy in the University of Melbourne; whilst Dr. A. W. Woo, a former student, had been elected President of the Chinese Medical Association. Three members of the hospital staff had lately been admitted as Fellows of the Royal College of Physicians, whose Croonian and Goulstonian Lectureships had been offered to two of them, Prof. H. M. Turnbull and Dr. Donald Hunter. Dr. Hunter and Dr. Lewis had been elected to Rockefeller Travelling Fellowships and Dr. L. J. Witts had been appointed Assistant Physician to Guy's Hospital. Of the three distinctions open to undergraduate students of the University of London—namely, the Dunn Exhibition in Anatomy, the Dunn Exhibition in Physiology, and the gold medal for the highest marks in the final examination, the first and last had been gained by London Hospital students—Mr. W. Mushin and Mr. E. A. Hunter. In the first professional examination for the L.D.S., out of 55 separate encounters with the examiners, on no less than 52 occasions were London Hospital students successful. After detailing these and other favourable events, Prof. Wright said he thought this long list of distinctions was unsurpassed in the records of any of the colleges of the University. In conclusion, he referred to the urgent need for improved residential accommodation for students.

Lord Dawson, in presenting the prizes, referred to the work of the Dean—"a man of vision and enthusiasm, and a friend whom no Londoner ever forgets"—and went on to speak of the multiplicity of qualities of head and heart which the medical profession called forth. The unfolding of science and the help it could give to medicine year by year was, he said, illustrated by recent developments with radium, which was going to bring out the necessity for team work. The concluding part of Lord Dawson's speech will be found on p. 85.

The Chairman proposed a vote of thanks, to which Lord Dawson briefly replied.

Freedom Research Entrance Scholarship.—This scholarship in pathology, of the value of £100, tenable at the London Hospital by students of the Universities of Oxford and Cambridge, has been awarded to Mr. J. F. Brock, of University College, Oxford.

DONATIONS AND BEQUESTS.—The late Dr. George Thompson Henderson left £5000 to Guy's Hospital, the income to be used for the general purpose of the hospital other than the medical school.—Mrs. Frances Helen Maria Jacobs, of Fairfield, Lower Shiplake, left £2000 each to the Children's Convalescent Hospital, Beaconsfield, the Medical Auxiliary and Church Society, and the Royal United Beneficent Association, and £1000 to the Wimbledon Hospital.

UNIVERSITY OF ST. ANDREWS.—Mr. Stanley Baldwin will be installed as Chancellor of the University on Nov. 6th and Sir Wilfred Grenfell as Rector on the following day.

DEATHS BY GAS POISONING.—The President of the Board of Trade has appointed a committee to consider the increase during recent years in the number of deaths ascribed to poisoning by coal-gas supplied for domestic purposes, and to make recommendations as to any measures relating to the production and use of gas for domestic purposes which might be taken with a view to diminishing the number of such deaths. The committee consists of Sir Evelyn Cecil (chairman), Sir John Robertson, professor of public health in the University of Birmingham, Mr. R. V. Wheeler, professor of fuel technology in the University of Sheffield, and Mr. F. J. Wrottesley, K.C.; with Mr. H. L. Spencer, of the Board of Trade, Great George-street, Westminster, as secretary.

BROMPTON HOSPITAL FOR CONSUMPTION.—A dinner took place at the Mansion House last week in support of the endeavour to raise £100,000 to provide an adequate annual income for the maintenance of the work of the hospital and money for essential buildings and extensions and the re-equipment of old wards. Lord Reading stated that the hospital has tended a total of 117,000 in-patients and 5,000,000 out-patients.

KING GEORGE'S HOSPITAL, ILFORD.—The Lord Mayor of London has issued an appeal for £50,000, the balance of the amount urgently needed to cover the cost of the first stage of the building operations which have already been begun. The hospital will be a large extension of the existing institution at Ilford with 70 beds; the new scheme provides for 300 beds. Housing schemes have in a short time added 76,000 people to the population of the district.

MEMORIAL TO THE LATE LORD HAMBLEDEN.—Last week the Duke of Connaught unveiled a tablet to the memory of the late Lord Hambleden which has been placed in the entrance-hall of King's College Hospital, of which he was chairman for 20 years. The tablet, which is opposite a memorial to Lord Hambleden's father, the late Rt. Hon. W. H. Smith, whose connexion with the hospital began in 1849, is of granite with a bronze panel bearing an inscription recording his "selfless devotion" to the hospital.

THE REBUILDING OF MIDDLESEX HOSPITAL.—The new west wing is so nearly approaching completion that it is hoped that it will be ready for the reception of patients in October. The building consists of a basement and seven floors. Four of the floors contain 37 beds each and the fifth is a gynæcological unit of 24 beds with its own operating theatre and adjuncts. The walls of the theatre are lined with green-tinted plateglass. The children's ward is on the top floor and has a roof playground. Of the one million pounds which the complete rebuilding will cost over £800,000 has already been obtained.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, July 15th, to SATURDAY, July 20th.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E. Afternoon course in Dermatology. Daily clinical demonstrations. Special demonstrations of interesting cases, Tues. Further particulars from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 15th.—2.30 to 5 P.M., Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.

TUESDAY, July 16th.—5 P.M., Sir Thomas Lewis, F.R.S.: The Mechanism of Raynaud's Disease (Victor Horsley Memorial Lecture).

ST. PAUL'S HOSPITAL, Endell-street, W.C.

THURSDAY, July 18th.—4.30 P.M., Mr. Frank Kidd: The Overflow Bladder.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

DEBATE ON THE ADDRESS.

ON Friday, July 5th, the debate on the Address thanking His Majesty for the Gracious Speech to the Throne was resumed.

Hygiene on Merchant Ships.

Dr. VERNON DAVIES urged that an Inter-departmental Committee of the Board of Trade and the Ministry of Health should be set up to inquire into the accommodation on ships for seamen and to report to the House as to whether some action could be taken. The situation of the seamen and fishermen in the mercantile marine, he said, was not quite so good as it might be. Their charter, the Merchant Shipping Act, was passed 30 years ago, and since then the only alteration made for the improvement of the conditions of our seamen was made in 1906 when the cubic capacity was increased from 72 to 120 cubic feet. At the present time a space of 72 cubic feet was supposed to be sufficient for lascars, but for the ordinary sailor it was 120. During the war there was an agreement between the controller of shipping and the people interested in shipping with regard to the conditions as to accommodation and standard ships were built in which the conditions were very greatly improved. The seamen even thought that a beginning of new times was at hand. Unfortunately, however, since that time the same rate of progress had not been maintained, but on the contrary there had been some slight set-back. They had to recognise that there were a certain number of ship-owners who did not give that care and attention to the conditions of their men that they should, and, as in all legislation, it was necessary to legislate for the recalcitrant and the backward. The "Regulations and Instructions for the Survey of Ships" issued by the Board of Trade, which was the guiding principle, had the fault that it simply made suggestions and was not compulsory. In Australia and also in Norway there were Acts of Parliament which made these things compulsory and by that means alone they were gradually but surely stealing ahead of this country in the accommodation provided for their seamen. In Australia there were medical men whose duty it was to supervise the hygienic accommodation in ships. There was nothing of the kind in this country, except in the Royal Navy, where on the staff of the Director-General of Medical Services there was an officer whose duty it was to see that in our warships there were proper hygienic conditions for the men. A recently inspected 1928 vessel, quite good in ordinary equipment, housed sailors and firemen in the forecastle and had only one wash-basin and shower-bath for all the sailors and firemen—20 in number. Another up-to-date vessel provided the sailors with a mess-room in addition to the sleeping room, but both were in the forecastle. Again a vessel with a large crew and a doctor had no hospital. It was a remarkable thing that it was not compulsory to provide a hospital on these ships. Another thing which would astonish the House was that it was not necessary to provide sanitary accommodation on a ship unless the owner wished to count that space for a reduction of dues for tonnage. Parliament had done something for the slums on shore, but it never seemed to enter their heads that these men who brought food to this country should be provided with proper hygienic and sanitary accommodation.

HOUSE OF COMMONS.

THURSDAY, JULY 4TH.

Police Called into Antivivisection Meeting.

Mr. DAY asked the Home Secretary whether his attention had been drawn to the recent disturbances at a meeting of the British Union for the Abolition of Vivisection at Caxton Hall, Westminster; if any request was made to the Metropolitan police authorities to provide adequate police protection on this occasion; and how many were specially detailed for this duty.—Mr. CLYNES replied: Yes, Sir. In response to the original request for police assistance, 12 police were sent and, subsequently, on receipt of a further message, 17 more.

Mr. BOYCE asked the Home Secretary whether he had received representations in regard to the disturbances at the meeting referred to above, and the alleged refusal of the police officers present to turn out the organised disturbers of the meeting unless the entire hall were emptied; whether any instructions were given to the police officers in question by his department; and if he would consider taking some steps whereby public meetings called for lawful purposes should receive the necessary police protection to carry out the purposes for which such meetings were convened.—Mr. CLYNES replied: The whole incident is under investigation by the Commissioner of Police, and I should prefer to have his report before saying anything further about it. If the hon. Member will repeat his question in a week's time I hope I may then be in a position to reply more fully.

Registrars and Vaccination Exemptions.

Mr. JAMES GARDNER asked the Minister of Health whether he was aware that some of the registrars of births and deaths were refusing to accept statutory declarations from mothers claiming exemption from the vaccination of their children; and if he would take steps to place the mother in the same position as the father for the purpose of the Vaccination Acts.—Mr. GREENWOOD replied: Registrars of births and deaths do not deal with statutory declarations of conscientious objection to vaccination, this being the duty of the vaccination officers appointed under the Vaccination Acts. I am advised that the obligation to cause a child to be vaccinated is placed on the person having the custody of the child, and, consequently, a declaration made by the mother, under the Vaccination Act, 1907, would not exempt the father from liability if he has the legal custody of the child. As regards the last part of the question, any such action would require fresh legislation, which I could not at present undertake to introduce.

Refuse Nuisance at Iver, Buckinghamshire.

Sir ALFRED KNOX asked the Minister of Health whether his attention had been drawn to constant complaints from the Iver district of Buckinghamshire regarding the dumping of London refuse at Iver and Little Britain, in Middlesex; that Mr. Daws, the public cleansing inspector of his department, reported last March that he had found these complaints on local investigation to be well founded; and whether he would see his way to take action to mitigate the nuisance from smoke, smells, flies, and rats, pending the report of the departmental committee recently appointed to recommend permanent measures.—Mr. GREENWOOD replied: I am aware of these complaints. I understand that in one case, where the district council have adopted special by-laws, conditions have improved. In the other case, the local authority have not adopted similar by-laws. I have no legal power myself to deal with particular cases of this kind; but where there is a nuisance or danger to health the local authority can move. The general problem is now being considered by the committee to which the hon. Member refers, and any comprehensive measure must await their report.

Grading of Milk.

Brigadier-General CLIFTON BROWN asked the Minister of Health whether, in view of the frequent misleading of the public by the present system of grading milk as I. Certified, II. Grade A (tuberculin tested), III. Grade A, and IV. Pasteurised, he would alter these designations to Grades A, B, C, and D, so that the purchaser might more easily recognise which was the highest grade of milk.—Mr. GREENWOOD replied: I will bear the hon. Member's suggestion in mind, but to give effect to it would involve the introduction of legislation which I cannot contemplate during the present session.

Panel Patients in Great Britain.

Mr. DAY asked the Minister of Health the number of panel patients at the present time in Great Britain, and the number of doctors who had been removed from the panel; and if he could give particulars.—Mr. GREENWOOD replied: The number of insured persons entitled to medical benefit in 1928 was about 14,800,000; 46 insurance practitioners have been removed from the medical list since 1913, when medical benefit came into operation. The figures relate to England and Wales. Questions relating to Scotland should be addressed to the Secretary of State for Scotland.

Deaths after Vaccination.

Mr. NEIL MACLEAN asked the Minister of Health whether his attention had been called to the coroners' inquests on deaths following upon vaccination; whether he was aware that since July, 1928, there had been 65 cases of serious illness following vaccination, 32 of which proved fatal; and whether he would consider the setting up of a committee of inquiry to go into the whole question of vaccination, and have among the personnel of any such committee representatives of the public.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. As regards the second part, 27 cases (and not 65) in which symptoms suggestive of disease of the central nervous system following within a month of vaccination were reported to have occurred during the period from July 1st, 1928, to June 30th, 1929. Of these cases 13 were fatal. As regards the third part, the whole question of vaccination has been recently examined by an expert committee, a report by whom was published last year and is now receiving my careful consideration. Investigations are still being made into certain questions by this committee, and I do not consider that any useful purpose would be served by the appointment at the present time of a further committee of inquiry.

Small-pox in West Ham.

Mr. GROVES asked the Minister of Health the total number of cases of small-pox in the West Ham county area since January, 1929; whether the disease had been of a mild character; and what fees had been paid to the public vaccinators for their services from January, 1929, to the end of May.—Mr. GREENWOOD replied: 690 cases of small-pox were notified in the county borough of West Ham during the 26 weeks ended June 29th last. These figures are provisional. The disease has, generally, been of a mild degree. The amount of the fees paid to the public vaccinators in respect of the vaccination of persons resident in the county borough during the three months ended March 31st last was approximately £91. Information as to the fees paid in respect of the months of April and May is not yet available.

Ratification of Washington Convention.

Sir ASSHETON POWNALL asked the Minister of Labour the terms of the announcement made at Geneva with regard to the ratification of the Washington Convention, and to give details of the precise nature of the obligations which they had entered into.—Miss BONDFIELD replied: The statement made by the British Government representative at the recent International Labour Conference was in the following terms: "I am authorised to state that His Majesty's Government in Great Britain propose to take the necessary steps to ensure at the earliest possible moment the ratification of the Washington Hours Convention. That statement requires no further explanation and would only suffer at this moment by further elaboration. I should, however, add that I understand that in introducing the hours legislation necessary His Majesty's Government will take account both of the Washington Convention and the London Agreement." I have nothing at present to add to that statement.

MONDAY, JULY 8TH.

Vivisection of Dogs.

Sir ROBERT GOWER asked the Home Secretary whether it was his intention to introduce legislation prohibiting the vivisection of dogs.—Mr. CLYNES replied: This is a matter on which the Government must be guided by the best possible advice which it can command, and having regard particularly to the carefully considered opinion on the subject which was expressed in the memorandum of the Medical Research Council presented to Parliament in 1927. I am afraid that I cannot undertake to introduce legislation on this subject.

Post-Vaccinal Encephalitis.

Mr. GROVES asked the Minister of Health how many certificates had been received in which the words vaccination or vaccinia or post-vaccinal encephalitis occurred as the cause of death since Jan. 1st this year; in how many other cases did death occur within one month after vaccination; the ages of the persons to whom both sets of death certificates referred; and in which cases were inquests held.—Mr. GREENWOOD replied: Since Jan. 1st, 1929, ten death certificates have been received in which the words "vaccination," "vaccinia," or "post-vaccinal encephalitis" appeared in the coroner's certificate or the medical certificate of the cause of death. The ages of the deceased were respectively 4 weeks, 4 months, 5 months, 6 months, 8 years, 9 years, 10 years, 17 years, 26 years, and 31 years; inquests were held on the persons aged 8 years, 10 years, 17 years, 26 years, and 31 years respectively. In addition I have information of seven cases in which death occurred within one month after vaccination. The ages of the deceased were respectively 9 years, 10 years, two of 13 years, 14 years, 51 years, and 58 years; inquests were held on the persons aged 10 years, 14 years, 58 years, and on one of the persons aged 13 years.

Medical Research in India.

Major GRAHAM POLE asked the Secretary of State for India whether he would inform the House as to why the Report of the Committee on the Organisation of Medical Research in India has not been published; whether he was aware that the All-India Medical Congress had urged its publication; whether any protests had been received against the proposed location of the Central Medical Research Institute at Dhera Dun; and if the legislative assembly would be consulted before any decision was taken.—Mr. WEDGWOOD BENN replied: I am informed that this report was published about five weeks ago. Some protests were made against the location of the Central Medical Institute at Dehra Dun; but the expenses for the scheme as proposed were approved on Jan. 29th by the Standing Finance Committee of the Legislative Assembly.

Veterinary Training in London.

Lieut.-Colonel Fremantle asked the Minister of Agriculture whether he had yet received the Report of the Committee appointed to consider the existing facilities for training veterinarians in London; whether this report would be published as a Parliamentary Paper; and, if so, when.—Mr. Buxton replied: No, sir; but I understand that the Committee has reached the stage of considering a draft report. When the report is received it will be printed and published, and copies will be available for the use of members.

Health of Miners in Rhodesia.

Lieut.-Colonel Fremantle asked the Under Secretary of State for the Colonies, whether the governor of Northern Rhodesia had been asked to submit proposals for the removal of the capital of that territory from Livingstone; whether, in view of the new mining developments in the copper field in that country, any special arrangements were contemplated in regard to the recruitment, supervision, health, and education of natives employed in connexion with the copper mines; and whether these matters would be under the direct control of the government or left to the mining companies.—Mr. Ponsonby replied:—The reply to the first part of the question is in the affirmative. Education is controlled directly by the Government; recruitment, housing, and health are controlled by the mining companies under Government regulation and inspection. The Government already has ample powers in connexion with these matters, but the Secretary of State is not satisfied with the information which he has received with regard to the health of the miners and he has called on the governor for further report and recommendations. Special arrangements for education of the natives at these mining centres are under the consideration of the Advisory Committee on Education in the Colonies. I may add that a revised mining Law is in course of preparation.

Veterinary Services in the Colonies.

Lieut.-Colonel Fremantle asked the Under Secretary of State for the Colonies what action was being taken to give effect to the recommendations of Lord Lovat's Committee on the development of veterinary services in the Colonial Empire, and, in particular, whether the scholarship scheme for recruiting and training veterinary officers for Colonial governments was being proceeded with; and whether it would come into operation this year.—Mr. Ponsonby replied: A despatch was addressed to Colonial Governments in April last dealing with the recommendations of this Committee and asking for their observations upon them. Replies to this despatch are now being received. In view of the present lack of qualified candidates the Secretary of State is of opinion that the first step towards the further development of the Colonial Veterinary Services should be the institution of the scholarship scheme which the Committee recommended, but he fears that it will not be possible to bring this scheme into operation this year.

Hydro-Therapeutic Treatment for Insured Persons.

Dr. Morris-Jones asked the Minister of Health whether he was aware that a scheme had been submitted by the British Spa Federation to provide hydro-therapeutic treatment for insured persons suffering from chronic rheumatism as an additional benefit under the National Health Insurance Act; and whether such scheme had received the sanction of the Ministry.—Miss Susan Lawrence (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the affirmative. The proposed scheme has received careful consideration, but has not yet been sanctioned. The present list of additional benefits already affords to approved societies a wide variety of forms of remedial treatment from amongst which they may select those to which the limited funds available for the purpose out of their disposable surpluses shall be allocated, and before adding further benefits to that list my right hon. friend would require to be satisfied that there was a fairly widespread desire on the part of societies for such an extension.

Salary of a School Dentist.

Mr. Thorne asked the President of the Board of Education whether his attention had been called to an advertisement inviting applications for appointment as a school dentist to the West Ham education committee at a salary of £450 a year, rising by annual increments of £25 to £500; that the advertisement had been declined by three professional publications on the ground of the salary being below scale; and whether the proposed salary was authorised by his department.—Sir C. Trevelyan replied: I am aware that the West Ham Education Committee propose to appoint an additional school dentist, but the circumstances referred to by the hon. member have not previously been brought to my notice. The Board have not prescribed or authorised the salary of this or any other school dentist.

TUESDAY, JULY 9TH.

Adoption of Children in Scotland.

Sir George Penny asked the Secretary of State for Scotland whether an Adoption of Children (Scotland) Bill would be introduced on the lines of the English Adoption of Children Act.—Mr. Adamson replied: The question is receiving consideration, but I am unable at present to give any undertaking as to legislation.

War Pensions Administration.

Mr. Kingsley Griffith asked the Prime Minister whether it was proposed to obtain powers to remove the pension grievances of ex-Service men and their dependants as specified in the proposals of the British Legion, and in particular with regard to the operation of the seven-year limit.—Mr. F. O. Roberts (Minister of Pensions) replied: Representatives of the British Legion have submitted certain proposals to me on various matters connected with the administration of war pensions, and these are having my immediate consideration. The point mentioned in the questions is certainly to be dealt with, but I cannot at this early date announce any definite decision. In the meantime I may say that the necessary steps are being taken to ensure that no case shall be rejected merely on the ground that it is submitted beyond the time-limit.

Protection against Air Gas Attack.

Brigadier-General Clifton Brown asked the Prime Minister whether the committee which has been considering plans for the protection of the civil population from attack from the air by poison gas had yet evolved a scheme, and, if so, whether the British Red Cross and local authorities were taking steps to operate it in case of necessity.—Mr. Ramsay MacDonald replied: In view of the recent ratification of the Geneva Gas Protocol of 1925 by most of the important European States, including this country, I do not think this is a moment to press the local authorities to develop plans for the protection of the civil population against gas attack. Much preparatory work had, however, been done by the Committee of Imperial Defence upon this problem prior to the ratification of the Protocol, and that work will not be thrown away if, unfortunately, a situation should hereafter arise requiring as a measure of prudence the development of plans for this purpose.

Children in Slum Areas.

Mr. Simon asked the Minister of Health whether he was aware that there were actually more children living in slums to-day than ten years ago, and whether he was prepared to enable their parents to move them into decent houses by some form of children's rent allowance.—Mr. Greenwood replied: I am aware of the unsatisfactory conditions under which many families are living. The provision of better accommodation for such families is one aspect of the general problem of the slums which is engaging my attention; but the hon. Member must not assume that I accept his view that the adoption of a system of children's rent allowances is a solution of this problem.

League of Nations and Radium Supplies.

Commander Bellairs asked the Minister of Health what steps had been taken in regard to international action as to the supply and price of radium; and whether the report of the Radium Subcommittee of the Committee of Civil Research had been brought to the notice of the League of Nations.—Mr. Greenwood replied: The report of the Radium Subcommittee has been brought to the notice of the League of Nations Health Organisation. As regards the supply and price of radium there is for the time being nothing to add to the reply given on April 18th.

Food Value of Half-Meat Cheese.

Mr. Remer asked the Minister of Agriculture if his attention had been called to the importation of large quantities of cheese from Holland and elsewhere which was sold at low prices as cheese, but which was known in the trade as half-meat cheese, and, in view of the low food value of this cheese, if he would take steps to see that this cheese was labelled half-meat cheese.—Mr. Addison (Parliamentary Secretary to the Ministry of Agriculture) replied: The question of the sale of both home-made and imported half-meat cheese has been constantly before the Ministry for some time past. Local authorities under the Food and Drugs (Adulteration) Act, 1928, have power to deal with cases where it is sold under a name which indicates that it is whole-milk cheese, and convictions have been obtained from time to time. In the opinion of my right hon. friend the fresh legislation which the hon. Member's proposal would involve could not at present be justified.

Scottish Local Authorities and Local Government Act.

Mr. DUNCAN MILLAR asked the Secretary of State for Scotland the number of resolutions he had received from town councils, education authorities, parish councils, and other public bodies in Scotland, respectively, calling for the suspension of the operation of the Local Government (Scotland) Act, 1929, until it had formed the subject of further inquiry or for the amendment of the provisions of the Act.—Mr. ADAMSON replied: The numbers are as follows: town councils, 23; education authorities, 7; parish councils, 59; other public bodies (including the *Association of Education Authorities*), 2.

Appointments.

WOOD, E. A., M.B., B.S. Lond., has been appointed House Surgeon to the Swindon Victoria Hospital.

Certifying Surgeons under the Factory and Workshop Acts: HAMILTON, A. B., M.B., Ch.B. Glasg., D.P.H. (Tipton District of Stafford); HUTCHISON, T. P., M.B., Ch.B. Glasg. (Muirkirk District of Ayr); and MORTIS, R. H., L.R.C.P. Lond., M.R.C.S. (Hertford).

City of London Maternity Hospital: ALLAN, W.B., M.B., B.S. Durh., Senior Resident Medical Officer; TAIT, C. B. V., L.R.C.P. Lond., M.R.C.S., Junior Resident Medical Officer.

Glasgow Royal Maternity and Women's Hospital: CROCKETT, MARGARET G., M.B., Ch.B. Glasg., and FULTON, J. B., M.B., Ch.B. Glasg., Indoor House Surgeons; SIMPSON, J. R., M.B., Ch.B. Glasg., and BARROWMAN, JEAN M., M.B., Ch.B., Outdoor House Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—Asst. Radiologist. £500.
Bethnal Green Hospital, E.—Asst. M.O. £350.
Birmingham and Midland Homœopathic Hospital and Dispensary, Easy-row.—H.S. £150.
Birmingham City Mental Deficiency Institution, Coleshill Hall.—Med. Supt. £700.
Birmingham General Hospital.—Res. Surg. Reg. £100–£140.
Birmingham University.—Walter Myers Travelling Studentship £300. Also Lecturer in Physiological Dept. £400.
Bolton County Borough Education Committee.—Asst. School M.O. £600.
Bootle Borough Hospital, Derby-road.—Sen. M.O. Also Two Jun. M.O.'s. At rate of £130 and £125 respectively.
Bournemouth, Royal Victoria and West Hants Hospital.—H.S. At rate of £120.
Bradford Royal Infirmary.—Two H.S.'s. Each £150.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Bristol General Hospital.—H.P.'s and H.S.'s. Also Obstetric Officer. Each at rate of £60. Also Cas. H.S. At rate of £80.
Bristol Royal Infirmary.—Sen. Res. M.O. £200. Also Res. HS.'s. to Special Departments. At rate of £60. Res. Cas. H.S. and Dental H.S. At rate of £80 each.
British Red Cross Society's Clinic for Treatment of Rheumatic Diseases, Park Square East, Regent's Park.—Med. Supt. £600.
Burton-on-Trent General Infirmary.—Second Res. H.S. £150.
Cairo, Egyptian University.—Prof. of Clinical Pathology. £E.1500.
Cardiff Royal Infirmary.—H.S.'s and H.P.'s to Special Depts. Each at rate of £50.
Chester Royal Infirmary.—H.S. and Cas. O. £120.
Derby, Derbyshire Hospital for Women.—Hon. Asst. S. Also H.S. At rate of £150.
Dorset County Council.—Asst. School Dentist. £450.
Dreadnought Hospital, Greenwich.—Asst. Radiologist. 50 gns.
Dundee Royal Infirmary.—Visiting M.O.
Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.
Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.
Gloucester, Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £100.
Great Yarmouth General Hospital.—Jun. H.S. £100.
Greenwich Union.—Fifth and Sixth Asst. M.O.'s. Each £300.
Guy's Hospital, Venereal Diseases Clinic, S.E.—Three M.O.'s. Each £365.
Holborn and Finsbury Hospital, Archway-road, N.—First Asst. M.O. £500.
Hull Maternity Home and Infants' Hospital, Hedon-road.—Res. M.O. £450.
Ilford Emergency Hospital.—H.S.'s.
Invalid and Crippled Children's Society's Hospital, Balaam-street, Plaistow, E.—H.S. to Ear, Nose and Throat Dept.
Liverpool, David Lewis Northern Hospital.—Med. Tutor and Registrar. £120. H.P.'s and H.S.'s. Also Hon. Anæsthetists.
London Jewish Hospital, Stepney Green, E.—Hon. M.O. for Actino-Therapeutic Dept. Also Out-Patient Asst. At rate of £50.
Lowestoft and North Suffolk Hospital.—H.S. £120.
Maidstone, West Kent General Hospital.—Hon. Anæsthetist.
Malayan Medical Service.—Asst. Med. Supts. for Mental Hospitals at Singapore and Tanjong Rambutan. Each £700.
Manchester City.—Asst. Tuberculosis Officer. £650.
Marseilles, Queen Alexandra Memorial Hospital.—Res. M.O. At rate of £150.
Middlesex Hospital.—Asst. to Ophthalmic Dept. £100.
Newcastle-upon-Tyne, Education Committee.—Asst. S.M.O. £650.
Nottingham General Hospital.—Two H.S.'s for Special Depts. Each at rate of £150.
Oldham, Royal Infirmary.—H.P.'s and H.S.'s to Special Depts. Each at rate of £175.
Oswestry, Shropshire Orthopædic Hospital.—H.S. £200.
Plaistow Fever Hospital, E.—Second Asst. M.O. £300.
Preston and County of Lancaster Queen Victoria Royal Infirmary. H.P. Also H.S. Each at rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P.
Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Radiologist.
Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.
Rotherham Hospital.—Sen. H.S. £200.
Royal Army Medical Corps.—25 Commissions.
Royal London Ophthalmic Hospital, City-road, E.C.—Gifford Edmond's Prize in Ophthalmology. £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.
St. Albans, Napsbury Mental Hospital.—Jun. Asst. M.O. £485.
St. Andrew's Hospital, Devons-road, Bow, E.—Three Asst. M.O.'s. Each £350.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.
St. Thomas's Hospital.—Three Med. Regs. Each £250.
South Africa, Bloemfontein Hospital.—Sister for X Ray and Electrical Dept. £300.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150 Also H.S. to Ophthalmic and Aural Depts. At rate of £150
Swansea Hospital.—Cas. O. £150.
Torquay, Torbay Hospital.—Hon. Surgeon to Surgical Out-patients.
University College Hospital.—First Hon. Asst. to Ear, Nose and Throat Dept.
West End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.—Jun. H.P. At rate of £100.
West London Hospital, Hammersmith, W.—Aural and Ophth. H.S. and Res. Asst. Cas. O. At rate of £100. Also Res. Anæs. At rate of £100.
Willesden General Hospital, N.W.—Clin. Assts. to Special Depts.
Windsor, King Edward VII. Hospital.—Third H.S. At rate of £100.
Wolverhampton Royal Hospital.—Hon. Surgeons to Ear, Throat and Nose Dept.
Woolwich and District War Memorial Hospital, Shooters-hill, S.E. H.P. and H.S. Each at rate of £125.
Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.
Wrexham and East Denbighshire War Memorial Hospital.—Res. H.S. At rate of £160.

Births, Marriages, and Deaths.

BIRTHS.

DYKE.—On July 8th, at a nursing home, to Janet, wife of Dr. S. C. Dyke, of 9, George-street, Wolverhampton—a son.

HANAFIN.—On June 26th, at Liverpool-road, Chester, the wife of Lieut.-Colonel J. B. Hanafin, C.I.E., I.M.S., of a daughter

LEWERS.—On June 30th, at Castle Hill, Ilfracombe, the wife of Dr. H. B. Lewers, of a daughter.

LOWE.—On June 29th, at Rey Bridge, Lacock, Wilts., the wife of Dr. John Burman Lowe, of a daughter.

REID.—On July 4th, at Rodney-street, Liverpool, the wife of Andrew McKie Reid, M.C., F.R.C.S., of a son.

MARRIAGES.

CARR—BOXALL.—On July 4th, at St. James's Church, Abinger, Dr. Stephen Alan Carr to Irene, only daughter of Mrs. R. Boxall and the late Robert Boxall, M.D., of Ingleside, Abinger Common.

ROUSE—MURRAY.—On July 6th, at the Parish Church of St. James, Paddington, Dr. James Edward Colleton Rouse to Nancy Mary Louise, younger daughter of Dr. and Mrs. Richard Galway Murray, of Sussex-gardens, W.

DEATHS.

BRUCE.—On July 7th, at Harley-street, John Mitchell Bruce, in his 83rd year.

FENTON.—On July 4th, at Croft Lodge, Brackley, John Samuel Fenton, B.A., M.D. (T.C.D.), in his 68th year.

GALE.—On July 5th, Arthur Knight Gale, M.R.C.S., L.R.C.P., of South Mount-terrace, York, late of Woodseats, Sheffield, aged 70.

HARDENBERG.—On July 2nd, at Frederica-road, Chingford, Emile John Frank Hardenberg, M.R.C.S., L.R.C.P. Lond., aged 52.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THOUGHTS ON UNIVERSITY COLLEGE.

An Address delivered to the Assembly of Faculties of the College on July 4th,

BY SIR WALTER FLETCHER, K.B.E., M.D., F.R.S.,
SECRETARY OF THE MEDICAL RESEARCH COUNCIL.

[Sir Walter Fletcher began his address by regretting the impending resignation of the Provost, Sir Gregory Foster, and continued :—]

I think it a high and a quite unmerited honour that I should have been allowed, among so many distinguished guests to-day, to be your special visitor and to receive, as I have done on your behalf, the scholars, medallists, and prizemen of the year. They have well shown by their achievements how lively is the spirit of endeavour here, and how high the level of performance. We congratulate them heartily; and to them and to all the graduates of the year now passing on to the next stages of their chosen work we bring our warmest good wishes. To stand here as I do now, your visitor to-day, gives me emotion for private and personal reasons, of which I hope you will allow me to speak briefly. I cannot help reflecting that more than 80 years ago my own father came here as a student. He was born almost in the same week as that of the foundation of the College itself. Debarred from Cambridge by the test then imposed of signing the Thirty-nine Articles, he came to this place of free learning. Here he found great teachers like Arthur Clough in English literature, de Morgan in mathematics, Graham and Williamson in chemistry, and to those men and to others here he never failed to acknowledge a lifelong debt. He might have found mathematicians *technically more competent at Cambridge, though de Morgan* can have had no equals even there in the kind of inspiration he gave. As to chemistry, he could have found no practical instruction at all in either Oxford or Cambridge at that time. It was not till three years later that Prof. Liveing, at Cambridge, began his first practical class in a small cottage hired for that purpose.

Family and Personal Indebtedness.

Will you pardon me if I recall some of the memories on which my father was fond of dwelling? In his years here, just at the mid-century, University College was not far from the edge of the town, with many green fields between it and Hampstead. My father's home was then considered to be far in the country; it was among fields and gardens at the top of Denmark Hill. Transport from Denmark Hill was not then what it is now, though I may say that his elder brother, an engineer, had already made a steam road-car and had successfully driven it from Reading to Maidenhead in 1843. For my father the daily journey from Denmark Hill to College took too long. He hired rooms in Gower-street, and used to come in on Monday mornings by a horse omnibus from the bottom of Denmark Hill for the week at College. He did his light reading in the 'bus, and for that purpose he commonly used the monthly parts of "Dombey and Son" and then of "David Copperfield," in their green paper covers, as they were written by Charles Dickens in *his house at Doughty-street, half* a mile from here. One of my most prized possessions is the gold medal for chemistry my father gained here in 1851, receiving it, I suppose, at some such ceremony as this. My family piety impels me to boast that the runner-up for the medal on that occasion was Sir Henry Roscoe, whose friendship my father gained here and enjoyed for over sixty years. You will understand how keenly I feel the pleasure of being allowed to come to this assembly of the faculties, and of being able thus to acknowledge here my father's lifelong affection for this College, and his lasting gratitude for all he owed to it. I owe so much to him that his debt to you is mine. I can only attempt to repay it by the honour and respect I give to this home of young life and friendship, this great house of learning and research.

This family debt I owe to University College is by no means the end of my debtor's account. In my father's time, and for a quarter of a century longer, that inspiring teacher, William Sharpey, was Professor of Physiology and Anatomy here. Of his immediate pupils, Michael Foster passed from this College to found the school of physiology at Cambridge, and in large degree indeed to found the whole group of modern biological sciences there. While Burdon Sanderson carried fire from the same torch to Oxford, and Schafer, happily still with us, bore it to Edinburgh. From those missioners of Sharpey and of University College at those three centres have come living developments clearly traceable in their perennial fertility though quite incalculable in extent, and not only in Great Britain but throughout the world. But I dare not begin to say more of this now. Of Foster no Cambridge man can speak without gratitude, and no pupil of his without glowing affection. I have here again to confess for his sake an obligation to this College which I share with so many others.

The Greatness of Lord Haldane.

The Provost in giving his interesting record of the past academic year said rightly that this year has been momentous in the history of London University. The new constitution of which this year has *seen the birth, will bring fresh unity* and effectiveness to the University. In so far as it does that it cannot fail to enrich the opportunities of this College for adding fresh lustre to its long and unparalleled history of service—of service devoted from the first to all those ideals that rightly belong to university life and work in London. There must be many here to-day whose reflections have been deeply stirred not only by thoughts of this but by another event also within the past year, and just recalled to us by the Provost. I mean the death of Lord Haldane, who formerly gave devoted effort here as Vice-President of the College Council and whose desire, stronger perhaps than any other desire of his life, was to see and to aid the advancement of those great purposes for which this College stands. For much more than 30 years he had given time and work lavishly to the cause of university reform in London. The story of those long, intricate, and controversial labours lies on record. To-day we think of him as a past officer here whose life has ended just as the seal was being set upon what it had so long been his object to secure.

I am sure you will think it right that on this occasion, and in this assembly of university men, that we should hold Lord Haldane in special remembrance. It is surely true to say that no man of his own or any other generation has done more to promote the growth of university education in this country. He saw clearly that not only the soul but the material welfare and even the safety of Great Britain were being endangered by our national neglect of university education. Throughout his long life he saw clearly and taught strenuously the true ideals of university life. He toiled ceaselessly in hard labour by day and night through clouds of controversy, through banks of apathy, and among intricate mazes of political and financial difficulty until he had secured the foundation in enduring form of one part after another of our national university system. If we look back upon what he actually did, the tale is almost incredible. His work for London University for over 30 years makes a drama known to you all. The present university system in Ireland was due to his conception, hard work, and diplomacy, though he gave others the credit. The foundations of Liverpool University and of the other civic universities that followed it were due in large part to him. His was the chief hand in framing the university system for Wales. He was foremost among the founders of the Imperial College of Science, and his work and influence were vital for the beginnings of the University Grants Committee and the Scientific and Industrial Research Department. For most men, Lord Haldane's service to education would represent whole-time labour for a lifetime. Yet he did it as a labour of love, while he was engaged in a huge professional practice at the Bar, and later, while he was Secretary of State for War, the busiest and greatest we ever had, and while he was Lord Chancellor. Already, as each year passes, the truth about his work is becoming more clearly known. His multiple *achievements stand out in their mass as we recede* from them in time. Unlike so many of his colleagues in the public service, Lord Haldane had no arts of the demagogue, natural or acquired. He had no gift of voice, no picturesque appearance. Devoid of all art in self-advertisement, he offered to the public in his writings and speeches an aspect which to the half-educated had no practical message. Even in his professional work at the Bar his massive success was won not by words cleverly spun before juries, but by his intellectual advocacy before the trained minds of the highest courts. These deficiencies in personality, if they were deficiencies, account for the tragedies of his life which he faced with such dignity and unselfishness. In the words of Lord Haig, which only echo those of all professional soldiers, Lord Haldane was the greatest War Minister this country has ever had. In the face of entrenched conservatism and financial stringency, he created the Imperial General Staff, the Officers' Training Corps, the Territorial Army, and that Expeditionary Force which the German commanders admitted to be incomparably effective. Yet for want of a few bold words of truth, openly spoken by the political colleagues who best knew his work, the country lost his services at the very time when it was being saved by the fruits of his work and when our further need of him was so great. Even Haig, in the hour of his triumph, had not the bravery to pay openly to Haldane the written tribute I have just quoted. He permitted himself to be content at the time with paying him a secret evening call. But if the Cabinets Lord Haldane served and the Army he created have run the risk of losing the respect of posterity by their great sins of omission, we who belong to university life must not fail with them, and must openly declare our debt. Haldane's future fame is assured, for it stands on the rock of performance, and it will live when the lesser men who failed him will have been long forgotten.

University College and University Ideals.

Here at University College are surely both the conditions and the embodiment of the university ideals that Lord Haldane so strenuously upheld. Of those ideals, one of the chief is represented by the very fact that this red letter, or red gowned, occasion is called the Assembly of the Faculties. I take this as marking your attachment to the principle that all branches of knowledge should be brought in such close relation within a true university that there may be in each part a sympathetic understanding of the work of all other parts, of their mutual relations, their possibilities and limitations. This College has not grown as the modern universities of the country have in the main grown, by the successive grafting of new faculties on to schools of technical instruction. University College has been a complete University from the beginning, and was indeed for long the only complete University in the country, having a full Faculty of Arts, including Fine Arts and Architecture. From the beginning, too, your faculties have been in close association both in place and in spirit. Only so can the true function of a university be realised. Only by taking the whole realm of human thought and experience for its kingdom can it bring workers in all the divers fields into a full community, effectively impose its distinctive influence upon them, and imbue them with one spirit and one aim. That spirit of the university must be the sense of a fundamental unity of purpose residing in every kind of creative work, whether in art, in letters, or in science. That single aim must be the conscious direction of all the powers that spring from knowledge or skill towards the promotion of the highest ends. Here is the true religion, and this College has always been faithful to it. We can afford to smile at the old nickname of the "godless University," once given to it by a narrow and sectarian jealousy.

The intercourse of different faculties, so vital if the university spirit is to be maintained, is actually endangered by the multiplication of human knowledge. As the boundaries of the body of knowledge are extended by research, the individual workers at the points of growth find themselves more widely separated along the advancing periphery. Yet growth at any point may cease unless it receives fresh impetus from some cross-contact with other parts, perhaps apparently distant parts, of the field of knowledge. This gives a practical reason of daily importance for the close contact of faculties which only reinforces the spiritual reasons that come first. The distinguishing character of university work depends upon this university spirit; it does not depend at all upon the mere complexity of the instruction given. Yet the university fails unless the students within it learn not only the value of truth but the difficulty of gaining it. I have sometimes passed through your main entrance hall and seen the students hurrying about their business, and upon the walls the silent witness of those members of the College who gave their lives in the war. More than once, as I have seen this, I have thought of those words of Bishop Hall, of Norwich, in the seventeenth century, "God sells knowledge for sweat; as he doth honour for jeopardie." Knowledge indeed comes only by effort, and a true university will always inspire those possessing it to use it and spend themselves freely in the public service, not caring to count the risks.

University College and Its Neighbours.

If I may say one last word, it will be in reference to some benefactions within and near this place. Great new opportunities of applying in practical directions the knowledge gained here in the primary sciences have come in recent years to the College. Grouped near your [illegible] of primary
study are buildings for the appl[illegible] of engineering,
of technical chemistry, and to [illegible]
also upon the literary side. [illegible]
coöperation with the Med[illegible]
the road, while close at hand [illegible]
School of Hygiene and T[illegible]
already giving your ass[illegible]
taken, I think carelessly, [illegible]
kinds are not trul[illegible]
as such. I thin[illegible]
reason. We [illegible]
character to [illegible]
[illegible] the direct[illegible]
applied s[illegible]
for the [illegible]

it is continually suggesting new problems for research work of a fundamental kind.

As in private duty bound, I would here refer in particular to your new neighbour, the London School of Hygiene and Tropical Medicine, which is to be opened within a few days. From my own relations to the school I know how confidently it hopes for your continued coöperation, and how keenly it desires to join in service with you to its fullest power. It offers work to post-graduate students in all the wide and varied fields of knowledge that now serve preventive medicine. The School has been founded in order to bring all the resources of science to aid the protection, right use, and development of human life at home and throughout the Empire. These great utilitarian needs can be met rightly only in the light that scientific work begins. That work must have its roots in the disinterested pursuit of primary learning. Its close association with this place will bring to it, I hope, much more than an exchange of practical services. I pray that there may be realised within the new School, as within this College, the true and inner meaning of university work. The satisfaction of material needs is not to be our first consideration. Within a university it should become instinctive for us to see that the name of truth is hallowed before we seek our daily bread. I would that the School may learn that first lesson from your example and from your long tradition.

CLEAN MILK.

On July 9th at the Express Dairy Company's Farm at Finchley a demonstration was given of the making and filling of a new milk container which has been named the "Sealcone." This container is made of thick soft paper which is sterilised and made impervious to fluid by hot wax. The paper is passed through a forming machine, which makes the cone; the cone is then passed through a tank of hot wax, before being carried by machinery to the filling and sealing stations. Here an operator works a tap in connexion with the milk supply, so that the cone is filled with milk; it then is placed under a machine by which it is hermetically sealed. Thus every pint of milk can be delivered as between the dairy and the consumer without risk of contamination. The milk can be kept sweet in the containing cone for such a considerable period as a week, and the firm states that specially cooled milk shows no sign of deterioration in a month. The sealed cones can be sold to the public from the counter without a money deposit upon them, as there is no need to return them.

OVERHEARD AT THE SEASIDE.

To the Editor of THE LANCET.

SIR,—The following was overheard on the pier at the seaside:—

First female: "You should take *my* doctor's advice; he used to be just a doctor, an ordinary common doctor, you know; but now he's dropped all that; he's an *olive oil* specialist; he says it's the one thing; if you've a pain you *rub* it *on* outside, and you *drink* glasses of it."

Second female (much impressed): "There now! And it's in the Bible, too!"

I am, Sir, yours faithfully,
C. WILLETT CUNNINGTON.

Dollis-avenue, Church End, Finchley, July 4th, 1929.

SOUTH HANTS AND SOUTHAMPTON HOSPITAL.

On Friday in last week Prince George opened a new wing, named after Colonel Sir Edward King Perkins in acknowledgment of his services to the institution. The wing consists of two main wards named respectively after Dr. N. E. Aldridge, formerly senior physician of the hospital, and Mr. G. H. Cowen, senior surgeon, and six single bed wards named after benefactors. The extensions, which provide 84 additional beds, have cost £30,000. In declaring the new wing open Prince George spoke of the "Hospital House Ballot" which had produced £5000. The house was built by Southampton trade-unionists in their spare time, with materials supplied by the master builders, both labour and materials being given as contributions to the hospital.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which
[illegible] completed with the issue of June 29th, is now
prep[illegible]on. A copy will be sent gratis to sub-
[illegible] of a post-card addressed to the
[illegible] LANCET, 1, Bedford-street, Strand,
[illegible]ibers who have not already indicated
[illegible]eive Indexes regularly as published

Lectures

ON THE

PHYSIOLOGY OF GLYCOGEN

AND THE

RÔLE OF INSULIN AND EPINEPHRINE IN CARBOHYDRATE METABOLISM.

Delivered at the London Hospital

BY J. J. R. MACLEOD, M.B., LL.D. ABERD.,
D.SC. (HON.) TORONTO, F.R.S.,
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LECTURE II. (PART II).*

EFFECT OF INSULIN ON CARBOHYDRATE BALANCE IN THE RAT.

OTHER researches bearing on our present problem are those of C. F. and G. T. Cori, in which an attempt has been made to compare the fate of ingested glucose in white rats injected with insulin with that in uninjected rats, by determining the amount of sugar absorbed and that oxidised and stored as glycogen. When glucose was given, by stomach-tube, to rats previously starved for 48 hours, it was found that between 86 and 90 per cent. of the amount which disappeared from the gastro-intestinal tract in a period of four hours could be accounted for, a similar total balance being obtained when insulin was injected at the time of administering sugar.† There was a difference, however, in the manner of utilisation of the sugar, as was ascertained by comparing the relative amounts of glycogen formed and of glucose oxidised in the two cases. Relatively more carbohydrate was oxidised and less deposited as glycogen under the influence of insulin. The ratio, $\frac{\text{glycogen formed}}{\text{glucose oxidised}}$ changed from 1·38 in normal rats to 0·87 in those injected with insulin, and, since it was known that the liver glycogen becomes less under these conditions, it was concluded that the glycogen deposited elsewhere in the body either remains unchanged or increases somewhat.

According to the Cori's, therefore, excess of insulin leads to an increased sugar oxidation and they claim that the results are of such a quantitative character as to disprove the hypothesis that some unknown carbohydrate is formed. I am doubtful as to whether this claim to strict quantitative accuracy is justifiable. In the first place, the method used for determining the quantity of sugar absorbed from the intestine does not take into consideration any possible loss through bacterial decomposition, or a slowing in the rate of absorption, due to reduction in strength of the sugar solution as less and less remains in the intestine to be absorbed. The authors state, however, that they have shown that neither of these possible errors was involved. But even if the income side of the balance sheet could be vouched for, the dependability of the items on the expenditure side is questionable. For example, the calculation of the amount of carbohydrate oxidised is based solely on an average increase in R.Q. from 0·838 to 0·882, no change in oxygen consumption being observed. Consideration is not given to the possibility, that some change in the alkaline reserve of the blood and tissues, or a depression in the process of gluconeogenesis, may have been factors accounting for the altered R.Q. It is to be noted also that no allowance is made in the insulin-treated animals for reduction in the free sugar of the blood or of the liver, which these workers themselves have demonstrated, or of the muscles which Dale, Best, &c., say occurs. This would add something to the credit side of the balance sheet in the case of the insulin-treated animals.

Different Sugars not Affected Alike by Insulin.

I have referred to the first of the series of papers by the Cori's (1926),[10] and now let me say something about two more recent ones (1928). In the first of these,[11] comparison is made—in rats previously starved for 24 (instead of 48) hours—of the rates of absorption of glucose, fructose, and dihydroxyacetone, and of the balances between the amounts of each of these sugars actually absorbed and those accountable for by oxidation and glycogen formation.

It is stated that absorption is more rapid after 24 hours' starvation than after 48 hours, and that the manner of disposal of the absorbed glucose also differs. Both oxidation and glycogen formation were absolutely greater after the shorter period of starvation and relatively more glucose was oxidised, as evidenced by the quotient, $\frac{\text{glycogen formed}}{\text{glucose oxidised}}$ being 1, as compared with 1·38 for the rats starved 48 hours. The glycogen deposited in the liver, however, was the same for both, so that relatively more must have been formed in the muscles of the 48-hour rats. These results show a most remarkable change in the nature of the metabolic processes after different periods of starvation. But our chief interest at present is concerned with the effect of insulin, and in this connexion we must regard all three sugars. If the rate of absorption of glucose be taken as 100, that of fructose is 51 and dihydroxyacetone 65. Insulin was found to have no influence on these absorption ratios, and it produced little change on the percentage of the absorbed sugar which could be accounted for by increased carbohydrate combustion *plus* glycogen deposition. What insulin did do was to alter the proportion of the absorbed sugar disposed of by each of the processes. This is shown in Table IX. which has been compiled from the data in Cori's paper. In the case of all three sugars it is seen that insulin‡ caused less glycogen to be deposited in the liver and more in the muscles, the extent of the decrease in the former being about proportional to that of the increase in the latter in the cases of glucose and dihydroxyacetone, whereas in *that of fructose* the loss in the liver was proportionately greater than the gain in the muscles. Consequently increased combustion of carbohydrate was pronounced only with fructose. This means that excess of insulin in the body causes glucose and dihydroxyacetone to be locked up as glycogen in the muscles and fructose to be oxidised; leaving, in all three cases, practically no sugar available to be formed into glycogen in the liver. Utilisation of sugar in the muscles therefore runs ahead of glycogen formation in the liver. Cori puts it thus: "The processes of sugar disposal that are accelerated in the body by insulin are those mainly in the peri[illegible]ral tissues and involve both glycogen formation

TABLE IX.—*Disposal in the Body of Absorbed Sugars.*

—	*Without Insulin.* Oxidised.	Deposited in— Liver.	Deposited in— Muscles.	Total disposed of.	*With Insulin.* Oxidised.	Deposited in— Liver.	Deposited in— Muscles.	Total disposed of.
	Per cent.				Per cent.			
Glucose	44	18	25	87	40	6	36	91
Fructose	36	38	12	86	50	8	27	92
Dihydroxyacetone	51	21	15	87	53	2	33	88

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* Part I. appeared last week.

† In later experiments the percentage recovered was higher in the insulin-treated animals.

‡ The dose of insulin was 15 units per 100 g. of rat.

and sugar oxidation." In so far as glucose is concerned, the conclusion drawn in the earlier papers, that insulin increases the amount oxidised, is therefore contradicted in this one.

In the light of these later results the fall in systemic blood-sugar following insulin injections is explained as due to increased utilisation in the muscles, by either glycogen formation or oxidation, running ahead of glycogen formation in the liver. But inasmuch as the gain in the one place practically balanced the loss in the other with glucose and dihydroxyacetone, it is difficult to see why any fall should occur in blood-sugar, unless we consider the lesser deposition of glycogen in the liver to be dependent upon inhibition of a process of gluconeogenesis. According to this view, the sugar which is certainly produced by gluconeogenesis in the liver during fasting will be suddenly cut off when insulin is injected, and the sugar absorbed from the intestine, which under normal conditions would be retained by the liver, is dealt with by the muscles, the blood-sugar falling because there is now no new sugar being produced by the liver. This view regarding the part played by changes in gluconeogenesis has been championed by Best, Dale, Hoet, and Marks, and was originally suggested in a general way by Laufberger.

In the last paper published by Cori and Cori [42] the effect of insulin was studied in the post-absorptive state, that is, after sugar absorption has been proceeding for four hours and the glycogen stores of the liver are being used up. The conclusion is drawn that insulin is a hormone that leads to a preferential utilisation of blood-sugar and, indirectly, of liver glycogen. The method used for calculating the amount of glycogen in liver and muscles at the beginning of the post-absorptive period is explained later on. The curious result is recorded in this paper that, whereas in uninjected rats 7·5 per cent. more carbohydrate disappeared than could be accounted for by oxidation, in animals injected with insulin 13·4 per cent. more was oxidised than could be accounted for. This result is given as final evidence that no unknown intermediary of carbohydrate metabolism can be formed in excess as a result of insulin, for, it is pointed out, if such were the case then the results should have gone in the opposite direction. But they prove too much. Indeed, so far as I can see, the results only show that comparisons between glycogen utilisation and carbohydrate combustion are not of sufficient accuracy to enable us to say whether or not some body, as yet unrecognised, is formed at some stage during the action of insulin.

Notwithstanding these criticisms, I should like to take this opportunity to express my admiration for the work of the Buffalo investigators. It may not have accomplished all that its authors had hoped for, but it has opened up new methods of approach and has demonstrated what many students of carbohydrate physiology have long suspected, that the rapid changes in glycogen content in the liver and the muscles are closely related.

Comparison of Different Views.

We may sum up the conclusions of these different groups of workers by saying that Lesser and the Cori's ascribe the entire effect of insulin to an increase in glycogen formation and carbohydrate combustion, whereas Best, Dale, &c., while considering that this explains the increased sugar loss in eviscerated animals, believe that in intact ones there comes into play another factor, which consists in an inhibition of gluconeogenesis in the liver. They point out that excessive gluconeogenesis and defective glycogen formation in the liver are the striking fundamental defects in diabetes and that insulin immediately rectifies these defects, its action on normal animals being merely an intensification of that on diabetic ones. This will therefore account for the raised R.Q., the subsequent depressed oxidation, the fall of temperature, and the depletion of glycogen, which are known to occur after very large doses of insulin, especially in small animals.

It is not easy, however, to harmonise all of the results of these researches, and this is particularly the case when we compare those of Best, Dale, &c., and the Cori's. When insulin was given, the former found that several grammes of glucose were utilised in the spinal preparation over and above the amount used without it, whereas the latter found in the white rat practically the same balances. Since some of the extra sugar which disappeared in the eviscerated spinal preparation was accounted for as coming from the liver, and since a shift of glycogen from liver to muscles occurred in the rats, this difference in results is partly accounted for, but by no means completely so.

Production of Unknown Sugar Derivative Increased by Insulin?

Although the suggestion which I offered in 1923 to account for the immediate disappearance of glucose from the blood which follows the injection of insulin—namely, that some unknown carbohydrate derivative is formed in considerable amount—has not therefore been sustained, either by experiments in which there is a much closer approach to quantitative accuracy than in those upon which I based the suggestion, or by direct chemical examination of the tissues, I am nevertheless disinclined to dismiss altogether the possibility that such a substance exists. It may not accumulate in sufficient amount to figure appreciably in the final balance between glucose disappearance and glucose utilisation, but it may be produced at an early stage of insulin action and then rapidly be transformed partly into glycogen and partly into some substance which is oxidised. That an unknown body related to carbohydrate must exist in mammalian muscle is suggested by the experiments of Fraser and myself, referred to in the first lecture, and it is possible that the substance which appears between glycogen and lactic acid when frozen muscle is pulverised and allowed to thaw is related to it. This intermediary substance may be of the nature of a trisaccharide having a lower reducing power than glucose and destructible by 30 per cent. potash. It is conceivable that such a substance may be responsible for the sugar which is excreted by depancreatised animals over and above that which can be accounted for as coming from the known carbohydrate reserves and from protein, and if such should prove to be the case, then it would be unnecessary to suppose that fatty acid is a source of sugar in diabetes. It is significant in this connexion that the unaccountable extra sugar excretion in diabetes occurs at early stages after the removal of insulin.

Respiratory Experiments on Rabbits.

As my reasons for still clinging to what may be called a remnant of my original hypothesis I have, so far, only shown why I do not consider it disproved by the results of others, and now I would like to dwell for a few moments on those of two researches done in my own laboratory which offer further reasons for my position. I will refer first of all to observations by Chaikoff and myself [43] concerning the effect of insulin on the respiratory exchange of rabbits, either while the animals were metabolising practically nothing but carbohydrate, or were deprived of this foodstuff. The former condition was provided for by feeding during several days with abundance of carrots and oats. The animal was then placed in a respiratory cabinet of the Benedict type, along with food, and the oxygen consumption and R.Q. measured from hour to hour during a period of six hours. Next day these observations were repeated with the difference that prior to placing the animal in the cabinet, it was injected with a sufficient dose of insulin to cause the blood-sugar to become decidedly decreased without, however, reaching the level at which hypoglycæmic symptoms supervene. Under these feeding conditions the R.Q. was found to stand practically at unity, indicating according to accepted doctrines that carbohydrate was alone being oxidised. Evidently the protein metabolism that must have been going on at the time was insufficient to affect the quotient measurably. Considering that the animals moved about to a varying extent while in the cabinet, the oxygen consumption was very steady from hour to hour, especially if we discount the first hour when a small error in measurement may have been involved.

It can be seen from the table of results that insulin had practically no effect either on the R.Q. or on the average oxygen consumption during the six hours. In some of the experiments (Table X.) it would appear that more carbohydrate was used on the insulin day, but the reverse is the case in others. These results were interpreted as showing that neither an increase in the combustion of carbohydrate nor an inhibition in gluconeogenesis could have occurred as a result of injecting insulin, leaving therefore increased glycogen deposition in the muscles as the only known process by which the sugar which disappeared could be accounted for. But this did not seem likely considering that the muscles were presumably already fully charged with glycogen. I have to confess, however, that these results are not so convincing as Chaikoff and I thought them to be at the time they were obtained. As Cori and Cori have pointed out, we did not know how much sugar actually disappeared and it may be that all which has to be accounted for is that represented by the fall in the blood and tissue-sugar percentages. During the first hour the blood-sugar percentage was reduced by about 0·070, and if we take the volume of the blood as 70 c.cm. per kg. and that of the tissue fluids as the same, then about 0·100 less sugar was present, an amount which would have caused an increase of 75 c.cm. in oxygen consumption if all of it had been burned. Now, if instead of taking the averages of the O_2 consumption over the whole period of observation, we compare the consumption hour by hour for each animal (*vide* original paper), then, with the exception of one out of five experiments, the increase during the first two hours in the insulin-injected rabbits is almost adequate to account for *the disappearing sugar*.

TABLE X.—*Comparison of O_2 Consumption and R.Q. in Rabbits With and Without Insulin.*

—	c.cm. O_2 per hr.	R.Q.	Total calories.	Total carbohydrate.	Difference.
			In 6 hrs. per kg.		
			Feeding.		
1. Normal ..	615	1·03	18·6	4·97 g.	
Insulin ..	577	1·04	17·46	4·67 g.	−0·31 g.
2. Normal ..	560	1·01	16·98	4·54 g.	
Insulin ..	603	1·01	19·00	5·10 g.	+0·56 g.
3. Normal ..	723	1·02	21·90	5·80 g.	
Insulin ..	764	0·99	23·14	5·87 g.	+0·01 g.
			Fasting.		
1. Normal ..	541	0·70	15·42	0·76 g.	
Insulin ..	607	0·77	17·39	1·09 g.	+0·33 g.
2. Normal ..	535	0·72	15·12	0·16 g.	
Insulin ..	558	0·74	15·90	0·49 g.	+0·33 g.
3. Normal ..	720	0·72	16·00	0·22 g.	
Insulin ..	657	0·78	15·77	1·06 g.	+0·84 g.

In rabbits which were observed in the fasting condition, the results for O_2 consumption as well as R.Q., both when regarded as averages for the entire period of observation and when compared from hour to hour, show an undoubted increased carbohydrate combustion after insulin, and it is possible that the less evident effects observed in carbohydrate-fed animals is dependent on the principle that the glucose equivalent of insulin becomes very low in the presence of excess of carbohydrate.

Insulin and Glycogen Formation in Rats.

The other research has to do with the influence of insulin on glycogen formation. We have seen that it has definitely been shown by Best, Hoet, and Marks that glycogen is deposited in the muscles of eviscerated preparations when excess of insulin and of glucose is present in the blood, and the question arises, whether any of the sugar which disappears when smaller doses of insulin are given is to be accounted for in this way. To test this possibility, Barbour, Chaikoff, Macleod, and Orr [10] used the standard white rat in which, as Karczag, Macleod, and Orr had previously shown, the percentages of glycogen in liver and muscles are predictable within narrow limits. The results for previously fasted rats show *definitely that insulin does* not at first cause glycogen to be deposited; indeed, on the contrary, it causes the glycogen to become less both in the liver and the muscles. Since this result, in exaggerated form, is that which is obtained when sufficient insulin is injected to bring on severe symptoms of hypoglycæmia, it may be supposed that it was owing to the onset of these that the glycogen disappeared. All I can say is that no evidence of these symptoms could be obtained by the closest scrutiny of the animals, nor did the blood-sugar fall to the level at which they are observed to occur. The results of these experiments were shown in the chart of Fig. 2 and from them another interesting fact comes to light—namely, that the glycogen percentage rises in the liver at a later stage of insulin action, before there is any return of blood-sugar and while the percentage in the muscles is still falling. This is particularly marked when the dose of insulin is relatively small and is in confirmation of work by Frank, Hartmann, and Nothmann on fasted rabbits.[44] It indicates that although excess of insulin in the normal organism always causes already existing glycogen to disappear from the liver and, as we shall see immediately, always retards its deposition while carbohydrate is being absorbed from the alimentary canal, doses which are insufficient to lower seriously the blood-sugar have the ultimate effect of encouraging the deposition of glycogen formed by gluconeogenesis in the liver. This effect is a pronounced one in diabetes in which gluconeogenesis is very active.

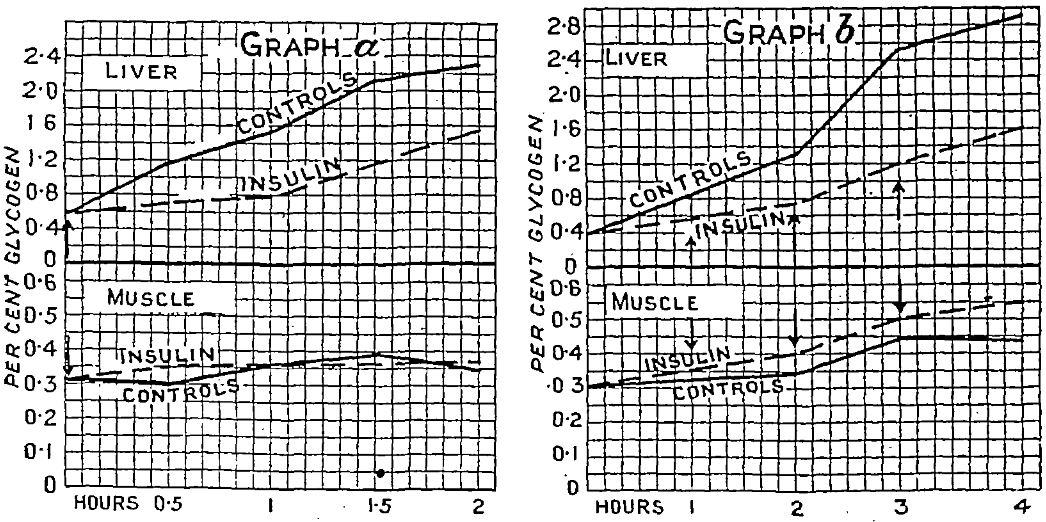
It is certainly safe to conclude that excess of insulin in the blood of fasting animals does not cause any of the sugar which immediately disappears from it to be deposited as glycogen, either in the muscles or in the liver.

Turning now to rats given insulin while maximal absorption of carbohydrate was proceeding (as the result of feeding previously fasted animals with all the starchy food they would take), we found that deposition of glycogen in the liver was invariably retarded and that extra glycogen was deposited in the muscles only when the dose of insulin was a very large one, or when the injection of smaller doses was repeated (Fig. 5). But even when this extra glycogen formation occurs in the muscle, it cannot probably be held responsible for any large part of the sugar which disappears, since the amount which fails to be deposited in the liver corresponds closely to the excess formed in the muscles. No evidence can be found in these results, which are sufficiently numerous to rule out errors of observation, to show that increased formation of glycogen in the muscles comes into play as a factor causing reduction of the blood-sugar when insulin is injected in moderate amounts. When the dose of insulin was very excessive during absorption of food more glycogen was deposited in the muscles, but, since there was a corresponding deficit deposited in the liver, all that this indicates is that insulin in large excess may cause a shift in the distribution of glycogen in the body. It is interesting, as Cori has proved, that excess of epinephrine causes a shift in glycogen distribution in the opposite direction—namely, from the muscles to the liver.

Present Status of Problem of Insulin Action.

We shall return to these experiments on epinephrine shortly, but meanwhile let me sum up the foregoing evidence with regard to the action of insulin. Taking all the effects which it produces, in diabetic as well as normal animals, we find that there is no known stage in carbohydrate metabolism, up to that in which lactic acid is formed out of muscle glycogen, that this hormone does not affect. It inhibits gluconeogenesis and stimulates glycogen formation in the liver of diabetic animals, whereas it retards glycogen formation in this organ in normal ones, except as a late effect when the animal is fasting. It reduces muscle glycogen when given in any dosage to fasting animals—and there is no basis for saying that this is because of the onset of hypoglycæmic symptoms—and has no effect on it when carbohydrate is being absorbed unless when an excessive dose is given. Under all conditions, both in normal and diabetic animals, it causes more carbohydrate to be oxidised, this being most marked in diabetic animals but so slight as to be almost imperceptible in normal ones in which absorption of carbohydrate from the alimentary canal is proceeding. The net effect of all these changes is to lower the percentage of sugar in the blood, notwithstanding that some of them, such as retarded glycogen formation in the liver, would rather tend to raise it.

FIG. 5.



Comparison of glycogen deposition in liver and muscles of rats injected with insulin with that of similarly fed control rats. One subconvulsive dose was injected at the beginning of Graph *a*, and several doses were injected in Graph *b*, as indicated by arrows. (Modified from Amer. Jour. Physiol.)

It seems to me, therefore, that these changes, which may or may not follow the administration of insulin, are secondary to some other fundamental change, and since it is impossible to demonstrate any influence of insulin on the sugar of the blood in vitro, either in the presence or absence of tissue extracts, we must assume that this hormone acts on some process that is dependent upon the structural integrity of the cells. Insulin must stimulate this process and lead, on the one hand, to a lowering of the tension of glucose in the cell—a glucatonia—so that sugar is removed from the blood, and on the other hand, to accumulation of some intermediary substance which, perhaps in association with phosphate—since this decreases in the blood as markedly as sugar after insulin—is then either oxidised or polymerised to glycogen.

I need not here refer to the several attempts which have been made to show that the fundamental change which insulin causes is a sensitisation of glucose, dependent on some rearrangement in the internal structure of the molecule. This may be so, but it has not been demonstrated, and so stands in much the same position as the hypothesis that some intermediary substance is formed. The possibility exists that one, or other or both of these hypotheses will be sustained by further researches, but at present all we know are the end-results of insulin, which consist in more rapid oxidation and lessened gluconeogenesis when no excess of absorbed glucose is present and in increased glycogen formation in the muscles when this is the case.

EPINEPHRINE.

It has in general been assumed that the hyperglycæmia which quickly supervenes upon the subcutaneous injection of epinephrine depends on a rapid glycogenolysis in the liver. A close scrutiny of the experimental evidence offers only feeble support for this assumption. Indeed, the majority of the experiments upon which it is based have obviously been imperfect in essential details, either in the methods used for determination of the glycogen or in the provision of controls. Whereas it is the case that the hyperglycæmia is sometimes of slight degree when epinephrine is injected into rabbits from which the glycogen content of the liver has been reduced to the lowest possible level, by fasting and strychnine, yet it is also well established, as was first shown by Pollak, that glycogen reaccumulates in the liver when the injections are repeated under these conditions. Pollak's results[12] were confirmed by Kuriyama[13] and, more recently, by Markowitz,[14] who used most drastic methods to rid the liver of glycogen before injecting the epinephrine. The injections were then repeated several times a day for periods varying from five to nine days and it was found that the blood-sugar was raised by the injection as greatly towards the end of the period as at the beginning, and that the liver, the muscles, and the heart still contained fairly large amounts of glycogen when the animals were finally killed. Thus, in a typical experiment in which the injections had been kept up for nine days following upon four days of fasting, a total of about 1 g. (1·05 per cent.) of glycogen was found in the liver and, taking the muscles as 40 per cent. of the body-weight (approximately 2 kg.), over 2 g. (0·265 per cent.) in the muscles, giving a total of between 3 and 4 g. of carbohydrate in the entire animal. Assuming that these amounts of glycogen were present throughout the experiment and that the immediate fuel for muscle is its glycogen, then it is obvious that gluconeogenesis must have been going on on a scale which was so large as to make it certain that fat as well as protein was being used for it. But the problem of the materials used in gluconeogenesis is not under discussion in these lectures.

The Cause of the Hyperglycæmia.

There are two possible causes for the increase in blood-sugar: a more rapid breakdown of the performed glycogen in the liver, or a decrease in the rate at which sugar is leaving the blood for the tissues. A third alternative—namely, that some of the increase depends on conversion of the glycogen of the muscles into sugar—is definitely ruled out. Thus Mann and Magath[44] and, more recently, Soskin,[45] have shown that no effect is produced on the blood-sugar level by injecting epinephrine into animals deprived of the liver. In this latter condition alone, the blood-sugar steadily falls and it continues to do so without any temporary delay following the injection of epinephrine. This, and other evidence, which I have referred to in another place, shows clearly that once sugar has passed from the blood into the muscles to form glycogen, it cannot be directly returned to the blood as sugar, by a reversal of the process. But this irreversibility does not necessarily mean that epinephrine is without influence on the glycogen present in the muscles. It might stimulate its natural breakdown into lactic acid which could then be transported by the blood to the liver to be reformed into glycogen there. As a matter of fact, Choi[31] found, by comparison of corresponding muscles of the two legs of the spinal cat, that continuous injection of epinephrine (intravenously) often caused the glycogen to be diminished, but he also noted that this only occurred when the preparation became hypersensitive, and fibrillary twitching was evident in the muscles. Some of the preparations were eviscerated and in these the blood-sugar was not affected by the injections, but it rose in those in which there was no evisceration. The general conclusion was drawn that injections of epinephrine do not deplete the muscles of glycogen unless fibrillation occurs, but it has not been sustained by the results of more recent experiments performed by Cori and Cori on white rats.

Experiments on Fasting Rats.

According to Cori and Cori[46] decreased utilisation of sugar by the muscles, and not increased hepatic glycogenolysis is responsible for the hyperglycæmia caused by epinephrine. On account of the originality and ingenuity of these experiments, we will consider them in some detail. The procedure was along the same lines as in the experiments on insulin, and the first series was on rats which had been deprived of food for 21 hours. The respiratory metabolism was then measured for three hours, when epinephrine (0·02 mg. per 100 g. body-weight) was injected subcutaneously and the respiratory measurements continued for a further period of three hours, after which the animals were killed and the glycogen determined separately in the liver and the remainder of the body. The R.Q. was the same following epinephrine as during the fore-period, but the consumption of O_2 rose by 17·8 per cent., indicating that the so-called calorigenic action of epinephrine does not necessarily involve carbohydrate combustion. This confirms previous work in my laboratory by Soskin.[47] The glycogen of the liver rose from an average of 6 mg. per 100 g. of rat to 42 mg., whereas that of the remainder of the body fell from 128 mg. to 71 mg. In other words, the glycogen of the liver increased by 36 mg. and that of the rest of the body decreased by 57 mg. The authors conclude that epinephrine causes a shift of glycogen from the muscles to the liver, and, since it is now an established fact that the latter cannot be directly returned to the blood as sugar, they have advanced the hypothesis that the glycogen must leave the muscles as lactic acid which is then re-converted into glycogen in the liver. To justify this hypothesis, it was necessary to show, first, that lactate is converted into glycogen in the liver and, secondly, that excess of lactic acid appears in the blood following the injection of epinephrine. The authors state that they have been able to fulfil both of these requirements. With regard to the former, it is true that Abramson, Eggleton, and Eggleton,[48] had failed to detect any increase in liver glycogen when *r*-sodium lactate, in quantities similar to those which would be produced by severe muscular exercise, was injected intravenously into dogs under amytal anæsthesia, but Cori and Cori state that this occurs when either the racemic or the dextrorotatory acid, or their salts, is fed to 24-hour starving rats. With regard to the second requirement, they had previously demonstrated a marked increase in the lactic acid of the blood in rabbits and cats following epinephrine,[49] but it may be remarked that no evidence is given that this may not have been due to anoxæmia or to shock.

Experiments on Rats in the Post-absorptive State.

Cori and Cori are careful to point out that although the circumstantial evidence strongly favours the view that the extra glycogen which appears in the liver in these experiments on fasting rats comes from that meanwhile disappearing from the muscles, it is also possible that a more active process of gluconeogenesis occurring in the liver might be the cause. They consider that this possibility is ruled out by the results of a second series of observations,[43] in which they injected epinephrine into rats in the post-absorptive state—that is, during the period following upon absorption of carbohydrate from the alimentary canal. The glycogen disappearance from the liver which would be occurring under these conditions was found to be changed by epinephrine injections into glycogen accumulation, accompanied by loss of glycogen from the muscles. On the assumption, which is probably justified, that gluconeogenesis will be latent when glycogenolysis is active, they conclude that alteration in the speed of the former process can play no rôle in accounting for the increased deposition of glycogen.

The procedure followed in these experiments is ingenious.

> Rats previously starved for 24 hours were fed by stomach-tube with 1·005 g. glucose per 100 g. of rat, which is the amount which would be absorbed in four hours.[41] During this period, measurement of the respiratory exchange showed how much carbohydrate was being oxidised and knowing, from previous experiments (1) that 80·6 per cent. of the absorbed glucose could be accounted for; (2) the proportion between the glycogen of the liver and muscles; and (3) how much glycogen is present both in the liver and in the muscles of 24-hour starved rats, it was possible, after making allowance for protein metabolism, to compute the amounts which must have been present in these places after absorption was complete. The injections were then made and the respiratory measurements continued for three hours when the animals were killed and the glycogen determined.

In four rats, in which saline was injected instead of epinephrine, an average of 220 mg. glycogen per 100 g. of rat was calculated to be present in the liver and 482 mg. in the rest of the body at the time of injection and these values were found (by analysis) to be 0·171 and 0·264 mg. three hours after it showing, therefore, decreases of 49 mg. and 168 mg. respectively. When epinephrine was injected in four other rats, glycogen increased in the liver to the extent of 26 mg. but decreased in the muscles to the extent of 208 mg. It may here be noted, however, that the values recorded for individual rats are very divergent; for example, in the control group the calculated values for the liver glycogen per 100 g. of rat, prior to injection, varied between 100 and 254 mg. and in the epinephrine group, between 178 and 257 mg., and at the end of the post-absorptive period in the controls the extrahepatic glycogen ranged from 315 mg. to 346 mg. and in the epinephrine group from 113 mg. to 130 mg. Surely it is somewhat risky to average figures that are so divergent when there are only four or five individual observations in each group. And when these loose averages are used, as the authors have used them, for balancing the carbohydrate which disappeared from the body (changes in glycogen and blood-sugar) with the carbohydrate which was oxidised (determined from the respiratory exchange), too much weight cannot be given to all the conclusions drawn from them. But, inasmuch as comparisons of individual observations in the different groups always show more glycogen in the liver and less glycogen in the muscles after epinephrine, it is no doubt justifiable to draw the general conclusion, that epinephrine in the dosage given reduces glycogen in the muscles and increases it in the liver. One would like to know, however, in view of Choi's results on the spinal cat, whether the muscles were hyper-excitable or were fibrillating.

It is next shown that there is an increased expenditure of energy (from 0·76 to 0·86 calories per hour) in rats injected with epinephrine in the post-absorptive state, two-thirds of the extra calories being furnished by fat combustion, and a third by carbohydrate. In the starving rats of the previous research all of the extra energy set free by epinephrine was found to come from fat, and since there was no oxidation of carbohydrates there was no depletion of the glycogen stores. In the starving condition there is merely a shifting of glycogen from muscles to liver, and the authors account for the practical constancy in glycogen between the twenty-fourth and the forty-eighth hours of starvation alone as due to a similar carbohydrate cycle.

Does Epinephrine Stimulate Gluconeogenesis?

These facts appear to the authors to make unnecessary the assumption that gluconeogenesis occurs as a process to maintain the glycogen stores, either during fasting or after epinephrine injections. They would have us believe that glycogen is a substance of no metabolic importance but which can be shifted about from muscles to liver according to the amount of epinephrine present in the blood. But it is difficult to harmonise such a revolutionary view with the known facts. Thus, it would mean that the 3 or 4 g. of carbohydrate (glycogen) which we have seen to be present in the body of a fasting rabbit which has been injected repeatedly with epinephrine for nearly two weeks is only some of that which was originally present, after having been shifted about between the muscles and the liver. The blood-sugar is merely the form as which the glycogen is shifted from liver to muscles and the blood lactic acid that as which it completes the cycle. No carbohydrate combustion therefore goes on under these conditions, so that no process of gluconeogenesis is necessary. The bearing of this conception on that of the chemistry of muscular contraction is not discussed, but it seems to me impossible to reconcile the two, unless we are to assume that all of the glycogen which is broken down during muscular contraction is carried as lactic acid to the liver and is there reconverted, through glycogen, into blood-sugar. In another paper the authors suggest the possibility, already made by me, that a process of conversion of fat and protein into carbohydrate may go on in the muscles, but in the present paper they point to the low R.Q. which is observed during fasting, as well as its failure to rise, in this condition, after epinephrine, as evidence that *no* carbohydrate is being oxidised.

It is very difficult to understand from the paper what the authors consider to be the physiological function of the shift of glycogen.

Another difficulty arises in explaining why it is that epinephrine always causes hyperglycæmia. One fact stands out prominently—namely, that increased glycogenolysis in the liver cannot account for it, even when there is a lot of glycogen in this organ. Thus, a hyperglycæmia amounting to 0·174 per cent. in three hours in rats following epinephrine injection would, as judged from sugar injection experiments, require the mobilisation of 750 mg. of liver glycogen (or an initial glycogen content of 20 per cent.), which is impossible. The authors think, however, that some mobilisation of liver glycogen may occur but is masked by the glycogenesis from the blood lactic acid, so that the glycogen percentage increases.

"Decreased utilisation of blood-sugar is one of the principal causes for epinephrine hyperglycæmia under post-absorptive conditions." Even although hepatic glycogenolysis is only proceeding at its normal rate, the blood-sugar will then rise. This decreased utilisation of blood-sugar does not mean decreased carbohydrate combustion, indeed, on the contrary, epinephrine increases oxidation of muscle glycogen and decreases blood-sugar utilisation.

Comparative Effects of Insulin and Epinephrine.

A very interesting comparison is made in this research of the effects of insulin and epinephrine on the behaviour of glycogen in the liver and muscles, and of the relative combustion of carbohydrate and fat, as calculated from the respiratory exchange. The following table gives a brief tabulation of the differences.

Glycogen Disappeared.

—	Total.	Per cent. derived from—		Calories and CHO oxidation compared with controls.	
		Liver.	Muscles.	Calories.	CHO.
	mg.				
Controls ..	216	23	77	—	—
Epinephrine	298	Increased	All	+24 %	+19·5 %
Insulin ..	329	43	57	Same	+97·3 %

Insulin therefore causes an equicaloric replacement of carbohydrate oxidation for fat oxidation. It "leads to a preferential utilisation of blood-sugar and indirectly of liver glycogen," whereas epinephrine increases the oxidation of both types of oxidation but diminishes the utilisation of blood-sugar and mobilises the muscle glycogen.

Experiments on Rats During Sugar Absorption.

The influence of epinephrine in the utilisation of blood-sugar was further studied in rats while absorbing glucose (third paper),[50] an advantage here, over observations made during the post-absorptive stage, being that carbohydrate metabolism is carried on mainly at the expense of the sugar that is circulating in the blood. The same dose of epinephrine, as used in the other experiments, now caused glycosuria which persisted throughout the observations, practically the same quantities of sugar being excreted during each of the four hours, although the blood-sugar steadily declined after the first hour, when it was at its highest. The rate of absorption of glucose was the same as that previously found in normal rats during the first hour following the injection, but it fell off later. Notwithstanding this slower absorption, more glycogen was deposited in the liver than in control observations, except during the first hour when the amounts were equal. This raises the question as to the cause of the glycosuria. Since it cannot depend on less sugar being retained by the liver, interference with the processes of sugar disposal in the tissues must be responsible. (The rapidity of these processes in a rat is called attention to; thus in a rat of 100 g. there are 7 mg. of glucose in the blood (blood-sugar 0·1 per cent.) and 1065 mg. are absorbed in four hours. If the blood-sugar rose to 0·158 per cent. only 28 mg. is accounted for in the blood.) By computation from the glycogen analyses and the respiratory metabolism, it was found that for every 100 parts of glucose absorbed, 10 parts less body glycogen were deposited and 5 parts less oxidised than in control rats. Of these 15 parts which failed to be utilised, 5 parts were stored in the liver as glycogen, 6 parts were excreted in the urine, and 3 parts retained in the body fluids.

It is stated that "after epinephrine injections, carbohydrate oxidation is carried on mainly at the expense of muscle glycogen" but, at the same time it is supposed that the utilisation of blood-sugar (and therefore of liver glycogen whence it comes) is diminished and so causes hyperglycæmia. It is very difficult to reconcile these facts, and the authors finally surmount the difficulty by concluding that "epinephrine has not a direct accelerating influence on carbohydrate oxidation. It merely mobilises muscle glycogen and it depends on the metabolic state of the animal (presumably on the insulin content of the tissues) to what extent the glycogen mobilised in the muscles is being oxidised."

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GRAVES'S DISEASE AND THYROIDECTOMY.

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IN March, 1922, I published in THE LANCET the results of a consecutive series of 250 operations for exophthalmic goitre. At that time the surgical treatment of Graves's disease was not as firmly established as it is at present, or perhaps it would be more accurate to say that it was only just beginning to become firmly established. It had been practised to a certain extent before this period, but it is only really since about 1915 that its mortality has been so considerably reduced that it can be confidently recommended to severe sufferers from the disease. Since that date I have operated on another 500 cases of which a fairly complete record has been kept, and the present seems a not unsuitable occasion to inquire into the results.

Definition.

In all scientific or semi-scientific discussions it is as well at the commencement to endeavour to be quite sure what we are talking about, for it is obvious to all that between the fully developed case of Graves's disease, with all the symptoms well marked and extreme toxicity present, and the simple parenchymatous or adenomatous goitre, an infinity of different variations is seen, depending on which symptoms are or are not present, on whether the greatest effect of the disease falls upon the cardiac, nervous, or alimentary systems, and upon how marked the general toxicity is. We must therefore have a definition of Graves's disease upon which we can work and to which we can adhere; the simpler this definition is the better. I am, therefore, accustomed to apply this term only to those cases where in addition to the signs and symptoms so well known to represent thyroid toxæmia—i.e., palpitation, rapidity of pulse, nervousness, excitability, tremor, shortness of breath, sleeplessness, damp warm skin, &c.—there are also definite enlargement of the heart and definite changes in the eyes. This definition will be seen to rule out the simple forms of toxic adenomata, and adenomatous or parenchymatous goitre in nervous women. Naturally, the microscopic examination of a section of the thyroid gland is of the greatest use and importance. In the majority of cases where eye signs and cardiac enlargement are present the pathologist's report is that the thyroid gland shows the changes characteristic of Graves's disease. This is not, however, invariably the case, and even if the microscopic section resembles a simple parenchymatous or adenomatous goitre, if the above clinical changes are present, I think the case is deserving of the title of Graves's disease. One not infrequently sees patients in whom all the above clinical symptoms are well marked, the exophthalmos often being particularly noticeable, in whom little or no enlargement of the thyroid is present. Nevertheless, they should come within the scope of our definition, though as a matter of fact they are not necessarily cases which are particularly suitable for operation.

This definition does not, of course, rule out the so-called secondary Graves's disease, for the distinction between secondary and primary Graves's disease is one of considerable importance in use. Primary Graves's disease denotes those cases where the first appearance of the goitre and of the toxic syndrome roughly coincide, or at any rate where the goitre does not appear long before the symptoms. Secondary Graves's disease is the term applied to the quite common class of case where a parenchymatous goitre or more commonly an adenoma has been present and free from toxic symptoms for a long time, often many years, and it is not until after a long interval that the toxic symptoms appear. The former class of case, the primary ones, are usually the most severe and intractable, and it is in these that the tendency of the disease is specially to pick out the nervous system. In the secondary cases the disease is less severe and even more amenable to surgical treatment than in the former class. There is also a marked tendency in these latter cases for auricular fibrillation to set in sooner or later. Even when this occurs it is no bar to surgical treatment for, as will be seen later, such cases with fibrillating hearts are frequently amongst the most successful results obtained after thyroidectomy.

Operative Technique.

Of the last 500 consecutive operation cases ten have died as the result of the operation, giving a mortality of 2 per cent. One hundred and five of them were hospital cases, of which 95 were females, of whom four died, and ten were males, of whom none died. Three hundred and ninety-five were private cases, of whom 375 were females, five dying, and 20 were males, one dying. The hospital mortality thus is 3·8 per cent., the private mortality 1·5 per cent. The mortality among females also seems to be considerably higher than that among males. I do not think we need lay a stress on this differentiation in mortalities except to point out that the larger number of bad cases occur among women and that possibly the private patients in many cases have better and more prolonged treatment before operation.

I do not wish to dwell in detail on points in the operative technique, though there are certain general principles which cannot be too often or too strongly insisted upon. Of the many operations which have been devised and practised the removal of large portions of thyroid tissue seems to be the only one that is likely to survive permanently, ligature of thyroid vessels being of very little practical use. In the cases which are so bad that it is the only thing which can be attempted, ligature is not likely to do much good, whereas in the milder cases it is certainly not the best thing that can be done. The amount of thyroid tissue that should be removed is very important. It is practically never sufficient to remove one lobe and the isthmus; though this will create an improvement it is not the least likely to be curative. A portion—varying in amount—of the other lobe should always be removed as well. It should also be remembered that just as in such conditions as myxœdema it is not possible to specify straight away exactly what the proper dose of thyroid required will be, and different doses may have to be tried until the right one is found, so in removing thyroid tissue it may be very difficult to settle how much should be removed at the operation; the surgeon must therefore be prepared occasionally to find that he has not removed sufficient and that a further portion may have to be removed subsequently. This is naturally a thing to be avoided if possible. The danger of causing myxœdema is apparently very small, for estimations of the basal metabolic reactions in many of these cases before and after operation have shown that it is very uncommon to find it reduced below normal after thyroidectomy. It looks as though the smallest amount of toxic thyroid tissue is enough to keep the normal metabolism of the body going. One's aim, therefore, should really be to remove as much thyroid tissue as possible, stopping short, of course, of a complete thyroidectomy, but the limit is naturally set, and in the very bad cases very rigidly set, by how severe a procedure the patient's strength is equal to.

Another point in the operation to be avoided, if possible, is the leaving in the neck of small isolated portions of thyroid tissue, in such situations as upon the recurrent laryngeal nerve or around the superior thyroid artery. Though this procedure may make the operation a little easier these isolated portions left behind are very liable to undergo hypertrophy later on, and then they may give rise to a recrudescence of symptoms.

Anæsthesia and Pre-medication.

The choice of anæsthetic is undoubtedly of the greatest importance. In the first series of cases published we made use very largely of local anæsthesia. The late Sir Hector Mackenzie was very strongly of the opinion that this was of the greatest importance, and it certainly appeared as though this was largely responsible for the small mortality. Recently, however, we have been doing more and more of these operations under open ether anæsthesia with equal safety, though in the very bad cases—i.e., those with very grossly dilated hearts and very rapid pulses—local anæsthesia is still employed. By its means no one can certainly undertake cases to which one would not venture to give a general anæsthetic. Ether given by the open method, and as little as possible of it, is what we now employ in most of these cases. Patients are kept very light throughout so that a minimum quantity is required. A dose of morphia, or in many cases a large dose of paraldehyde in the rectum (a drachm for every stone of the patient's weight), can usefully be given an hour or two before the operation. Rectal ether we have used on occasions, though it does not appear to present any particular advantages over ether given by inhalation; I do not think intra-tracheal anæsthesia either necessary or advisable. It is not necessary, because it is very uncommon indeed to find any stridor or tracheal pressure or displacement in cases of Graves's disease, for the goitre is usually too uniform, while the disadvantages are due to the fact that it entails a very considerable depth of anæsthesia at the commencement for the passage of the catheter and also a considerable amount of manipulation of the neck.

It is only of recent years that it has been an almost invariable routine to give all patients before operation a preliminary treatment with Lugol's solution of iodine. Complete rest in bed on a full diet with Lugol's solution in doses of about 10 minims two or three times a day almost invariably results in considerable general improvement, especially of the pulse-rate and cardiac irritability. This improvement, however, is only of short duration, rarely lasting for more than two or three weeks, but it constitutes a very valuable form of preliminary preparation for operation. A few patients are encountered who are made worse by Lugol's solution and in whom therefore it cannot be used. Some surgeons make it a practice to select the cases suitable for operation and the best time at which the operation should be done by reference to how long the patient has had the condition altogether, feeling that certain periods in the duration of the disease are more suitable for operation than others. I have never been convinced that there is any really sure ground for this, and in most of these cases we have been guided far more by the clinical condition of the patient, the basal metabolic reaction, &c., than by the actual time that the disease has been in existence. It is a fact that such patients tolerate hot weather badly, and probably very hot weather is not the best time to select for operating on them. At the same time, in London at any rate, thick foggy weather is just as unsuitable for operations, and we have not therefore as a rule laid very great stress on these weather conditions.

Selection of Cases.

There are, of course, no fixed rules that can be laid down for the selection of cases suitable for operation, but it may be remembered that in quite a number of cases the condition is so slight or early that it may well be doubted if operation is really necessary, and that, on the other hand, there are a few cases (and only a few) which are so bad that an operation cannot be advised. In almost all cases it is wise to try the effects of medical treatment first, for though this may not necessarily be curative, it is an almost necessary preliminary to operation. The only features which can definitely be said absolutely to contra-indicate operation are marked failure of the heart and myocarditis, as shown by œdema of the feet, &c., and serious mental changes of the melancholic or maniacal type. Naturally, the usual nervous and emotional instability which is one of the features of the disease is no contra-indication, nor is auricular fibrillation. As I have already said, certain cases with marked auricular fibrillation (especially cases of secondary Graves's disease) do most remarkably well, the cardiac irregularity sometimes entirely disappearing within a few days of the operation, though one would prefer that they should be done, if possible, before bad fibrillation sets in.

There are certain cases which usually do not do very well after operation and in whom, therefore, operation is rather to be avoided if possible. The first group of these are children under 15. Fortunately, the disease is distinctly rare in children, though it is occasionally seen as young as 5 or 6 years old. Here the results of operation are usually disappointing. The second group of cases are those who, although they have marked signs and symptoms of Graves's disease, have no enlargement of the thyroid, not a very uncommon class. One may well wonder what the true pathology of these cases is. Remembering that the other ductless glands, such as the pituitary, are all involved to a certain extent in this disease, it is possible that in this type of case the influence of some other gland, again possibly the pituitary, is predominant, the thyroid only playing a very secondary part. However this may be, these particular cases do not appear in practice to get as much improvement after a thyroidectomy as do the more ordinary ones.

It must be remembered that Graves's disease is not necessarily a fatal disease. It is probable that quite half the cases, if untreated or only inefficiently treated, will survive and live for a long time, though the majority of these will certainly pass into chronic invalids unable in any way to lead an ordinary life and only hanging on to life precariously, while they are liable to be carried off by any intercurrent infection. Those that get well spontaneously will probably only do so after many years of ill-health. There is little doubt that operation, though not necessarily absolutely a life-saving measure, is the quickest and most certain way of getting these patients well enough to lead a normal life, and this question of saving time and ill-health is one of the most important influences which makes an operation desirable. The earlier the operation is performed and the fitter the patient is at the time, the quicker will this result be achieved.

Results of Operation.

Patients with Graves's disease as a class, both in hospital and in private practice, appear to be very easy to keep in touch with. They take a great interest in their own condition and are always pleased to report how they are and to submit to examination if necessary.

With regard to the results, one may say in general that it is the rarest thing in the world to see a patient who has had an *adequate amount* of thyroid tissue removed who is not very greatly improved. The worse the patients are before the operation the more marked the improvement is and the more pleased they are with the results as a rule, and it is a remarkable feature that the sense of well-being and the improvement in their subjective symptoms are generally even more marked than the amelioration in their physical signs. Thus most patients six months after the operation are able to lead a normal life, sleep and eat well, put on weight (in some instances too much), and express themselves as feeling perfectly well. Nevertheless, on examining them it is not uncommon to find that their pulse may still be a trifle quick—say, in the neighbourhood of 80 to 90—and they may still be somewhat jumpy and excitable. The exophthalmos disappears less than the other features, and if marked before the operation, though it will improve, it is not likely to disappear completely. These physical signs, however, tend gradually and slowly to vanish in the course of the first year after the operation. The dilatation of the heart which nearly all these cases have also disappears. Mentally and emotionally they become more stable. It must be remembered, however, that many of them are by nature and family history excitable, emotional, and unstable, and we can hardly hope by thyroidectomy to alter their constitutional tendencies, though we can well expect to return them to the condition they were in before the Graves's disease started.

The first few months after the operation is a very important period and the patients should be under careful observation for at least six months, while it is as well to warn them before the operation is performed that they must not expect to be well for quite this period. During this time they must *lead the quietest possible life*, avoiding all excitement, staying in bed late in the morning, and going to bed early at night; at the end of this period they may gradually begin to lead normal lives again. Once they have recovered sufficiently to lead a normal life there need be few restrictions on what they do, though long periods of strain and anxiety should be avoided if possible. The question of child-bearing is one which often arises, and once the pulse-rate has dropped persistently to below 90 and they feel and appear well there seems to be no objection to their going through pregnancies should they so desire. Many of these patients have had two or three children since operation. The risk of myxœdema following operation does not seem to be at all great, on the whole less than after treatment with X rays.

PSITTACOSIS,

WITH AN ACCOUNT OF CASES OF HUMAN INFECTION.

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Psittacosis is an epidemic disease of parrots, the chief symptoms of which are general debility, loss of appetite, and chronic enteritis. Its mortality among infected birds is very high and it is probably responsible for a large proportion of the deaths occurring among parrots soon after their arrival in Europe. This mortality forms a serious problem for bird-fanciers.

History of the Disease.

Boggs[1] states that the disease was first recognised in Germany by Ritter in 1879, but as I have been unable to consult the original paper I am not certain whether Ritter described the disease in man or only in parrots. However that may be, it was not until the years 1892–93 that psittacosis acquired serious clinical importance. At that time there occurred in Paris a large number of human cases of continued fever, one of the chief characteristics of which was pulmonary consolidation of unusual type. Accurate statistics cannot have been available but the epidemic was obviously a grave one, for contemporary physicians estimated the mortality at 45 per cent. of the patients attacked.

In view of the fact that Paris had but recently emerged from the great pandemic of 1889–90, it is not surprising to find that this new epidemic was at first regarded as an unusual manifestation of influenza, particularly as it was clear that in the great majority of cases abnormal physical signs were found in the lungs alone. According to Macaigne[2] it is to the French physician Dubief that credit is due for first directing attention to the fact that in the case of sufferers from this new and anomalous disease it was possible to trace close previous contact of the patients with sick parrots, which at that time were popular and fashionable pets in Paris. Shortly afterwards Nocard isolated a bacillus from the bone-marrow of affected parrots and established it as the cause of their disease; he also proved the toxicity of the organism for a large number of other birds and laboratory animals and showed that it could be recovered from feathers shed on to the floors of cages and that its virulence was retained for many months. An organism indistinguishable from Nocard's was first isolated from a human case by Gilbert and Fournier in 1896.

Since this Parisian epidemic of 1892 accounts have been published from time to time of similar outbreaks in different parts of Europe, particularly in Italy, Germany, and France, but I can find only one reference to the disease in the English journals and this is in the form of a short note written by Prof. Gulland[3] in 1924, which describes two typical cases of psittacosis in women, both of whom tended the same parrot. In Gulland's cases the diagnosis, though clinically certain, was not established bacteriologically and the first of the short series that follows appears to afford the only instance of the recovery of *Bacterium psittacosis* from a human case of infection in this country. In America, McClintock[4] has reported very fully a serious local epidemic beginning in a department store which undertook the sale of a consignment of parrots.

Case Records.

Case 1.—For information on several points in connexion with this case I am much indebted to Dr. J. A. Knott of Warwick, who had charge of her throughout.

The patient, a lady of middle age, first became ill early in July, 1928. For some days she suffered from indefinite malaise, complete loss of appetite, and frequent vomiting after meals. Despite these symptoms and the fact that she discovered that her temperature was raised, she did not go to bed. On July 9th she was very restless and an irritable cough developed; on the following day she became delirious and was unable to get up and her temperature in the evening reached 103° F. Three days later she seemed a little better and her temperature had fallen to 99°. During this period there was no vomiting or diarrhœa; the cough was more troublesome and almost incessant, but there was no expectoration. Physical examination was entirely negative.

On July 13th, when we saw her together in consultation, she was a little delirious but could be roused to answer questions sensibly. She complained of fairly severe headache and of a feeling of extreme illness. On examination some sharp crepitations were found at the apex of the left lung; in addition there was slight tenderness in the hypogastrium and the urine contained a little pus, but nothing else could be found to account for her condition. A Widal test gave a strongly positive reaction (1 in 1000 dilution paratyphoid B) and inasmuch as it was noticed that her pulse had remained slow (between 80 and 90) despite the fever, a diagnosis of typhoid infection was made.

On July 14th she was moved into a nursing home and her temperature persisted with slight fluctuations between 100° and 103° until the 23rd, when it fell by crisis to subnormal. During the whole of this period of ten days she was gravely ill with constant muttering delirium, incessant cough without expectoration, and sharp crepitant râles in the left upper lobe; she nevertheless took fluid nourishment extremely well.

At no time was the spleen palpable and never was there the slightest rash of any kind. Early on she was rather constipated and enemata were necessary, but towards the end of the febrile period there was slight diarrhœa. Pus was often present in the urine but it was known that she had had cystitis previously. On July 19th the right parotid gland became swollen and painful, and on the 23rd a small quantity of blood-stained fluid was aspirated from it and culture media were inoculated. After the critical fall in temperature convalescence was very rapid and eventually, after three months, complete; the swelling of the parotid gland disappeared in ten days.

We should probably have been content, in view of the positive Widal reaction, with the diagnosis of an unusual type of typhoid infection, had it not been for the fact that on discussing the matter with the family we were told that the patient's niece had made the remark that, "Auntie had what the parrot had had." On inquiry we found that a West African parrot which had been purchased some weeks previously had sickened subsequently and died shortly before our patient became ill. On further investigation it was found that the parrot was one of a number that had been imported together, a large proportion of which had already succumbed to the "parrot disease" and it seemed probable that our patient, who had cared for the bird while it was sick, had become infected by it. The cultures from the parotid gland confirmed this supposition for the bacteriological report that follows, although it does not conform in every detail with some of the published accounts of *B. psittacosis*, nevertheless shows that it belongs to the same group of organisms, individual strains of which are known to vary considerably in their behaviour in the laboratory.

There was slow growth on the usual solid media and on potato and slight hæmolysis on blood-agar; in nutrient broth a small petal-like growth developed upon the surface of the medium; no liquefaction of gelatin occurred and there was no anaerobic growth. The organism, which was in pure culture, was found to be a short bacillus with polar staining ends; in the early stages it was mainly Gram-positive, but after 48 hours' growth in vitro it became completely Gram-negative. The bacillus produced acid and a little gas with glucose and acid with mannite, but there was no reaction with lactose, saccharose, or dulcite. Litmus milk first became acid but in 24 hours rapidly became alkaline. There was very slight agglutination with paratyphoid B serum, but none with a serum of *Bacillus enteritidis* Gaertner. It was unfortunately impossible to obtain serum from the patient to test its agglutinating power against the organism isolated.

In March, 1929, while I was engaged in searching for further information in connexion with this curious disease I happened to describe this case to my surgical colleague Mr. H. H. Sampson, and he at once suggested that I should investigate the circumstances of several instances of mysterious illness that had occurred in a nursing home in Birmingham. My subsequent inquiries brought to light the following details:—

CASE 2.—Mrs. A., proprietress of a large nursing home, aged about 50 years, in November, 1928, purchased a parrot which shortly afterwards became ill with vomiting and diarrhœa. A veterinary surgeon was called in consultation and formed the opinion that the disease was not infectious to man and that no alarm need be felt on that account. Mrs. A. continued, therefore, to attend the parrot, frequently nursed it in her hands, and to keep it warm allowed it sometimes to sleep under a woollen jacket against her breast. The parrot eventually became so ill that it had to be destroyed. While attending the parrot Mrs. A. had an attack of what seemed to be simple bronchitis which kept her in bed for a few days. She appeared to be recovering, but a few days after getting up was seized with severe pain in her back and had to return to bed. During the last two weeks of her life she had a continuous temperature which varied between 100° and 105°F., with signs of diffuse bronchopneumonia in both lungs. It was noticed that the pulse-rate never exceeded 80 per minute to within about three days of her death in January, 1929, when it became very rapid. At the onset the bowels acted normally, but in a few days became very relaxed and finally she had incontinence of fæces. In the later stages of her illness there was retention of urine and she had to be catheterised; sweating was often profuse, abdominal distension was very marked throughout, and she vomited frequently after nourishment.

CASE 3.—A young woman of 27, by occupation personal maid to the proprietress of the nursing home (Case 2), assisted her mistress in the care of the sick parrot. On Jan. 17th, 1929, when her mistress was already gravely ill, she complained of severe headache and backache and her temperature was found to be 103°. At the onset of her illness she vomited frequently. Doubtful signs were found in the lungs and a tentative diagnosis of pneumonia was made, although there was no cough and respiration was not markedly increased. The pulse-rate varied between 100 and 110; sweating was profuse. During the next five days she had a high continuous temperature, between 103° and 104°; the pulse, however, remained relatively slow, at about 100 per minute. She was frequently delirious and had some diarrhœa. The diagnosis remained in doubt, but on the 22nd a rash was noticed and it was thought that she had scarlet fever, although she stated that she had had it twice previously. On that day she was sent to the City Hospital under the care of Dr. E. H. R. Harries, to whom I am much indebted for details of her subsequent progress.

On admission she was found to be of frail physique and in poor general condition. There was a good deal of nasal catarrh but the *fauces and tonsils were clean and showed* neither exudate nor injection. The tongue was clean, red, and dry, and there was no enlargement of the papillæ. There was a large patch of facial herpes. Across the abdomen and upon the back there was a punctate erythema, which Dr. Harries thought was probably a "flannel rash"; the *skin was generally moist*; *the urine was normal*. As there was no definite evidence of scarlet fever the patient was removed to an isolation ward and barrier-nursed throughout. A note made on her admission states that the first sound at the apex was soft and indistinct and the percussion note over the right lower lobe was impaired; in this area the breath sounds were harsh but there were no adventitious sounds.

On the following day she was very delirious and constantly attempted to get out of bed; she had an occasional cough. The abdomen was distended but no enlargement of the spleen could be made out; the rash had faded and tubular *breath sounds* with moist râles were now apparent at the right base. By Jan. 24th the rash had entirely disappeared, her respiration had become laboured, physical signs in the right lower lobe were more marked, and in the left lung expiration was noticed to be prolonged. Abdominal distension continued and she passed a good deal of flatus. *The tongue* was dry, brown, and cracked, and there was marked sordes. On Jan. 25th there was less distension but tubular breath sounds were present in both lungs with a large number of crepitations. She died on the following day; no autopsy was allowed.

During the whole of the four days that she was in the isolation hospital before her death the temperature was high and continuous and ranged between 105° and 102°. The pulse-rate reached 132 on the day before her death, but previously had averaged about 110 despite the high temperature.

In a personal letter to me about the patient, Dr. Harries says: "There was no évidence of scarlet fever; death was certified as due to pneumonia. In the light of what you say about the parrot and from a comparis[illegible] the [illegible] of S. R.'s case with Macaigne's [illegible] seems highly probable t[illegible] condition."

Case 4 [illegible] but it is worthy of [illegible] nursing home who [illegible] 2 and 3 and also with the parrot, suffered at the same time from an unusual and obstinate form of bronchitis from which she eventually recovered completely. The three cases from the nursing home were all under the care of one of my colleagues, with whom I have since discussed the matter. He has told me that their course was a very unusual one, and that at the time he was not at all satisfied with the tentative diagnosis of broncho-pneumonia. Although the responsibility of the parrot for their infection was not suspected during their illness or, indeed, until some months after the death of two of them, I think that the details that I have since been able to obtain leave practically no doubt of the true nature of their condition.

Clinical Manifestation of Psittacosis Infection in Man.

The first three cases described correspond very well with the text-book descriptions of psittacosis in man; the fourth may have been a mild infection. Clinically, the patients present evidence of septicæmia of the typhoid type complicated by unusual signs in the lungs suggestive of pneumonia. Vomiting at the onset is frequent and may persist; delirium is nearly always severe. The spleen is at times said to be enlarged, though apparently it was never so in any of my cases, and rose spots occasionally occur. Positive agglutination reactions with the typhoid group of organisms are sometimes met with but rarely to the marked degree found in my first case. An unusual symptom of diphtheroid stomatitis has been noticed in those who have practised what must be the difficult art of mouth-to-mouth feeding with parrots. The duration of the fever varies from 15 to 20 days and the total mortality is said to be extremely high, in the neighbourhood of 40 to 50 per cent., and even more than this in elderly people. It is a striking thing that while in parrots the lesions are limited to the alimentary tract, in human beings it is the pulmonary complications that are the most conspicuous features of the septicæmia.

The chief clinical point that emerges from this study is that anomalous cases of continued fever, in some ways suggestive of typhoid septicæmia with marked pulmonary involvement, should raise the question of the possibility of psittacosis infection.

Incidence of Psittacosis.

The paucity of references in English journals to psittacosis and its scanty treatment in the text-books show that in England it is a disease but rarely recognised; that its occurrence is as rare as its recognition is by no means certain. On the contrary, several considerations warrant the suspicion that this extremely serious condition may occur more frequently than is believed. Firstly, it is known that a number of imported parrots die of it; secondly, the infecting organism has been shown by many workers, particularly by Perry,[5] to belong to the salmonella group and to have close affinities with *B. paratyphosus*, *B. aertrycke*, and *B. enteritidis* Gaertner; there is no confirmation of McClintock's opinion that it is pleomorphic. It is further established that when removed from its host *B. psittacosis* can retain its virulence for a long period of time both in the dejecta and on feathers, and opportunities for infection must therefore be frequent, particularly among those who handle parrots. Thirdly, in human infection the symptoms are such that, unless they are fully aware of the existence of the disease, competent observers may be led to be content with an erroneous diagnosis of some form of pneumonia or of typhoid fever, as indeed would have been my own fate had it not been for the insistence of the niece of my patient (Case 1) on the correct diagnosis.

It is of practical importance to determine the manner in which parrots become infected. It has been suggested that the insanitary conditions which prevail in their journey from the tropics to Europe are responsible and, certainly, the fact that psittacosis is most common in newly imported birds supports this view. If this, indeed, be true it would be well for the responsible authority to insist on a period of quarantine for imported parrots before they are set free for sale. On the other hand, it may be that the sudden change of climatic conditions and from freedom to close confinement so reduces the general resistance of the birds that they fall a prey to invasion by an organism which they usually carry without ill-effect. If this view be correct any parrot in captivity may be a source of danger. To clear up this point I should be glad to receive swabs from dejecta of parrots for investigation. Lastly, I feel that the attention of veterinary surgeons should be directed to the extremely serious nature of psittacosis infection in man and to the established fact that it is generally acquired directly from sick birds (oddly enough, infection between individual patients seems to be rare though, of course, its *possibility cannot properly be denied*). The opinion expressed by the veterinary surgeon called into consultation on the nursing home parrot, the cause of infection of Cases 2, 3, and 4, was to me surprising, but I discovered that he may claim a certain amount of authority for it.

On turning to what appears to be a standard work[6] published so recently as 1920, I found that the authors do not regard it as proved that the disease of psittacosis can be transmitted to man and quote Leichtenstein, who says that "Epidemiological, clinical, and especially bacteriological evidence is not disclosed to prove that the infection of house epidemics of pneumonia, suspected of being psittacosis, did originate from sick parrots. The same house epidemics of pneumonia occurred not rarely without the intervention of parrots, and one may from this draw the conclusion that former psittacosis epidemics were nothing more than atypical pneumonia in which the sick parrot, accidentally present in the house, played no ætiological rôle."

The recovery of the organism in Case 1 of my series may, I hope, make a revision of this opinion possible.

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THE INTRATHECAL TREATMENT OF PARASYPHILITIC AFFECTIONS OF THE NERVOUS SYSTEM.

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JUST as intravenous salvarsan treatment has taken a number of years to attain universal recognition, so a long period will be necessary before the indications and simple technique of the endolumbar treatment of meningeal syphilis will become generally appreciated. Up to the present, views upon its suitability are much divided. A constantly reiterated objection is that the same results can be obtained with intravenous salvarsan treatment, both clinically and in the effects upon the cerebro-spinal fluid. It is quite certain, however, that in 20 to 40 per cent. of cases a pathological fluid cannot be cleared up with intravenous salvarsan treatment, the figure varying with the quality of the general treatment and the age of the infection, and becoming more and more unfavourable with advance in the age. No fluid has ever been permanently restored to normal by intravenous salvarsan treatment after the fifteenth year of infection. According to Gennerich, these conditions have been completely changed by the endolumbar treatment.

The Technique and Its Purpose.

As early as 1912 Wechselmann and Marinescu made injections of salvarsan into the lumbar sac and noticed signs of irritation in the spinal cord, corresponding with the site of injection, as the drug remained in the same spot. Swift and Ellis reported in 1913 on their new method with salvarsanised serum, and Fordyce and Lafora obtained very good success in all stages of meningeal syphilis, especially in the optic atrophy of tabes. Fordyce also had many remissions in general paralysis, but the permanent success was less satisfactory. The Swift-Ellis method has proved inefficient for older and deeper-lying parenchymatous processes in general paralysis and its preliminary stages in cerebral syphilis and in latent processes. The superficiality of the effect is easily explained by the very small quantity of salvarsan used in the Swift-Ellis method: less than ⅓ mg. The small dose of salvarsan also explains the absence of excitatatory effects from this method, even in cases of severe spinal change.

In 1913 Gennerich began his treatment of syphilis of the central nervous system. He had ascertained, on the basis of many years' study, that, even in recent cases, neither clinical improvement nor benefit to the fluid could be obtained, in spite of energetic salvarsan treatment. Often, indeed, the condition became worse. He therefore decided to attack the syphilitic process not only through the blood but also through the fluid. He did not, however, use a serum for this purpose, but mixed the fluid which he took from the lumbar sac in quantities of 50–90 c.cm. with neosalvarsan and then let about two-thirds of this salvarsanised fluid run back again in the hope that, by this means, the salvarsan would reach the seat of the disease more effectively than if he left its distribution in the fluid to the existing limited circulation. The success of this treatment showed itself immediately. Whereas up to that time only 36 per cent. of cases of cerebro-spinal syphilis could be cured by intravenous treatment, Gennerich's figure rose to 76 per cent. Encouraged by this, he proceeded to treat the metaluetic process, with the same good results. With intravenous salvarsan treatment he was able to produce normal fluid and freedom from symptoms in three cases of early general paralysis; in six cases he got an improvement in health without cure of the fluid, while ten cases remained uninfluenced or grew worse. The endolumbar treatment, on the other hand, showed that out of 26 cases of tabo-paralysis remission was attained in 20 cases and that 5 cases were able to practise a profession.

Gennerich found that the success of the treatment depended upon the quantity of the dose. As it had been shown that the reliable maximum dose of salvarsan for a spinal cord suffering from pathological degeneration could only exercise an inadequate therapeutic influence on the brain, and that the brain could bear much higher doses without complications, the problem was to find out a means by which both processes could be treated simultaneously. This Gennerich attained through his double-puncture treatment. By this means it became possible to carry effective quantities of salvarsan into the cerebral fluid while the sensitive spinal cord did not come into contact with them for some time. For this purpose two punctures are made simultaneously, an upper one in the region of the lower dorsal cord and a lower one near the sacrum. From the upper five to six c.cm. are run out into a measuring-glass; from the lower 50 to 80 c.cm. or more, according to the body-weight of the patient. To the fluid obtained from the upper puncture is added a quantity of neosalvarsan varying from 1 to 3 mg., according to the disease process to be treated. If there is coincident tabes, ¼ to ¾ mg. of neosalvarsan are added to the fluid taken from below. After a thorough mixing of the fluids, first the upper and then the lower are run back. The head and upper part of the trunk must be kept low for 24 hours afterwards. Only about two-thirds of the lower fluid is reinjected, as there has been an excess of pressure, and withdrawal has a very favourable effect. The highly salvarsanised fluid has never been known to pass down into the caudal region of the lumbar sac and cause harm to the spinal cord. In the early stages of syphilis, in latent meningeal processes, in diffused syphilitic meningitis, and in the varied and more or less complicated symptoms such as attacks of cramp or disorder in the region of one or more cranial nerves, the cure of the fluid is very simple indeed. Since the introduction of double puncture it has been carried out in a far shorter time and usually with half the number of treatments required with simple puncture.

As soon as it is known what dose the degenerated spinal cord can bear (it varies between ¼ and ¾ mg.), the treatment can be carried out without any difficulty or complication. As the brain can bear more than five times as much as the dose mentioned for the spine, it is obvious that double puncture treatment should be used to the fullest extent if all cerebral disease processes are to be removed as rapidly as possible. That this treatment has led to a considerable advance in results may be seen from the following figures extracted from Gennerich: (1) cerebrospinal syphilis was cured with the simple endolumbar treatment in 76 per cent. of the cases; with the double puncture treatment in 100 per cent. (2) For prætabes and tabes the corresponding figures are 73 per cent. and 100 per cent. (3) For optic atrophy in tabes the double puncture treatment showed an improvement or cessation of active disease in two-thirds of the cases. (4) In 31 cases of general paralysis and tabo-paresis professional capacity was restored or far-reaching remission attained in 80 per cent. and the fluid was restored to normal in 55 per cent.

In our own series 50 per cent. of the cases of general paralysis and tabo-paresis were able to carry on their professions. Dementing cases of general paralysis are the most suitable for endolumbar treatment; the expansive cases offer greater difficulties for purely technical reasons, on account of the psycho-motor restlessness. The demented forms seem to involve more superficial meningitic processes; the expansive forms evidently go deeper into the parenchyma and for this reason do better under malarial therapy. If the symptoms of the illness have been manifest more than three to eight months before treatment is begun, there is little hope of success. As the case improves clinically so the fluid shows retrogression or disappearance of the positive Wassermann, albumin, and cells. If the treatment is broken off too early there is always a rapid deterioration.

Duration of the Improvement.

Gennerich reports cures lasting up to four years. We have a case of pronounced general paralysis that has been in complete remission for five years. Other patients can carry on their profession from six months to two years after treatment. Professional capacity could be attained in about half the cases and a far-reaching improvement in one-third of the remainder, so that no paralytic has been detained in my sanatorium since the introduction of endolumbar treatment. All patients treated by us live at home and come in at intervals of one to three months, or even longer, for two to four days' treatment.

Simultaneously with the endolumbar treatment, the patient undergoes an intravenous salvarsan treatment alternating with bismuth and iodine.

Whether or not a real cure of general paralysis can be attained with this treatment cannot be said with any certainty. Cure is anyhow only conceivable in quite recent cases, and, provided that the two methods, endolumbar and intravenous, cover the area of the disease.

Disease of the Spinal Cord.

The most difficult field of application for endolumbar treatment is, without doubt, spinal infection, where, owing to degenerative changes, the cord can only bear about a quarter of the endolumbar dose which has been proved safe for a healthy spinal cord. In the presence of all metaluetic processes, tabes as well as myelitis, the salvarsanised fluid penetrates much more easily into the nerves, and may therefore very easily injure them and thereby cause a cessation of function which can only be set right with difficulty if at all. The greater the inflammatory changes in the fluid—i.e., a high cell count—the higher can be the endolumbar dose, and the greater the diminution in the meningeal inflammation, the more urgent is the restriction of the endolumbar dose within those limits which experience has proved to be safe; that is to say, 0·5 mg. to 60 or 80 c.cm. of fluid, or still less if possible. Gennerich has succeeded in proving the permeability of the pia in general paralysis, tabes and optic atrophy, and shown the essential importance of diffusion of the fluid in setting up metaluetic processes. In treating all late stages in the central nervous system, it is essential to understand this diffusion, as it is otherwise impossible properly to estimate the dose for endolumbar treatment.

Indications for Endolumbar Salvarsan Treatment in Tabes.

For all cases of stationary tabes with normal fluid specific treatment and endolumbar treatment may be used. We treated a case experimentally with the endolumbar method and were able to convince ourselves that, when symptoms had existed for more than five years, neither an appreciable improvement in the ataxia nor any considerable diminution in the attacks of pain could be achieved. In all those cases, however, where there are slight changes in the fluid, the process is progressing slightly or severe attacks of pain occur, endolumbar treatment should be tried, as with careful administration it may lead to very far-reaching improvement.

In gastric tabes also early treatment may lead within a short time to a complete removal of the disorder and, finally, to a definite suspension. The effect of endolumbar treatment on older cases of gastric tabes is exceedingly varied. Isolated cases are freed from disorder after one or two treatments, but the great majority prove uncommonly stubborn. Many react with very severe crises, so that they are no longer fit for treatment without special preparation. Gennerich gives them a preliminary paravertebral injection of antipyrin (15 per cent. alcoholic solution with novocain), which facilitates the subsequent endolumbar treatment.

The treatment of degenerative optic atrophy is very gratifying and improvement may be expected in two-thirds of the cases. The dose must not exceed 1 mg., as the degenerated optic nerve shows the same irritability as the degenerated spinal cord.

If in the course of tabes severe changes take place in the fluid (strongly positive Wassermann, gold test, and mastisol curves, and large albumin values), pointing to cerebral involvement, double-puncture treatment is indicated. In simple cases of tabes the single puncture treatment suffices.

It has been contended in Germany that endolumbar treatment is dangerous, but this is not correct. According to Gennerich, the mortality-rate is 0·2 per cent. provided asepsis is complete; complications can be excluded with certainty if technical skill is attained. To secure this and to obtain the necessary knowledge of the most important question of dosage, any practitioner who wishes to use endolumbar treatment must undergo a thorough, practical introduction to the method. Temporary spinal irritation only occurs as a complication in about 3 to 5 per cent. and exercises no influence upon the final result of the treatment. Occasionally after the first treatment the Herxheimer reaction appears as attacks of cramp or acute relapse, but this is never more than temporary.

Still more important than treating the manifest metalues is preventing it. The premonitory symptoms of meningeal inflammation are known to occur in the earliest stages of syphilis and to carry on the disease process—according to the proportion between virulence and resistance—while the patient goes his way for many years, suffering no inconvenience, unwarned and free of misgivings, towards an unhappy fate and chronic illness. By investigating the fluid at the proper time the threat could be recognised, and treatment given which would guarantee certain cure of all latent meningeal processes.

SELF-RETAINING TUBES FOR THE OPERATIONS OF CÆCOSTOMY AND CYSTOSTOMY.

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F.R.C.S. Eng.,

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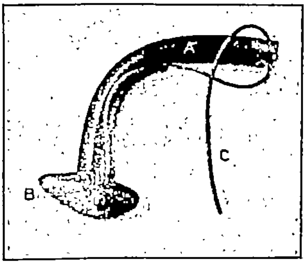
THE operation of cæcostomy is undertaken, more often than not, under the most adverse surgical circumstances as regards the general condition of the patient; or else it is performed as an adjunct to a larger and often drastic abdominal operation. The time factor is therefore of peculiar importance. From my consideration of the results of others, and from my own experience, I observed that unless a fairly considerable time was taken for careful suturing of the cæcum around the tube the result was unsatisfactory; both in the deflation of the large gut and lower ileum in the early stages, and in the fistula produced after removal of the tube.

I therefore endeavoured to devise a more rapid technique for my own use, and as a result the cæcostomy tube illustrated was constructed. Briefly, it consists (Fig. 1) of a stout rubber tube A, 1 cm. in diameter, with a wall 0·8 cm. thick. Attached to one end is a bag B, of thinner rubber, like a miniature air ring in appearance and structure and 6 cm. in diameter. A supply tube C is connected to B, and runs alongside the main tube A; it is of a calibre equal to that of the nipple of a record syringe. The technique of the operation is as follows:

FIG. 1.



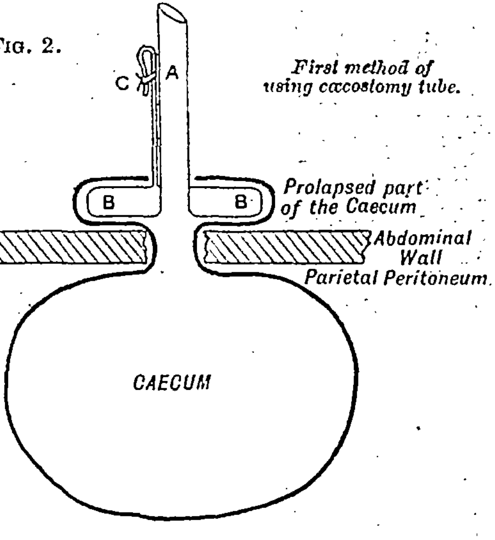
Cæcostomy tube.

A 5 or 10 c.cm. syringe is filled with sterile water and fitted by its nipple to the tube C. The bag or rubber flange B is now distended until quite hard and firm by driving home the piston in the syringe. The amount required to produce this distension is noted. The syringe is disconnected, after sucking back the fluid from the bag, and its contents are discharged. The syringe and rubber cushion flange are thus completely emptied.

Filled with the required amount of sterile water, the syringe is once again connected to the supply tube C, but the piston is not driven home. The collapsed cushion flange is folded on itself into four layers and held in this position by lightly-clamped sponge-holding forceps or large artery forceps. The actual operation is now commenced. The routine muscle-split incision is made not more than three inches long, and the peritoneum is picked up and divided in the usual way. The cæcum is sought and a portion of its anterior wall brought out of the wound by the fingers, aided by mouse-toothed Porier's forceps or Lane's forceps. These forceps are then attached to this protruded portion of the cæcum at either end of the wound so as to anchor it in position, and gauze is packed around to prevent soiling of the wound edges.

A purse-string suture is introduced into the cæcum enclosing an area 2 cm. in diameter, which is then incised longitudinally for almost its full extent. The collapsed cushion flange of the tube, held folded in the forceps, is immediately inserted into the cæcum. The forceps are then taken off and the purse-string suture rapidly tied. The piston of the record syringe is driven home, thus converting the collapsible rubber bag into a firm flange which effectually anchors the protruding portion of the cæcum in position. The syringe is disconnected and the supply tube doubled on itself and tied with any available ligature material. The protecting gauze is then removed and a silkworm gut suture introduced through all the layers of the abdominal wall at either end of the incision. When these are tied, the abdominal wall fits snugly round the prolapsed piece of the cæcum. Except for dressings and the attachment of a tube by means of a glass connexion to the distal end of the cæcostomy tube, the operation is now completed.

FIG. 2.



The main tube A is either made curved at right angles 3 to 4 inches from the cushion flange, as shown in the illustration, or else quite straight. In the latter case it can be divided at a convenient distance from the wound, and a rectangular glass connexion fitted; personally I find this the more satisfactory method.

The cæcostomy tube can be removed when required by aspirating the water from the cushion flange with a record syringe fixed to the supply tube. It will then be found to slip out quite readily. The larger size of the cushion flange when distended, in contrast to the glass flange of a Paul's tube similarly used, holds open and from the first prevents any possibility of occlusion of the fistula produced. Also it will be found that a larger permanent fistula (lined by mucous membrane) eventually results after removal of the cæcostomy tube.

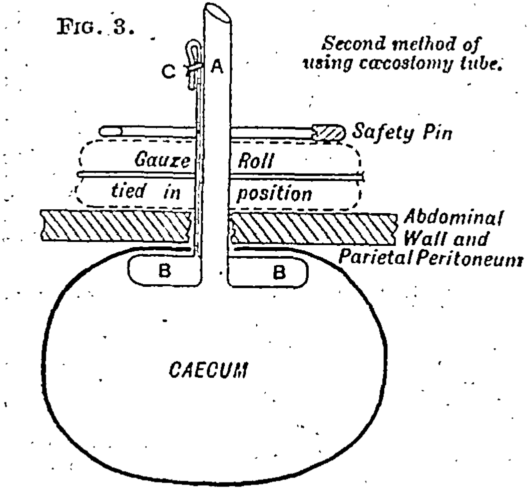
Fig. 2 shows a sectional view of the cæcostomy tube in position at the end of the operation.

This method of using the tube is only possible when the cæcum is sufficiently mobile to allow a pouch to be brought through the abdominal incision. For descriptive purposes it has been labelled the first method of using the cæcostomy tube.

When the cæcum is fixed and immobile, and a pouch of its anterior wall cannot be brc [illegible] the abdominal incision, an equally satisf[illegible] can be as rapidly produced by a slight variation of the technique. The modifications are as follows.

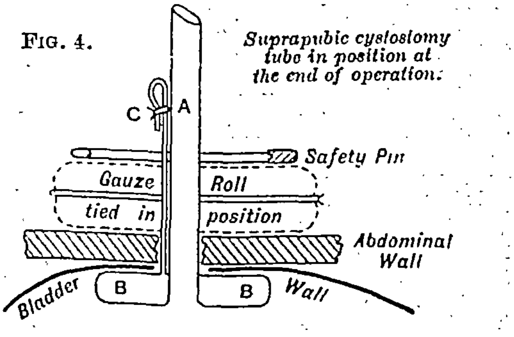
A somewhat larger incision will, as a rule, be necessary. A suitable portion of the anterior cæcal wall is then anchored at the bottom of the wound by grasping either end of the part exposed with Porier's forceps. These forceps are now held by an assistant, and the general peritoneal cavity is protected from soiling by gauze packing tucked under the wound edges. The insertion of purse-string suture and cæcostomy tube is carried out as before. The assistant now removes the Porier's forceps and packing, and applies traction to the cæcostomy tube. The anterior cæcal wall, which has been spread out over the upper surface of the distended cushion flange, is thus brought firmly against the parietal peritoneum. The two silk-worm gut sutures are now inserted and tied; and one or two large safety-pins are fastened into the main tube one inch from the wound, roughly one and a half inches distal to the cushion flange. If two safety-pins are used they are placed at right angles to each other. While the assistant still maintains traction on the cæcostomy tube, a roll of sterile or iodoform gauze is wound round the tube between the abdominal wall and the safety-pins and fixed firmly in position by tying some ligature material around the roll after encircling it several times. The safety-pin constitutes an external flange, and the roll of gauze and layers of the abdominal wall a washer between it and the internal cushion flange.

FIG. 3.



The anterior cæcal wall is thus maintained in contact with the parietal peritoneum, to which it forms adhesions around the opening for the tube. To ensure continuous close contact between these layers of visceral and parietal peritoneum, the gauze washer should be supplemented at each dressing, while traction is exerted on the cæcostomy tube by a nurse or assistant. The cæcostomy tube can be removed as readily as in the previous cases, after removing the water from the cushion flange, when the adhesions are firmly established. An equally satisfactory fistula will result. It was in experimenting on these cases in the cad [illegible] that the advantages of a known volume [illegible] an uncertain volume of air were dis-

FIG. 4.



covered, and water is therefore now used in all cases instead of air.

Fig. 3 illustrates a sectional view of this method, called for descriptive purposes the second method of using the cæcostomy tube. The tube, as illustrated and described, is the size found most suitable for well-developed adults. It is especially useful when employed according to method II. in the case of an obese patient with a thick abdominal wall. For emaciated and less well-developed patients it will be found too large and cumbersome, and for these cases a second size of tube has been constructed, smaller in all its proportions. The tube A is 0·75 cm. instead of 1·0 cm. in diameter, and 0·2 cm. instead of 0·3 cm. in the thickness of its wall. The diameter of the cushion flange is 4 cm. instead of 6 cm.

A New Pattern Cystostomy Tube.

A cystostomy tube has also been produced on exactly the same principles. The diameter of the cushion flange B is 4 cm., the main tube A has a wall 0·3 cm. thick and a bore of 0·5 cm. The supply tube C, which also runs alongside the main tube A is identical with that in the cæcostomy tube—namely, just large enough to fit the nipple of a record syringe accurately.

It is not necessary to describe in detail the operation of cystostomy and the insertion of the tube. Before beginning the operation the collapsed cushion flange is folded on itself in four layers, and held in this position by a lightly-clamped pair of artery forceps. A record syringe containing the known quantity of fluid required to distend completely the internal flange is attached to the supply tube. The bladder is reached and opened in the routine way, and the folded cystostomy tube thrust in. The artery forceps are removed and the flange distended by discharging the water from the syringe down the supply tube into it. The syringe is removed and the supply tube doubled on itself and tied off as in the operation of cæcostomy. The operation is now completed by suturing the recti abdominales and sheath, together with catgut above and below the tube, and similarly closing the skin incision with silk-worm gut or clips. It is probably safer to insert a small drain to the suprapubic space, though lately I have been omitting this without any harmful results. Finally, whilst an assistant applies gentle traction to the tube, a safety-pin and gauze roll are applied, exactly as described in the second method of performing cæcostomy (Fig. 4). The drainage of urine has been found to be more satisfactory than with the other types of cystostomy tubes even when no automatic aspirating apparatus was used.

The collapsed cushion flange, folded as described, can be inserted through an opening in the bladder of less than half its diameter in the distended condition. In consequence no sutures in the bladder wall are necessary to retain it firmly in position once it has been inserted, and urine does not leak around it if the pin and gauze flange are properly fixed. So far these cystostomy tubes have remained continuously in position and drained satisfactorily until it was decided to remove them. After aspirating the water from the cushion flange with a record syringe they come away easily and painlessly, only quite gentle steady traction being required to effect their removal.

The majority of surgeons will admit that all the usual types of cystostomy tubes can and do become displaced at times, however careful the nurses and patients may be. Cystostomy patients are very often mentally unable to assist at all in preventing this. Such minor catastrophes are not only alarming to the patients themselves but, as they often occur at the most inconvenient hours of the day or night, they are also productive of much annoyance to the busy surgeon. There are, however, already so many forms of cystostomy tubes designed for the operation of suprapubic cystostomy that it was, after considerable hesitation, that I had the temerity to suggest an addition to their number. It was only the fact that so far I have never had to replace one of this particular variety that finally led me to do so.

All forms of the tubes described are made for me by Charles F. Thackray, Surgical Instrument Maker, 110, High Holborn, W.C.1, to whom I am indebted for assistance in the experimental stages.

Clinical and Laboratory Notes.

CRUCHET'S "ENCÉPHALOMYÉLITE SUBAIGUË DIFFUSE"

AND EPIDEMIC ENCEPHALITIS LETHARGICA.

BY CONSTANTIN VON ECONOMO,
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IN the winter of 1916–17 I made observations on a small epidemic that occurred in Vienna. The infection was one which had not been known previously. It is a matter of common knowledge that on April 17th, 1917, I delivered a public lecture and showed patients before the Psychological and Neurological Association of Vienna, entitling my address "Encephalitis Lethargica." I gave the disease this name because the majority of the patients showed somnolence and disorder of the optic musculature, but I exhibited at the same demonstration patients with other symptoms and without drowsiness. I identified the disease with the mysterious "Nona" of 1890.[1] I also produced specimens showing the pathological anatomy, from which I proved that, despite the varying clinical picture, the condition was a disease-entity characterised by non-purulent non-hæmorrhagic inflammation of the grey matter: an inflammation consisting of a large number of small foci and involving the whole nervous system though chiefly localised in the grey matter of the mid-brain.; and one with no tendency to necrosis or softening. A few weeks later, working with Wiesner, I proved beyond controversy that the disease could be transmitted to monkeys and that it was therefore infectious. Since then epidemic encephalitis lethargica has been universally recognised as a disease-entity, and is described by many authorities under the shorter name of epidemic encephalitis.

A few months ago Cruchet published a short monograph entitled "Encéphalite épidémique—les 64 premières observations"[2] in which he claimed to *have been the first to discover the condition.* He asserted that he had described the first forty cases under the name of "encéphalomyélite subaiguë diffuse." This paper appeared in the *Bulletin* de la Société Médicale des Hôpitaux de Paris for April 27th, 1917. Since in any case it was published ten days after mine, I have the priority of date. Cruchet, however, claims that his work was published on April 1st, since that was the day on which he entrusted it to the post. This is against all custom, but even if it stands I can place my date of publication before that of Cruchet.

There is, therefore, no question about the priority of my paper. Moreover, I do not attach much importance to these dates, since I am satisfied that Dr. Cruchet could have known nothing about my work at the time he wrote his. The point I consider to be of far more importance, however, and which will at once be plain to every reader who studies Cruchet's cases in detail, is that the picture they show is in many respects quite different from that of epidemic encephalitis lethargica. If we select from his 64 cases the 40 which he saw before April, 1917, and discussed in his first paper, it is obvious that only a single one of them, to wit No. 45, represents a true encephalitis lethargica. In two other cases only—Nos. 16 and 29—there is a certain possibility of a differential diagnosis of encephalitis lethargica. All the remaining 37—or 39 if these two be included—show, by Cruchet's own description, no symptoms of epidemic encephalitis lethargica at all. They are all war-time psychoses, epilepsies, hemiplegias, or cases of myelitis or neuritis. None of the familiar symptom-complexes of encephalitis lethargica in its many forms plays a part in any of them and not one of them shows any symptoms of the mid-brain. If these 37 or 39 cases really manifest a disease-entity, as Cruchet says they do, it is a very different one from the encephalitis *lethargica described by me.* In the last few years we have come to recognise a variety of nervous diseases which are probably infectious, but are not encephalitis lethargica, such as Redlich's encephalitis cerebelli et pontis, Albrecht's encephalomyelitis migrans, Japanese encephalitis, and many varieties of acute multiple sclerosis. Sicard, the distinguished neurologist who died a short time ago, regarded epidemic singultus as distinct from encephalitis lethargica, and aptly suggested that these other varieties of encephalitis should be known by the name of para-encephalitis. If, therefore, Cruchet's cases really display a disease-entity—a hypothesis for which he provides no proof in his last monograph—his "encéphalite subaiguë diffuse" is at best one of these para-encephalitic conditions. It can hardly be assumed that 39 out of the 40 cases described by Cruchet as encephalitis lethargica showed *quite an atypical form.*

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[1] Jahrbücher f. Psychiatrie, xxxix., 202.

[2] Doin et Cie, Paris.

Such anatomical details as Cruchet gives also make it quite obvious that his cases were not encephalitis lethargica at all. Only two of his cases were investigated anatomically; in one of these the examination was purely microscopical and revealed one or two large hæmorrhagic foci in the cerebellum, and none of the non-hæmorrhagic polio-encephalitis characteristic of my encephalitis lethargica. The other, No. 49, had presented throughout the clinical picture of Landry's *myelitis; microscopical examination* revealed a single focus of inflammation, as large as a pea, with a necrotic centre, in the white and grey substance of the medulla oblongata in the region of the hypoglossal nerve. The isolation and size of this focus, and particularly the central softening, show that it was produced by some other myelitic process and not by encephalitis lethargica. Cruchet, moreover, mentions especially that the cases he quotes showed no epidemic character.

It is clear, from all these *considerations, that the* question of priority does not arise; not only because my paper appeared ten days earlier than Cruchet's, but also because his encéphalomyélite subaiguë diffuse, if it is a disease entity at all, is quite distinct both clinically and anatomically from epidemic encephalitis lethargica.

A SIMPLE METHOD OF DEALING WITH CONGENITAL FISTULÆ.

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Congenital *fistulæ in* the neck, owing to continuous or intermittent discharge of glairy mucus, are a source of great annoyance to their possessors, particularly when adolescence is reached and a greater pride is taken in clothes and personal appearance. The two fistulæ for which treatment is most commonly sought are branchial and thyroglossal.

Branchial fistulæ are due to the non-closure of a cervical cleft, and are most commonly seen along the anterior border of the sterno-mastoid muscle near its lower end. They may extend upwards as high as the bifurcation of the common carotid artery. Very rarely they are completely patent, the inner end opening in the supratonsillar fossa.

Thyroglossal fistulæ are due to the non-obliteration of the thyroglossal duct, which extends from the foramen cæcum in the tongue to the isthmus of the thyroid gland. Authorities differ regarding its precise relationship to the hyoid bone, but from the surgeon's point of view the relationship is so intimate that if the fistula extends above the hyoid bone then the middle quarter of an inch of bone should be resected. The upper part of the thyroglossal duct occasionally remains patent, but this condition passes unnoticed during life, as the secretion merely mixes with the saliva.

The difficulty of complete removal of congenital fistulæ is largely due to the inability to ascertain their precise extent. This fact was well illustrated in one case which came under my notice in which five attempts had been made to remove a thyroglossal fistula. As a result the patient's neck was disfigured by an ugly contracted scar, from the lower end of which mucus still escaped. Further dissection with the removal of the centre of the hyoid bone and a wedge of the tongue muscle resulted in cure.

Attempts to inject opaque substances, with subsequent radiography, are not always successful, as the orifice of the fistula may be almost capillary in calibre, and the outlying portions of the fistula already contain mucus. Again, passage of a probe is uncertain, as constrictions in the fistula may hinder its progress.

A simple procedure which greatly facilitates removal consists in encircling the orifice of the fistula with a fine purse-string suture of horse-hair. This is inserted as close to the orifice as possible and tightened so as to close the opening. In a few days continued secretion begins to distend the fistula, converting it into a cyst. When sufficiently tense, the limits of the fistula are clearly definable, and accurate dissection and complete removal with a minimum amount of trauma are then comparatively easy.

Case 1.—Female, aged 22. Branchial fistula, 1 inch above sternum along anterior border of right sterno-mastoid. Injection of bismuth *paste and radiogram suggested that* the fistula was about ¼ inch in length and passed inwards. A purse-string suture was inserted, and three weeks later a firm cord-like swelling was easily palpable, passing inwards and downwards. Under local anæsthesia this was dissected out, the fistula being 1¼ inches in length and passing downwards and inwards under the deep cervical fascia. Section showed columnar epithelium.

Case 2.—Female, aged 12. Thyroglossal fistula. Seven days after purse-string closure, was distended, passing upwards and apparently attached to the hyoid bone. On dissection it was *found to be attached to the posterior* aspect of the bone, reaching as high as its upper border. The middle portion of the bone was removed. Section showed columnar epithelium with the remains of cilia.

Both wounds healed by first intention and have remained healed after a lapse of several months.

Centenary of Cheshire Mental Hospital.—The centenary of the Cheshire County Mental Hospital at Upton, Cheshire, was celebrated on July 2nd.

Fellowship of Medicine and Post-Graduate Medical Association.—The course in gastro-enterology, tentatively arranged for July 22nd to 26th, has been postponed and will be held at the Prince of Wales's Hospital, Tottenham, from Sept. 30th to Oct. 4th. There will be three courses in August: In urology, at the All Saints' Hospital, Vauxhall Bridge-road, occupying each afternoon from July 29th to August 24th; in diseases of children, at the Queen's Hospital for Children, Bethnal Green, occupying most of each day from August 12th to 21st; and in medicine, surgery, and the specialities at the Queen Mary's Hospital, Stratford, occupying the whole of each day in demonstrations, operations, and lectures in the various departments, from August 26th to Sept. 7th. Subjects of courses in September include diseases of the chest at the Brompton Hospital, from Sept. 9th to 14th; diseases of infants at the Infants Hospital, from Sept. 9th to 21st; psychological medicine at the Bethlem Hospital, Tuesday and Saturday mornings, from Sept. 10th to Oct. 5th; and medicine, surgery, and the specialties at the Westminster Hospital, from Sept. 10th to 28th. The following special courses have been arranged in addition to the list published for the year: evening course for the M.R.C.P. Lond., from Oct. 15th to Dec. 6th (Tuesdays and Fridays at 8.30 P.M.); and an all-day course in medicine, surgery, and the specialties at the Metropolitan Hospital, Kingsland-road, from Oct. 21st to Nov. 2nd. Syllabuses of special courses, together with information about the general course of work, may be had from the Secretary of the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

THE annual meeting of this Society was held in London on July 12th, with Dr. J. H. COUTTS, the President, in the chair. After the transaction of business, which included the re-election of the President, the discussion was resumed on Col. HARRISON'S paper, read at the last meeting,[1] on

EXPERIMENTAL WORK IN SYPHILIS AND ITS POSSIBLE BEARING ON MAN.

The PRESIDENT remarked that many of the conclusions which were drawn from the experimental work on animals were disconcerting to those treating the human being, and seemed contrary to preconceived ideas. The subject of immunity, both to tuberculosis and syphilis, was remarkably complex. It was hoped that this country would not be so behindhand as in the past in carrying out research on it. The United States were affording a valuable object-lesson in this respect, and to-night the Society was fortunate in the presence of Dr. Louise Pearce, of the Rockefeller Institute of Medical Research.

Dr. LOUISE PEARCE said she had read Col. Harrison's able review, and had been invited to give a short account of the work which had been carried out on syphilis by Dr. Wade Brown and herself, working entirely with the rabbit, in which animal the disease was found to be as characteristic as in the human. It was a chronic disease, and strains were used which were passed from rabbit to rabbit many times, being each time capable of imparting the disease. *It was non-lethal and was self-limited*, in that the manifestations eventually disappeared. The rabbit, however, remained infected as long as it lived, and the spirochæte could at all times be recovered from the lymph nodes. Two or three weeks after intratesticular inoculation one found the first clinical manifestations of the disease. In the third week a primary orchitis developed. After two or three more weeks that lesion regressed and almost healed. The second latent period was the fifth week. After a variable period of time—usually seven weeks—if one testicle had been inoculated, there was a metastatic orchitis, and, shortly afterwards, secondary lesions were found in the bones; after a further period the skin and mucous membranes were involved, and then the eyes. After three to four months the manifestations of disease had all practically healed except the residual lesions of the tunics, the epididymes, and sometimes the testes. The animal thus recovering could be proved to be a carrier only by inoculation of its tissue into another animal. The typical order or sequence of infection of tissues was: bone, skin, mucous membrane, eyes, though this was not invariable. If five animals were inoculated in the testes with a given dose of inoculum, one would be found to have severe syphilis, one very mild syphilis, and three disease of intermediate severity.

In work of this kind it was very important to use and have available a large number of animals. At the Rockefeller Institute a round was made of the patients every morning, just as in the human wards of a hospital. The strains of spirochæte used must be virulent—i.e., they must be able to induce manifestations of the disease; also there must be an appropriate adaptation of the rabbit's tissues; the soil must be suitable; and the dose must be adequate. The route of inoculation was likewise important. In the animals she used, the inoculations were intratesticular, scrotal and ocular. When no primary lesion was supposed to have occurred after intravenous injection she thought there were multiple primary lesions. So far as the work had gone, the characteristics of the host seemed to be relatively more important than the characteristics of the parasite, so far as the eventual outcome of the disease was concerned. The "host factor" included breed, sex, age, and general condition. The ordinary grey-brown rabbit gave the best results. The New Zealand red rabbit proved to be very resistant to the disease. If the animal was in poor health, the results of the experiment were not satisfactory. Environmental conditions were also very important; for instance, caging or a sedentary life had a marked influence on the manifestation. The animals were separately caged and fed on a standard diet. If inoculation was carried out within two or three days of the animal's arrival, the usual result was to get a more severe disease than if the animal were first kept three or four weeks—i.e., after it had become adapted to the sedentary life. Also the experimentally induced disease was much more severe in spring and autumn than at any other time. To further elucidate this point, sets of animals were placed in three kinds of rooms: an ordinary animal room, lighted by two windows of ordinary lead glass facing south; a room strongly illuminated by electricity the whole time; a room continuously dark. The animals were detained there during the four months of the experiment. It was found that the disease manifestations—i.e., the efficacy of the reaction—increased with the amount of light and the constancy of exposure to it. Animals in the constantly dark room showed deterioration, particularly changes in the thyroid, thymus and parathyroid glands. In some of the rabbits a complete, in others a partial thyroidectomy was performed, and the inoculation of the spirochæte which followed this gave such severe syphilis as the speaker had seldom seen. It seemed that the resistance to the disease was subject to the same influences as those concerned in regulating growth and maintaining the general metabolic activity. Dr. Pearce's latest inquiry concerned the effects of dosage and the various routes of inoculation. If one simply dropped a suspension of 0·2 c.cm. inoculum into the eye, it was diluted, and one did not know how many spirochætes remained adherent to the surface—probably very few. In some previous work she noted that when this route was chosen the disease was very mild, especially in comparison with the following intratesticular inoculation, the material in the latter case being forcibly injected. Metastatic orchitis was, strictly speaking, a secondary lesion, but the conditions of growth were so different that she and her colleagues made a separate division for it. All the animals experimented with developed generalised lesions. With intratesticular inoculations the dose was enormous in comparison with the ordinary dose received by the human beings, and so the primary lesion was an enormous one. The result of that, presumably, was a rise in immunity, or an increase in the efficiency of the immune reaction. If both testicles were inoculated—i.e., if a double lesion were produced, the primary syphilitic lesion was doubled, but there were not so many secondary lesions.

Another set of experiments, said Dr. Pearce, was also very instructive—namely, concerning double or concomitant infections. By chance, she had found that an animal sent from Europe supposed to contain certain strains of *Spirochæta pallida*, also carried a vaccine virus. Injecting the latter into an animal at the same time as the spirochæte resulted in what could only be called malignant syphilis. If intratesticular syphilis was inoculated into a vaccine-immune animal, the syphilis was mild. If into the same testicle vaccine virus and syphilis were inoculated, again the syphilis was mild. The reason, probably, was that the destruction of tissue had provided a poor medium for the growth and distribution of the spirochætes. The influence of one infection on another, well recognised in connexion especially with children's diseases, she did not think had been sufficiently realised in this work. Blood examinations showed a tremendous increase in mononuclear cells in the circulating blood at the time of the occurrence of the metastatic orchitis and the secondary lesions. Similar changes were seen in association with virus disease, and also in malignant tumours of rabbits.

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[1] See THE LANCET, 1929, i., 1248.

In conclusion, Dr. Pearce said it was necessary to observe considerable caution in applying results obtained in animal work to the human being. The disease presented many points of similarity in the two cases, but also many differences. She also insisted that before results of work were given out to the world, considerable numbers of animals should have been used, to avoid all accidental error.

The PRESIDENT spoke of the great value of the research carried on by Dr. Pearce, which required much patience, as weeks of observation were sometimes needed in order to establish one apparently small fact.

Mr. DAVID LEES agreed with Dr. Pearce about the caution needed before applying to man the results of animal experiment on this subject. Some said that better results from the treatment of syphilis would be obtained by waiting until about the eightieth day after the infection was acquired before initiating salvarsan therapy.

Dr. H. M. HANSCHELL asked whether Dr. Pearce found, in these experiments, lesions in the walls of the arteries and other vessels.

Dr. PEARCE replied that practically no lesions of the vessels were to be found with the exception of those of the heart, and only very few there. Many more granulomatous lesions were found if the animals were killed at the beginning of the secondary period. The lesions in the rabbit seemed to be peripheral rather than central.

SOCIETY FOR THE STUDY OF INEBRIETY.

AT a meeting of this Society held on July 9th, Mr. W. MCADAM ECCLES took the chair and delivered his presidential address, which was entitled

Some Gaps in the Scientific Study of Inebriety.

Much, he said, remained to be discovered about the effect of varying percentages of circulating ethylic alcohol upon the cellular contents of the blood and upon the blood-plasma itself. Arteriosclerosis was now reported as one of the principal causes of death; had alcohol any effect on the delicate cells of the arterial walls, and was arteriosclerosis more common in immoderate than in moderate drinkers of alcohol? Was the low expected mortality of the total abstainer due to freedom from arteriosclerosis? Alcohol in large doses caused peripheral neuritis, and it might be that much lower dilutions might affect the more delicate nerve mechanisms of the blood-vessels. This might perhaps be a cause of the stigmata seen on the cheeks of those who indulged freely in alcohol. Investigation was required to establish whether alcohol circulating in the blood affected the muscular tissue of the heart as well as the endocardium, and to discover the cause of fatty degeneration of the heart, which occurred even in moderate drinkers. Modern text-books gave no explanation of the nature of delirium tremens. If it were due to circulating ethylic alcohol, the practice of tapering alcohol in its treatment was illogical. The possibility that it might be due to another constituent of the beverage, or to some toxin produced in the body, should be investigated. Work was also necessary on the effects of alcohol on urine excretion, and the length of time taken by the alcohol from one glass of champagne to appear in the urine and to disappear from it; the results might be useful in establishing tests for drunkenness in motorists.

Sir WILLIAM WILLCOX then opened a discussion on the

Toxic Effects of Methylated Spirits and Impure Forms of Alcohol.

In 1858, he said, the Government had felt that alcohol used in art, commerce, and industry should not pay a tax, and for this reason methylated spirit, or ethyl-alcohol containing 10 per cent. of wood naphtha, had been introduced. During the war the authorities had found that people could drink this spirit, and a mixture was produced containing 9·5 per cent. of wood naphtha, 0·5 per cent. of pyridine, and 0·375 per cent. of paraffin, together with some colouring matter. The methylated spirit of to-day was poisonous both internally and externally. Its use in industry was hampered by the substances it contained, and another spirit had therefore been introduced consisting of 90 per cent. of ethyl-alcohol mixed with 5 per cent. only of wood naphtha. This industrial spirit was sold under strict safeguards. Surgical spirit was industrial spirit to which had been added 2½ per cent. of castor oil and 1 per cent. of boric acid, to make it still more unpalatable.

Many cases of illness due to methylated spirit drinking had been observed. In America 2000 deaths from this cause had been recorded in 1926. The evil had been prevalent in Scotland in 1922, and a convention of the Royal Burghs had met and passed stringent regulations to prevent it. Isolated cases had occurred in this country, but the speaker had never met one in which the patient had taken the spirit sold nowadays. Methylated spirit produced much the same symptoms as alcohol. The most dangerous of the effects of the methyl-alcohol, or wood naphtha, was blindness, but the speaker did not know that any case had been recorded in this country. In the great eye hospitals, however, about 5 per cent. of the cases of optic atrophy were due to undiscovered causes, and perhaps methyl-alcohol had not been sufficiently considered as a possible factor. A departmental committee which had sat in 1926 had decided that it would not be in the general interests of the community to label methylated spirit as poison. In the United States, however, every package containing less than five gallons was marked with a skull and cross-bones, and the inscription:

> "Completely de-natured alcohol is a violent poison. It cannot be applied externally to human or animal tissues without serious injurious result. It cannot be taken internally without inducing blindness and general physical decay, ultimately resulting in death."

This summed up the whole situation: it was the impure forms of alcohol which were dangerous to life and sight.

Methyl-alcohol was slower than ethyl-alcohol in its action, and symptoms might not appear for several hours.[1] It produced gastric irritation, with abdominal pain and vomiting; intense headache; drowsiness and coma, which might last for three or four days. The fatal dose was 1–2 ounces. It had a selective action on the optic nerve, so that the patient who took a large dose, whether it made him drunk or not, usually became blind. Partial recovery might take place after a few days, but was succeeded by permanent loss of sight or a central scotoma. Methyl-alcohol was excreted very slowly; the breath would smell of it for over a week, and even after that time 50 per cent. of the poison would remain unoxydised in the body. Its oxidisation produced formic acid, which might be the cause of the optic neuritis. Methyl-alcohol had been used in many countries as a substitute for ethyl-alcohol, and beverages containing it were most dangerous poisons, for they were taken in the same quantities as if they contained ethyl-alcohol. It was sometimes sold in America as Columbian, Colonial, or Eagle spirit, and essences of ginger and peppermint, bay rum and bitters made with it had caused numerous deaths some years ago. It had also been used to adulterate whisky, brandy, sherry, rum, and cider. Serious epidemics of poisoning had resulted in Germany from brandy containing two-thirds of methyl- to one-third of ethyl-alcohol; out of 113 men who had drunk this mixture, 56 had died and 42 had become blind. Roumania had also suffered recently from similar epidemics due to the use of industrial alcohol. These examples proved that the evil was not confined to countries where alcoholic beverages were prohibited.

Isopropyl alcohol, or C_3H_7OH, had the same value as ethyl-alcohol in forming the basis of tinctures. It was not taxed, because it did not produce the pleasurable effect of ethyl-alcohol. It was twice as poisonous and induced lethargy, headache, and epigastric pain. Tolerance was established, and the permanent effects were no more harmful than those of ethyl spirit. Allyl alcohol, or $C_5H_{11}OH$, had as its principal constituent, fusel oil, a late product of yeast distillation; it was five times as poisonous as ethyl-alcohol. Contrary to a widespread belief, however, it was not responsible for the effects of the ingestion of bad spirits, as it was present only in minute quantities. The speaker enumerated some of the commoner alcohols and described their formation from hydrocarbons by the substitution of a hydroxyl for an oxygen group.

The PRESIDENT remarked that some three hundred varieties of alcohol were known to chemists; all the forms mentioned by the speaker were pure, and he questioned his use of the term "impure forms of alcohol."

Dr. COURTENAY WEEKS stated that investigations by the United States Government had proved that many of the deaths from spirit drinking were not due to methyl-alcohol, but to the effects of unusually large quantities of ethylic alcohol. Whisky in America might be above proof—i.e., contain more than 57 per cent. of ethyl spirit—and its consumers were liable to treat it as though it contained less than half that proportion. Many deaths reported as due to methylated spirit had occurred before prohibition, and victims of this poison were usually persons who were already vitiated by ethyl-alcohol. Dipsomaniacs would drink all kinds of irritant substances indiscriminately; he quoted a case where one had tried to make a beverage in a saucepan with paint scraped from a door.

Sister EMILY ISABEL mentioned two cases of methylated spirit addiction under her care. One was in a middle-aged woman, who was also a heavy drinker of other forms of alcohol, and had been taking impure methylated spirits for two years because of their cheapness; she was going blind. The other patient had used methylated spirit because it was easier to hide from her husband; her sight was not affected.

Mrs. M. S. DALTON agreed that the cheapness of methylated spirit was an attraction.

Mr. L. A. SENN asked if the Colonial or India Offices analysed the gin shipped from Holland to West Africa, or the foreign brandy imported by India and the Colonies in hundreds of thousands of gallons every year. These spirits must have a very deteriorating effect.

Sir ARTHUR NEWSHOLME remarked that the increased mortality from various causes shown in the statistics from time to time were largely due to "fashions" in nomenclature. The present fashion was arteriosclerosis. The high reported mortality from methylated spirit drinking in America might also be due to a passing phase of public interest in this cause.

Dr. F. W. WILLWAY pleaded for some effort to correct the erroneous idea, fostered by systematic propaganda in the daily press, that prohibition was responsible for indulgence in impure forms of alcohol. All alcohols were poisonous, and it would be of no advantage to remove restrictions on the sale of ethyl-alcohol.

Sir WILLIAM WILLCOX, in reply, agreed that the number of different alcohols was probably infinite. Much of the harmful effect of methylated spirit poisoning was, of course, due to its ethyl-alcohol content. He mentioned the case of a female patient who had been rich enough to afford the finest alcoholic beverages but had preferred methylated spirit—of the pre-war kind—probably because its effects were more intense and prolonged. She had been very neurotic. Another very tragic case was that of a young man who, after one drink of adulterated whisky in America, had developed central scotoma and died of cerebral degeneration.

Reviews and Notices of Books.

UNIVERSITY COLLEGE, LONDON, 1826–1926.

By H. HALE BELLOT, M.A., Reader in Modern History in the University of Manchester. London: University of London Press, Ltd. 1929. With nine statistical charts and other illustrations. Pp. 404. 25s.

IT is always of interest and oft-times of importance to trace the way in which great institutions come into being. In cases where the history is ancient, when we endeavour to follow it far back we do not often get behind the stage of firm establishment, and we are able to learn little or nothing of the actual origins; but in institutions of more recent formation we have an opportunity of learning the mode of their birth, and we can trace development year by year until the position which they occupy to-day is reached. So it is with the teaching body which we now call the University College, London, and its offspring the University of London itself.

Sir Thomas Gresham's foundation in the middle of the sixteenth century introduced the idea of a University of London 200 years before the inception of the present University, but from one cause or another it had never borne fruit. It was not until the year 1820 that a real beginning was made, when Thomas Campbell, the brilliant erratic poet, went to Bonn, and there was struck by the mutual tolerance in University circles of protestants and catholics and by the liberal treatment accorded to the Jews; at once the desire for a University for London arose in his mind, which should admit to its privileges and opportunities all who wished to learn without distinction of creed. There can be no doubt that it was Campbell's promulgation of this sentiment that led ultimately to the establishment of the University of London. The older universities had done much splendid work and were doing it; they had changed also in response to the changes in the life and thought of the country, but the work they were doing, excellent though it was, did not fulfil all the needs of the time. The enormous advances in physical science, the changes in many branches of exact knowledge, and the development of new classes in society whose interests differed in many ways from those of the dominating sections of the previous century—all these things had led to a widespread feeling that there was room for drastic alteration in the mode of training those who had to take part in the business of life in every field of activity. Science was not receiving the place in education which its ever-increasing importance in manufactures demanded. But—and it was, of course, the fact of prime importance—in the older universities even that measure of science which was taught, and which was capable of practical application, was not available to that large portion of the population which did not belong to the Established Church. In this respect there were indeed slight differences between the attitudes of Oxford and Cambridge, but at neither University could a degree be obtained by any nonconformist. Thus there was a large body of all denominations anxious to have systematic teaching in many branches of modern learning who were unable in this country to get any university training at all. It was not that in Great Britain there was any lack of modern thought; in Scotland especially much had been done during the latter half of the eighteenth century to advance the cause of modern learning; but the fact remained that the whole country was not benefiting as it should have done from the accumulating stores of knowledge, and this at a time of great material development.

Exactly at this place a great factor in the demand for a modern university in London was furnished by the position of medical education. It was seen to be unreasonable that a London student of medicine should be unable to obtain a degree in London, but be forced to go to Oxford or Cambridge, or to proceed to other divisions of the Kingdom or abroad. Moreover, though there was an enormous amount of clinical instruction available in London, all the systematic teaching was on the whole ill-organised; for the large number of medical students in London the need for a regular and complete course of medical teaching in London was urgent, and this made obvious the great desirability of the establishment of a university medical faculty in the metropolis. To Campbell must be given the credit of bringing to a head the recognition of this need; the original idea was his, and credit is often given to others which, in part at least, belonged to him. But a large number of progressive and highly educated men resident in London soon came to take part in the attempt to form a metropolitan university, and Campbell was soon joined by, among others, Brougham, Bentham, Grote, Mill, Tooke, Macaulay, Birkbeck, and Goldsmid, who may be taken as typical of those who shared in the work. Ultimately it was resolved to start a joint stock company, and under a deed of settlement it was arranged to raise a capital of not less than £150,000. Sufficient money was received, not without delays and disappointments, to justify the laying of the foundation-stone of University College under the title "London University," and this was done on April 30th, 1827.

Then came the task of appointing the professors. The new Council of the College wished to choose men of high standing, but the fact that the emoluments of the professors had to depend mainly on the fees of the students, while the students had not yet materialised, limited the number of applicants, and many difficulties arose. Of the professors appointed some in nearly every department resigned after a short tenure of office, and the lack of sufficient capital increased greatly the responsibilities of the Council. Of all the departments during the first few years of the life of University College, the most successful by far was that of medicine. In the first session there were 183 medical students, in 1831 there were 252, and in 1834 the number had risen to 390, when the success of the new institution led naturally to imitation by other metropolitan medical schools and the rate of increase fell off. At first the medical students of University College had to seek their clinical knowledge where they could obtain it, but University College Hospital was opened in 1834, and this disability was removed. But Mr. Hale Bellot brings out clearly in his book the anxious time which the College had before it for many years. The establishment of King's College, London, detached many who would otherwise have been students. The Law Society and the Inns of Court established courses of lectures on the various branches of legal study, and this reduced the number of legal students, and the need of a charter to give power to confer degrees was a serious drawback. It was exactly this proposal on the part of the Council that was the cause of the greatest opposition; this came particularly from Oxford and Cambridge and the Royal College of Surgeons of England, and it seems, from physicians and surgeons of the medical schools of London other than the school of University College Hospital. But towards the latter half of 1836 the Government of the day took a hand. Two charters were drafted, by one of which the body hitherto called London University was incorporated as University College, London, while by the other charter an entirely new body was created, to be styled the University of London with the full powers of a university. Thus the long struggle was ended in what was probably the best settlement, despite subsequent history.

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umber of its students, who went to other educational bodies, which were now granting increased facilities. It was not until the sixties that the fortunes of the College were placed upon a firm basis, but by that time it had become generally recognised that it had achieved and was achieving famous deeds in enlarging the sphere of learning, in removing obstacles which hindered the entry of promising students, and in turning out graduates fit to hold great national positions. Since that time the progress has been continuous. In many departments of learning the College has been a leader, and from its walls many professors have gone out as missionaries of learning to other seats of education. During the hundred years that have passed since its foundation it has done perhaps more than its famous founders expected, while it is entering on its second century stronger than it has ever been.

Mr. Hale Bellot has written a clear and interesting account of the birth and growth of University College, London, and we congratulate him on a literary performance which must have called for an infinitude of labour, as the multiplicity of references and the elaborate statistical tables show, while proving the trouble he has been at to secure accuracy. May we, from a personal point of view, mention one thing? On page 395 it is stated that in 1888 a house at Longcross was left to University College for use as a convalescent home; the house was bequeathed to the College in 1886 by James Wakley, the editor of THE LANCET from 1862 until his death in the year of the bequest.

THE PHYSICS OF X RAY THERAPY.

By W. V. MAYNEORD, M.Sc. London: J. and A. Churchill. 1929. Pp. 177. 10*s.* 6*d.*

THE essential messages of this book concern practical therapeutic X ray measurement, and are introduced by arguments drawn from physics which imply considerable mathematical proficiency; the *methods of X ray measurements are discussed*, and then the chief results of such measurements are detailed with the effects of varying conditions of irradiation in practice. The problem of the radiologist, viewed from the physical standpoint, is to deliver a certain dose of X rays at a determined depth below the surface, while observing, as far as may be, the distribution of X radiation within a mass of tissue. A clear résumé of the important factors affecting the choice of therapeutic conditions is given, and the small book closes with an analysis of the physical principles underlying the construction of the apparatus used in X ray therapy. The author acknowledges in the preface assistance from Kaye's "X Rays," Grossmann's "Physikalische und technische Grundlagen der Röntgentherapie," and Compton's "X Rays and Electrons," and to the first two authors he is indebted for permission to use data from their respective treatises. As an account of some of the physics of X ray therapy the book is of distinct value, and displays its author's intimate knowledge of the subject.

TROPICAL DISEASES.

The Diagnosis and Treatment of Tropical Diseases. Fifth edition. By E. R. STITT, Ph.G., M.D., Rear-Admiral, Medical Corps, U.S. Navy; Graduate, London School of Tropical Medicine. London: H. K. Lewis and Co., Ltd. 1929. Pp. 918. 31*s.* 6*d.*

THOSE who have profited from the earlier editions of this comprehensive book will welcome its development into an imposing octavo volume, fully illustrated with no less than 249 figures. It has now taken a high place amongst the standard works on this subject in any language containing an immense amount of information on many subjects which are not even mentioned in other text-books. The opening chapters on malaria are admirable; the sensible views expressed upon the subject of quinine prophylaxis are backed by an array of facts and figures of great use to the malariologist. In the treatment of sleeping sickness emphasis is laid upon the action of etharsanol and proparsonol, two new arsenical derivatives prepared by W. K. Stratman-Thomas and A. S. Loevenhart. Finality in nomenclature of typical parasites has not been attained, and we have not previously seen the generic term *Borrelia* applied to the blood spirochætes; *Wucheria bancrofti* replaces the time-honoured *Filaria bancrofti*. It must be admitted that the frequent changes in the nomenclature of parasites are a source of confusion to the student and of despair to the teacher, and we trust it will soon become standardised.

In the treatment of relapsing fever the contra-indications for salvarsan therapy are emphasised; these apply equally well to the treatment of syphilis. The discussion upon the nature, chemistry, and therapeutic utility of vitamins is on a broad basis not confined to tropical diseases, and the same may be said of the excellent index of clinical diagnosis. The hygienist and epidemiologist will glean much information of value, not, as far as we are aware, obtainable elsewhere, on anatomical and physiological normals and on the physiology of tropical residence.

So far very good, but the book is so packed with scientific data that practical points in treatment have suffered. This section is not developed in sufficient detail. While most of the illustrations are excellent, future editions would be much enhanced by the inclusion of coloured plates, especially in the section on malaria.

Exotische Krankheiten. Ein Lehrbuch für die Praxis. Second edition. By Prof. Dr. MARTIN MAYER. (From the Institut für Schiffs- und Tropenkrankheiten.) Berlin: Julius Springer. 1929. Pp. 368. M.39.

ALTHOUGH some five years of fertile work have elapsed since the publication of the first edition of this practical handbook, it has been found possible to incorporate the new information without adding largely to its bulk. Zoological and entomological data are supplied with reference to each disease, and no attempt is made to deal with protozoology and helminthology as separate entities. A hæmatological section forms a useful addition. The descriptions are adequate but very brief. The text illustrations, especially those in colour, deserve especial praise. This book is likely to be popular among students of tropical medicine who know German, though the price is high for a manual of this kind.

THE PRACTICE OF PERIODONTIA.

By SIDNEY SORRIN, D.D.S., and S. C. MILLER, D.D.S. New York: The Macmillan Company. Pp. 160. 15*s*.

IN the introductory note by J. McCall and P. Stillman this book is stated to be "a milestone of progress in the control of periodontal disease by the dental profession." So laudatory a statement raises hopes which are damped when we find that the book is an exposition of the thesis that pyorrhœa is chiefly caused by "traumatic occlusion" and that the methods of treatment described are based throughout on the assumption that this hypothesis is correct. The chief protagonists of this particular theory are McCall and Stillman, and while it is not unnatural for them to regard with special favour such enthusiastic disciples as Sorrin and Miller, more impartial testimony to the outstanding merits of the book is still to seek. It is generally admitted that gross deviations from what is usually termed normal occlusion put an excessive stress on the teeth which may so injure the supporting tissues that they become unable to resist infection. There is much clinical observation to support this view, which is by no means a new one. But the advocates of traumatic occlusion as the chief ætiological factor in pyorrhœa go far beyond this. They postulate a rigid standard of arrangement of the teeth as the normal one and every deviation from this, however slight, as being essentially pathological. Furthermore, the existence of pyorrhœa in a mouth is regarded as an implication that the occlusion is traumatic and therefore must be corrected by grinding the teeth or using some prosthetic or other forms of restoration to the "normal." In the chapter labelled physiology it is pointed out, no doubt correctly, that the grooves on the crowns of teeth act as spill-ways which deflect food from the septal tissues and protect the latter from injury. Few would agree that the function of these grooves is so vital that teeth worn flat by attrition should be artificially grooved. The difficulty of accepting their views is that occlusion so far from being fixed, varies throughout life in proportion to the normal wear of the teeth, which brings about a progressive series of modifications in the relationships of the upper and lower teeth. In prehistoric man, among primitive peoples, and even in some individuals of the highly civilised races, attrition sufficient to obliterate the cusps and grooves is a normal feature of adult life. It is a familiar fact that persons whose teeth show well-marked attrition have healthy mouths. Attrition is evidence of vigorous mastication combined with the use of a coarse, detergent diet; and we fail to see any adequate reason for the artificial rejuvenation of the teeth here advocated. Much of the treatment recommended in the book is sound, for it embodies measures practised successfully by dentists all the world over long before the theory of traumatic occlusion was propounded. Those who are prepared to winnow the grain from the chaff will find useful and interesting hints in this book, but its value to the general medical reader is vitiated by its insistence on developing a hypothesis which is fantastic rather than scientific.

ANATOMY AND THE PROBLEM OF BEHAVIOUR.

By G. E. COGHILL, Wistar Institute of Anatomy and Biology, Philadelphia. Lectures delivered at University College, London. London: Cambridge University Press. 1929. Pp. 113. 7*s*. 6*d*.

THESE lectures concern the study of the growth of behaviour in the light of the development of the nervous system. The work on which they are based was carried out almost exclusively on amblystoma, which afforded excellent material for this kind of study. While psychologists view the problem of behaviour from the more or less philosophical angle, it is rather the objective attitude that has prompted the line of research in this investigation. Dr. Coghill has observed the gradual unfolding of amblystoma in order to follow the changes in the structure of the nervous system pari passu with the appearance and acquirement of full function of the limbs. The study of the relation between movements of the limbs and those of the trunk is essentially the study of one of the most important activities of the organism, that of locomotion. How far correspondence of behaviour to neural structure satisfies all the peculiarities of organic life is open to grave doubt, but there are good methodological reasons for supposing correspondence between neural events or patterns and behaviour. The discovery of the Rohan Beard cells linking up proprioceptive with exteroceptive mechanisms helps to explain that strange integrity of inner and outer events which make up the associations in the higher or psychic life of the organism. The demonstration of the growth potentiality of this system does something to check the apparently victorious march of behaviourism into neurological territory and thence into psychology. The conception of continued growth in this Rohan Beard system allows for the possibility "that such a progressive differentiation of sensitivity may be the essential constitution of the conditioning process." Hence the study of these growth potentials assigns a limit to crude behaviourism, and the impulse of growth which Dr. Coghill's researches have led him to invoke, becomes inventor and operator to the organism.

JOURNALS.

AMERICAN REVIEW OF TUBERCULOSIS, Vol. XIX. (Nos. 4–6).—*April.*—Two studies on Pulmonary Acoustics are contributed by P. F. Metildi and R. S. Lyman, and R. R. Hannon and R. S. Lyman.—Stephen J. Maher illustrates an article on Some Sources of Acid-Fast Bacilli with a series of coloured plates. Acid-fasts are forms of ordinary bacteria which have developed waxy capsules to resist an unfavourable environment. They frequently accompany cancerous growths. These are distinguished from tubercle bacilli by their action in curdling and reddening litmus milk.—Frederick L. Hoffman writes on Cancer of the Lungs. The increase in this form of malignant disease is real and is probably connected with atmospheric pollution due to modern development of road transport. Neither smoking, effects of gas poisoning nor the influenza pandemic appear to have influenced the spread of the disease nor has any direct connexion between pulmonary tuberculosis and malignant lung disease been established.—Everett K. Geer, F. F. Callahan, and D. Greth Gardiner describe their experience in the use of Iodised Oil in Pulmonary Tuberculosis. The supraglottic method is recommended in order to avoid trauma to mucous membrane in frequent contact with tubercle bacilli. Injections are of value in defining fistula tracts, outlining tuberculous empyema cavities, determining the pulmonary condition when thoracoplasty is under consideration and in revealing slight degrees of bronchiectasis, as the source of unexplained hæmoptysis.

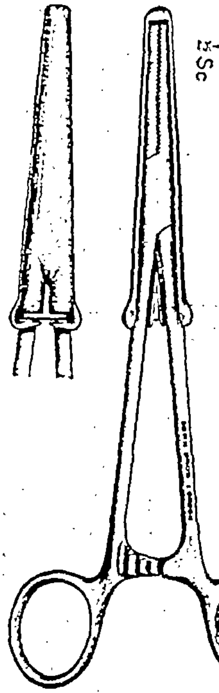
May.—Edgar Sydenstricker discusses the Trend of Tuberculosis Mortality in Rural and Urban Areas. That of the former was essentially identical with that of the latter during the period 1900–15, but since the world war the net effect of the interplay of various factors upon the tuberculosis death-rate has been to favour a somewhat greater decline in cities than in country districts.—Ralph R. Mellon and Elizabeth L. Jost describe experiments on the filtrability of the granular phase of the tubercle bacillus.—A. Levinson contributes a Study of Pulmonary Tuberculosis in Children. Cases may be classified as (1) generalised miliary tuberculosis, (2) acute tuberculous pneumonia, and (3) subacute or chronic pulmonary disease. While most of the cases in the last group are of the adult type, reference is also made to chronic tuberculous broncho-pneumonia in infancy and to the so-called epituberculosis of Eliasberg and Neuland. The tuberculin test was negative in all cases of miliary tuberculosis.—Richard H. Miller and William M. Shedden deprecate the modern tendency to exclude operative measures from the treatment of tuberculous cervical adenitis. While recognising the value of hygiene, heliotherapy and X rays they consider that tuberculous lymph glands constitute foci from which disease may spread at any time and prove a source of grave danger. Radical surgical operation is the method of choice in a considerable number of cases in both adults and children.

June.—A. Calmette and Harry Plotz contribute a leading article on Preventive Inoculation against Tuberculosis with the Bacillus Calmette-Guérin in which they vigorously controvert the opinion that the B.C.G. vaccine is dangerous.—Adolph L. Gallant describes the results of the treatment of syphilis in tuberculous patients. A positive Wassermann reaction was obtained in 21 per cent. of hospital patients suffering from pulmonary tuberculosis. Treatment of the syphilis resulted in marked amelioration of the symptoms of tuberculosis, and a significant reduction in the death-rate of the treated cases. In the presence of tuberculosis the dose of arsenicals should be reduced to half or one-third of the usual dose.—Benjamin Goldberg gives an account of the Chicago antituberculosis scheme. The most noteworthy regulation is one which makes it illegal for a child to share the home of a consumptive.—Theses by J. Dwight Davis and Maude L. Lindsey are concerned with obliterative changes of the pulmonary lymph vessels in tuberculosis and reactions of the subcutaneous connective tissue to experimental tuberculosis in the guinea-pig.

New Inventions.

APPENDIX SHIELD.

THE details of technique in the removal of the appendix, particularly the unperforated or "clean" appendix, vary considerably in the hands of different surgeons. The majority of surgeons prefer to insert the purse-string before dividing and removing the appendix, thereby reducing the chance of contamination of the peritoneal cavity to a minimum. Others make a practice of removing the appendix before inserting the purse-string; this makes matters more simple since the offending organ has not to be held up out of the way, but it has the grave disadvantage that it is impossible to be sure that the suture will not fall across the appendix stump and become contaminated. This danger can be obviated by fitting a shield or sheath over the blades of the Mayo-Ochsner forceps (see figure), grasping the stump of the appendix immediately the latter has been removed. Rowlands and Turner state that it is unnecessary to ligature the stump of the appendix provided it be crushed by a strong forceps for some moments before being covered over by the purse-string. The steps of the operation would then be as follows: The meso-appendix is ligatured and divided right down to the base of the appendix. The appendix is then grasped at its base by a Mayo-Ochsner forceps which is closed tightly. A second forceps is placed on the distal side of the first and as near to it as possible. The two forceps are then laid side by side on a piece of gauze and the appendix divided between them, close to the first forceps. The appendix is removed, the piece of gauze thrown away, and the stump of the appendix lightly touched with a swab which is thereupon thrown away. The appendix shield is now clipped over the blades of the Mayo-Ochsner forceps on the appendix stump. The purse-string suture is inserted, the shield and forceps removed and laid aside, and the operation concluded in the usual way. If for any reason the base of the appendix is divided before the meso-appendix, two shields may be used.



The shield is made by Messrs. Down Bros., Ltd., 21 and 23, St. Thomas-street, London, S.E.

Derby. A. ERNEST SAWDAY, F.R.C.S. Edin.

REBUILDING OF ST. BARTHOLOMEW'S HOSPITAL.—Lord Stanmore, the treasurer, states that the hospital can no longer meet the demands upon it, and that it must be enlarged, modernised, and partly rebuilt. The present wards were built nearly 200 years ago, and it is intended to launch an appeal for money in the early autumn.

THE LANCET.

LONDON: SATURDAY, JULY 20, 1929.

THE MENTALLY DEFECTIVE ADULT.

THE missing section of the report of the Mental Deficiency Committee has now appeared.[1] It will be remembered that Part III. of the Special Committee's report dealing with the adult defective was ready for publication when the rest of the report appeared in April,[2] but was held over for consideration by the Board of Control and the Ministry of Health. Conjecture had it that the delayed section of the report was too strong meat for the populace on the eve of a general election, or alternatively that it contained proposals for the sterilisation of the adult defective of a kind too drastic for promulgation at such a time. As we had good reason to surmise,[3] neither conjecture is realised in the report before us. Far from providing an easy solution of the social problem of mental defect, the Committee believe that the legal sanction of sterilisation would simply enhance the difficulty of bringing defectives within the scope of existing measures for control. We print *on another page* the few well-considered remarks in which the Committee convey this result of their investigation. The real thrill is contained not in this part of the report, but in the survey made by Dr. E. O. LEWIS and his assistants which appeared in April. This was the discovery that there are in this country some two and a half to three times as many defectives as are known to or being dealt with by the proper authorities. Their estimates were made by applying the figures of a local survey, with appropriate corrections, to the country as a whole. The resulting total was twice as high as that of the Royal Commission of 1906, and no doubt much of the excess is due to better ascertainment. There are now more welfare agencies of all kinds than there were, and with the rising standard of living the defective becomes more obvious. Mental defectives are finding more and more difficulty in getting work owing to the enforcement of trade-union standards, of workmen's compensation, of employers' liability, and of health insurance, obligations which make the employer more chary of taking on a defective individual. Thrown out of the labour market they come on the poor-law, and so into public notice. What real increase there may be is more marked in the country areas; the better and more energetic stock forsake the isolated villages, leaving behind a poorer stock to breed from. More inquiry is desirable in order to ascertain whether *this holds good generally.*

Having now answered to the best of their ability the two questions: How many defective persons are there, and what is the best thing to do with them? the Committee propose a third and very pertinent question: Are there any means of lessening the burden of mental defect? For this purpose they distinguish between primary and secondary amentia. The latter presents the simpler problem. Secondary amentia is usually of a low grade and is distributed with some uniformity throughout all social classes. Few secondary aments are likely to mate; girls, it is true, might be exposed to some danger if not cared for, but so far as is known secondary amentia is non-heritable. Moreover with improved midwifery, with the increase in antenatal and V.D. centres, and with the growth of infant welfare and school clinics most of the causes of secondary amentia are being dealt with. Primary amentia, on the other hand, occurs as a family and group problem; it is unevenly distributed in the population, the majority of the cases coming from the lowest tenth in the social and cultural scale. Part of the incidence depends on the germinal variation which occurs in all classes, a variation which is as likely to be in both directions as one only. Genius and defect may be found in the same family; as is well known, the Jewish race provides both much genius and much defect. If this is so, sterilisation would be liable to remove the assets as well as the liabilities of the race. In the main, however, primary amentia is an end-product of continuous poor breeding and deterioration of stocks. Relatively few are the children of *certifiable defectives*, many come from poor stocks in which there are all forms of social inefficients. In part it may be a cultural problem, for as culture rises, and with it the standard of living, fewer are willing to produce children for whom they can provide nothing. Cultural rise, moreover, seems to some extent to sublimate the sex instinct, and, as education penetrates, the birth-rate of the several classes will tend to approximate.

In education, then, the Committee see the chief hope of betterment. Of the effect of sterilisation on any particular group too little is yet known, while there is the risk of diverting public opinion from providing the needful institutions, for sterilisation does not render its object stable, employable, or amenable. Many, too, would hesitate to notify or certify the defective if his act might lead to a maiming operation. The greatest thing of all is to catch the defective young, to train him manually and in character, and to introduce him gradually to the world under efficient supervision. Much relief is given to defectives under the poor-law, but many who are now sent to institutions could remain at home if some small additional support were available. The Committee would make it legal to pay sums for maintenance of defectives under supervision, and would simplify the rules of guardianship which at present are so minatory as to frighten off the relatives. Though the distinction between mental deficiency and insanity may be useful in administration, both have environmental stresses especially in early life which need study. Out-patient and guidance clinics may do much to check the individual causes of degeneration. As all these things need correlating the Committee suggest that the time is coming, if it has not already come, to appoint a medical officer of mental health to survey all preventive measures from the mental standpoint as does the medical officer of health from the physical. Whether he should be attached to the health service, or to a separate mental service, is left open. Logically he would stand to the superintendents of mental hospitals or certified institutions in the same relation as the medical officer of health to the superintendents of sanatoriums or fever hospitals—and under the new régime of general hospitals. His task would be the even wider one of correlating all influences for good mental health.

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[1] Part III. The Adult Defective. H.M. Stationery Office, Pp. 102. 1s. 6d.

[2] See THE LANCET, 1929, i., 930.

[3] Ibid., p. 1044.

CORPORA TRIVIALIA.

THE appalling increase in motoring casualties has consequences for the hospitals and the medical profession which call for immediate remedy. Etymologically, it appears, those things are trivial which are met with at the cross-roads,—things common-place, ordinary and familiar. Trivial enough, in this sense only, are the traffic accidents which happen either where three ways meet or elsewhere upon our roads to-day. A Home Office return shows 156,024 persons killed or injured by road accidents in England and Wales during 1928; this total, representing an average of over 460 cases a day, is 12 per cent. higher than that of the previous year. This is not a trivial matter for the hospitals, some of which report that the expense to which they are thereby put runs into thousands of pounds a year, with nothing but negligible contributions from the injured persons to set against it.

Nor is it a trivial matter for the medical practitioner who gives skilled attention in some sudden emergency and too frequently receives neither payment nor even thanks. Recent discussions in the *Manchester Guardian*[1] have revealed that in one instance a practitioner attended as many as 13 cases without receiving any kind of fee. The circumstances, of course, are unfavourable to the normal arrangements for charge and payment. There is a general atmosphere of sympathy; the condition of the patient may prevent his making an offer of immediate remuneration, or a contract to pay; he is often a stranger to the neighbourhood, and the casual helpers who accompany him can hardly be expected to emulate the Good Samaritan by making an immediate financial deposit and promising further payment at their next visit. Liability for the accident may be hotly disputed; insurance companies may be vaguely relied upon; perhaps most frequently of all, there is a general impression that treatment for accident injuries is a gratuitous public service—something which it is the duty of the police or other authorities to provide. So the very mention of charges for professional service is invidious as well as ultimately unavailing. Persons who can afford their own motor-car manage to evade payment, and the motor-cyclist (as common experience shows) is often neither insured against accidents nor worth the cost of suing for the recovery of a fee. Meanwhile the practitioner may have given an hour of his time to dressing an awkward cut or setting a fracture; there may be anxious relatives to interview and ambulances to be arranged for; bandages and even drugs may have been furnished, and domestic servants will have extra work in cleaning up the mess. The practitioner gives no less care to the *corpus triviale* than to his other patients. If his surgery adjoins a high road, the routine of his Sundays —if not of his weekdays as well—is upset by this new significance of the "trivial round and common task." Why, as a county court judge asked recently, should the doctor be expected to give his services for nothing? The medical profession is not the only one to make sacrifices in service of the poor; the legal profession does the same. But it would possibly occasion some surprise in legal circles if the sabbath quiet of a solicitor's home were invaded by a procession of injured persons requiring their dying declarations to be taken, or their last wills and testaments to be drawn up, without prospect of fee or even of any expression of gratitude.

The absence of an obvious remedy is no reason for quiescence in the present state of affairs. In one small way the police can help by furnishing the doctor with the name and address of the patient he has treated. Larger proposals have two objects to achieve. In the first place some comprehensive system of first-aid ought to be evolved by the official and unofficial bodies concerned, the local authorities, the police and those associations which coöperate in the managing of traffic while promoting the interests of the motorist. The Order of St. John of Jerusalem has already done splendid work in organising its home ambulance service for the transport of accident cases; it is also engaged in preparing specifications for first-aid huts suitable for erection by the roadside, to be equipped to minimise the consequences of injuries. If the traffic casualties continue to increase, we may require the Royal Army Medical Corps to work out schemes of dressing stations and field hospitals. In the second place there is the financial difficulty to be tackled. Decent folk will be ashamed to trade upon the gratuitous services of the hospitals and the medical profession. Police authorities can incur expense in connexion with ambulance work; it may be necessary to extend their powers. In any case the treatment of traffic casualties is as much a part of the traffic problem as the maintenance of road surfaces, the planting of trees, or the removal of blind corners. The Road Fund is rightly employed to minimise the risk of accidents; why is it not also available to minimise the consequences of accidents? A fraction of its millions would go far to pay for the care of the victims. Proposals have been made in Parliament that no one should be licensed to take a motor-car or motor-cycle upon the roads unless he first produces evidence that he is adequately insured against third party risks. If present conditions continue, such legislation is inevitable. The companies through which certain newspapers insure their subscribers must have obtained useful data and experience. Can they produce a comprehensive scheme, or must it be left to the State to evolve from its imperfectly coördinated arrangements for workmen's compensation, health and unemployment insurance, and old age and contributory pensions, a universal all-in system, which will cover accidents also?

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THE CHILDLESS MARRIAGE.

To gain more control over the processes of reproduction so that he may prevent the birth of the unwanted and secure that of the desired child has long been the aim of civilised man. Towards the realisation of both of these objects he has made great strides, but he has still far to go. Sterility, whether it be that of the male or of the female, is a condition that more often than not defies treatment, and as a result we find that some 10 per cent. of marriages remain involuntarily childless As Miss **F. M. HUXLEY** makes clear in her article on the treatment of sterility in women (see p. 138) the treatment of childlessness, if it is to have any chance of success, must rest on an exact diagnosis, and it is in this direction rather than in the discovery of any new therapeutic weapons that progress is at present being made. In the female the use of insufflation of the tubes or of lipiodol injections allows of a precision in diagnosis that was formerly unattainable. In the male a similar exactness has for many years been possible by ordinary urological methods of examination. But even here progress has been made by the method of spermatozoon counts introduced by Dr. D. **MACOMBER** and Dr. M. B. **SANDERS**. These observers have found that healthy semen contains about one hundred million spermatozoa per cubic millimetre. This figure is remarkably constant for all normal men below the age of 40. Above that age the spermatozoon count tends to fall. In abnormal cases the figure may be reduced to anything from sixty million down to complete azoöspermia. An examination of a large series of cases revealed the fact that in only four instances had a pregnancy resulted when the count had been below sixty million. A spermatozoon count furnishes therefore useful information in diagnosis and prognosis as well as a guide to the effect of treatment.

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[1] See THE LANCET, pp. 50 and 85.

Another advance that has been made in recent years is the recognition of the part played by diminished fertility in childlessness. If one of the partners in a marriage be highly fertile a relative sterility of the other may be fully compensated. If, however, both be below par childlessness may result even although examination proves neither to be sterile. It is, indeed, probable that in a very large number of childless marriages multiple factors are at work, factors that affect not one but both of the persons concerned. The problem is more complex than was formerly supposed, and in order to discover an answer numerous causes of sterility must be considered, both local and constitutional. The local conditions that effect fertility, such as inflammation of the genital tract, have long been known; the constitutional factors are only now being recognised. They are summarised in the paper read last year before the British Medical Association by Mr. **Kenneth Walker** and in the excellent article by Dr. S. R. **Meaker** published in the *Journal of the American Medical Association* (May 4th, 1929.) For the sake of convenience these constitutional factors in sterility may be divided into four groups—namely, those due to endocrine disorders, chronic intoxications, metabolic faults of extrinsic origin, and conditions of general debility. Of endocrine disorders that affect fecundity the commonest are those of the pituitary and thyroid. As an instance of the sensitiveness of the gonads to chronic intoxications and especially to intoxications of microbial origin, may be cited **Kyrle's** statement to the effect that it is hardly possible to find a normal testicle in adults who have died of infective diseases. The rôle played by faults in metabolism and by diet has been emphasised by the work of many different observers, amongst the first of whom were C. B. **Paul**, T. B. **Osborne**, and L. B. **Mendel**. These workers found that rats brought up on a restricted diet that was sufficient to permit of their normal development remained sterile. To the unknown vitamins in which their diet was deficient they applied the letter E. Observations on the effect of food on fertility have also been made by veterinary surgeons, who have long recognised that dogs fed on cooked meat and biscuits become sterile. Amongst the states of debility that carry with them a low fecundity may be mentioned anæmia and severe neurasthenia.

Some day our methods of examination may become still more exact, so that we shall be in a position to express the fertility of a marriage in figures. This fertility index will be arrived at by multiplying together those of the husband and of the wife. The estimation of the fecundity index of the male is almost within our reach, but that of the female presents difficulties that are at present insuperable. It is interesting to speculate on the way that the problem of the childless marriage will be treated in the future. Some indication is given by the clinics already established on the other side of the Atlantic. At present these clinics are concerned mainly with diagnosis and prognosis, both partners in the childless marriage being subjected to a searching examination not only of the genital tract, but also of their general health, metabolism, endocrine balance, and mode of life. The factors responsible for the diminished fertility are diligently sought out, and as far as possible remedied. But as is so often the case diagnosis in sterility is ahead of treatment and too frequently conditions are found for which no remedies are at present available. In the future it may be otherwise. The time may come when those who intend to procreate children will voluntarily embark upon a régime calculated to raise to its zenith their general physical and reproductive efficiency. The dictum of **August Weismann**, that the germ cells remain unaffected by changes elsewhere in the body, may cease to be given the literal translation accorded to it to-day. It is not easy to believe that whilst the number of spermatozoa secreted is influenced by states of health their quality is unaffected. Although we have no proof that such is the case, on theoretical grounds it would seem probable that the death of a fertilised ovum is sometimes due to a fault in the male cell rather than in the female. If this be so, and if the cause of such a miscarriage is to be remedied, we shall be forced to increase the range of our treatment and to include within its scope the care of the spermatozoon as well as that of the ovum.

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THE PLACE OF SURGERY IN EXOPHTHALMIC GOITRE.

Both physicians and surgeons achieve results in the treatment of Graves's disease, but as the condition is further studied and the mass of reliable clinical records increases it becomes more and more clear that the patient's prospects are improved by a close alliance between them. Cure would probably be commoner if treatment were based on an exact knowledge of the cause, but this is at present unknown. If, as was once supposed, Graves's disease were due to a simple over-activity of the thyroid gland the problem would be simpler, but it is now recognised that in this form of goitre the thyroid secretion is in some way altered and made toxic, as well as being increased in amount. The primary mechanism of this alteration and increase of secretion is not understood, although R. J. **Ludford** and W. **Cramer**[1] have shown that there is a difference in the mechanism of secretion in the normal gland and in that of exophthalmic goitre. C. W. **Crile**[2] has lately brought forward evidence in support of the theory that suprarenal over-activity is also an important factor, and that the acute crisis of hyperthyroidism are related to over-activity of these glands. Meanwhile, lacking more information, we can recognise numerous predisposing causes of the disease. Thus, acute infections, focal sepsis, shock or prolonged worry and heredity are factors of importance in many case-histories, and the disease occurs ten times more frequently in the female sex.

The fact that the normal course of exophthalmic goitre is extremely variable leads to difficulty in estimating the value of different forms of treatment. Probably half the patients eventually get well with or without treatment after varying periods of chronic ill-health, while the remainder go intermittently down hill until after long periods of invalidism they are carried off by intercurrent disease or cardiac failure, or die suddenly in the throes of thyroid crisis. But in spite of this difficulty almost everyone would agree that treatment should begin with the eradication of septic foci, and with the patient's removal to surroundings where mental and physical strain are reduced to a minimum, and rest can be obtained. Once these conditions are secured symptomatic treatment would naturally be given; a sufficiency of sleep would be maintained by sedative drugs such as quinine hydrobromide, and the patient would receive a diet unlikely to stimulate the already raised metabolism, but sufficient to meet the increased energy requirement. So much is pretty generally accepted. Often, however, measures of this kind are inadequate, and it is then that the problem of surgical treatment arises. During the last ten years thyroid surgery has made rapid strides on both sides of the Atlantic. Its progress was assisted by the observation of D. MARINE and LENHART that small doses of iodine or potassium iodide, previously taboo in hyperthyroid conditions, produced an artificial remission of the disease. H. S. PLUMMER and W. M. BOOTHBY, working at the Mayo Clinic, then began to use iodine extensively in the form of Lugol's solution as a means of preparing patients for operation, and found that by so doing they were able to prevent the disastrous thyroid crisis, which in the earlier days were the cause of so many deaths at, or shortly after operation. This discovery, coupled with a steady improvement in surgical technique, now makes it possible to review the results of many hundreds of scientifically recorded cases treated by partial thyroidectomy, and to consider the part which surgery should play in treatment. CRILE, for instance, has recently reviewed over 10,000 cases of hyperthyroidism treated surgically; a week or two ago we published[3] a summary of F. H. LAHEY's deductions from the study of the results of 6700 goitre operations, of which 4000 were for Graves's disease or toxic adenoma; whilst in our present issue appears a paper by Mr. W. H. C. ROMANIS, in which he reviews his operative results in a smaller series of 500 consecutive cases. These three observers agree about the great value of surgical treatment. ROMANIS applies the term Graves's disease to cases in which, besides the usual signs of thyroid toxæmia, there is definite enlargement of the heart and definite changes in the eyes. He divides his cases into primary and secondary, the latter being those in which a thyroid toxæmia supervenes on a parenchymatous goitre or toxic adenoma of many years' standing, in which type there is a particular liability to auricular fibrillation. This type is the one referred to by most American authors as toxic adenoma. CRILE, LAHEY, and ROMANIS are at one about the importance of iodine medication before operation without distinction between the two types, although LAHEY says that the beneficial effects of iodine are less obvious in toxic adenoma. As regards the amount of tissue to be removed at operation, all three writers admit a difficulty. They agree that it should usually be considerably more than half the gland and that occasionally a further portion may have to be taken away at a second operation. CRILE and LAHEY both record a mortality of less than 1 per cent., and ROMANIS a mortality of 2 per cent. LAHEY gives a separate quotation for a series of 200 cases of toxic adenomata with auricular fibrillation of which only three died. ROMANIS, though he does not quote separate figures, agrees with both other observers in emphasising the great value of partial thyroidectomy in thyrotoxic fibrillation. All speak of rapidly beneficial effects from surgery, both CRILE and ROMANIS emphasising the need for removal of enough thyroid tissue if the best results are to be obtained. When this is done ROMANIS considers that most patients can return to a normal life within six months although, especially in long-standing cases, a pulse-rate of 80–90, and some exophthalmos, often persist.

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[1] Proc. Roy. Soc. B., 1928, civ., 28. (See THE LANCET, 1928, ii., 712.)

[2] Bruxelles Méd., July 7th, p. 1002.

So striking a consensus of opinion from American and English sources cannot fail to impress those who are doubtful about the part surgery should play in the treatment of hyperthyroidism. For what are the alternatives? There is the wait-and-see policy, which, from the nature of the disease, will often justify itself; and there is local treatment of the gland with radium or X-rays. Both these methods yield a high proportion of partial and complete cures, but it is doubtful whether in primary Graves's disease the risks of these more conservative measures are not greater than the risks of operation, whilst in the secondary type operation is certainly the treatment of choice, and should be done before auricular fibrillation has had time to develop. In the absence of a true cure the objections to surgery, or to any other treatment which aims at partially destroying the thyroid gland, are mainly theoretical. These objections are that exophthalmic goitre is due to an unknown stimulus affecting the whole gland, so that however much is removed the stimulus to the remaining portion remains, and a low-grade form of the disease is likely to persist or recur; that there is no accurate way of estimating the amount of gland which should be resected in each case; and finally, that removal of the greater part of a gland so important as the thyroid is unsound as a means of re-establishing its normal physiological action. The problem, of course, is so much an individual one in every case that it is difficult to dogmatise. From a consideration of the results of thyroid surgery for the last few years, it does, however, seem that if medical measures fail, partial and sufficient thyroidectomy by experienced thyroid surgeons offers the sufferer from Graves's disease her best chance of certain and speedy recovery to the extent of being able to live a normal life.

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[3] THE LANCET, July 6th, p. 30.

THE KING.

THE clear and detailed bulletins which have been issued during the week have alike informed and reassured the public in regard to the health of the King. It being known that there was a residual abscess communicating with the surface by an oblique sinus increasingly difficult to keep patent, steps were taken to accurately localise the abscess by a radiological examination after the injection of lipiodol. Stereoscopic pictures were taken at Buckingham Palace and these were closely examined and their implications discussed by Sir Stanley Hewett, Sir Hugh Rigby, Mr. Wilfred Trotter, Mr. Martyn, and Lord Dawson on Tuesday, July 9th. After a further consultation the next day the nature of the operation was agreed upon. This operation was performed by Sir Hugh Rigby and Mr. Wilfred Trotter, after which the following bulletin was issued on July 15th.

> The operation on His Majesty the King has been performed. Portions of two ribs were removed, in order that the circumscribed abscess, 1½ in. across, should be directly drained and treated.
>
> The condition of His Majesty is satisfactory.
>
> STANLEY HEWETT. FRANCIS E. SHIPWAY.
> HUGH M. RIGBY. DAWSON OF PENN.
> WILFRED TROTTER.

As His Majesty has now acquired a high degree of general immunity, there is every prospect that the abscess cavity will steadily progress towards healing.

Annotations.

"Ne quid nimis."

SEAMEN'S HOSPITAL SOCIETY.

THE week has seen another milestone passed in the *adventurous career of the Seamen's Hospital* Society, for on Monday last the Duke and Duchess of York declared open the new pathological laboratories built to the design of Sir Edwin Cooper, which are to serve the needs not only of the Seamen's Hospital itself but of the whole neighbourhood in which it lies. Another building opened at the same time was the nurses' home, situated within the gardens of the Royal Hospital School, which is to provide a separate room for each of the 130 nurses who staff the "Dreadnought" itself and its local extensions. The capital cost of both buildings has been fully met out of the fund raised by Viscount Devonport, in 1915 and after, as a lasting memorial to the work of the mercantile marine, and there is a small balance for maintenance. Not as large certainly as some of the optimists on the staff would like. Responding at the banquet to the toast of the laboratories proposed by Lord Devonport himself, the dean, Mr. Percival Cole, spoke of their double function in supplying the known needs of the moment and in organising research to meet the unknown needs of the future; and Prof. R. T. Hewlett, who was in the chair, pictured the endowment of research scholarships as the next objective in view. The scheme has in fact come to fruition at an opportune time. *Even in their previous* domicile the laboratories, under the joint direction of Prof. Hewlett and Dr. Arthur Davies, had served the health departments of five London boroughs and the neighbouring poor-law hospitals. The new unit is fit to play an integral part in any new organisation of *a local health service if only for the* remarkable faith shown by the promoters of a great fund in allotting it to the development of pathology rather than to the provision of beds or clinics. Sir John Rose Bradford, in giving eloquent expression at the banquet to this feeling, was but echoing what was no doubt in the minds of many of his listeners, and his remarks were endorsed by the Member of Parliament for Greenwich who, while disclaiming knowledge of pathology or of the sea, said he knew something of human values at the Seamen's Hospital. It must not be assumed by those who do not know all the facts that the "Dreadnought" is now nothing more nor less than a school of pathology. Since 1901 when, according to Prof. Hewlett, the palæolithic period in the Society's history came to an end, the hospitals for sick and injured merchant seamen under the auspices of the Society have increased remarkably in size and number; there are now 627 beds in the seven establishments, including the *sanatorium* at Bramshott and the hospital at Marseilles. The point is rather that pathological research has always been a tradition in the Society—*was it not at Greenwich* that one of the first cases of acromegaly was described?—and that this tradition is now assured full scope in its further development.

RETROPHARYNGEAL ABSCESS IN INFANTS AND CHILDREN.

ALTHOUGH retropharyngeal abscess is not common, its recognition is important owing to the risks attending spontaneous rupture. According to Greenwald and Messeloff[1] the majority of cases occur during the first year of life, and it is just at this time that an adequate examination of the throat is difficult. Inspiratory and expiratory stridor, aggravated by the horizontal position, is, of course, the outstanding symptom, but diagnosis should usually be possible before it becomes the presenting symptom. A previous history of acute nasopharyngitis is the rule, and in any case in which this is followed by restlessness and unilateral enlargement of the cervical glands, the question of a retropharyngeal abscess should arise. Owing to difficulty in swallowing, mucus collects in the throat and causes the rattling and stertorous breathing so often heard in the later stages. A *snoring, gurgling respiration during sleep is, in fact*, one of the most constant symptoms. Further, the younger the patient and the more rapid the course of events, the more pronounced are these findings. Torticollis is nearly always found, and its presence should suggest retropharyngeal abscess before anything else. As Greenwald and Messeloff point out, the examiner must have a clear conception of a normal throat in infants and children in order to determine, from his brief glance, whether or not there are pathological changes. Even then inspection of the throat in infants is rarely conclusive, and should be followed in all suspicious cases by palpation with the finger. In older children, difficulty is encountered in the examination because of trismus. The pushing forward of one faucial pillar is an outstanding sign found on inspection and one that may easily be overlooked. Slight œdema of the soft palate may also be seen in some cases. The mucosa covering the swelling is at first red, and later, when there is suppuration, the redness fades and the pharyngeal wall becomes pale and somewhat yellowish, feeling elastic and boggy to the finger. Once an abscess has formed, surgical measures and evacuation of the pus are obviously indicated, but in the stage of lymphadenitis, before *true suppuration, great harm may be done by incision*, because generalised sepsis may follow. In Greenwald and Messeloff's opinion, the best results are obtained under light ether anæsthesia, unless the child is desperately ill; the outlook as a rule is excellent.

THE TRAFFIC IN DANGEROUS DRUGS.

THE third annual report made by the British Government to the League of Nations respecting the traffic in opium and other dangerous drugs is now available. It would appear that while the administration of the Dangerous Drugs Acts, 1920 to 1925, seems to have given effect to the principles implied in The Hague and Geneva Conventions, and to have greatly restricted illicit procedures in Great Britain, there is abundant evidence of vigorous illicit commerce elsewhere. *Reports of seizures* have during 1928 been received from the colonies and the Dominions, in particular India and Canada, from the United States, as well as (through the Secretariat of the League) from other countries, notably Egypt and China.

The total amount of morphine and its salts manufactured in Great Britain, by the two Edinburgh firms licensed for the purpose, was 60,021 ounces, a *further* reduction on the previous year. Likewise the amount exported from Great Britain, 40,824 ounces, was greatly less than obtained only a few years ago. Of this exported morphine, 7058 ounces went to Asiatic Countries and 2740 ounces found their way to China, an increase of 1831 ounces over the previous year. The exports of British morphine to Africa, America and Australasia also show an increase over the figures for 1927, while the consignments to European countries showed a considerable decrease. *Of heroin* (diacetyl morphine) 10,704 ounces were manufactured in Great Britain, of which 6038 ounces were exported. It is interesting to note that Indian opium is now almost entirely employed in this country for pharmaceutical purposes to the exclusion of Persian and Turkish opium, which latter were formerly regarded as the more appropriate sources of the alkaloids. It is also to be noted that in addition to the import of raw opium 6017 ounces of crude morphine were imported from India (presumably from the Government factory) and used for the production of the alkaloid or its salts. No less than 64,091 ounces of morphine were last year used for the making of codeine, an alkaloid not at present included within the provisions of the Hague or the Geneva Conventions. A novel departure has been made whereby 4934 ounces of cocaine were manufactured last year for the first time in this country by the one firm (May and Baker, Battersea) licensed for this purpose. The imports of cocaine (9353 ounces) were less by 6000 ounces than in 1927. On the other hand the exports of cocaine salts (3950 ounces) showed an increase on the previous year, such increased exports being chiefly to China and New Zealand. The exports of heroin (diacetylmorphine), generally speaking, show a similar tendency, while in the case of "artificially dried opium" there was a curiously large increase in the consignments to South Africa—viz., a total of 195,000 lb. or an excess over the figures for 1927 of 88,428 lb.

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[1] Greenwald, H. M., and Messeloff, C. R.: Amer. Jour. Med. Sci., June, 1929, p. 767.

From press reports it would appear that in more than one case the diplomatic privilege which secures immunity from search to consignments of goods to embassies and legations has been abused by the inclusion of dangerous drugs. Meanwhile the Permanent Central Opium Board has held its second session at Geneva. The relation of that body to the Advisory Committee on Traffic in Opium remains somewhat indefinite, though close coöperation is naturally deemed to be essential. The Board nominated certain officers for the secretariat and these await the approval of the Council and the Secretary General of the League. After prescribing the forms of statistical returns of import and export of the scheduled drugs the Board adjourned till October.

VARIOLA IN RABBITS.

THE variolous origin of vaccinia is now generally accepted as a fact and anyone familiar with the correct technique has no difficulty in producing a strain of vaccinia by passing the virus of small-pox through an appropriate series of animals. An important difference between small-pox and the disease produced by the virus thus modified consists of the inability of the latter to spread from one individual to another by any means other than actual inoculation of virulent material. So far as we are aware the disease in animals other than man has always shown this absence of infectivity, and if this characteristic can be taken as the distinction between variola and vaccinia an outbreak among laboratory rabbits described by S. Nicolau and L. Kopciowska[1] fully merits the name of variola.

The epizoötic occurred in April of this year among some 50 rabbits in a room where there had been no animal infected with vaccinia since the previous September. Two animals undergoing antirabic immunisation developed simultaneously a peculiar form of acute coryza, with purulent nasal discharge, later becoming sanguineous with the formation of blackish crusts round the nares. Respiration was difficult owing to the nasal obstruction and the animals died on the fifth and eleventh days respectively. Each rabbit showed three or four small papules on a previously shaved area on the flank. Within 40 days symptoms of the illness had appeared in 34 other rabbits housed in cages in the same room, which measured approximately 26 feet by 60 feet. The symptoms varied and out of 23 which died six had acute coryza, two acute coryza and cutaneous papules, eight coryza and conjunctivitis or kerato-conjunctivitis, one of these having orchitis in addition, one kerato-conjunctivitis alone, three orchitis, and three showed no definite symptoms. Of these last three one on dissection was found to have a pustule on the nasal mucous membrane, and several of those with coryza had one or more pustules on the tongue. Orchitis did not occur among the rabbits which recovered, but otherwise their symptoms were similar. Post mortem all the dead animals were found to have a greatly enlarged spleen. Purulent pneumonia was found among those which had shown coryza before death, and the meninges were frequently adherent, a condition typical of cerebral vaccinia. These adhesions were more marked in the rabbits which had shown no definite symptoms while alive, suggesting a special localisation of the virus in the brain in these cases. The skin papules were typical of the lesions of vaccinia. Out of 12 attempts the virus was successfully recovered every time from the tissues of rabbits which died in the epizoötic, nine times from the brain, twice from cutaneous papules or pustules, and once from the testis. This virus proved highly virulent for rabbits, killing with the typical signs of vaccinia in four to six days when introduced into the testis or brain, and on skin inoculation producing a characteristic eruption intermediate between that of neurovaccine and dermovaccine. Cross-immunity experiments demonstrated the variolous or vaccinal nature of the virus. Animals immunised with ordinary vaccine were completely resistant to the virus from the epizoötic both with cutaneous and subdural application. Likewise the animals which recovered were refractory to ordinary vaccine. Moreover, a number of rabbits which had been through the epizoötic without showing symptoms also proved to be immune to ordinary vaccine.

The authors of the paper have nothing definite to suggest as to how the infection arose or was disseminated beyond vague speculations as to the possibility of its having been latent in the dust of the room for seven months and been carried by air and dust. *It is noticeable that no mention is made of* the possibility of its importation and spread by the attendants of the animals. It is suggested that seasonal influences played a part, mainly on the grounds apparently that the outbreak coincided with the "recrudescence of the epidemic of human small-pox observed particularly in England"—a recrudescence which actually consisted of a comparatively small number of imported cases of a virulent type which achieved a disproportionate international prominence.

The interest in the outbreak reported by Nicolau and his colleague seems to lie in the virulence and infectivity of an outbreak among rabbits. Vaccinia among rabbits and other animals is generally regarded as a mild and comparatively innocuous disease which can be relied on to breed true to type—a fact of which advantage is sometimes taken in the preparation of vaccine used for protective purposes.

THE TAVISTOCK CLINIC.

THE problem of functional nervous disorder is becoming increasingly important. It is dealt with to a certain extent in consulting practice, but many thousands of patients with limited means have no one to cater for them. The Tavistock-square Clinic is making heroic efforts to fill a gap many times larger than its utmost capacity. Its work has increased by 30 per cent. in two and a half years, and the activities of the Children's Department by no less than 57 per cent. in one year. Its services are in ever-increasing demand among hospitals, police-courts, and private patients who cannot afford a consultant. The Clinic has now, however, reached saturation point. Its work is carried on by 25 regular physicians, and in only seven consulting rooms, and every part of the building is utilised to the utmost. The result is that the waiting list has twice had to be closed in the last 18 months. These limitations have produced what Dr. H. Crichton Miller calls "very active compensatory phantasies of extension." The phantasies, however, are of a constructive kind, and are embodied in a well-developed scheme. Mental hygiene, as he points out, can no longer be considered as the fad of a handful of men and women. In all countries where it has been systematically practised it has proved as necessary and valuable to the health of the community as the work of stamping out tuberculosis, cancer, or infantile mortality. The extension scheme has been worked out in such a way that it can be realised step by step as the necessary funds are subscribed. The first need is for an institution where treatment, teaching, and research can be conducted on a scale more approaching the needs of the country. The building will cost £80,000, and its endowment another £100,000. Observation homes for mal-adjusted children will cost £20,000. The most urgent necessity, however, and one which is hampering the work of the Clinic at the moment, is for a hostel for patients who cannot afford nursing homes, and are not well enough to stay in cheap lodgings and hotels. The hostel proposed will house 20 patients, and will cost £13,000; when once established, it will be almost self-supporting. It may be noted that the appointment of a Deputy Director of the Clinic, Dr. J. D. Rees, at the beginning of the year, which was made possible by an anonymous donation, has resulted in an immediate improvement in the coördination of the staff. New activities have been initiated in every branch of the work, and especially a system of record-keeping which will facilitate treatment, administration, and research. The Clinic is, therefore, prepared for further expansion, and it remains for those who appreciate its importance to give it the financial assistance which it is well-adapted to transmute into mental efficiency and happiness.

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[1] Comp. rend. de la Soc. de Biol., 1929, ci., 551–555.

DENGUE IN ATHENS.

THE clinical aspects of the Athens epidemic of dengue[1] were minutely studied, but no account of them has hitherto been available. We therefore welcome a recent report[2] by physicians who had immediate access to over 1000 cases. In October, 1927, the disease suddenly made its appearance in the city, but the outbreak was a small one and was extinguished in November. In mid-June of 1928 a few sporadic cases were noted, and the infection spread so quickly that towards the end of September quite nine-tenths of the population were attacked. In the Piraeus, which has direct communication with Athens, dengue was disseminated more rapidly than elsewhere. The election of August 19th and the constant interchange of population between capital and provinces which this entailed during the summer season all contributed towards its propagation.

Amongst the prodromata of dengue slight headache and otherwise inexplicable fatigue are noted. In the invasion period the muscles of the eye are implicated, the patient suffering especially on lateral movement. The joints are generally painful. The fever rises gradually, sometimes with a rigor; a temperature of 104° or 105° F. may be recorded. In the invasion period the pulse-temperature ratio is normal. Pains in the body become intense, so that every movement is accompanied by great difficulty. In the Athens epidemic the gastric phenomena were remarkable. Nausea usually accompanied the primary rise of fever, but the straining at vomit was so intense as often to rupture small arterioles in the palate, pharynx, or tonsils, with effusion of blood into the vomit. The primary eruption was characterised by hyperæmia of the face and neck, and suffusion of the conjunctiva. This reddening was sometimes so slight that it escaped detection and in 10 per cent. of the cases no primary eruption was noted. The febrile illness was occasionally over within four or five days, and though in certain cases fever lasted as long as 23 days, in 85 per cent. it ended within six days by a typical crisis lasting 3–6 hours. Intense headache usually persisted for some 80 hours after the fall of temperature. As a rule there was a fall of temperature on the third day, accompanied by a sense of well-being, and this lull might last for 30 hours; afterwards, however, the temperature soon began to rise until it had reached its former maximum. The second crisis may take place on the fourth, fifth, seventh, or even the ninth day; or the fever may end by lysis. After the first drop of temperature bradycardia becomes noticeable, and these observers say they have often recorded a pulse of 70 with a temperature of 104° F. Not only is there a great slowing of the pulse, but also a fall in pulse tension. A secondary eruption was a pretty constant feature, usually appearing on the second or third day after the decline of fever. It might be roseolar, morbilliform, scarlatiniform, or even petechial. The exanthem itself lasted 12–30 hours and in disappearing was accompanied by furfuraceous desquamation. Examination of the blood revealed a constant leucopenia; a count of 3000 leucocytes was common and occasionally it was only 1500. The mononuclear element was increased to 30–50 per cent. of the total. Convalescence was marked by debility, emaciation, loss of appetite and taste, and relapses were rare (5 per cent.). In a relapse the exanthematous eruption, pain and bradycardia are all repeated. Usually an attack of dengue provides an absolute immunity, but very rarely it may be repeated two or even three times, as was especially noted in the case of refugees from Asia Minor.

Unfortunately the Athens epidemic has added little to our knowledge of treatment. The authors of this report are convinced that neither the salicylates nor urotropine, whether given by the mouth or intravenously, have any decided specific effect. In their protocols they record seven deaths, of which the direct cause is attributed to dengue, but post-mortem examination was not obtained.

THE NEW PHARMACOLOGICAL LABORATORIES IN MANCHESTER.

ON Wednesday of last week, Mr. F. H. Carr, late President of the Society of Chemical Industry, opened the new laboratories which Messrs. Benger's Food, Ltd., have presented to the Medical School of Manchester University. The new laboratories are for the study of pharmacology, pharmaceutical chemistry, and biochemistry in its relation to pharmacology. They consist of a room suitably equipped for experimentation on animals and man, with a preparation room attached, a biochemical laboratory, a pharmaceutical laboratory with separate balance and furnace rooms, a demonstration theatre to accommodate some 50 students, private laboratories for the head of the department and a lecturer, and a room to be used as a library and secretary's room. There are three small rooms near by in which animals can be housed under ideal conditions. This extension has been rendered possible, firstly through the removal of the department of pathology to York-place, where it is in more immediate contact with clinical work and the related departments of bacteriology and public health, and secondly through the generous donation of £2000 in memory of Frederick Baden Benger. This was the Benger who coöperated with Sir William Roberts in the eighties of last century in the production of an efficient pancreatic extract. Roberts described it in his Lumleian lectures as "an almost faultless pharmaceutical preparation with high diastatic and proteolytic properties of the gland in a highly concentrated degree." Other digestive products were subsequently put on the market to meet Roberts's wishes. The study of pharmaceutical chemistry in Manchester goes back a good many years, the first systematic course having been given in 1824 by John Dalton, F.R.S., then president of the Literary and Philosophical Society. The lectures, about 15 in the course, were given in the evenings at seven o'clock, and Dalton, after explaining the first principles of chemistry, proceeded to apply them to investigations respecting the materia medica, and to other medical purposes. The items on his printed syllabus were these: Heat or Caloric, Constitution of Bodies, Chemical Syntheses and Analyses, Simple or Elementary Gases, Elementary Solids, Compound Bodies, Alkalies, Acids, &c., Earths, Sulphurets, Metals, Vegetable Kingdom, and Animal Kingdom. Dalton received fees totalling £27 8s. 9*d*., from which he had to deduct his expenses which amounted to £10 10s. It seems that he maintained his connexion with the medical school for at least six sessions, and that towards the end he had three separate classes, each attended by eight or nine students. The pharmacological department at Manchester owes its present efficient condition to the influence, material support, and devotion of the late Prof. D. J. Leech, who organised and fully equipped it for its needs in 1884, and in whose memory a departmental library was built up. He endowed the Leech chair of materia medica and therapeutics which he held himself for some years, and in which he was succeeded by Prof. R. B. Wild, who retired in 1927. Since then the chair has not been filled but a readership is held by Dr. A. D. Macdonald. It is hoped that the present scheme will provide a modest beginning out of which may grow a school of pharmacology and pharmaceutical chemistry, comparable in its influence to the other schools of the University.

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[1] Clinical Study of the Dengue Epidemic in Athens during the Summer of 1928. By Apostolides, Ch., Chaniotis, N., Hadjissarantos, D., and Frankiadakis, G. Paris Méd., May 11th, 1929.

[2] See THE LANCET, 1928, ii., 454.

DAMPNESS IN HOUSES.

THAT damp is a potent source of illness is a traditional belief in support of which more and more evidence is slowly accumulating. The proof is all the more difficult in view of the fact that the influence of damp, or more correctly of cold damp air, can be neutralised by adequate clothing, by exercise and to a limited extent by diet. Careful investigation into the housing conditions of children suffering from acute rheumatism led Dr. R. A. Miller to the conclusions that nearly two-thirds of those children lived in damp rooms. Largely at his instance the Science Committee of the British Medical Association asked the Royal Institute of British Architects for assistance in investigating the reasons for dampness in houses, with a view to a plan of action for its prevention. The Institute, having addressed a questionaire to medical officers of health throughout the country, have now considered the replies and published the result.[1] In new houses, that is, houses less than ten years old, porosity or faulty construction of the walls has been found to be the principal cause of dampness; rain beating against a wall with a strong wind blowing or capillary action causes the penetration of moisture to the interior. Attempts to make walls impermeable by cement coverings often fail owing to the development of shrinkage cracks; the true remedy is a cavity wall. There has been a post-war tendency to cut down the overhang of the eaves, a potent device for keeping external walls dry. A curious fact elicited by the inquiry is the absence of damp-courses in new dwellings and defects in those provided, conditions which call for the stricter supervision of the process of building and the prohibition of the use of ineffectual damp-course materials; these might well be subject to standard specification. Dampness arises in a number of cases from failure to cover the whole of the surface of the ground within the building with concrete; if damp is present, as from rise in the level of the subsoil water, a layer of hard broken material must be interposed between the concrete and the soil in order to obtain a completely dry floor. In older buildings the chief causes of dampness are the absence of a damp-course and inadequate maintenance, especially of roofs and rain-water gutters. Sufficient care is not taken to secure a thoroughly waterproof roof; often the pitch is unsuitable; pantiles or interlocking tiles of unsatisfactory manufacture have been used or flat tiles and slates with perishable nails or inadequate overlap. Roofing tiles could, with advantage, be standardised. Another source of damp is defective cement fillets used to fill up intervals between roofs and walls; cracks often develop in these fillets owing to the shrinkage of the mortar or the roof timbers. Walls cannot be protected by bedding tiles in mortar; capillarity comes into action. Condensation on internal walls is of some import in older houses; the construction of the house must allow of the wall being rapidly heated up. Certain amendments to public health legislation are necessary, it seems, to provide a complete safeguard so far as resistance to the penetration of damp into buildings is concerned; the building by-laws as they now stand do not suffice. It is noteworthy that this valuable report, issued after much labour and research and of far more importance than its length would indicate, has been rendered possible by the coöperation of clinical physicians, medical officers of health, and of architects.

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[1] Report on Damp Houses. Prepared by a Subcommittee of the Science Standing Committee. London: Royal Institute of British Architects, 9, Conduit-street, W.1. March, 1929. 6*d*.

THEFTS FROM DOCTORS' CARS.

AN industrious member of Parliament has been drawing the Home Secretary's attention to the thefts of drugs from medical practitioners' motor-cars. Supplementary questions invited Mr. Clynes to suggest to "the medical fraternity" that, if these losses continue, "some method will have to be adopted of enforcing penalties"; was he not aware that criminal negligence on the part of miners and railwaymen was invariably punished with imprisonment? The Home Secretary replied with perfect propriety that such thefts had occurred, that the [illegible] regarded them as unconnected with the drug traffic, and that it was desirable that the medical profession should do its utmost to minimise the danger. Yielding to the torrent of "supplementaries," he added that, if this publicity were not sufficient warning, "further steps might be taken." To the member of Parliament who put the questions the remedy is simple—a one-clause Bill for the more frequent imprisonment of doctors for criminal negligence. Be it therefore enacted that on and after the first of April any person whose goods are stolen shall, if he be a registered medical practitioner, be guilty of felony, and sentenced to penal servitude. The law already forbids cars to be locked when left at parking-places. An amendment to compel the equipment of medical motor-cars with barbed wire and machine-guns would rightly be ruled out as too militaristic for this peaceful age. Marked economies in police administration will follow by adopting the convenient principle of arresting the owner, rather than the thief or receiver, of goods that have been stolen. One point remains, which can easily be settled on the committee stage of the Bill. Will it be an aggravation of the crime—or will it, on the other hand, be a good defence—if, as sometimes happens, not only the contents of the doctor's car are stolen, but the whole car, contents and all?

SULPHUR AND SALICYLATES IN ACUTE RHEUMATISM.

EXCEPT at spas, the therapeutic use of sulphur has not received very much attention in this country, but in France and elsewhere on the continent this element is employed in colloidal form with increasing frequency. Thus two French workers[1] have lately described its successful use in a case of severe cardiac rheumatism which had proved completely resistant to salicylates. The patient was a woman of 24 who had suffered twice previously from acute articular rheumatism without any cardiac involvement. Her third attack began with a sore-throat followed by acutely painful swelling of the joints, and despite the administration of about 90 grains of sodium salicylate daily by the mouth she had developed signs of gross cardiac failure within ten weeks. Intravenous injections of sodium salicylate in glucose had little effect upon this condition, but some amelioration of symptoms was obtained by substituting intravenous injections of colloidal sulphur, the dose being gradually worked up from 0·25 to 2 c.cm. daily. The patient's condition became worse again, so sodium salicylate was recommenced, this time in conjunction with the sulphur. From this moment improvement set in and slowly but surely the patient recovered, so that she was able to return to work nearly eight months after the beginning of her illness. The case is also recorded of a boy of 17, who developed a severe pericarditis in the course of his first attack of acute articular rheumatism. Here again the malady was very resistant to medication by salicylates, but the addition of colloidal sulphur intravenously quickly brought about a cessation of the acute rheumatic manifestations. Leoper and Vahram, who experimented with sulphur in acute articular rheumatism in 1915, are quoted as giving guarded opinions about its employment when cardiac complications are present; they uttered a special warning against injecting sulphur into the veins in the course of a bout of acute endocarditis. Marchal and Thiolat, however, believe that with care there is no danger in its use; it does not even cause the sclerosis of veins which may lead to difficulty when intravenous salicylate is given repeatedly. The exact action of the sulphur is still, of course, in dispute. It has been held that it has a purely local action in the neighbourhood of joints where there is a veritable shortage of sulphur, but its apparent success in cardiac rheumatism, when employed with salicylates, suggests that this hypothesis is not a complete explanation. Marchal and his collaborator hold that it is upon the infective process that sulphur exerts its influence, probably by producing some metabolic change. They say that the action of mercury and of bismuth may be accentuated and that large doses may be given without danger if sulphur is employed at the same time, and they think it possible that sulphur plays the part of a catalyst in promoting the action of salicylates on rheumatism.

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[1] Marchal, G., and Thiolat, P., Monde Méd., June 15th, p. 681.

MEDICO-LEGAL PROBLEMS.

Lord Riddell, the newly elected President of the Medico-Legal Society, has usefully brought together in one volume[1] his papers read before that body in recent years on such topics as the legal responsibility of the surgeon, the ethical, legal, and medical aspects of abortion, the law and ethics of medical confidences, and the question of sterilising the unfit. The standpoint is that of an observer, himself well acquainted with the medical as well as the legal view, who sees new problems created by developments in surgery and other sciences and by the quickened popular interest in racial and social concerns. Prof. Gilbert Murray lately remarked, in an address to the Hellenic Society, upon the shaking of the intimate beliefs, philosophies, and standards of modern man, the rejection of Christianity by Russia and of Islam by Turkey, the collapse of Victorian ethics and cosmology, and the developments in physical science and psychology. "Impulses hitherto deemed unspeakably obscene or malignant have not only been recognised as part of the human make-up but have received a quite disproportionate welcome from the public." There is all the more need of a calm statement of modern professional practice and its legal aspects in such matters as the "Medico-Legal Problems" with which Lord Riddell deals. If the law requires to be changed to keep pace with present conditions, the public must be educated. Lunacy and mental deficiency, says Lord Riddell, are unpleasant subjects which most people are loth to face or discuss; his chapter on sterilisation focuses attention on the results of shirking a well-considered policy; the central and local authorities concentrate, he says, upon individual treatment without due regard to the interests of the community. Abortion, hitherto a matter for masculine ecclesiastics, lawyers, and doctors, he regards as mainly a question for women, though he deprecates the view of some German writers that every woman, by virtue of her right over her own body, is entitled to decide whether the fœtus shall become an independent human being. Of sterilisation as a means of birth control he expresses no ethical estimate, but desires to see the subject "ventilated and not left exclusively in the hands of the high priests of obstetrics and gynæcology and their prompting and consenting patients." Mr. Justice McCardie has lately been saying at Birmingham Assizes that the public must face the question of sterilisation: it is terrible, he says, that we cannot prevent a woman bringing eight or ten children into the world cursed with the taint of mental deficiency. If people are to face these questions, a well-equipped observer can perform a great public service by setting forth the facts and tendencies clearly and impartially. In this task Lord Riddell has achieved an unquestionable success.

TRAINING IN HOSPITAL DIETETICS.

About five years ago the managers of the Royal Infirmary of Edinburgh equipped and staffed a special department for dietetic work. At first the work was confined to out-patients, but later assistance was sought for patients in hospital, mainly in surgical wards and special departments. More recently two small wards of six beds each have been opened in connexion with the new clinical laboratory, in order that controlled metabolic observations may be possible. The dietetic staff closely coöperate in these investigations. For the past two years special instruction and experience in dietetics has been offered to nurses who have finished their general training. In addition a six months' course for pupil dietitians has now been instituted. Candidates for this require to have had a preliminary training of two or three years in domestic economy and the chemistry of foods in order to benefit from the course. Instruction is given in dietetic work of all kinds, including the calculation and construction of dietaries for all types of metabolic disease and for research purposes. Experience in the preparation of foods is also available. The course is thoroughly practical and those who have taken it have readily found opportunity of making use of their special knowledge.

THE SHORTAGE OF WATER.

A memorandum issued by the Ministry of Health to water authorities calls attention to the shortage arising from the abnormally low rainfall and discusses the provision of supplementary supplies from neighbouring authorities where there is a local shortage. If existing supplies cannot readily be supplemented, all reasonable measures should be taken early, even at some inconvenience to the consumer, to conserve them. The need for drastic economy and for the detection and prevention of remediable waste is urged. Intermittence of domestic supply is not recommended except in cases of actual necessity. There is always some risk of contamination where pipes are not fully watertight or for other reasons the influx of impure water is possible. In any sustained dry period the risk of pollution is enhanced, and must be kept under close observation. Wherever the purity of the water is threatened, special means of purification should be undertaken. The readiest of these is chlorination, which should be employed only under expert supervision. Properly chlorinated, water which ordinarily could not be used without some danger to health may be safely put into service, and some water authorities may have to resort to such supplies in order to meet the present emergency. Where general measures of purification are not practicable, if any serious danger of pollution is ascertained, the individual householders should be impressed with the need for boiling the water used by them.

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[1] Medico-Legal Problems. London: H. K. Lewis and Co. 1929. Pp. 100. 5s.

Where expense has to be incurred by a local authority in relieving water shortage in their district County Councils and Rural District Councils are empowered, under sections of the Local Government Act, 1929, to contribute to the expenditure.

THE B.M.A. MEETING.

THE ninety-seventh annual meeting of the British Medical Association opens at Manchester to-day (Friday) with the first session of the Representative Body, which again meets under the chairmanship of Dr. C. O. Hawthorne. A strenuous four days' work is anticipated by the representatives, and the agenda contains subjects lending themselves to almost unlimited discussion, including a national maternity service, a specialist refraction service, the relation of the general practitioner to hospitals and the public health service, and such topical matters as the licensing of motor drivers before their accidents and the care of their injuries afterwards. At the annual general meeting, on Tuesday next, the new President, Prof. A. H. Burgess of Manchester, will be invested with the badge of office and the President-elect for 1930, Prof. Harvey Smith of Winnipeg, will be introduced to the meeting. The scientific sessions begin their deliberations, as usual, on the Wednesday morning. A popular lecture on Frogs and Men will be given by Prof. A. V. Hill, F.R.S., on Friday, the 26th, and the following day will be taken up by an excursion to Colwyn Bay. The annual exhibition will be on view from Monday afternoon until Friday.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which was completed with the issue of June 29th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

DONATIONS AND BEQUESTS.—Dr. H. T. George, of Hampstead and Cardiff, left £1000 to St. Bartholomew's Hospital and £100 to St. Dunstan's Hostel for the Blind.—Mr. Edwin Brough, of Hastings, left £1000 to the East Sussex Hospital.

THE OSLER CLUB.—A meeting of the Osler Club was held in the evening of July 12th to celebrate the eightieth anniversary of Sir William Osler's birthday. Sir Archibald Garrod delivered the Oslerian Oration which marks these annual occasions; his subject was the Power of Personality, as exemplified in the teaching and practice of medicine by Osler. A discussion followed, which was opened by Dr. A. G. Gibson, and joined in by Dr. G. Feine, Prof. F. R. Fraser, and others. A selection of Osler's writings on Medical Education was displayed, and many messages were read which had been received from friends and corresponding members of the Club abroad. Among those present were Sir D'Arcy Power, Sir William Hale-White, Sir F. G. Kenyon, Dr. Andrew Balfour, Mr. Hugh Cairns, Mr. Philip Franklin, Dr. Marshall Fulton, Mr. R. H. Hill, Dr. Gerald Horner, Mr. Muirhead Little, Dr. J. D. Rolleston, and Mr. Paterson Ross.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCV.—THE TREATMENT OF STERILITY IN WOMEN.

PART I.—GENERAL CONSIDERATIONS.[1]

THE questions of sterility on the one hand and that of over-fecundity on the other seriously affect the lives of women of all classes. The doctor is consulted with almost equal insistency on the problems of how to acquire the wished-for child, at almost any cost, and of how to avoid acquiring another child for a time at least.

Diagnosis of the Cause of Sterility.

In dealing with sterility, every effort must be made to diagnose with exactitude the underlying cause or causes before any treatment is initiated. Cases of "functional" sterility become fewer as methods of diagnosis improve. Treatment of a woman should not be started, even when an obvious lesion exists, without proof that her partner is normal. Until comparatively recently the question of male sterility was not seriously considered. It is still usually the woman who seeks advice, though I notice a growing tendency among my patients to come with a history that their husband has been examined and found normal. It is, generally speaking, easier to deal with the male side of sterility in private practice than among hospital patients. Clinical facilities for the necessary examinations and tests are not great in hospital, and under the conditions that do exist the patient has diffidence in voicing his requirements.

Examination of the husband may be direct or indirect. Direct examination involves, as well as history-taking and examination for any physical disability which might interfere with fruitful intercourse, the microscopic examination of the semen for active spermatozoa. Indirect knowledge of the husband's condition with complete knowledge of the wife's reception can be obtained in positive cases by microscopic examination of specimens from the cervix uteri taken within two to three hours of normal coitus. If active spermatozoa are found, the search for the cause or causes of sterility are much narrowed down. If impotence exists in the presence of living spermatozoa, artificial insemination can be tried (see below), but should not be undertaken until the woman has been examined and treated for any lesion which might prevent a successful issue.

Investigation of the History.

At a woman patient's first visit, attention should be paid to her general appearance, and guidance as to treatment may be gained from a careful history, the main points being—age; general health, past and present; duration of married life; whether the sterility is primary or secondary (if secondary, details of previous confinements should be given); menstrual history, as regards age of onset, periodicity, and flow; presence of any abdominal pain or vaginal discharge, or of dyspareunia. The incidence of coitus, its frequency and the position taken should be ascertained; also details of any contraceptive measures used in the past. The family history may also be of interest. The reason for obtaining information on most of these points is obvious. Regarding the menses, although we know that pregnancy can and does occur without them, a poor menstrual history is often associated with poor development of the pelvic organs and, especially if the patient is comparatively young, good results can be obtained with treatment directed towards stimulating development. With regard to dyspareunia, often associated with incomplete coitus, as a cause of sterility, it is surprising how long patients continue to suffer without seeking advice. Material help can be given in some cases regarding the best time for fruitful intercourse, which, in my experience, is the first week after the period. R. Kurzrok recorded two cases recently where Jewish women, misinterpreting the old Talmudic Law, waited consistently for a full fortnight after each period before intercourse took place. When, according to advice, intercourse took place within a week of the onset of flow, both women conceived readily.

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[1] Part II., on Local Measures, will appear next week.

It is also important that the wife should be in a positive phase of sexual excitability. Although it is very doubtful whether the cervix actually gapes during orgasm, there can be no doubt that receptivity is increased when the emotion of both parties reaches its height simultaneously.

The use of contraceptives has frequently been cited as a cause of sterility. In view of the very powerful drugs we use in the treatment of cervicitis and infections of the lower part of the genital tract, and falling statistics, my view is that such contraceptives as quinine pessaries can hardly be so seriously culpable. Any device introduced and left in the uterine cavity, such as the gold wish-bone pessary, or caps which fit tightly on to the cervix and hold up the normal secretions are almost certain to produce inflammatory changes and are much to be deprecated.

Position during and after Coitus.

Conception takes place more readily when the cervix is directly inseminated. In its normal position in the posterior fornix this is best obtained by the "normal" position for coitus—the wife lies on her back with the knees flexed and separated. Free access is obtained, energy is in no way restricted, and there is the further advantage that the semen can be retained in the vagina. In patients with lax vagina and mobile uterus there is a tendency for the uterus to fall into the retroflexed position when the thighs and knees are flexed. Such patients after intromission should straighten and adduct the legs. More important than the position during coitus, when the cervix is not well placed, is position after coitus. Semen can be retained in the vagina by contraction of the sphincters and a change into the semi-prone position. Muscular movement can then further aid insemination of the cervix. It is in these cases that a saline or mildly alkaline douche before coitus may further help by retaining the vitality of the spermatozoa, which is soon destroyed in the natural acid medium of the vagina.

Methods of Examination.

This involves a survey of the patient's general development, the condition of her thyroid, her pulse, and so forth, and a detailed local and bimanual examination. Added to these are the methods introduced in the last few years of per uterine insufflation and injection of the Fallopian tubes—methods which have revolutionised our views on cases of sterility. Before these methods of diagnosis were available, the presence of tubal lesions could be determined only by bimanual palpation or suspected from the history associated with minor degrees of pelvic peritonitis. Now conditions of blockage are found when little suspected and their site defined with a view to treatment. In certain cases the method of diagnosis alone has worked a cure.

Uterine Insufflation.—It was in 1920 that Rubin read his first paper on insufflation and not long afterwards S. Forsdike and others were successful in obtaining good results from the injection into the uterus and tubes of a solution opaque to X rays. Now both methods are greatly improved and widely practised. Neither can be used in inflammatory conditions of the tract, when uterine hæmorrhage exists, on account of the risk of air-embolism, or in patients with cardiac or other serious lesions. The insufflation method can be practised without anæsthesia and is indeed only complete under these conditions, because the patient's sensations are of value in diagnosis, localised pain being felt at the site of blockage. The apparatus consists in a cannula that enters the uterus, fitted with an "acorn," which pushes firmly into the external os. Air or gas is driven through the uterus and tubes at a known pressure. Leakage can only be prevented by firm pressure of the acorn into the os, firm traction of the cervix downwards on to the acorn or clamping the cervix on to the cannula. Many patients do not bear this procedure well. If we use anæsthesia for insufflation, it is possible to say only whether the tubes are patent or impermeable. For the anæsthetised patient dilatation is performed and a cannula that fits tightly into the cervix is used.

Injection.—Lipiodol is the fluid of choice for the injection method. Since its presence in the pouch of Douglas has been found by experience to be innocuous, the only disadvantage of this method is the obvious one that X ray apparatus must be available for its practice. In other respects it is essentially more satisfactory than insufflation, the apparatus being simple (a 10 c.cm. serum syringe attached to a cannula with acorn, as described above), leakage obvious, and the results to be seen, rather than to be interpreted. Injection can be done equally successfully with or without anæsthesia according to the requirements of the patient, and a permanent record can be kept of the results obtained.

FRANCES M. HUXLEY, M.D., Ch.B. Manch.,
Surgeon to the South London Hospital for Women.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. B. P. Pick to *Egmont*, for Malta Hospital.

Surg. Comdrs. L. W. Gemmell to *Ganges*, for R.N. Sick Quarters, Shotley; G. H. Hayes to *Pembroke*, for R.N. Hospl. Gt. Yarmouth; J. F. Hayes to *President*, for Recruiting Headquarters; R. F. Quinton to *Defiance*; H. H. Ormsby to *Vernon*; and J. H. McDowall to *Pegasus*.

Surg. Lt.-Comdr. A. W. McRorie to *Medway* and (on commg.).

Surg. Lt. J. K. G. Way to *Ark Royal*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D.) C. T. Pomeroy to *Vivid*, for R.N. Barracks, Devonport.

ROYAL ARMY MEDICAL CORPS.

Capts. P. A. Stewart (prov.) and W. C. Mackinnon to be Majs.

ARMY MEDICAL RESERVE OF OFFICERS.

2nd Lt. R. H. Bland, from Gen. List, Inf., to be Lt.

TERRITORIAL ARMY.

Col. J. S. Riddell (late R.A.M.C., T.F., retd.) to be Hon. Col. R.A.M.C. units, 51st (Highland) Div., T.A.

Capt. R. J. W. A. Cushing to be Maj.

C. R. Greene to be Lt.

Supernumerary for service with O.T.C.: Lt. H. S. Allen to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. H. G. L. Haynes from Active List, to be Lt.-Col.

Maj. C. Webb-Johnson having attained the age limit relinquishes his commn. and retains his rank.

Lt. A. S. Gough, from Active List (Supern. for serv. with Med. Unit, Univ. of Lond. Contgt., Sen. Div., O.T.C.), to be Lt.

ROYAL AIR FORCE.

AUXILIARY AIR FORCE.

Flying Officer J. S. Jerome, N. 605 (Co. of Warwick) (Bomber) Squadron, to be Flight Lt.

INDIAN MEDICAL SERVICE.

Temp. Capt. Mangharam Rochiram Lalvani relinquishes his temp. commn. and retains his rank.

The undermentioned relinquish their prob. appts.: Lts. W. Walsh and G. J. O'Connor.

Special Articles.

FOURTH IMPERIAL SOCIAL HYGIENE CONGRESS.

THIS Congress, which was organised by the British Social Hygiene Council, was formally opened on July 8th, at Livingstone Hall, Broadway, S.W. 1, by Lord Linlithgow, assisted by Mr. Wedgwood Benn, Secretary of State for India, Mr. A. A. W. H. Ponsonby, for the Dominions Office, the Hon. Sir. Atul Chatterjee, High Commissioner for India, Dr. C. L. Park, representing the High Commissioner for Australia, and Dr. Bernard Myers, representing the High Commissioner for New Zealand.

The League of Red Cross Societies was represented by Dr. C. Lillingston, the Admiralty by Surgeon-Commander Rivaz, and Surgeon-Captain T. B. Shaw, the Air Ministry by Squadron-Leader H. S. C. Starkey, the Board of Education by Dr. R. H. Crowley, the Colonial Office by Dr. D. H. Owen, the Ministry of Health by Col. L. W. Harrison, the War Office by Major C. F. White, the Department of Health for Scotland by Dr. T. F. Dewar, the Welsh Board of Health by Dr. T. W. Wade, the Government of Northern Ireland by Dr. N. C. Patrick. Australia, Canada, India (31 delegates), New Zealand, S. Africa, Barbados, British Guiana, British Honduras, Ceylon, Cyprus, Fiji, the Gold Coast, Malta, Mauritius, Northern Rhodesia, Seychelles, Southern Rhodesia, Straits Settlements, Tanganyika, Uganda and Zanzibar, were all represented. Mr. N. W. Edson represented the American Social Hygiene Association. Among the home organisations represented were, the British Medical Association (Dr. H. Guy Dain and Mr. N. Bishop Harman), and the Central Council for Health Education (Prof. A. Bostock-Hill and Dr. J. Robert Kaye). Many Universities and towns had sent their own representatives.

Reviewing the work of the League of Nations and of the Advisory committee in relation to prostitution, on July 8th, Dame **RACHEL CROWDY**, Chief of the Social Questions Section of the League of Nations, gave an account of the international situation with regard to the venereal diseases. Her conclusion was, the advocates of attacking the problem of prostitution from the old angle of control and regulation were losing ground every day. Certain countries are introducing, through compulsory treatment, a new kind of regulation, while other countries are ensuring the complete freedom of treatment. It was for the public to choose between the two. The work of the League of Nations in connection with venereal disease was described by Sir George Buchanan and Col. L. W. Harrison, and the work of the International Labour Office in social hygiene by Mr. H. B. Butler.

Venereal Disease in the Navy.

At the afternoon session, Mr. E. B. **TURNER** in the chair, Surgeon-Commander P. M. **RIVAZ** described the preventive measures taken against venereal disease in the Navy. He pointed out that, during recent years, there has been a considerable decline in the incidence of all forms of venereal disease, the North American, West Indian and African Stations being exceptions. He added that, as a rule, the further a sailor get from home, the more he is liable to contract venereal disease. Most countries visited by the British Navy have licensed brothels under medical supervision which is apt to be carried out in a perfunctory manner. There is very little disease contracted in Malta itself, in contradistinction to the relatively high rate of many other Mediterranean ports. With regard to control, he described the strictly confidential venereal case sheet which follows a man from ship to ship. On it full details as to progress and recommendations as to further treatment are noted. This enables medical officers to ensure that the syphilitic patient, who is half way through his course does nor get overlooked and that the man with a chronic discharge is properly supervised. Men suffering from venereal disease can only be drafted to ships carrying a medical officer. He had been asked to produce some statistics bearing on the efficiency of prophylactic treatment in the Navy, but, though he did offer some figures, he was inclined to regard them as of very doubful value. However, he believed them to show that early disinfection is of value. One of the chief causes of the decline of venereal disease in the Navy was, in his opinion, the lowered alcohol consumption. He had ascertained that, at one large shore establishment, only 28 per cent. of the men drew their rum ration—an indication of the temperance and sobriety of the present-day blue-jacket.

Squadron-Leader H. S. C. **STARKEY**, representing the Air Ministry, made a brief statement with regard to venereal disease in the Air Force, and Admiral Sir **REGINALD TUPPER** gave a comprehensive survey of what has been and is being done for the British Merchant Service at home and abroad. Among those who took part in the subsequent discussion was Fleet-Surgeon W. E. **HOME**, whose remarks clearly showed how much there still remains to be done for the merchant seamen.

Administrative Control in Scotland.

On July 9th, Prof. A. Bostock-Hill in the chair, Dr. T. F. **DEWAR**, Medical Officer of the Scottish Board of Health, read a paper on the administrative control of the venereal diseases in Scotland. He said that, even to-day, only a relatively small proportion of the cases of venereal disease, whether syphilis or gonorrhœa, receive early, efficient and adequate, or sufficiently prolonged treatment. He was inclined to throw some of the blame for this state of affairs on the medical profession, and to overcome this evil, he said "there seems no measure except to secure that every medical graduate shall have had adequate training in the diagnosis and treatment of the venereal diseases." He gave the following statistics for the years ended May, 1922, and May, 1928, respectively:

In 1921–22 the total number of patients attending the various clinics in Scotland was 22,898. The number of new patients was 12,542, and the total number of attendances was 262,643. In 1927-28, the corresponding figures were 27,259—16,032—and 442,807, respectively.

Dr. **DEWAR** also said that there is a general opinion that the incidence of syphilis, as revealed by the attendance of cases alike in early and late stages, has steadily tended to fall from the years 1918 or 1920 to about 1926. Since then it is believed that, for some unknown reason, there has been an increase in the prevalence of this disease. Ophthalmia neonatorum has been so vigorously dealt with in Scotland that, in the last seven years, only ten children have lost all useful vision from this cause. Taking part in the subsequent discussion, Dr. **DEWAR** assured his listeners that, were Scotland to be given facilities for compulsory measures, those who had to carry them out would take very good care that they were not abused.

The diagnosis and treatment of venereal disease in Wales was the subject of a paper by Dr. T. W. **WADE**, Medical Officer of the Welsh Board of Health, and the problem of venereal disease in Australia was dealt with by Dr. C. L. **PARK**, Chief Medical Officer, Australia House. A summary of the venereal disease problem had also been prepared by the Australian Association for fighting venereal disease.

Disinfectant Packets.

In the course of the discussion some interesting figures were quoted by Mrs. C. **NEVILLE ROLFE** in connexion with the suggestion that the disinfectant packets served out to men in the Army and Navy are of a certain value in preventing venereal disease. These figures, which were compiled by Dr. Querat, and published in *Bulletin de la Société Française de Prophylaxie Sanitaire et Morale* for July, 1927, were quoted by Mrs. Rolfe "for what they were worth." The French

Army authorities started a mass experiment in 1921, the men of five Army Corps being provided with prophylactic packets, while the men of five other Army Corps were not thus equipped, the conditions being, otherwise, approximately similar. In the Army Corps provided with packets, the incidence of gonorrhœa was reduced from 10·92 per thousand to 7·51—a reduction of 3·41. But, in the case of the Army Corps not thus equipped, the incidence of gonorrhœa per thousand was reduced from 18·70 to 10·30—a reduction of 8·40. A similar difference in favour of the men not provided with packets was observed in the case of syphilis.

Venereal Disease in British Guiana.

During the afternoon Session, Mr. L. S. AMERY, M.P. in the Chair, a paper was read by Dr. B. N. V. BAILEY on venereal disease in British Guiana. As a result of his experience in this country, he was averse from compulsory measures. Of the 13,000 in-patients treated in the Georgetown Hospital during 1927, 915 were reported as suffering from one or other of the venereal diseases, while, of 27,000 out-patients, over 2,000 were so diagnosed, or approximately 8 per cent. of the total number of cases treated. Of the in-patients at the Georgetown Hospital in 1927, as many as 760 suffered from syphilis and only 42 from gonorrhœa. He commented on the remarkable infrequency of organic nervous disease due to syphilis, and he suggested that, in a country where malaria is so profoundly endemic, this disease might have some influence on the development of syphilis of the central nervous system.

Dr. R. E. HOPTON gave an account of the organisation of the anti-venereal disease campaign in Cyprus. He was sent there in 1927 as a venereal disease specialist, and now has the assistance of a fully qualified English bacteriologist.

False Names and Addresses.

During the morning session on July 10th, Mr. SOMERVILLE HASTINGS, M.P., in the Chair, Col. L. W. HARRISON produced some statistics dealing with the frequency with which the patients attending the male section of his department at St. Thomas's Hospital gave false names and addresses. Of 4950 follow-up letters sent to patients on first default in the five-year period, 1924–28, 1280, or between 25 per cent. and 26 per cent. were returned through the Dead Letter Office. Except for 1924, when the percentage was 21, the proportions were very constant, varying only between 26 per cent. and 28 per cent. The percentage of the patients who resumed attendance as a result of this first letter was between 23 per cent. and 24 per cent. and just under 9 per cent. wrote and explained their absence. Of the large remainder of between 42 per cent. and 43 per cent. who did not reply or resume attendance at once, many eventually resumed attendance. In the female section of his department false names and addresses were given very rarely. Discussing the comparative merits of a venereal disease centre, inside or outside of a general hospital, he was inclined to think that this question was subordinate to that of the personality of the staff of such a centre and he remarked on the devastating efficiency with which an unsympathetic member of the staff could empty such a centre. He described in some detail the attractions which he had encouraged in order to make patients less clinic-shy. In the discussion which followed this paper, a speaker from Scotland tempered his praise of Col. Harrison's paper with the suggestion that the compulsory measures which many of the authorities in Scotland would like to see introduced, were, in the long run, likely to prove more effective than the blandishments with which venereal disease workers in England were trying to keep their patients under continuous medical supervision. Answering these and other criticisms, Col. Harrison apologised for having introduced the subject of compulsory versus free treatment, but he confessed to being still an unrepentant advocate of gentle moral suasion, without draconic measures.

Some Figures from India.

In a paper on the venereal diseases in the United Provinces (India), Dr. A. B. SOUSA said that Col. H. Stott had, for one year, carried out the Wassermann test on all the patients coming to the Kasauli Institute for treatment for dog-bite, and had found it positive in about 22 per cent. The incidence of syphilis and gonorrhœa in the adult population of Lucknow was approximately 20 per cent., whereas it was uncommon in the rural areas. While the incidence per thousand of all forms of venereal disease in the Indian troops in Lucknow had fallen from 99 in 1926 to 85 in 1928, the corresponding figures for the British troops in the same area were 160 and 66 respectively—a very much greater decline.

Conclusion.

This Congress has served many useful purposes. It has brought together many of the men who, during the last few years have taken out post-graduate courses, formal or informal, and have carried out and sometimes modified, according to circumstances, in different parts of the world, the system which has been organised at home under Col. Harrison. Many tributes were paid to the British system by those who have attempted to follow its main principles in other lands. The question of the comparative merits of compulsion and freedom was in the air most of the time, and it is probable that many of the delegates have left the Congress with the impression that the choice between the two systems must largely depend on geographical and ethnical factors. In defining the policy of the British Social Hygiene Council, Mrs. NEVILLE ROLFE pointed out that it tries to give expression to the wishes of its constituents, without imposing any arbitrary or oligarchical policy.

THE NATIONAL INSTITUTE FOR THE DEAF.

THE fifth annual meeting of the National Institute for the Deaf was held at the Caxton Hall, Westminster, on July 11th, when Lord Charnwood, the President, occupied the chair. He was supported by Mr. Somerville Hastings, M.P., and Sir Frank Benson. There was a large attendance.

Before the report of the Committee and the accounts for the year were submitted to the meeting for approval, Mr. A. J. Story, the secretary, summarised the history of the National Institute for the Deaf. It commenced its activities, he said, four years ago, before which time, although there were a number of local organisations for promoting the welfare of the deaf, there was no central body whose concern it was to watch over the interests of the deaf and the deafened. The Committee felt that the time had now arrived in the social history of the country to place the case of the deaf persons before the public, taking note of the intellectual, social, industrial, and religious questions which constituted a great problem. There were many indications, he said, that the national conscience was awakening to the gravity of deafness, both as it affected those who suffered from it and the economic interests of the country. The estimate had been made that the annual loss caused by deafness in this country amounted to £7,000,000. An important feature of the report was a reference to the work of the Committee in devising methods for safeguarding the deafened against the disappointment and loss involved in dealing with firms whose only apparent concern for deafness was the extent of their sales. It had been decided to maintain a register of firms and dealers who had agreed to the conditions:—

(1) That each client will be advised on the merits of his case as to whether an electrical or mechanical or no instrument at all is likely to help;

(2) That, in the event of a client being dissatisfied with the performance of the instrument supplied, the firm or dealer will refund the purchase money, less

10*s.* 6*d.* to cover expenses, if the instrument is returned in good order and condition within four weeks and;

(3) That no call will be made at the home of an inquirer unless at his request;

A number of reliable firms and dealers who conduct their business on these fair conditions had coöperated with the Committee, and no doubt others would be willing to add their names to the register. Deafened persons were strongly advised in their own interests to treat only with those firms and dealers who had agreed to the conditions, and lists would be sent to any inquirer on receipt of postage.

Mr. W. G. Yates the hon. treasurer, submitted the report and accounts for the year 1928-29, stating that although the Committee were able to meet their expenditure during the year, there was only a small balance of £221, so that anxiety was felt regarding current income, which was entirely inadequate to the needs. [The document, which was in circulation in the room, dealt in detail with the work of the Institute and the national organisation of welfare work, reviewed the social and industrial position of the deaf and deafened, and emphasised the imperative need for Government inquiry. A large portion of the report was devoted to the serious matter of the commencing as well as of the higher education of the deaf and the training of teachers of lip-reading. It can be obtained from the Office of the National Institute for the Deaf, 2, Bloomsbury-street, London, W.C.]

Lord Charnwood then moved the adoption of the report and accounts, and referred to the efforts which he had made in the House of Lords, supported by the Duke of Montrose and others, to induce the Government to set up a body for inquiry into the position of the deaf. Although the attitude of the Government at that time was unsympathetic, he hoped that the future would be more promising.

Mr. M. Birley, chairman of the Executive Committee, seconded the adoption of the motion; which was unanimously carried.

Mr. Somerville Hastings, M.P., aural surgeon to the Middlesex Hospital, moved:—

> "That having regard to the grave social and industrial hardships caused by deafness in the lives of large numbers of adolescent and adult persons who were born deaf or have become so, and to the fact that no official inquiry into the results (in the terms of improved social and industrial well-being) of large public expenditures in their education has ever been held, this meeting is strongly of opinion that the time has arrived when a complete investigation into the conditions and needs of these deaf and dumb and deafened persons should be made; and, further, that this meeting urgently calls upon the Government to make such an investigation by means of a Departmental Committee, or otherwise, at an early date."

He said that the inquiry into the condition of the deaf was urgently needed and that the right and proper body to make that inquiry was the Government of the country. The question was sometimes asked as to which was the most unfortunate individual, the *wholly* blind or *wholly* deaf. He would not attempt to make a decision, but he was quite sure that the person who was *almost* blind was much less to be pitied than the person who was *almost* deaf. The person who was almost blind could see just enough light to get about without assistance, but the person who was almost deaf was shut off from his friends. There was a peculiar psychology associated with deafness which, apart from the deficiency of hearing, was provocative of much sympathy. The sensation of hearing was, perhaps, evolved by the necessity of the animal to protect itself against its enemies, and the person who lacked that sense lacked a primitive function. There was therefore little surprise, granting the truth of that theory, that the deaf person was very liable to be introspective, to shun his fellows, to be shy and to be morose. Knowing this, a good many of those who, like himself, had to deal with the deaf professionally, advised them to cultivate more than anything else "cheek"—to be pushful. The deaf, particularly the industrial deaf, were handicapped by lack of the qualities of self-assertion throughout their industrial lives. The employer was afraid that the deaf would be more liable to accidents, and he instanced a case which had recently come before his notice in which a skilled engineer had been compelled to take a job as a labourer by reason of becoming deaf, and not only was his work affected, but his consequent moroseness had blighted the amenities of an otherwise happy home. It should be remembered, too, that no one was free from the possibility of becoming deaf. Therefore the condition of the deaf man or woman was one that needed special care, and it was time that the State took notice of the matter. A large proportion of deafness among children was due to middle-ear disease, and, while a good deal of that could be prevented, the State was not doing all that it might do for those below school age. Although the State did do something for the congenitally deaf child, care started too late, as the early years of education were all important—this criticism, he said, did not apply to Scotland. He would like to see complete deafness in children made a notifiable disease, so that the State could know exactly who were the deaf and would be able to deal with them sensibly. As for the adult deaf, the State did nothing for them, and those who had the matter at heart should demand the Government to make an investigation into the condition of the deaf generally, by means of a Departmental Committee or otherwise.

Sir Frank Benson, who seconded, made an earnest plea for sympathy and help for the deaf, a word which he said implied a tragedy. Everything that delayed action and communication of thought delayed the progress of the people and the welfare of the State, and it was up to everybody to see that no efforts suffered from slackness.

The resolution was supported by Mr. Hugh Morrison and carried unanimously.

On the motion of Lady Charnwood, seconded by a member of the audience, the thanks of the meeting were given to those who had served during the past year on the Executive Committee, and the following were elected for the ensuing year: Rev. F. W. G. Gilby and Rev. A. Smith; Sir Harry Stephen; Col. H. S. Ravenhill, C.M.G.; Major F. J. Wegg Prosser; Dr. Chas. Heath and Dr. D. A. H. Moses; Misses H. Davids; M. Hare, B. Nevile, and F. M. Townsend; The Hon. Mrs. John Tennant; Messrs. E. Ayliffe, H. J. Gibbons, W. McDougall, C. F. Mott, S. A. N. Oxley, L. B. Phillips, C. Shaw, and A. W. Taylor.

A vote of thanks to the Chairman terminated the proceedings.

MENTALLY DEFECTIVE ADULTS.

THE QUESTION OF STERILISATION.

IN the first instalment[1] of their report the Joint Committee of the Board of Education and the Board of Control discussed briefly the extent to which sterilisation of mentally defective adults in the present generation would reduce the volume of mental deficiency in the next, and came to the conclusion that, even if this measure were rigidly applied to all the mentally defective, the reduction would not be great. The last instalment[2] considers a more cogent ground for advocating sterilisation, namely, that its application would ease the economic burden by enabling defectives who would otherwise have to be permanently segregated in institutions to return to the community with no risk of their becoming parents, and that a number of them could live happily and harmoniously outside institutions. If it could be proved, say the Committee, that sterilisation could safely and profitably be applied even to certain groups or categories of defectives, the question of its adoption would no doubt deserve careful attention.

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[1] Report of the Mental Deficiency Committee. Parts I. and II. H.M. Stationery Office. 2*s.*

[2] Same Report. Part III. 1*s.* 6*d.*

American Experience.

The advocates of sterilisation maintain that the method is successfully applied in America. Sterilisation laws have been passed in about twenty American States, and more recently in Alberta, Sweden, and Switzerland; but only in two American States have these laws been enforced on any considerable scale. The reasons generally given by those who have studied the problem in America for the failure to enforce these laws in those States in which they have been enacted, are that public opinion has apparently disapproved of sterilisation on humanitarian grounds: that the question of doubt as to diagnosis and prognosis and the difficulty of drawing the fine line of demarcation between those who should and those who should not be deprived of the power of propagation appear to have served as deterrents in making the decision on a concrete case: that many well-informed persons have opposed sterilisation as tending towards the spread of immorality and venereal disease by giving liberty to the individual together with the assurance of immunity from pregnancy and its consequences; and that the general aspects of the relation of heredity to mental deficiency have served to raise doubt as to how much may be gained by sterilisation.

The evidence available in regard to the results achieved in California, where the first sterilisation law was passed in 1909, is far from conclusive. So far as it goes it tends to show that sterilisation has only enabled a small proportion of the defectives to be discharged from institutions. A failure of first efforts in this direction need not, however, surprise us, and further experiments should be sympathetically watched. The Committee are not prepared to deny that this measure might, under adequate safeguards prove of value in a very limited number of individual cases seleced from among the more stable type of defective with no anti-social tendencies, though they cannot disguise from themselves the serious difficulties that would arise in restricting sterilisation to this particular type of case. They feel, however, that there is not sufficient evidence at present to justify the general adoption of sterilisation of defectives, and are convinced that, even if it were adopted, no great alleviation of the burden of mental deficiency would follow.

Three Grounds for Hesitation.

In the first place, in the Committee's view, sterilisation would not reduce to any appreciable extent the numbers of defectives already in institutions, since the large majority of these have been admitted and are retained because they are urgently in need of the care and protection which institutions alone can give. The sterilisation of the mentally defective adult is advocated by some persons as an alternative to what they regard as the more expensive method of segregation. Their assumption is that large numbers of mental defectives who are now retained in our institutions would be capable, if sterilised, of maintaining themselves economically, or at least of living harmoniously outside the institution. The consensus of opinion however amongst those who best know the practical capacities and the temperamental features of the patients who are at present in colonies and institutions, is that comparatively few of them would be fit to be restored permanently to live in the community. Sterilisation does not make defectives more stable, does not enable them to earn their living, does not prevent them from getting into mischief, and does not enhance their social efficiency in any way; it may, indeed, increase their moral danger, and prove injurious to the health of the community.

In the second place the sterilisation of a few individual cases, if legal sanction for this could be obtained would not appreciably, if at all, reduce the urgent need for a large increase in institutional accommodation. The Committee regard with much apprehension the tendency observed in some quarters to allow the discussion of this question and the hope of legislation on the subject, to retard the provision of the institutional accommodation which is so lamentably insufficient in all parts of the country. The cases to which sterilisation could profitably be applied are not among those for whom this additional accommodation is required, for it must be borne in mind that large numbers of defectives are not socially adjustable and should not be left in the community in any circumstances, while many of those who might ultimately be returned to the community would first require a long period of training and stabilisation to fit them for life outside an institution. Moreover, the view of many who have had wide experience of mental defectives in this country is that the freedom accompanying sterilisation, though it might increase the happiness of some defectives, would be positively harmful to many others.

In the third place the Committee believe that the legalisation of this measure, however carefully safeguarded, would inevitably greatly enhance the difficulties of bringing defectives within the scope of the Mental Deficiency Acts. The parent would be less likely to apply for the protection of the Acts to be extended to his defective child, the certifying officer would be more reluctant to issue his certificate, and the magistrate would be less willing to make an order, if it were known that such action on the part of each of them might render the defective liable to be sterilised.

Personnel of the Committee.

The names of those who have thus given their considered opinion on the merit of sterilisation as a practical method of dealing with mental defects in the adult, are: Mr. Arthur H. Wood, late Assistant Secretary, Medical Branch, Board of Education (*Chairman*); Dr. Ralph H. Crowley, Senior Medical Officer, Board of Education (*Vice-Chairman*); Mr. Cyril L. Burt, Psychologist, London County Council; Mr. Cecil Eaton Assistant Secretary, Medical Branch, Board of Education; Miss Evelyn Fox, Hon. Secretary, Central Association for Mental Welfare; Mrs. Hume Pinsent, Commissioner, Board of Control; Miss Hilda Redfern, Head Mistress, Monyhull Colony School for Mentally Defective Children.; Dr. Frank C. Shrubsall, Senior Medical Officer, London County Council; Dr. Alfred F. Tredgold, Lecturer in Mental Deficiency, London University; Dr. F. Douglas Turner, Medical Superintendent, Royal Eastern Counties Institution, Colchester; and Mr. N. D. Bosworth Smith, Principal, Medical Branch, Board of Education (*Secretary*).

PAY BEDS IN LONDON HOSPITALS.

The number of pay beds at voluntary hospitals in London is now 1154 distributed over 88 hospitals. The charges are usually about four to six guineas a week, exclusive of certain extras and of medical and surgical fees, though, at either end of the scale, there are a few beds for the well-to-do and some for those in straitened circumstances.

A complete list of the beds available at hospitals making returns to King Edward's Hospital Fund has been prepared and is obtainable for 6d. from the offices of the Fund at 7, Walbrook, London, E.C.4. For the convenience of our readers, we set out below a list of the hospitals which have pay beds, the number of beds and the normal weekly charges. This charge does not include any medical or surgical fees that may also be payable. In nearly every case one or more of the following specific services, if required, are charged for as extras, sometimes as an addition to the hospital charge, sometimes as part of the medical fee, viz.: Anæsthetist; exceptionally expensive drugs and/or dressings; electrical treatment; light treatment; massage; extra nurses; operating theatre; pathological examinations; radium; X ray.

For a description of the type of accommodation available (cubicles, wards with more than one bed, single rooms) and the number of beds allocated to either sex the list must be consulted.

General Hospitals with Schools.

Hospital.	Pay beds.	Normal weekly charge in guineas.
Guy's	3	5 to 6
King's College ..	65	5 to 8
Royal Free ..	9	8
St. Thomas's ..	40	6 to 9
University College ..	8	6
Westminster ..	14	6 to 10

General Hospitals with R.M.O.

Hospital.	Pay beds.	Normal weekly charge in guineas.
Acton	6	3½ to 5
Bolingbroke ..	15	4 to 6
Connaught ..	10	From 5
East Ham Memorial ..	4	From 4
German ..	10	4 to 5
Hampstead General ..	21	3½ to 7
Hospital of St. John and St. Elizabeth ..	28	2½ to 15
Hostel of St. Luke* ..	31	6 to 7
Ilford	14	3½ to 5
Italian ..	5	3
King Edward Memorial ..	8	4½
London Homœopathic.. ..	19	4 to 11
London Temperance ..	5	6
Miller	8	5
Nelson	14	3 to 5
Putney	7	5
Queen Mary's ..	6	5
Royal Northern	38	4½ to 6
St. Andrew's Dollis Hill ..	52	2½ to 8
St. John's Lewisham ..	3	4 to 6
Seamen's (Dreadnought)	20	3 to 4
Weir	4	3 to 5
West London..	26	4 to 5
Willesden ..	15	3½ to 6
Wimbledon ..	10	4 to 6
Woolwich War Memorial ..	32	From 3

* Clergy and their families.

General and Cottage Hospitals Without R.M.O.

Hospital.	Pay beds.	Normal weekly charge in guineas.
Beckenham Cottage ..	8	7
Blackheath ..	2	4
Brentford ..	4	4 to 5
Bromley (Kent) and District† ..	4	6
Carshalton ..	8	2 to 4
Eltham Cottage	4	5
Enfield War Memorial ..	2	4½
Finchley Memorial† ..	9	3 to 6
Forest, Buckhurst Hill ..	8	3 to 6
Hanwell Cottage	1	From 3
Hendon Cottage	5	5 to 6
Hornsey Central	16	3 to 6
Kingston-on-Thames Victoria	3	3
Mildmay Memorial ..	4	4
Norwood Cottage	2	4 to 6
Passmore Edwards ..	6	From 4
Phillip's Memorial Homœopathic ..	2	2 to 7
St. John's Twickenham..	1	3 to 5
Victoria Cottage Barnet	4	4 to 6
Wembley	4	3½ to 5
Woodford Jubilee	6	3 to 7

† For local residents only.

Hospitals for Women.

Hospital.	Pay beds.	Normal weekly charge in guineas.
Chelsea ..	18	5
Elizabeth Garrett Anderson ..	8	4 to 6
Florence Nightingale ..	38	2 to 4
Grosvenor ..	5	2½ to 4
Hospital for Women (Soho)	19	5
St. Saviour's ..	21	2 to 5
Samaritan Free..	9	6
South London ..	22	4 to 6

Other Special Hospitals.

Hospital.	Pay beds.	Normal weekly charge in guineas.
All Saints' (Genito-Urinary)	2	5
Belgrave (Children) ..	12	3
Bermondsey Medical Mission (Women and Children ..	3	2 to 5
Central London Ophthalmic ..	3	4 to 6
Central London (Throat, Nose and Ear) ..	6	4½ to 5
City of London Maternity ..	7	5
Clapham Maternity ..	4	3
Golden-square (Throat, Nose and Ear) ..	24	5 to 7
Gordon (Rectal)	16	3 to 5
Hospital for Consumption Brompton ..	48	4
Hospital for Tropical Diseases	50	3 to 7
Jewish Maternity ..	3	6
London Fever	24	7 to 10
London Lock ..	12	2 to 5
Mount Vernon (Cancer) ..	12	From 5
National Heart..	1	5
National, Queen square (Nervous Diseases) ..	4	Up to 3
Royal Eye ..	2	5
Royal National Orthopædic ..	12	4 to 6
Royal Waterloo (Children and Women) ..	9	3 to 7
Royal Westminster Ophthalmic	14	5 to 6
St. Mark's (Rectal) ..	10	5 to 6
St. Paul's (Genito-Urinary and Skin)	11	5
St. Peter's (Stone)	6	5
South-Eastern (Children) ..	4	2 to 3
Stoke Newington (Women) ..	8	2 to 3½
Victoria (Children)	12	5

In a preparatory note the Fund expresses approval of the insurance scheme for the middle and professional classes outlined last year in the report of its Pay Beds Committee.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1928 statistics of four boroughs:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Watford .. (54,460)	15·4	9·4	0·68	1·40	1·1	1·4	52/35	—	3·5
Torquay .. (38,170)	14·5	14·3*	1·28	1·81	2·3	2·5	50/25	5	5·4
Tunbridge Wells (34,820)	11·7	15·0†	0·75	2·17	2·1	3·0	49/27	24	4·9
Chelmsford .. (23,680)	15·7	9·5	0·93	1·10	1·1	1·6	48/27	31	10·7

* Standardised rate, 10·5. † Standardised rate, 11·0,

Watford.

Dr. W. J. Cox says that the two chief public health questions of his borough are housing and the provision of public baths. During 1928 435 subsidy houses were erected, 24 by the local authority and 411 by private enterprise. There is much overcrowding in the smaller houses and the decision of the council to build another 110 houses is well-timed. The closing and demolition of 139 houses during the last four years has made the slum question in Watford much less evident. There are 700 families on the waiting-list for houses and 30 new houses are needed to replace houses which ought to be demolished. The supervision of the watercress beds is being continued, although none was closed in 1928 as compared with three in 1927. Dr. Cox points out that the existence of watercress beds in thickly populated urban districts is not desirable, but that in a rural district it is a different matter, if the cress beds can be provided with a pure water-supply and are so situated that the general public has no access to them. The Red Cross orthopædic centre did valuable work and a list is given describing the nature of the 58 cases referred to the clinic, which is conducted by Mr. S. L. Higgs, F.R.C.S.

The isolation and small-pox hospitals serve a population of about 40,000 in the surrounding district in addition to the residents of Watford. Watford is growing rapidly and Dr. Cox thinks 100 beds are needed instead of the 66 at present provided. The small-pox hospital was opened twice. Between Feb. 3rd and Feb. 11th three "casuals" were admitted from the workhouse, each of whom had contracted small-pox in quite different parts of the country. On May 29th another "casual" was admitted, by whom a Watford resident was infected. A proposal to pool the small-pox accommodation in the county did not meet with the approval of the management of the joint hospitals, it being held that Watford might suffer if it had to provide small-pox accommodation for a larger district than at present.

Torquay.

Dr. Thomas Dunlop says the opening of the New Torbay hospital with its up-to-date maternity wards has met a much-felt want. The maternity ward has eight beds and arrangements have been made by the council for the admission of necessitous cases. A separate antenatal clinic is to be established at the hospital. The clearing of the Pimlico insanitary area has reached its final stage, but there are still certain properties on the area which are not insanitary, but are essential to the scheme and which will have to be acquired by arbitration. The gathering ground of the water-supply is being extended and it is expected that the new source of supply will be available during the summer of the present year. The gathering ground is on the borders of Dartmoor and the water, although soft, contains sufficient lime and magnesia to prevent any solvent action on lead. Housing remains a difficult problem and there are still a large number of applicants living under bad conditions. The new houses erected numbered 198, of which only 20 were subsidy houses, all municipal. A vita-glass sun lounge has been erected by the council as an adjunct to the medical baths. The record kept of the results of the acetone methylene-blue tests shows that Torquay is high up among the places keeping such records, and the hours of bright sunshine numbered 1845·6.

Tunbridge Wells.

Dr. F. C. Linton says that one patient was admitted to the small-pox hospital, which serves Tunbridge Wells and the surrounding districts, and made a good recovery. There is an increasing demand for the beds at the maternity home, which is a "voluntary" institution, serving the surrounding district. Ninety-four of the patients admitted were Tunbridge Wells residents, for nine of whom the corporation paid the fees according to agreement. The question of the extension of the home is now under consideration. For half the year Tunbridge Wells is supplied with water from springs in the Tunbridge Wells sandstone. During the remainder of the year this supply is supplemented by artesian wells bored through the Wadhurst clay to the Ashdown sand. Until the dry season of 1921 these two sources were adequate, but at the present time the work for a further supply, by boring down to the Ashdown sand in another position, is in hand. The number of new houses erected was 94, of which 34 were municipal and nine private enterprise subsidy houses. The construction of an open-air school was to have been begun in the autumn of 1928, but at the last moment the site was discarded and a search is being made for a new site with more advantages. In the meantime voluntary workers are making provision for some of the delicate children who need an open-air school. The work of the aural clinic for the school-children, which is held at the Eye and Ear Hospital, shows a large increase and on April 1st an orthopædic clinic was established at the General Hospital under the auspices of the education authority. The rainfall, about 34 inches, exceeded the average, largely owing to a fall of seven inches in October. The 1810 hours 18 minutes of bright sunshine made Tunbridge Wells an easy first for sunshine amongst the inland health resorts.

Chelmsford.

Dr. Richard H. Vercoe reports that at the end of the year the scheme to obtain water from the river Chelmer was nearly completed. The treatment tanks are divided into nine compartments. Sulphate of alumina solution and lime-water are added at the point of entry and carbonic acid gas is diffused in the water in the penultimate compartment. After storage the treated water is pumped through Paterson pressure filters to the service reservoir, chlorine gas being added to the water both, before and after filtration. There is a well-equipped laboratory, where constant tests will be made by a resident chemist. There are a large number of houses in Chelmsford which are constantly in need of repairs to keep them fit for human habitation, and in some cases demolition is the only satisfactory remedy. About 50 are only fit for demolition; and 300 more need regular repairs. On the municipal estate 62 houses were completed during the year and 56 are contracted for. An antenatal clinic was held monthly at the Chelmsford Hospital and attended by 34 expectant mothers. The report of the veterinary inspector, Mr. W. Mulvey, states that all the cows and cowsheds are inspected at least once in every two months. The sheds number 11 and the cow population is about 250. Twenty-two cows were removed from the cowsheds during the year and 20 cows tested with tuberculin.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 6TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 153 (last week 160); scarlet fever, 1898; diphtheria, 000; enteric fever, 44; pneumonia, 909; puerperal fever, 40; puerperal pyrexia, 98; cerebro-spinal fever, 12; acute poliomyelitis, 7; encephalitis lethargica, 22; continued fever, 1; dysentery, 14; ophthalmia neonatorum, 115. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on July 9th-10th was as follows: Small-pox, 200 under treatment, 6 under observation (last week 190 and 8 respectively); scarlet fever, 1820; diphtheria, 1660; enteric fever, 8; measles, 231; whooping-cough, 487; puerperal fever, 28 (plus 9 babies); encephalitis lethargica, 124; "other diseases," 80. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, 5 (1) from enteric fever, 42 (8) from measles, 5 (0) from scarlet fever, 30 (8) from whooping-cough, 16 (7) from diphtheria, 48 (7) from diarrhœa and enteritis under two years, and 25 (5) from influenza. The figures in parentheses are those for London itself.

The single death provisionally classified to small-pox was assigned to Stepney. Liverpool reported 12 deaths from measles, Wallasey, Salford and Leeds each 3. Three deaths from whooping cough occurred at Sheffield. The highest figures for diarrhœa were Birmingham and Liverpool each 8, Manchester 5, Nottingham, Warrington and Salford each 3.

The number of stillbirths reported during the week was 270 (corresponding to a rate of 40 per 1000 births), including 40 in London.

RESEARCH IN THE BREWING INDUSTRY.

MANY industries in this country have been carried on for hundreds, or in some cases for thousands, of years on purely empirical lines, and it is only since the later decades of the nineteenth century that science, with its exact knowledge based upon definite facts, has intervened to displace gradually the former universal rule-of-thumb methods. Even now there are business men who consider science of little value apart from its immediate application to their own problems and the production of increased profits. They do not realise that "Science moves but slowly, slowly creeping on from point to point." But the industrialist does appreciate the value of a sound knowledge of fundamental principles, and the 1929 Memorandum of the Research Scheme of the Institute of Brewing is a good illustration of this fact. This memorandum summarises a number of investigations carried out under the ægis of the Research Committee, many of them in collaboration with other bodies. They include the production of new varieties of barley and hops, the effects of various agricultural conditions, chemicals and biological methods for the evaluation of hops and methods of defence against their field parasites, and the utilisation of the nitrogenous constituents of wort by yeast. The magnitude of the undertaking may be realised when it is considered that the whole of the factors under investigation, from the breeding of the barley and hops, must be correlated singly and in conjunction with the qualities of the finished beer. The Research Scheme is administered by a committee in conjunction with various advisory sub-committees, the members of which are representative of all branches of the brewing industry, together with botanists, chemists, bio-chemists and growers of barley and hops. Team work of this kind may well have results of value outside the brewing trade, in which it is not forgotten that the brilliant bacteriological researches of Pasteur, when applied by Lister, revolutionised the practice of surgery.

Correspondence.

"Audi alteram partem."

THE DEVELOPMENT OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Dr. H. V. Morlock's paper in your last issue will be welcomed by many as throwing considerable light on that somewhat "elusive Pimpernel," the early case of pulmonary tuberculosis. The tuberculosis officer, no doubt, sees, or should see, most of the cases in his district, but it is an unfortunate fact that the number of early cases examined are few and far between. I feel however that they do, if discovered, conform to the description given by Morlock, and quote the following two cases as examples.

1. A. B., female, aged 26, was well until Christmas, 1928, when she had an attack of pyrexia with cough. On examination in January, 1929, her general condition was good and no signs detected. The cough continued with pyrexia and in April, at the onset of expectoration, her sputum was positive, crepitations were heard below the left clavicle and at the left apex behind, and an X ray photograph showed a triangular opacity just below the left clavicle, with the base against the ribs and an appearance of cavitation.

2. C. D., female, aged 18, had, as it happened, been under close medical supervision. In July, 1928, her weight was 8 st. 5¼ lbs., her general condition very good and she had no physical signs. In December, 1928, her weight had increased to 8 st. 7¼ lbs., her general condition was still good with no physical signs, but she complained of an irritable cough and her temperature was 99·2° F. In February, 1929, her weight had fallen to 8 st. 2¼ lbs. Crepitations were now heard below the right clavicle, but not behind. Her sputum, when examined at the onset of expectoration, was positive on three consecutive days, and X rays showed an area of infiltration, proceeding to cavitation in the right subclavicular region.

The above type of case, as already stated, is not often seen, for in the majority of cases, the tuberculosis officer is called in at a later date, when the infiltration has already spread upwards and downwards into the rest of the lung. I have myself been struck with the frequency with which patients state that they first consulted their doctor "some months ago" and were told that they were suffering with "influenza." This point is of great importance, and is brought out by Morlock in his paper. When diagnosing a sudden febrile attack as "influenza," the general practitioner should bear in mind the possibility that the case may be one of early tubercle, and although there may be no physical signs, he is fully justified in sending such a case for further investigation to the tuberculosis officer, who should have at his disposal complete facilities for X ray examination.

The particulars of another case show the disasters which may readily occur, if we do not orientate our minds to this new conception of phthisis with its acute onset and rapid progress.

3. E. F., female, aged 20, used to sleep in the same room as her sister A. F., who died of advanced pulmonary tuberculosis at Christmas, 1927. E. F. was examined as a contact in January and June, 1928, and was found to be in good condition with no physical signs. She remained under the care of her doctor, and in November last was sent to the throat department of a London general hospital for a sore throat. She was kept there for out-patient treatment and in January referred to a physician of the hospital for an opinion on her chest. No physical signs were found and she was given a clean bill of health but was unfortunately not X rayed. In May her own doctor suspected pulmonary tuberculosis, and she went away to a convalescent home. In June I was asked to see her and found an advanced case of tuberculosis with extensive signs in both lungs, any form of treatment being hopeless. The sputum was positive.

We must consider, if we intend to accept the views of Morlock and of continental workers, where they lead us. A consideration of contact examination in the tuberculosis of infancy, together with the post-mortem findings of Küss, Ghon and Aschoff, and Armand-Delille and Lestocquoy, cannot but lead one to believe that in infancy tuberculosis is a true infective disease, spread directly from one person to another. It may be that the latest work on the development of pulmonary tuberculosis in the adult will lead us in the same direction, *i.e.*, that in the adult the disease is spread in the same way. Such a theory will shatter many of the tenets of our forebears, but inasmuch as it may lead to a study of the disease on more scientific lines, and perhaps to a discovery of more early cases, it deserves our consideration.

I am, Sir, yours faithfully,

C. H. C. TOUSSAINT,
Tuberculosis Officer, Bermondsey.

Grange-road, Bermondsey, S.E., July 16th, 1929.

LOSS OF APPETITE IN CHILDHOOD.

To the Editor of THE LANCET.

SIR,—Your comments on Dr. Garland's article and Prof. Mottram's letter on the same topic prompt me to say a word regarding the importance of educating the human palate from early years to appreciate and enjoy the right kind of food, and of not allowing natural healthy instincts to be spoilt by indulgence in tasty luxurious foods. A child brought up in the country on simple healthy food, and having the run of a well-stocked kitchen garden, displays an instinctive delight, not only in fruit, but in such vegetable produce as young peas, carrots, onions, and lettuce. Why do we not take this hint and encourage children from quite an early age to cultivate their natural taste for these healthy foods? The wide range of adaptability of the youthful palate is shown by the ready way in which children of every country take to the national diet.

A word regarding sugar in the present connexion. Sugar is a good food from the point of view of nutriment, but unless given cautiously it is a bad food for children, in that it is apt to spoil the palate for simple healthy food. It is not a necessary food in the pure form; children can get all the sugar they need from starchy foods and fruit. Our ancestors reached the full status of manhood on a diet from which all pure sugar was excluded save that derived from occasional finds of honey. In Elizabethan times when beef cost three farthings a pound, the price of the same quantity of sugar was twenty shillings, the equivalent of much more of our present money, so that we may be sure the boy Shakespeare got along all right on a diet from which both cane and beet sugar were conspicuously absent.

We shall do well, in considering the value of sugar as a food for children, to beware of the harm it may do in spoiling the palate, and in causing dental caries. I personally am convinced that the conversion of all the sweet-stuff shops in the Kingdom into fruit shops—assuming this were practicable—would lead to a great improvement in the health of our children. It would not be far from the truth to say that the near approach to practically all the elementary schools in London contain sweet-stuff traps, where the children spend their odd coppers. Now they enjoy an added service of ice-cream vendors.

I am, Sir, yours faithfully,

Harley-street, W., July 15th, 1929. HARRY CAMPBELL.

IMPLANTED RADIUM SEEDS.

To the Editor of THE LANCET.

SIR,—Dr. Joseph Muir, of New York city, in his article entitled Radium Treatment by the Implantation of Screened Seeds (THE LANCET, July 6th, p. 7), recommends for the radium treatment of bladder cancer the insertion of seeds through a cystoscope, and for prostatic cancer implantation into the gland only by the perineal route. Both methods, whether emanation or the element is used, I submit, are unsound from the pathological standpoint. On more than one occasion and recently by an article in the *Cancer Review* (July, 1929) I have drawn attention to the necessity of thoroughly exploring the full extent of a bladder neoplasm before adopting radium treatment. With the aid of the cystoscope this is impossible; only digital exploration can ensure this knowledge.

Again, in cancer of the prostate Dr. Muir is advocating a method which I have described[1] and abandoned. Malignant disease of the prostate spreads along lymphatics situated in the fibrous sheath surrounding the vesiculæ seminales. It is useless to attack the prostate only, either from the perineum or the bladder, as I have learnt from an experience extending over 15 years. If any success is to be achieved in the radium treatment of this organ the seeds must be implanted in tissues far beyond the frontiers of the prostate.

I am, Sir, yours faithfully,
A. CLIFFORD MORSON.

Brook-street, Grosvenor-square, W., July 11th, 1929.

SHEWRY v. MAYBURY.

To the Editor of THE LANCET.

SIR,—The letter from a juror in this case, in your issue of July 13th, seems to call for comment on one point—namely, as to the contrast that was noticed between the attitude of the medical witnesses on the two sides.

In this case, I was called to give "expert evidence" on a comparatively small point—viz., the interpretation of the Wassermann test—but it so happened that I was present in Court on and off during almost the whole trial. I had not seen or tested the patient. One would have thought that the fact that two of the medical witnesses for Mr. Shewry were present during the whole time and in constant communication with counsel, whereas those for Dr. Maybury did not adopt this practice, was in favour of the latter. A medical witness is not an advocate.

There is another point. The clinical witnesses for the defence were all of them on the active staff of teaching hospitals, and if they had stayed in Court throughout the trial, which lasted over a week, they would have neglected their most important work of teaching students and ministering to the wants of their hospital patients. Those on the other side had no such obligation.

With the rest of the letter I think most of us who have to give expert evidence would agree, and the profession would surely welcome the trial of cases in which questions of clinical practice and pathology play an important part by judges with medical assessors rather than by jury. Even if the jury system had to be retained, it would be well if the medical opinions in a technical case were presented to them after they had been contracted into a coherent mass. It is the details that worry members of a jury and are apt to lead to confusion, which often results in a prejudiced opinion in a certain type of mind. Even the most lucid summing up by a judge—and I have never heard anything fairer or more lucid than that of the Lord Chief Justice in this case—is apt to fall on ears that have been rendered deaf by reiteration of technical terms. What some members of a jury do not seem to realise, however, is that in adhering to prejudice they are false to the oath that they have taken.—I am, Sir, yours faithfully,

A. KNYVETT GORDON.

Bedford-square, W.C., July 15th, 1929.

To the Editor of THE LANCET.

SIR,—A Juror's Reflections describe in concrete form the lack of method in submitting relevant technical medical evidence to a judge and jury. Four-fifths of the medical *opinion* in this case would never have been given to medical assessors. I was one of the ten medical witnesses! Judges decide on questions of law, juries on questions of fact. Expert opinion and expert evidence should be judged by assessors, on behalf of the Court. Important statements as to the results of arsenic injections into the brain, and as to the value or possibility of skull percussion were made on the one hand and denied on the other. No witness could state he had ever seen a solution of arsenic injected into the brain; one witness only had applied skull percussion to this case.

I submit two things (1) that McEwen, Dr. Alexander Robertson (Glasgow Hospital Reports, 1898), Jullès (Percussion du Crane) may be all wrong in the opinion of a particular witness, but to describe their writings and methods as "magic, not medicine," could only be to influence the jury as counsel for the defence, and is unworthy of our profession. (2) That the effect of injecting a solution of arsenic into the brain could only be judged by the condition it produces in the cellular tissue elsewhere.

We can all agree that it is unfair to prosecute nine years after an alleged act of negligence. There should be a Statute of Limitations. And "expert opinion" given by well-known men should be governed by the strict law of evidence, and not by their professional status. I am, Sir, yours faithfully,

W. B. COSENS.

Oakley-street, S.W., July 14th, 1929.

To the Editor of THE LANCET.

SIR,—In your issue of July 13th "a Juror in the Lord Chief Justice of England's Court" reproduced in full a letter from the *Times* on Technical Evidence. Common juries are credited with common sense, special juries with special sense, for which fees are paid commensurate with the supposed educational standard and common sense of the two classes of jury members. Both classes of jury swear on oath or attest that they will listen to the evidence and upon the sworn evidence of the witnesses called for the plaintiff and defence shall on the law of evidence give their verdict. Sympathy is beyond their ken as a jury and is out of bounds. A jury is on a pedestal far above sentiment and sympathy. Each member has sworn to find his verdict on the evidence before the court.

"Special Juror" is not quite correct in his letter to the *Times*. All trials of necessity must have witnesses on one side and witnesses on the other. The jury have to determine on which side is the weight of evidence. The judge, whether it be a civil or criminal case, analyses the evidence and may or may not direct the jury. It is admitted on all sides that the summing up of the evidence in the case of Shewry v. Maybury was wonderful—the expression of a barrister. The Lord Chief Justice emphasised in his summing up that the jury had sworn to give their verdict on the evidence. It is not correct to say counsel were "labouring among technical terms which they did not always know how to pronounce." On one occasion only did counsel say when reading from an authority: "Then comes two words which I cannot pronounce."

"A Juror" goes on to say: "I was one of the majority in the jury, who were unwilling that after eight years a case should be brought up against Dr. Maybury." Sentiment is here again ruling "A Juror." The Lord Chief Justice so clearly laid down the law with reference to a minor, the law with reference to the statute of limitations, and the law with reference to charges for criminal offences. Contrition has now entered into the soul of "A Juror," when he says: "I now suffer from a distinct feeling that Dr. Maybury did not get justice *on the evidence*." What an admission for a special juryman to make, who, with the other members of the jury has sworn to find a true verdict on the evidence before the court. "A Juror" admits that the jury lamentably failed to carry out their sacred duty and were swayed by sentiment and prejudice. It must certainly be a very uncomfortable feeling when one has not acted up to and upon one's oath. How a letter to

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[1] British Jour. of Surg., 1915, ii., 302; and 1920, viii., 38.

THE LANCET assuages "A Juror's" conscience may be relegated to metaphysics for a solution.

When "A Juror" mentions that "medical witnesses on one side remained in court and showed sincere interest in the case. Those on the other side appeared, spoke and disappeared like a drilled phalanx. This... was noticed by the jury"—when, I say, such nonsense is written by "A Juror," and such trivialities are taken notice of by members of a jury who have sworn to find a true verdict on the evidence, it is not difficult to understand the answers given by the jury to the questions put by the Lord Chief Justice. There was no "piteous muddle" anywhere in the conduct of the case. If there were a "piteous muddle" it emanated from the jury box. The case was opened high; the plaint having absolutely failed, side issues were embarked upon. Of such tactics the judge said he would have something to say later on, and his summing up expressed his extreme disapproval at the line counsel for the plaintiff had taken in shifting the charge of negligence to one of fraud. The Lord Chief Justice's remarks will ever remain indelibly stamped upon the memories of those who listened to those impressive words of disapproval.

If "A Juror" and the other members had listened attentively to the plaint, the sworn evidence, the cross examination, the speeches of counsel, the summing up of the judge, not forgetting they had sworn to find a verdict upon the evidence given, they would now be happier and wiser, sentiment and prejudice having no place in the finding of their verdict.

I am, Sir, yours faithfully,

LEX.

July 17th, 1929.

CONGRESS OF THE ROYAL SANITARY INSTITUTE.

About 1500 delegates arrived in Sheffield at the beginning of the week to attend the annual congress of the Royal Sanitary Institute. Nine hundred of them, or thereabouts, represented governments at home, in the Dominions and India, or abroad, and the meeting is notable because of the unusually large number of participants from every continent. The business of the Congress is being conducted in six sections—viz., Preventive Medicine, Architecture and Engineering, Maternity and Child Welfare, including School Hygiene, Hygiene of Food, Hygiene in Industry, and Veterinary Hygiene; and there are also seven conferences of special officers. A large congregation assembled for the opening service in the cathedral and listened to a stimulating address from the Bishop of Sheffield. Dr. Burrows traced the extraordinary development of the sanitary conscience since Beaconsfield uttered his famous parody, "Sanitas sanitatum, et omnia sanitas," and referred to many of the pioneers, including Shaftesbury and Charles Kingsley. The public conscience, he said, had become much more assertive in his lifetime and no political party dared treat housing and sanitary matters as if they did not matter. Sanitary reform was now part of Christian duty and had become international in its aims. All this work implied faith that it was God's will that man should improve.

On Monday, July 15th, the Lord Mayor of Sheffield presided over a gathering of 500 at the Congress luncheon. The Bishop of Sheffield in proposing the toast of the Institute, sketched the history of its growth and good work during its 53 years' existence, and made special reference to the international character of its operations. The Chairman of the Council, Mr. Edward Willis, in returning thanks, hoped and thought that the present week would be a memorable one in the history of Sheffield and of the Institute. The Duke of Northumberland, in proposing the toast of the municipality, made special reference to the versatility of the present Lord Mayor and his personal efforts for the welfare of the community.

At the inaugural meeting held at the University, the retiring President, the Duke of Northumberland, inducted his successor, Earl Fitzwilliam, who, in his address, spoke of the extraordinary changes caused in the Sheffield neighbourhood during his lifetime by industrialisation. Instead of scattered hamlets and villages, they had everywhere gigantic colliery undertakings, which made all the more necessary the beneficent activities of bodies such as the Sanitary Institute. Lord Fitzwilliam referred particularly to the need for a better allocation of the available water-supply of the country. A vote of thanks to the President was moved by Sir Arthur Newsholme and supported by Surgeon W. H. Frost (U.S.A.) and the Bishop of Sheffield. who indicated his faith in future progress by the remark that the world would be a much better place to live in when we were all dead and buried.

A delightful function on July 16th was the luncheon given to the delegates from overseas by the Council of the Institute. Dr. Charles Porter presided and welcomed the guests in felicitous terms, which were warmly reciprocated by Colonel Phya Damrong Baedyagun (Siam), who spoke of the great improvement in conditions of life in London during the 25 years interval between his two visits to England, by Sir Henry Barwell (Agent General for South Australia), by Miss Howard (Nova Scotia), by Dr. Mallik (India), by Dr. P. S. Fridericia (Denmark), by Councillor W. H. Port (Johannesburg), who said "the city of sunshine built on gold" was making use of the best of the sanitary experiences of the old country, and by Miss Ellen Babbitt (U.S.A.)

PREVENTIVE MEDICINE IN LONDON.

THE NEW SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

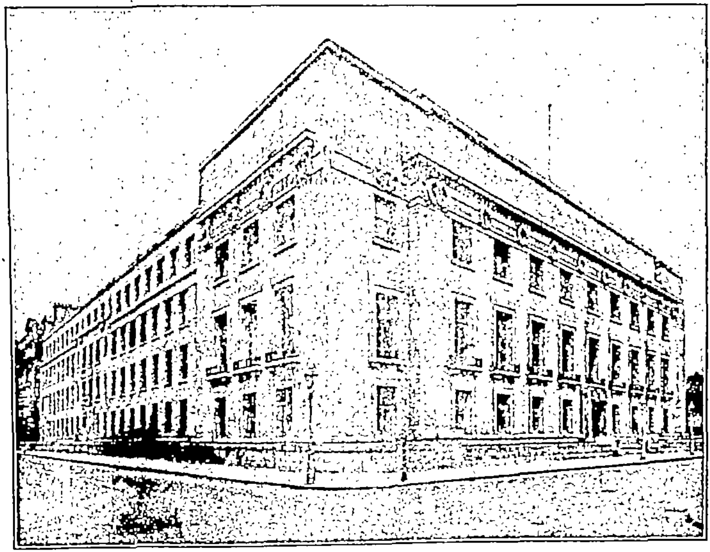
THE great new building opened in London this week is something more than the Institute of State Medicine envisaged by the Athlone Committee of 1921. It will be an international, as well as a national, centre of public health, and its definition of preventive medicine will cover the needs not of this country alone, but of the whole inhabited world.

So wide a view of its functions is justified partly by its constitution, and partly by the way it has come into being. On the one hand, union of the new school of Hygiene with the old School of Tropical Medicine gives it a large basis and historical continuity, whilst on the other, it has an international status from the first, because it is built with American money for the benefit of the world at large, and not of Englishmen alone. London has many advantages as the site of such an institution, but its chief claim to outside assistance for public health work lies in this country's past record rather than its present needs. The Rockefeller Foundation's grant of £400,000 to build a new school is doubtless made in the lively expectation that this branch of English medicine is still capable of contributing something important and individual to the progress of mankind.

It will be remembered, however, that the grant was conditional on financial support from the British Government, and that the capital sum available was not to be used for running the School. Thus, from the time of its opening, the new building, though the gift of American citizens, will be a national concern, in which we hope to take a national pride. Moreover, thanks to the generous terms of the grant, the design and construction has been left to those who will control the fortunes of the School—notably, Dr. Andrew Balfou, (the Director) and the heads of the various divisions.

The type of building required needed long and careful consideration, and when preliminary plans had been prepared, a limited number of architects with experience in laboratory construction were invited to submit designs. The one prepared by Mr. P. Morley

FIG. 1.



The London School of Hygiene and Tropical Medicine.

Horder was approved, and has been executed by Mr. Verner O. Rees in association with him.

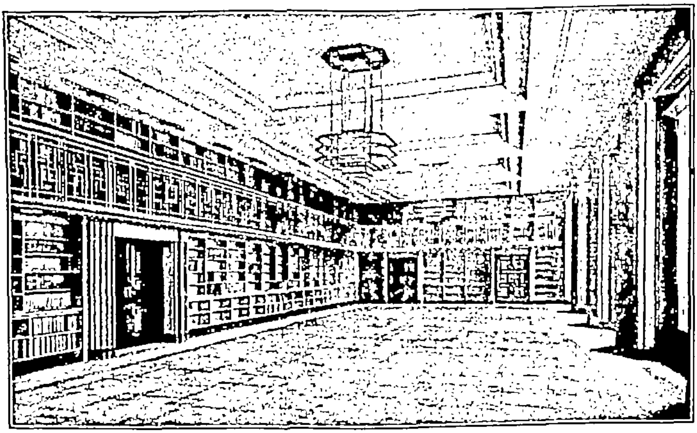
Having already published a full account[1] of the structure, we need now do no more than draw attention to some of its principal features. The accompanying photograph (Fig. 1) gives an idea of the outward appearance. The walls of Portland stone confer an air of permanence desirable in public buildings, and the work has been carried out with imagination as well as restraint. Thus the roving eye is at once edified by a frieze bearing the names of twenty-one pioneers of public health, and entertained by gilded insects on the balconies—surely the first official appearance of the louse as a decorative emblem?

The pioneers whose names are commemorated in the frieze are as follows:—

H. M. Biggs (1859–1925), Edwin Chadwick (1800–90), William Farr (1807–83), J. P. Frank (1745–1821), W. C. Gorgas (1854–1920), Edward Jenner (1749–1823), Robert Koch (1843–1910), C. L. A. Laveran (1845–1923), William Leishman (1865–1926), T. R. Lewis (1841–86), James Lind (1716–94), Joseph Lister (1827–1912), Patrick Manson (1844–1922), E. A. Parkes (1819–76), Louis Pasteur (1822–95), Max von Pettenkofer (1818–1901), John Pringle (1707–89), Walter Reed (1851–1902), Lemuel Shattuck (1793–1859), John Simon (1816–1904), and Thomas Sydenham (1624–89).

On the left of Fig. 1 is Gower-street, whilst on the right is the Keppel-street frontage and main entrance of the building. The block looking out on Keppel-street is mainly devoted to the rooms required for public use. The entrance hall affords direct access to a lecture theatre seating 250 persons. On the first floor is a library (Fig. 2), 33 feet wide and 120 feet long, apart from accessory rooms with which it communicates. On the third and fourth floors is the museum of hygiene, which has 15,000 square feet of floor space and will be open to the public. It is divided into three sections—namely, sanitary engineering, hygiene in

FIG. 2.



The Library.

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[1] THE LANCET, 1926, ii., 36.

the general sense, and tropical medicine—and many of the exhibits will be furnished gratis by commercial firms and kept up to date by them.

The rest of the building takes the form of a letter H whose bases rest on the Keppel-street block, and the whole is thus built round two courtyards, measuring 160 × 80 and 100 × 80 feet, in such a way that light and air are amply supplied to every part. The various wings and floors are divided into the territories of the various divisions and departments of the School, according to the description we have already given, and there are numerous large laboratories and lecture rooms admirably reflecting the intention of the architect and Director to make "a workshop in which all the parts will be appropriate for their use, durable and lasting in construction, and in proportions exactly related to the whole." At first sight, this ideal and its achievement may seem far removed from the temple schools where medicine was first taught in Europe; yet the new building in Bloomsbury is nothing if not the modern concept of a temple to Hygeia. It is true that five-sixths of its space will be reserved for teaching in one form or another, and the post-graduate student will be asked to work rather than to pray. But these two functions are now regarded as largely interchangeable and the record of the staff is a guarantee that prayerful research after truth will not be lacking in the proper places and that the sacred animals of this particular temple will not be sacrificed in vain.

The organisation of the School, and its connexion with special institutions and branches of the public health service, have been made clear in a number of editorial articles in our columns, and a certain amount of information about them can be gained from the list of the principal members of the staff, which follows. There is, however, one aspect of the work to which special attention may be drawn. In the words of Prof. Jameson "it is earnestly desired that the School should become a centre to which all those interested in public health may look for assistance and advice. Members of the public health service will have a common-room placed at their disposal, and will be welcomed at all times—not only at the lectures given by the staff of the School, but also at the series of special afternoon lectures to be delivered by recognised experts on special public problems. We have no greater need at the present time," he says, "than for some sort of centre where our own public health workers can meet those from other lands, and discuss how best the experience of both may be made of service to the world at large. In this respect the London School of Hygiene and Tropical Medicine may be expected to play a not unimportant part."

The School was inaugurated as one of the constituents of the University of London in 1924, and the new building is intended to accommodate up to 250 students (of all nationalities), of whom probably not more than 100 will be working at tropical medicine. The present staff includes the following:—

Director—Dr. Andrew Balfour.

Directors of Divisions—Public Health: Prof. W. W. Jameson. Bacteriology and Immunology: Prof. W. W. C. Topley. Biochemistry and Chemistry: Prof. Harold Raistrick, D.Sc. Epidemiology and Vital Statistics: Prof. Major Greenwood, F.R.S. Tropical Medicine and Hygiene: Dr. Balfour. Medical Zoology: Prof. R. T. Leiper, F.R.S.

Directors of Departments—Chemistry: Prof. M. E. Delafield. Helminthology: Prof. Leiper. Protozoology: Dr. J. G. Thomson. Entomology: Dr. P. A. Buxton.

Director of Institute of Animal Parasitology—Prof. Leiper.

The Secretary of the School is Mr. R. W. Harris, the Curator of the Museum Dr. H. B. Newham, and the Director of Library Services, Dr. J. F. C. Haslam.

BRITISH INSTITUTE OF RADIOLOGY (incorporated with the Rontgen Society).—The following officers have been elected for the coming year:—President: Mr. C. Thurstan Holland, F.R.C.S.; Vice-Presidents: Sir W. H. Bragg, F.R.S., Dr. L. A. Rowden, and Dr. C. E. S. Phillips; Hon. Treasurer: Dr. D. B. McGrigor; Hon. Secretaries: Dr. Stanley Melville and Mr. G. Shearer, D.Sc.; Hon. Editors: Mr. G. W. C. Kaye, D.Sc., and Dr. R. J. Reynolds.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) ACT.

IN the House of Commons on Wednesday, July 10th, the debate was resumed on the motion that an Address be presented to His Majesty, thanking him for the Gracious Speech from the Throne.

Mr. MACPHERSON moved an amendment to the Address regretting that the Gracious Speech contained no reference to the demand for the suspension of the operation of the Local Government (Scotland) Act, 1929, until further inquiry had been made as to its effect, and consultation had taken place with the authorities concerned. He said that at the General Election there was scarcely a platform in Scotland on which the local government proposals of the late Government were not described by the Labour Party as anti-democratic, retrograde and reactionary, and instead of the miserable allocation of the new block grant which they were going to get under that Act, it was suggested that they were going to get huge schemes for Scotland as soon as the Socialist Party were in office. This amendment gave the Government an opportunity to respond to Scottish democratic opinion. The Secretary for Scotland could not deny that there was a very strong and clamant opinion in Scotland against the Act, and the real question was whether the Government were prepared to give an opportunity for consultation with the local authorities. The Royal and ancient burghs of Scotland had been the pioneers of liberty, and it was no wonder that they resented the treatment given them under this Act. They were being well-nigh obliterated, so far as real powers were concerned. The individuality of the *Royal burghs had been the saving* grace of local government in Scotland, but under this Act that individuality was to be destroyed, and they were to become the creatures and serfs of the mushroom-growth County Councils. The parish councils, the second body concerned, were a thoroughly democratic body and, as the Prime Minister had suggested in his excellent vote-catching speech in Glasgow, there was no reason whatever why because boards of guardians were being abolished in England the equivalent body in Scotland, the parish councils, should be abolished too. Education had always had a special significance in the minds of the people of Scotland, and there was great animosity against the late Government for trying to wipe away the 1918 Education Act.

The Prime Minister's Pledge.

Mr. RAMSAY MACDONALD, Prime Minister, said that he wished it were possible to suspend the operations of the Act and consult authoritative Scottish representatives as to amendments and then pass them as quickly as possible, but he did not know whether that was possible. If Labour had five years, not only of office, but of power, before the end of that time, a Labour Goverment would consider the whole broad question of Scottish administration. This Act had been passed and was in operation. Mr. Macpherson suggested that the Government should take from the Act all that it liked and suspend all that it did not like. Was it practical politics or commonsense to bring in a new Bill that was not a suspensory Bill, but a suspensory Bill with a thousand and one exceptions? It would be full of complexities and would take more time than the original Bill. The Government had found that with a little adjustment they could separate education and suspend the education provisions of the Act. A Bill had been drafted and it would be introduced and printed so that the House could see what it was, and find out if it would be possible to get it through in a reasonable time. If that could be done with goodwill, which did not *amount to agreement, and with a helpful* discussion, the Government would find the necessary time. The pledge which he gave at Glasgow held. What was in his mind was this: If they could save education they must give the other parts of the machine time to work, and after about twelve months of experience an inquiry would begin. That inquiry would be primarily into local administration though he would be very sorry if the larger question of Scottish self-government were excluded.

Sir JOHN GILMOUR (who was Secretary of State for Scotland in the late Government) said that one of the difficulties in dealing with education in Scotland had been that more and more the education of the children was being linked up with the health services of the country, and if they were to have even ad hoc education authority, separate from those authorities which had to deal with the health of the children, there must obviously be cases where there would be a lack of co-ördination, an increased and unnecessary expenditure, and a duplication of officials, which was *unnecessary and undesirable.* All he could say at this stage, speaking for the Conservative opposition, was that while, of course, they would consider any Bill which His Majesty's Government might introduce, they stood by the Act as it left that House. In their view the proper procedure, whatever the Government might do at a later stage, was to let the Act come into operation. It was not fair to the local authorities or to the House of Commons to rescind an Act of a previous Government in a manner which left great dubiety in the minds of those who had to administer these questions.

Mr. T. JOHNSTON, Under Secretary of State for Scotland, said that they were faced with this situation. The teachers' organisations in Scotland had definitely taken a stand, for reasons which they considered to be valid, against ad hoc authorities. On the other hand, practically the entire body of local administrators in Scotland, people of all sections and classes and political persuasions, had declared in favour of ad hoc authorities. The Prime Minister had suggested that the House would be well advised to accept not an amending Bill, not a repealing Bill, but a mere measure of suspension so far as the education clauses were concerned, and that forthwith there should be set up an *inquiry—whether a committee or a* commission he was not in a position to say—before which all sections of public opinion in Scotland could present their views, and the House of Commons at a very early date would then be in a position to give a considered judgment as to whether or not the ad hoc system should be retained. The Government would use all their persuasive powers to induce the local authorities, education and health, during the interregnum and the period of inquiry to prevent overlapping, and to see to it that the health of the children should be properly looked after.

Physically Defective Children.

The Duchess of ATHOLL said that in previous debates when the Act was passing through the House reference was made to the overlapping that had occurred in regard to clinics under the ad hoc system, and also to the economy that would be possible in the provision of hospitals under the Act in general. There was another respect in which coördination between the medical services of the schools and of other authorities seemed to her vital to the welfare of the children of Scotland. She referred to the question of defective children. Anyone who had studied the question of physically-defective children knew that in the last few years a new hope had arisen on the horizon for those children. They were told on the highest surgical authority that there was real hope in the great majority of cases of preventing lasting crippledom provided the children could get orthopædic treatment at an early enough age. In England and Wales fully half the education authorities had schemes for the orthopædic treatment of children, every one of which had been concerted jointly by the education committee of the Council and the maternity and child welfare authority. Such concerted action had been very much facilitated by the fact that in many areas, notably in the county burghs, both these authorities were part and parcel of the main authority—namely, the borough council. As a result of this concerted action, if they visited one of these hospital schools for orthopædic treatment, they found, if it had been in existence for some time, that the children in it were very young, almost in arms, or at any rate "toddlers," because the medical officers realised how much more valuable work could be done if the children were brought there long before school age. As a result of this treatment there was in some areas practical evidence of the decrease of crippledom. In Scotland they had so far very little orthopædic treatment for these children. They had a splendid educational system, but that was one of the ways in which there was room for improvement. It was just as vital in Scotland as in England that any treatment of that kind should include children below school age, as well as those who were old enough to attend school. Was it not obvious that they would have a far better chance of coördinated concerted action in cases of this kind if the education authority was the town or county council which in Scotland under this Act would also be the authority for maternity and child welfare? Take again the case of the mentally-defective children. There were many children of this type who were not receiving proper care either in Scotland or in England. There were those who were described as educable in regard to whom the responsibility fell on the education authority, while those who were regarded as non-educable were at present under the parish council and district board of control. Very often these children fell between two stools and nothing was done for them. She had heard of cases where parish officers had come to the medical officer of the school authority and implored him to declare educable children previously declared non-educable so that the parish council might be relieved of the responsibility of looking after these children. Lately in England and Wales these children had been the subject *of a long and exhaustive inquiry by a committee which* had recently reported. The main purport of that report has been to ask for much more flexibility in the way of treating these children, and many suggestions were made for much closer coöperation between the authorities for the educable and the non-educable. Did not all that show the importance of having machinery in Scotland under which education would be one department of the county council and the care of these unhappy children who were declared non-educable would be the responsibility of another branch of the same body? That would offer them a chance which had not yet been provided for them. She was very pleased to think that many medical men and women were included in the ranks of those newly returned to the House of Commons as representatives of the Labour party. She would ask them how they could find it in their hearts and consciences to vote for the repeal of provisions which gave so much greater opportunities for the care of mentally-defective children than they had ever yet been able to enjoy?

Mr. JAMES STEWART said that he was strongly in favour of the unification of the health services. He believed that if they unified those services under one authority they would promote efficiency in a most important direction. But the late Government in their Act *did not do that.* They merely transferred from one authority to another the carrying out of the administration of the work of the parish council and of education. It would be a good thing if the Government would press on with the inquiry so that they might help to bring about the reform in local government which everyone in that House without regard to party was agreed was necessary.

Major ELLIOT said let the House end this interminable grinding and regrinding of outworn problems and settle this problem here and now, and pass on to newer and fresher problems which urgently needed consideration. The Conservative party were against this inquiry proposed by the Prime Minister; they were against the Bill which he proposed to print and circulate, and would offer it the most definite and uncompromising resistance. They believed quite firmly that the proposals which they had brought forward were for the good of Scotland, and that four-fifths of them had commended themselves to the people of Scotland. It was not proposed to touch them; they were to be allowed to operate, although it was proposed to inquire into them. With regard to the ad hoc or ad omnia education authority opinion, medical opinion at any rate was agreed that the unification of the health services should take place; and many were agreed that the control of finance by the central financing body should take place. Take away the control of finance and take away the health services and what was left of this ad hoc authority which it was proposed to put under the authority of an ad omnia body? The decision had been made, and the inquiries had been held: let them at any rate try what could be done under the new system. The Conservative party would vote with the Government on this occasion; they had no hesitation in voting down the suggestion for suspending the whole of the Act; when the proposal to take out some of its provisions came forward they would meet it with the same uncompromising opposition.

Reply to the Debate.

Mr. WILLIAM ADAMSON, Secretary of State for Scotland, replying to the debate, said that as to the coördination of effort on health and relief services he saw no reason why that should not be secured by coöperation between the local authorities concerned as it had been in the past. In fact, the threat to the life of the education authorities should be a warning that such coöperation was vital if their independent existence was to be justified.

The amendment to the Address was negatived by 374 votes to 61.

The Functions of Education Authorities.

On Friday, July 12th, Mr. W. ADAMSON, Secretary of State for Scotland, presented a Bill to amend the provisions of the Local Government (Scotland) Act, 1929, with regard to the functions of education authorities.

The Bill was read a first time.

THE HOUSING SUBSIDY.

On Monday, July 15th, the House of Commons went into Committee, Mr. YOUNG in the chair, on the following resolution:—

> That it is expedient that the provisions of the Housing Acts (Revision of Contributions) Order, 1928, relating to houses subject to special conditions in the case of which contributions are to be provided under section two of the Housing (Financial Provisions) Act, 1924, should cease to have effect and that the same contributions should be payable and the same provisions applicable in the case of any such houses completed after the thirtieth day of September, nineteen hundred and twenty-nine, as are applicable in the case of any such houses completed on or before that date, and that all such additional amounts as

may become payable by virtue of this Resolution should be defrayed out of moneys provided by Parliament."

Mr. GREENWOOD, Minister of Health, in moving the resolution said, that he proposed, until September next year, when the next revision was due, to maintain the subsidy under the 1924 Act, at its present level. The same policy had been adopted in the case of Scotland. As regards the subsidy under the Chamberlain Act he proposed that that should be allowed to fall, as the late Government desired that it should fall. He had received an assurance from an important body representing the local authorities of this country, that if the subsidy order was modified as the Government were now proposing, he could rely on the local authorities continuing their building programmes without the hiatus which would otherwise inevitably follow. The resolutions, and the Bill which would follow, were designed merely to bring a measure of stability and continuity to the building of houses to let, while a larger and more comprehensive scheme was being prepared and being passed through Parliament. He hoped that with the hearty coöperation of the building industry, and in the closest association with the local authorities, to secure within a relatively short time, the adoption of a reinvigorated and more determined housing and slum clearance policy.

Mr. NEVILLE CHAMBERLAIN said, that nobody would grudge the expenditure of very much larger sums on housing if he were satisfied that they were being usefully employed, but in this case it was practically certain that the money would not benefit those who were crying for cheaper houses, but would merely be distributed in some way throughout the various branches of the building industry. The Government were entitled to put their ideas to the test of practice, and having made his protest he (Mr. Chamberlain) felt disposed to see whether hard experience would not bring the conviction which solid argument had failed at present to do.

Lieut.-Col. FREMANTLE said that hon. Members should think for a moment of the gigantic amount of money which was being spent upon subsidies and on housing. He would not object if they were getting their money's worth, but he was bound to say as a medical officer of health, that there were any number of practical health schemes being turned down because they would cost perhaps £1,000,000, £2,000,000 or £500,000. Yet the Government were now proposing to increase the housing subsidy to the extent of £6,000,000 a year. All medical officers recognised the gravity of the housing question, and that by improving the housing of the working classes they could do more than in any other way, with the exception of education, to prevent ill-health in future generations. But they must consider the cost.

Dr. MORGAN said they had just listened to a speech from one who belonged to the same profession as himself, and the Committee would excuse him if he said at the outset that they had in politics two opposite views in the medical profession—the one reactionary, and the other progressive.

Lieut.-Col. FREMANTLE: Which is which?

Dr. MORGAN said he had listened with great care to what Col. Fremantle had said, and he would excuse him if he said as another member of a profession in which they were accustomed to conciseness, definiteness, and order, that he was surprised at the vagueness, indefiniteness, and almost incoherency of what he had just said. The bulk of what Col. Fremantle had just said meant that the housing policy which was being proposed that day—a policy which was put into operation for a considerable time by the Government which Col. Fremantle supported—was an extravagant one. Col. Fremantle said that the expenditure on housing now proposed was wrong. The late Minister of Health had asked the question: "Is the subsidy always to go on?" The Labour Party's answer was: "Yes, as long as overcrowding goes on." The report of the Special Committee appointed by the National Housing and Town Planning Council, stated that the Glasgow slums were described in the annual report of the Scottish Board of Health for 1926. The Commission appointed to hold the local inquiry wrote, among other things, that it was impossible to draw any picture which could adequately describe the conditions under which they found human beings living in practically the whole of the houses which they inspected. There were, it was true, differences in degree, but all were hopelessly unfit for habitation . . . . . . Damp was present everywhere, the walls and ceilings in a large number of houses being literally soaking. Everywhere they noticed an almost total lack of sanitation, conveniences being few, and for the most part out of repair, and in some cases leaking down the stairs and even into the houses. . . . . A very revolting feature of the slums was that the majority of the houses were infested with bugs. . . . . . . The Labour Party knew of these conditions, and that was why they wanted money spent on housing. The policy of the Government was not extravagant. They wanted the Minister of Health to increase the subsidy still further, and to see that more houses were built.

The Resolution was agreed to.

HOUSE OF COMMONS.

THURSDAY, JULY 11TH.

Thefts of Dangerous Drugs.

Mr. GEORGE OLIVER asked the Home Secretary whether his attention had been drawn to the number of thefts of drugs from motor cars belonging to doctors; and whether, in view of the increasing number of this class of theft and the consequent dangers arising therefrom, he proposed to take any steps to prevent medical practitioners leaving dangerous drugs unattended or in other than some reasonably safe place.—Mr. CLYNES replied: Yes, Sir, there have been a certain number of such thefts, but I am informed by the police that they are satisfied that these thefts are ordinary cases of petty larceny, and have no connexion with any form of traffic in dangerous drugs. It is a little difficult to see what action I could usefully take in the matter, but it is desirable that medical practitioners and others who have these drugs in their possession should be particularly careful to avoid any risk of their being lost or stolen, and I hope the publicity which has been given to the matter will lead to greater care being taken.

Mr. OLIVER: Is the right hon. gentleman aware that 20 cases of this description have taken place during the last twelve months; that yesterday in Bolton, drugs of a similar character were stolen, and that it is stated in the press to be more than likely that a quantity sufficient to kill 20 people has found its way into the hands of children?

Mr. CLYNES: I am not aware of any occurrence of that kind, but I think that the publicity now given to the subject is likely to reduce the number.

Mr. OLIVER: Will the right hon. gentleman suggest to the medical profession that if cases of this kind increase or continue at the same rate, some method will have to be adopted of enforcing penalties; and is the right hon. gentleman aware that criminal negligence on the part of miners or railwaymen is invariably punished with imprisonment?

Mr. CLYNES: I can only add, that if the terms of my answer are not effective, further steps might be taken.

Education of Blind, Crippled, and Deaf Children.

Mr. FOOT asked the President of the Board of Education, the number of blind and crippled children in England and Wales for whom no educational provision was being made.—Sir CHARLES TREVELYAN replied: According to the returns furnished by Local Education Authorities there were, on Dec. 31st, 1928, 602 blind, and 5336 crippled children not attending any school, though it must not be inferred that in all these cases some provision has not been made for their education.

Mr. FOOT also asked for the number of deaf children of school age in England and Wales, and the number of these who were being taught in special schools or special classes for the deaf.—Sir CHARLES TREVELYAN replied: Returns furnished by local education authorities show that on Dec. 31st, 1928, there were 8935 totally deaf children of school age in England and Wales, and that of these 3464 were being taught in special schools.

FRIDAY, JULY 12TH.

Nursery Schools.

Mr. REGINALD YOUNG asked the President of the Board of Education, if he would, at an early date, give effective help for the establishment of nursery schools and regard these schools as an integral part of his educational policy.—Sir CHARLES TREVELYAN replied: I am anxious to see an expansion in the supply of nursery schools, and I am considering what steps I can most effectively take to encourage their provision.

Mr. KELLY asked for the number of nursery schools in Lancashire, and the number in England and Wales.—Sir CHARLES TREVELYAN replied: The number of nursery schools in Lancashire is four, and in England and Wales 28. In addition the Board have approved proposals for eight new nursery schools, one of which is in Lancashire, and proposals for at least five other schools, including two in Lancashire, are in contemplation.

Percentage Grants for Maternity and Child Welfare.

Mr. SIMON asked the Minister of Health, whether he was aware of the feeling among those interested in maternity and child-welfare work, that the provisions of the Local Government Act, 1929, will hamper the development of this work; and if he proposed to take the necessary steps to prevent this by restoring the percentage grant for these services.—Mr. GREENWOOD replied: I am aware that in certain quarters there is an apprehension of this kind, but I could not undertake at the present stage to introduce legislation for the continuance of percentage grants for maternity and child-welfare work. The effect of the new system of grants on the development of the public health services will be carefully watched.

Local Hospitals and the National Radium Fund.

Sir CHARLES CAYZER asked the Prime Minister if he would consider the desirability, in connexion with the National Radium Fund, of allowing local hospital authorities to send earmarked contributions to the fund so that these might be doubled by the State grant, as was the case in connexion with the Miners' Distress Relief Fund.—Mr. GREENWOOD replied: I am afraid that I cannot undertake to adopt the hon. Baronet's suggestion, since, as was stated in the House on April 16th, the contribution from public funds towards the purchase of further supplies of radium is subject to a maximum limit of £100,000, and the equivalent of this sum has already been raised by private subscription.

Sir C. CAYZER: In view of the fact that £100,000 has been or will be contributed to this fund by the general taxpayers, does not the right hon. gentleman think that provincial hospitals have a very strong claim to receive some assistance from the central fund?

Mr. GREENWOOD: That matter is now being dealt with, and a statement will shortly be made public as to the manner in which the radium supply is to be allocated.

Deaths from Small-pox and after Vaccination.

Mr. WELLOCK asked the Minister of Health the number of deaths that had occurred during the last twelve months from small-pox and from the after-effects of vaccination respectively.—Mr. GREENWOOD replied: During the twelve months ended May 31st last, 30 deaths occurred in which small-pox appeared in the coroner's certificate or the medical certificate as the cause or one of the causes of death. In the same period there were 20 deaths which were returned as having been associated with vaccination.

Hours Worked by Mental Hospital Attendants.

Viscount ELMLEY asked the Minister of Health the number of hours worked weekly by the attendants at the Thorpe Mental Hospital; and whether he had received any reports from his inspectors regarding this matter.—Mr. GREENWOOD replied: The weekly hours of duty amount to 60¼ hours actual working time spread over five days. The attendants, however, are allowed two whole days consecutively off duty each week, and also 21 days' leave each year. These arrangements are in accordance with the recommendations of the Joint Conciliation Committee of the Mental Hospitals Association and the National Asylum Workers' Union. The answer to the last part of the question is in the negative.

Slum Clearance Schemes.

Mr. ALPASS asked the Minister of Health, in view of the dimensions of the problem of slum clearance and the urgency of dealing with the same, if he would state what steps he proposed to take to carry out that part of the policy announced in the King's Speech.—Mr. GREENWOOD replied: It is the intention of the Government to introduce legislation on this subject at an early a date as practicable.

Liquor Advertisements in Post Offices.

Viscountess ASTOR asked the Chancellor of the Exchequer if he will state the revenue derived from advertising intoxicants in the post offices for each of the last two years; and whether he will consider abolishing this revenue in the national interest.—Mr. H. B. LEES-SMITH (Postmaster General) replied: The Government has decided that liquor advertisements should be excluded from post office buildings and publications as soon as the provisions of existing agreements permit. The revenue at present derived from these advertisements is about £4000 per annum.

Census and Overcrowding Standard.

Mr. GRAHAM-WHITE asked the Minister of Health if he would cause a new standard of overcrowding to be used in the Census Reports of the Registrar-General.—Mr. GREENWOOD replied: I propose to give consideration to this among other matters which will arise in connexion with the preparations for the next census.

MONDAY, JULY 15TH.

Vivisection of Dogs.

Sir ROBERT GOWER asked the Prime Minister whether he would grant facilities during the present Parliament for the consideration of a Bill to make the vivisection of dogs illegal.—Mr. RAMSAY MACDONALD replied: I cannot undertake to give special facilities for a Bill of the nature indicated by the hon. Member. Private Members interested will no doubt use, as before, the facilities they have for testing the opinion of the House on the subject.

Education of Defective Children.

Dr. MORGAN asked the President of the Board of Education the comparative cost of educating a normal child, a blind child, a deaf child, and a mentally defective child, respectively; and whether part of this cost could be saved in future years by a judicious health expenditure in infant years by the development and extension of infant welfare centres.—Sir CHARLES TREVELYAN replied: The cost per child in an ordinary elementary school in 1927–28 was £11 15s. 4*d*. According to the latest statistics available, the cost (excluding loan charges) of educating a blind child is approximately £29 in a day school and £88 in a residential school, the corresponding figures for the deaf being £48 and £82, and for the mentally defective £25 and £71. The second part of the hon. Member's question raises issues which it is difficult to deal with in the limits of an answer to a question.

Mentally Deficient Children.

Dr. MORGAN asked the President of the Board of Education the total number of mentally deficient children in Great Britain now receiving education in special schools; whether he was considering further developments of such institutions in the near future; and whether the teachers were required to have special qualifications.—Sir CHARLES TREVELYAN replied: The number of mentally deficient children attending certified special schools in England and Wales for the year ending Dec. 31st, 1928, was 15,339. As regards the second part of the question, the hon. Member will be aware that a Joint Committee of the Board of Education and the Board of Control have recently presented a report which is receiving my careful consideration. I am sending the hon. Member a copy of a memorandum indicating the requirements in regard to teachers in schools for mentally defective children.

Lunacy Law Reform.

Mr. HORE-BELISHA asked the Home Secretary whether it was the intention of the Government to put into operation the recommendations of the recent Royal Commission regarding the reform of the existing lunacy law.—Miss LAWRENCE replied: This matter is under consideration, but my right hon. friend is not at present in a position to indicate when it will be practicable to introduce legislation on the subject.

Experiments on Animals.

Mr. BROMLEY asked the Home Secretary whether applicants for licences or certificates, under the Cruelty to Animals Act of 1876, for the performance of experiments on animals were required to state the number of animals they proposed to use for such experiments; whether the Home Office had any record as to the number of animals used, as distinct from the number of experiments performed, under that Act in 1927; and whether the Home Office had any record of the number of dogs and the number of cats used for experiments in 1927, under Certificate B, plus EE.—Mr. SHORT (Under Secretary to the Home Office) replied: The answer to each part of the question is in the negative. With regard to the last part, I may point out that Section 5 of the Act, which governs Certificate EE, does not distinguish between cats and dogs.

TUESDAY, JULY 16TH.

Operative Treatment of Physically Defective Children.

Duchess of ATHOLL asked the Secretary for Scotland the number of education authorities having approved schemes for the orthopædic treatment of physically defective children that included operative treatment where necessary and remedial after-care; and the number of such schemes that were provided jointly with the authorities for maternity and child welfare.—Mr. ADAMSON replied: No education authority makes independent provision for major operative treatment of physically defective children, such treatment being ordinarily carried out by the voluntary hospitals. Thirteen education authorities have approved arrangements for the treatment of deformities by massage and remedial exercises, and twenty-one education authorities have approved arrangements for treatment by orthopædic appliances. In practice all education authorities supply splints, surgical boots, and such like appliances where necessary. As regards the last part of the question, there is no scheme for orthopædic treatment provided jointly by an education authority and a maternity service and child welfare authority, though there are a number of cases in which there is coöperation between the two authorities in the use of premises.

Government and Local Government Act.

Mr. SCURR asked the Minister of Health, whether he had received representations from many important public bodies asking for the postponement of the coming into force of the Local Government Act; and, if so, whether he could make any statement on the matter.—Miss SUSAN LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend has received a certain number of representations from local authorities; it is not the intention of the Government to postpone the coming into force of the Act.

Town Planning in Built-up Areas.

Mr. SCURR asked the Minister of Health whether it was his intention to introduce legislation applying the principle of town planning to built-up areas.—Miss LAWRENCE replied: My right hon. friend hopes to introduce legislation on the subject.

Highlands and Islands Medical Fund.

Sir ROBERT HAMILTON asked the Secretary for Scotland whether he could state the present condition of the Highlands and Islands (Medical Services) Fund; whether the beneficial services assisted by the fund were being in any way curtailed; and whether steps were being taken to maintain the fund on a sound financial basis.—Mr. ADAMSON replied: The war-time accumulations in the fund will be exhausted within the next few months, and the present statutory income of the fund will require to be supplemented in order that the current year's liabilities may be met. While there has been no curtailment of established services assisted from the fund, and certain expansions have been sanctioned from year to year, other desirable developments have been delayed pending reconstitution of the fund. I have the whole position under consideration, and hope to be able to submit proposals to the House on an early date.

Ophthalmic Clinics.

Mr. DAY asked the Minister of Health whether he would give particulars of any experimental or ophthalmic clinics that had been set up under the provisions of the National Health Insurance Acts during the last six months.—Mr. GREENWOOD replied: No regulations have yet been made under the National Health Insurance Acts governing the provision of ophthalmic and other forms of treatment of insured persons in clinics, and, consequently, no clinics have up to the present time been set up under the provisions of the Act. A certain number of dental and ophthalmic clinics have been set up by private enterprise, and some insured persons have elected to obtain through them treatment towards the cost of which their approved societies have contributed by way of additional benefit; but no official recognition has yet been given to any of such clinics, and their continued use as agencies for the provision of treatment to insured persons entitled to additional benefits will be conditional upon their complying with such requirements as may, in due course, be laid down by regulations under the Act.

Obituary.

HAROLD ANDREW KIDD, C.B.E., M.R.C.S. ENG.

Dr. H. A. Kidd, who died suddenly at his home in London on July 12th, was the first medical superintendent of the West Sussex Mental Hospital, better known as Graylingwell, near Chichester, and held this post for 30 years. When the hospital was opened in 1896, Dr. Kidd took personal charge not only of the clinical side, but of the organisation as a whole, and worked out the details of administration with such success that for many years Graylingwell was famous as one of the most efficiently run mental hospitals in the country. During the war, Graylingwell was converted into a military hospital, and Dr. Kidd was appointed officer commanding, with the rank of Lieut.-Colonel, R.A.M.C. The patients in residence were removed to other mental hospitals, and nearly 30,000 wounded or sick soldiers were treated at Graylingwell. Operating theatres were devised, wards were converted, apparatus was procured, and Dr. Kidd had all the responsibility connected with this great change, and afterwards the arduous task of re-conversion. He was given a C.B.E. for his services, and received praise from all who inspected the ingenious temporary arrangements.

Dr. Kidd received his medical education at St. Mary's Hospital, which he entered with a science scholarship in 1883, qualifying in 1889. He turned at once to psychiatry, taking the post of assistant medical officer at the London County Asylum at Cane Hill, which he held for seven years. As a student, and indeed throughout his life, he was a keen athlete, playing Rugby football in his youth and later cricket, tennis and golf, with more than average skill. For years a team from St. Mary's Hospital went to Chichester for an annual cricket festival organised at Graylingwell and Dr. Kidd loved to welcome past and present students of the hospital to his delightful home. Dr. Kidd was a keen freemason and was Master of the Sancta Maria lodge in 1914, coming up to London regularly for its meetings. In this way he renewed old friendships and his connexion with St. Mary's was further strengthened in recent years by the entry of his eldest son, who qualified from the hospital in 1927.

Dr. Kidd was a genial and charming host and he delighted to show visitors ignorant of the routine of a large mental hospital how much liberty was compatible with the necessary discipline. He was keen to welcome any suggestions for improving conditions and was convinced that the difficulties standing in the way of further progress were mainly economic. His constant aim was to cut down only such administrative expenses as did not contribute to the comfort of patients or staff and to make Graylingwell as far as possible a self-supporting colony with a strong team spirit. He was rewarded by the trust reposed in him by his committee and the affection with which he was regarded alike by patients, colleagues, and nursing staff throughout his career.

Medical News.

UNIVERSITY OF OXFORD.—The Radcliffe Scholarship in Pharmacology has been awarded to J. R. Braybrooks, New College, and G. S. Grist, Pembroke College, who are equal in merit.

UNIVERSITY OF LONDON: *University College.*—The following awards have been made in the Faculty of Medical Sciences:—

Entrance Scholarship: J. C. Thomas (Christ's Hospital, Horsham).

Bayliss-Starling Memorial Scholarship in Physiology: F. G Young.

Cluff Memorial Prize (Anatomy, Physiology, Pharmacology, and Chemistry): E. A. Devenish.

UNIVERSITY OF SHEFFIELD.—At recent examinations the following candidates were successful:—

M.D.—Janet Breakey.

FINAL EXAMINATION FOR M.B., CH.B., WITH HONOURS.

Class II.—Frank Ellis and T. H. Pullar.

FINAL EXAMINATION FOR M.B., CH.B.

W. H. Carlisle, Iris M. Moody, and Isaac Slesnick.

UNIVERSITY OF LIVERPOOL.—Dr. W. J. Dilling has been appointed Dean of the Faculty of Medicine, and Prof. W. H. Gilmour Secretary of the Dental Board of Studies.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations for the Society's diploma of Master of Midwifery the following candidates were successful: B. P. Baliga, F.R.F.P.S. Glasg., C. A. Birch, M.D. Liverp., and W. C. V. Brothwood, M.B. Manch.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly meeting of the Council was held on July 11th, with Lord Moynihan, the President, in the chair. The President announced the re-election to the Council of Sir Holburt Waring, Mr. C. H. Fagge, and Mr. W. Sampson Handley, and the election of Prof. Graham Simpson. The newly elected members were introduced and took their seats in the Council.

Lord Moynihan was re-elected President, and Mr. C. H. Fagge and Mr. V. Warren Low were elected Vice-Presidents for the ensuing collegiate year.

Mr. R. H. Burne, F.R.S. (Physiological Curator), Mr. C. F. Beadles (Pathological Curator), Sir Frank Colyer (Honorary Curator of the Odontological Collection), and Mr. C. J. S. Thompson (Honorary Curator of the Historical Section of the Museum) were re-elected to their respective posts. Mr. W. R. Le Fanu, Second Librarian to the Hellenic Society, was appointed Assistant Librarian to the College.

Mr. H. J. Burrows was appointed Beaverbrook Research Scholar of the College for 1930 and 1931. Until the end of this year he will pursue tissue culture research at the Research Hospital, Cambridge. The Hallett Prize was awarded to Mr. L. A. Riddell, M.B. New Zealand, for the recent examination in Anatomy and Physiology for the Fellowship.

The Council elected the following Professors and Lecturers for the ensuing year:—

Hunterian Professors.—Sir John Rose Bradford, P.R.C.P., Mr. Victor Bonney, Mr. J. H. Fisher, Mr. G. E. Gask, Mr. W. Sampson Handley, Sir Arthur Keith (six lectures) and Mr. Geoffrey Keynes.

Arris and Gale Lecturers.—Mr. W. McAdam Eccles, Mr. E. R. Flint, Mr. R. H. O. B. Robinson.

Erasmus Wilson Lecturers.—Mr. C. E. Shattock and Mr. C. P. G. Wakeley.

Arnott Demonstrator.—Sir Arthur Keith.

Dr. John Eyre, bacteriologist at Guy's Hospital, was appointed Examiner for Part I. of the Examination for the Diploma in Public Health.—Lord Moynihan presented to the College a portrait-group of the Council in 1927–28, painted by Mr. Moussa Ayoub.—It was decided to have printed Plarr's "Lives of the Fellows," which have been edited by Sir D'Arcy Power, with the assistance of Mr. W. G. Spencer and Prof. G. E. Gask; and a guide to the Historical Section of the Museum prepared by Mr. C. J. S. Thompson.

The Fellowship of the College was conferred on R. L. Almond, and the Membership on V. L. Misso and R. M. Sargent, who had passed the necessary examinations and complied with the regulations.

Licences in Dental Surgery were granted to the following:

N. L. Barber, S. W. Beales, R. G. Boodle, D. S. Clogg, Marcus Cohen, F. N. Corfe, F. L. Crameri, J. P. Davies, W. F. Goddard, W. B. Harris, H. T. Honeybourne, G. E. S. Jeffery, S. R. Johns, R. E. L. Jones, F. F. Kennedy, J. J. D. King, J. F. Lockwood, A. A. Mallet, R. H. Matthews, J. I. Mathias, C. E. B. Maytum, David Monk, C. G. Moore, R. O. Murray, A. B. Nielsen, C. A. Pank, D. L. Parkes, William Peebles, H. E. Pickering, J. E. D. Pollard, T. W. E. Pugh, J. C. Read, L. G. Rowe, L. A. Sewell, P. R. Shepherd, Samuel Sidebotham, H. F. Strickland, W. L. Sutcliffe, C. A. Tinn, and A. L. Wraight.

The following diplomas were granted jointly with the Royal College of Physicians of London:—

Diploma in Psychological Medicine.—Leonard Barber, Flora H. MacD. Calder, Viola C. Cameron, Ruby T. Curr, S. W. Davies, J. H. Ewen, E. A. Haslam-Fox, J. E. S. Lloyd, S. V. S. Rao, and Kathleen M. Todd.

Diploma in Laryngology and Otology.—B. R. Chaudhri, Patrick Hickey, G. J. Hutchison, Rajnarain Kacker, W. A. Kerr, K. S. May, R. F. Paterson, C. L. Rosenfield, and Gobind Vaishnavi.

ST. THOMAS'S HOSPITAL.—An address and a sum of money from past and present students will be presented to Robert Hopkins, Bedell of the Medical School of St. Thomas's Hospital, at the annual dinner on Oct. 4th, to celebrate his fiftieth year in the service of the School.

BEIT MEMORIAL FELLOWSHIP FOR SCIENTIFIC AND MEDICAL RESEARCH.—At the last meeting of the Trustees of this establishment the report of the hon. sec., Sir J. Kingston Fowler, alluded to the frequent resignation of the Fellowship as a practical tribute to the status of those who were selected for them, inasmuch as it meant the appointment of the Fellows to permanent posts.

The following were elected to Fourth Year Fellowships:—Richard J. Lythgoe (Electric reactions in connexion with Special nerves) and Maurice W. Goldblatt (carbohydrate metabolism).

The following elections have been made to Junior Fellowships, the subjects of research being announced:—

Robert Hill (from the Biochemical laboratory, Cambridge), specificity of hæmoglobins.

Ann Bishop (from the Molteno Institute for Parasitology, Cambridge), completion of studies on the morphology and development of Trichomonas of man and monkeys in culture.

Cuthbert Leslie Cope (from the Radcliffe Infirmary and Physiological and Biochemical Laboratories, Oxford), the diuretic responses of normal and pathological kidneys in man to tubule diuretics, especially to intravenous sodium sulphate.

Leonard Ernest Bayliss (from the department of Physiology and Biochemistry, University College, London), the metabolism of the isolated heart and kidney by means of the heart-lung and heart-lung-kidney preparation and the artificial oxygenator of Bayliss, Fee, and Ogden.

Walter Phillips Kennedy (from the Physiology Department and Royal Infirmary, Edinburgh), investigations into the function of the Ovary, including *in vivo* and *in vitro* actions of oestrin and the hormone of corpus luteum. The research is now in progress.

Eric Boyland (from the Lister Institute), investigation of the mechanism of carbohydrate metabolism.

Edwin Martin Case (from the Sir William Dunn Institute of Biochemistry, Cambridge), the study of the metabolism and thermodynamics of muscle. This research is already in progress.

Kenneth A. C. Elliott (from the Biochemical Laboratory, Cambridge), the study of biological oxidations.

Margaret Honora Roscoe (from the Lister Institute), continuation of the investigation begun in conjunction with Dr. Aykroyd (Aykroyd, 1929) on the distribution of the anti-pellagra vitamin B2 in natural foodstuffs and a comparison with the distribution of the anti neuritic vitamin B1. The methods of vitamin assay will be those described by Chick and Roscoe (1928, 1929) using the growth of rats as criterion. The distribution of the antineuritic vitamin has hitherto only been studied in connexion with the prevention and cure of polyneuritis in birds. 2. Investigation of possible synthesis of vitamin B1 and B2 in the intestine, as the explanation of the phenomenon of refection described by Fridericia of Copenhagen (1926) and Roscoe (1928). Study of the anti-pellagra vitamin B2 in connexion with the antineuritic vitamin B1.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, July 22nd.—2.30 to 5 P.M.: Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

THURSDAY, July 25th.—4.30 P.M., Mr. Kenneth Walker: The Enlarged Prostate.

Appointments.

BAKER, Doris, M.D., M.R.C.P.Lond., has been appointed Assistant Physician to the South London Hospital for Women, Clapham Common.

COTTRELL, J., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for Grimsby.

GAVIN, F. W., M.D., Ch.B. Edin., D.P.H., Asst. M.O.H. and School M.O. for Croydon.

St. Thomas's Hospital: COOKE, A. M., B.M., B.Ch. Oxf., M.R.C.P.Lond., Deputy Director of the Medical Unit; CHESMAN, W. E., M.B., B.Chir.Camb., M.R.C.P.Lond., First Assistant to the Medical Unit; JONES, B. H., M.D., B.S. Lond, M.R.C.P.Lond., Resident Assistant Physician.

ILFORD, Borough of: EDGECOMBE, K., M.D., Ch.B., D.P.H. Liverp., Assistant Medical Officer of Health; and CROW, A. F., M.B., Ch.B., L.D.S., Assistant Dental Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—Asst. Radiologist. £300.

Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham City Mental Deficiency Institution, Coleshill Hall.—Med. Supt. £700.

Birmingham, General Hospital.—Res. H.P £70. Also Second Asst. Visiting Anæsthetist. £50.

Birmingham University.—Lecturer in Physiological Dept. £400.

Birmingham Union, Erdington House.—Res. Asst. M.O. £250–£350.

Bootle Borough Hospital, Derby-road.—Sen. M.O. Also Two Jun. M.O.'s. At rate of £150 and £125 respectively.

Birmingham and Midland Eye Hospital, Church-street.—Res. Surg. O. Also Two H.S.'s. £160 and £110 respectively.

Bradford Children's Hospital.—H.S. Also H.P. Each £120.

Bradford Royal Infirmary.—Two H.S.'s. Each £150.

Bristol General Hospital.—H.P.'s and H.S.'s. Also Obstetric Officer. Each at rate of £80. Also Cas. H.S. At rate of £30.

British Red Cross Society's Clinic for Treatment of Rheumatic Diseases, Park Square East, Regent's Park.—Med. Supt. £600.

Burton-on-Trent General Infirmary.—2nd Res. H.S. £150.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Cairo, Egyptian University.—Prof. of Clinical Pathology. £E.1500.

Chester Royal Infirmary.—H.S. and Cas. O. £120.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Croydon Mental Hospital, Upper Warlingham.—Second Asst. M.O. £350.

Derby, Derbyshire Hospital for Women.—Hon. Asst. S. Also H.S. At rate of £150.

Devonport, Royal Albert Hospital, &c.—Asst. H.S.'s. At rate of £50.

Dewsbury and District General Infirmary.—H.S. £200.

Doncaster Royal Infirmary.—H.S. £150.

Dudley, Guest Hospital and Eye Infirmary.—H.S. £150–£175.

Dundee Royal Infirmary.—Visiting M.O.

Durham County and Sunderland Eye Infirmary.—Locum.

East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £150.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Exminster, Devon Mental Hospital.—Jun. Asst. M.O. £300.

Gloucester, Gloucestershire Royal Infirmary, &c.—Second H.S. At rate of £100.

Great Yarmouth General Hospital.—Jun. H.S. £100. Also Sen. H.S. £150.

Hull and Sculcoates Dispensary.—M.O. £500.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Indian Medical Service.—Commissions.

Liverpool, St. Paul's Eye Hospital, Oldhall-street.—H.S. £60.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Longton Hospital, Stoke-on-Trent.—H.S. £120.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Macclesfield General Infirmary.—Res. H.S. £180.

Manchester City.—Asst. Tuberculosis Officer. £650.

Manchester, Royal Eye Hospital.—Jun. H.S. £120.

Miller General Hospital, Greenwich-road, S.E.—Hon. P. to Skin Dept.

Nottingham City Education Committee.—Sen. Asst. School M.O. £600.

Philadelphia, Hospital of the Woman's Medical College.—Hospital Resident.

Plymouth, City and Port of.—Asst. M.O.H. £600.

Plymouth Poor-law Institution.—Res. Locum Tenens.

Plymouth, Udal Torre Sanatorium, Yelverton.—Res. M.O. £450.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Asst. P.

Queen Mary's Hospital for the East End.—Hon. Asst. Radiologist.

Radcliffe-on-Trent, Notts County Mental Hospital.—Sen. Asst. M.O., &c. £520.

Rotherham Hospital.—Sen. H.S. £200.

Royal Army Medical Corps.—25 Commissions.

St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively.

Salisbury Municipality, S. Rhodesia.—M.O.H. £900.

Sheffield Royal Infirmary.—Surg. Reg. £200. Also Asst. Cas. O. H.S., Ophth. H.S., and Asst. Ophth. H.S. Each at rate of £80.

Society of Apothecaries of London, Water-lane, Queen Victoria-street, E.C.—Examiner in Midwifery.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £120.

Stafford, Staffordshire General Infirmary.—H.S. At rate of £200.

Stockport Infirmary.—H.S. £175.

Swansea Hospital.—Cas. O. £150.

West London Hospital, Hammersmith, W.—Res. Anæs. At rate of £100.

West Riding C.C., Yorkshire.—Temporary Pathologist. £750.

Willesden General Hospital, N.W.—Two Clin. Assts. to Special Departments. Also Ophthalmic Surgeon.

Winchester, Royal Hampshire County Hospital.—Res. H.S. £150.

Worcester County and City Mental Hospital, Powick.—Jun. Asst. M.O. £350.

Worthing Hospital.—H.S. At rate of £150.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Addingham (York, W.R.), Uffculm (Devon), Haverhill (Suffolk), and Clwt-y-bont (Cærnarvonshire).

Births, Marriages, and Deaths.

BIRTHS.

CALVERT.—On July 12th, 1929, to Nancy (*nee* Marsden), wife of Dr. E. G. B. Calvert, 132, Harley-street, W.—a son.

DUCHESNE.—On July 10th, at "Langton," Swanage, Dorset, the wife of H. W. Duchesne, L.D.S., R.C.S.Eng., of a son.

MARRIAGES.

MARTEN—MONTEITH.—On July 6th, at Christ Church, Westminster, Robert Humphrey Marten, M.D., of Adelaide, South Australia, and Artillery Mansions, S.W., to Mary Elizabeth, elder daughter of the late Charles Dickey Monteith and Mrs. Monteith, of Carlton-hill, Exmouth.

REEVES—ENGLISH.—On July 13th, at St. Matthew's, Westminster, Guy Kingham Reeves, L.R.C.P.Lond., M.R.C.S. Eng., of Tulse-hill, S.W., to Audrey Malcolm English, of Poynders-road, S.W.

RUSSELL—WATERS.—On July 10th, at St. Mary Magdalene's Church, Westerfield, Henry Stewart Russell, B.Sc., M.B., Ch.B., to Betty Coyne Waters, B.A.Cantab., M.B., B.S., elder daughter of Mr. and Mrs. H. E. Waters, Westerfield, Suffolk.

DEATHS.

BISHOP.—At Bathurst, Gambia, West Africa on 20th May, 1929, Thomas Bishop, L.R.C.P.E., &c., J.P. and Coroner, aged 61.

BURY KNIGHT.—On July 10th, at Wooldown, Marhamchurch, Bude, Henry Bury Knight, M.R.C.S., L.R.C.P., aged 58.

CROOK.—On July 11th at Dumpton Cottage, Park-avenue, Broadstairs, Herbert Evelyn Crook, M.D.Lond., F.R.C.S. Eng., Barrister-at-Law of the Middle Temple, aged 64.

IRVING.—On July 12th, at Bedford, Major Henry Court Irving, L.R.C.P., L.R.C.S., late of British Guiana Medical Service, aged 68 years.

KIDD.—On July 11th, suddenly, at Addison Court-gardens W., Harold Andrew Kidd, C.B.E., late Medical Superintendent, Graylingwell Mental Hospital, Chichester, and late Lieut.-Col. R.A.M.C., aged 65.

MALING.—On Tuesday, July 9th, at St. Monica's, Micheldever-road, Lee, George Alan Maling, V.C., M.A., M.B., B.Ch. Oxon., aged 40 years. Interment at Chislehurst Cemetery.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

FOUR MILLENIUMS OF CHINESE MEDICINE.

BY K. C. WONG.

To the uninformed the term Chinese medicine conveys either a dark picture of charms, incantations, and magic, or one of disgusting concoctions, painful manipulations, unsightly plasters, and worthless remedies. Everywhere, however, superstition and healing are so closely related that it may be impossible to draw a line between them, and while there are quacks in China just as in other countries, the Chinese regular practitioner treats diseases according to rules and standards and has a clear conception of the responsibilities of his calling. From a mass of folly and nonsense there has been produced a rational, semi-scientific, and dignified empirical practice, which is based upon the accumulated knowledge of 40 centuries and which represents the thoughts and experiences of many bright minds. Chinese medicine as it exists at the present time is comparable to the situation of medicine in Europe during the sixteenth century, and viewed from the historical standpoint, it was at least equal to, if not more profound than, that of other countries at the same period. It certainly merits deeper investigation than it has heretofore received, when it will earn greater appreciation. Many books and very many articles have been written on the superstitions of Chinese medicine, but its more scientific aspects have scarcely been touched upon. The present short sketch attempts to deal more particularly with its proper position in history, its value and defects, and its relation to scientific medicine. In this brief survey no attempt will be made to give full references for the conclusions arrived at; only the outline of the medical conception of the various dynasties will be drawn.

FOUR EPOCHS.

Four distinct epochs may be distinguished: (I.) From the dawn of history to the end of the Shang Dynasty, 1154 B.C., may be termed the legendary period. Thereafter the accounts were more authentic and the legendary developed into the historical. (II.) Beginning with the Chow and ending with the Tang Dynasty (1000 B.C. to A.D. 960) may be styled the historical or classical period. Chang Chung-king, the Hippocrates of China, and Hua To, the most celebrated surgeon, lived late in the middle of this period—viz., A.D. 195. (III.) From the eleventh to the seventeenth century there was a marked change in Chinese medical thought. Instead of the pedantic worship of the ancients the publications of this period are mostly controversial in character, old writings being attacked as well as current opinion. Four schools were recognised and subsequent writers all revolved round these different schools. This period may be called the mediæval or controversial period. (IV.) With the introduction of Western medicine in A.D. 1805 came the modern or transitional period. The most prominent feature of this period is the struggle for supremacy between the old and the new. The latter, however, is slowly and steadily gaining ground. Though it may take some time the dawn of another golden era is looming large on the medical horizon of China.

I. THE ANCIENT OR LEGENDARY PERIOD.

There are many legends concerning the founders of Chinese medicine. The first was Sheng Nung, 2737 B.C., the originator of the Materia Medica. Like Mithridates, King of Pontus, who achieved a reputation in the art of taking poisons, he has said to have tasted 70 different kinds of poison every day and established the art of pharmacology. To him is usually ascribed the writing of the Pentasso or great Herbal which is supposed to be the earliest Chinese scientific work. Sheng Nung is venerated as the Father of Medicine. Another noted and nearly contemporary figure in Chinese healing art was Prince Hwang Ti, 2697 B.C. In conjunction with Chi Pok, one of his Ministers, he was said to have written the famous Nei Ching or Canon of Medicine. But historical researches prove that this important medical classic was not composed by him but was a later production written probably about 1000 B.C. What the Four Books are to the Confucianists the Nei Ching is to the native doctors. Upon it is built most of the indigenous medical literature of China, and so important is it considered by medical men that even at the present time, 3000 years after it was written, that it is still regarded as the greatest authority, though it is the oldest Chinese treatise on medicine proper extant. It has been translated into

French by Dabry. A third name to be mentioned in this legendary period is I Yin, the able and faithful Prime Minister of Emperor Tang, founder of the Shang Dynasty, 1783 B.C. He is credited with the discovery of making medicinal decoctions.

As with the early civilisations of other countries religion and astrology merged into healing, so in China the medical profession was from the earliest times under the sway of priestcraft and sorcery, and it was not until the Chow Dynasty, 1140 B.C., that the functions of these two professions were separated. An interesting sidelight on this situation is thrown by the formation and development of the ancient written character for doctor. It is composed of three parts; at the top and left corner is a quiver, at the right corner a spear, and below is the symbol common to sorcerer or priest. The significance is that the priest employs strong weapons to kill or expel the demons of disease. Later this last symbol was changed to that for wine, signifying that the profession was no longer in the hands of the priests but had passed to the regular doctors who administered wines (elixirs) to their patients. A study of the archaic writing of Chinese characters will throw much light on the medical conditions of the various periods.

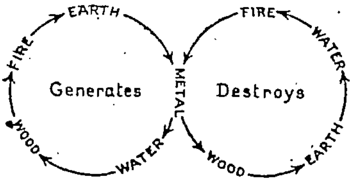
II. THE HISTORICAL OR CLASSICAL PERIOD.

Documented history does not extend further back than the middle of the Chow Dynasty, 723 B.C., one of the most glorious periods in Chinese history. Literature, art, philosophy, government, religion, and all that is included in the term civilisation flourished and reached a high degree of development. Laotzu, Confucius, Mencius, and most of the famous philosophers lived during this period, and these men speculated on all things, and their influence was so great that it was felt in every branch of literature. But, as a result, we find medicine no longer an effective practical although restricted art based upon observation and knowledge. We see rather, masquerading under its name, pretentious systems of healing carried to an absurdly extravagant pitch; we have elaborate systems of theoretical knowledge developing in complexity without gaining in meaning, tending to become less and less effective in practice. The study of medicine was dominated by the scholastic subtleties of visionary philosophers, and reverence for authority became petrified formalism with a pedantic excess of detail. And these varied speculations on the nature and causation of disease led to the evolution of two doctrines which formed the basis of the whole of Chinese medicine.

Yang and Yin.

The first doctrine is that of the two principles or primordial elements called "Yang" and "Yin." Everything under the sun is supposed to originate from them. They are generally represented by a circle named the great absolute or infinite void, which is divided into two pear-shaped bodies by a curved line. Attendant upon these diagrammatic elements are eight symbols, each made up of a combination of triple lines whole and broken, arranged in such a manner as not to repeat itself. This Pah-kwa or eight trigrams is supposed to date from Fuh Hsi, 2353 B.C.—the plan being revealed to him on the back of a supernatural animal called a dragon horse, that rose from the waters of the Yellow River. Each of the eight trigrams has a special name with symbolic and fanciful meaning, but no one has been able to give a definite interpretation to them. Confucius was greatly enamoured of these figures, and said that if he could devote 50 years to the study of these lines he might attain wisdom. The Yang and Yin principles represent the male and female element. They stand for heaven and earth, the sun and the moon, day and night, heat and cold, life and death, positive and negative, strong and weak, corresponding to Ohrmuzed and Ahriman of the Zoroastrians, Asiris and Isis of the Egyptians, the even and odd of Pythagoras.

The Five Elements.



The second doctrine is the five elements which are metal, wood, water, fire, and earth. The human frame is supposed to be made up of a harmonious mixture of these primordial substances. So long as the proportions remain proper, health exists; but if the balance is disturbed, disease follows. The five elements again interact on one another, thus:—

Metal generates water; destroys wood.
Water „ wood; „ fire.
Wood „ fire; „ earth.
Fire „ earth; „ metal.
Earth „ metal; „ water. (See figure.)

Corresponding with the five elements are the five organs—spleen, liver, heart, lungs, and kidneys—which are further related in a complex system of arrangements to the planets, colour, taste, climate, &c., according to the following scheme:—

	Organ.	Planet.	Element.	Colour.	Taste.	Climate.	Direction.
1	Heart.	Mars.	Fire.	Red.	Bitter.	Hot.	S.
2	Liver.	Jupiter.	Wood.	Green.	Sour.	Windy.	E.
3	Spleen.	Saturn.	Earth.	Yellow.	Sweet.	Moist.	C.
4	Lungs.	Venus.	Metal.	White.	Pungent	Dry.	W.
5	Kidney.	Mercury.	Water.	Black.	Salt.	Cool.	N.

S = South; E = East; C = Centre; W = West; N = North.

This reminds us of the humoral pathology of the Greeks, the Chinese system, however, being more complicated.

Classical Medicine.

Turning to the more strictly medical aspects of the classical epoch, the first authentic doctor who practised medicine and surgery appears to have been Pien Chiao, who lived about 255 B.C. Round him legends cluster. It is said that he could see through the human body, all diseases of internal organs being revealed—an anticipation of the X rays. In the Lietse the following story is related. Ching Wu of Lu and Tsi Ying of Chao were sick, and both asked Pien Chiao to treat them. He gave them a narcotic wine to drink which made them unconscious for three days. He opened their chests, exchanged their hearts, and when they awoke they felt as before, and took leave and returned home. This is the earliest record of the use of anæsthetics in China. But Pien Chiao is also regarded as the first exponent of taking the pulse which is considered indispensable by native doctors in diagnosis.

Massage has been practised in China from time immemorial. Its value is fully recognised, and in the Tang Dynasty it was elevated as a science, formed one of the seven departments of medicine, and at universities a special chair of massage was established with a professor in charge of it. But after the Sung Dynasty the practice degenerated till at the present day it is mostly in the hands of the barbers and the blind.

Acupuncture is a very old Chinese method. On the body 367 points of puncture are described, and more harm than good is done by its practice as asepsis is unknown to native doctors. The use of acupuncture spread early to Japan and, according to Remusat, it was introduced into Europe by Ten-Rhyne, a Dutch surgeon, at the end of the seventeenth century and was much extolled in France early in the nineteenth century. The late Sir James Cantlie and others tried it on sprains of joints and in chronic rheumatism and reported very favourably on it, and with further investigation it might prove a useful addition to our armamentarium. In the Imperial Academy of Medicine at Pekin there is still to be found a copper model of the human figure pierced with holes at the proper places for puncturing. The model is covered with paper and the student practises needling to discover a particular hole.

Anatomy and Dissection.—Because of the great reverence for the dead, human dissection was seldom attempted; hence gross mistakes are found in the Chinese conceptions of anatomy and physiology. But dissection was described in 2697 B.C. In the Lin Shu it is stated that after death the body may be dissected and observations made as to the size of the organs, the capacity of the intestines, the length of the blood-vessels, and so on. In the Han Dynasty Emperor Wang Mang captured a revolutionary and ordered his physician to dissect his body. Measurements were made of the internal organs and bamboo rods were inserted into the blood-vessels to see where they began and when they ended. Many records of this nature are in ancient literature, and about 2000 years before Harvey made his discovery of the circulation of the blood, the Chinese made a near guess at the story. For we find the following significant passages in the Canon of Medicine: "All the blood is under the jurisdiction of the heart. The 12 blood-vessels are deeply hidden between the muscles and cannot be seen. Only those on the outer ankles are visible because there is nothing to cover them in these places. All other blood-vessels on the surface of the body are 'loh' vessels (veins). The harmful effects of wind and rain enter the system first through the skin. It is then conveyed to the 'sun' vessels (capillaries). When these are full it goes to the 'loh' vessels (veins), and these in turn empty into the big 'chin' (arteries). The blood current flows continuously in a circle and never stops."

Examinations.—State medical examinations were held in China as early as the tenth century B.C. In the Chow rituals it is stated at the end of each year the work of the doctors was examined and the salary of each fixed according to the results shown.

Hygiene, General and Personal.—Sanitation was in a comparatively advanced state throughout much of this period. Wine-drinking was prohibited. The law against it was as stringent as the present prohibition laws are in the United States of America. There were special doctors to look after food and drink, dietitians, physicians, surgeons, and veterinary surgeons being the four classes of doctors. Temperance in the broad sense of the word was strongly advocated. The value of exercise was recognised. From experience the medical profession learned many laws of eugenics, though their real meaning was imperfectly understood, Many very sensible rules were laid down for prenatal care.

Hospitals.—These were established more than 600 years before the celebrated Basilian monasteries, yet in spite of such a good start the Chinese were slow to push their investigations into disease further: on the contrary, they lost sight of many of the valuable discoveries left them by their predecessors.

(*To be continued.*)

NEW CATALOGUE OF LEWIS'S LIBRARY.

THE new catalogue of Lewis's medical and scientific circulating library (136, Gower-street, London, W.C.1), which has proved indispensable to generations of students and medical men, has now been issued, revised to the end of December, 1927. It is published in two parts, conveniently bound together, of which the first (408 pages) is devoted to authors and titles arranged alphabetically and the second (166 pages) is a classified index of subjects with the names and initials of those authors who have written on them. To meet a suggestion made by critics of the last edition of the catalogue, now more than ten years old, the publishers state in a note to Part II. that authors' initials have been added to facilitate reference to the body of the catalogue. Unfortunately these are not uniformly supplied, and seem to be omitted in an undue proportion of foreign names where they are perhaps most needed. This is almost the only disappointment we have had in examining a catalogue that will be welcomed not only by subscribers but by men of science throughout the empire. In medicine and its allied sciences at least, it provides a list of publications in each subject which includes all the important works published in the English language. A bi-monthly list of new books and new additions is issued, so that subscribers are kept up to date. It is worth remembering that surplus copies of books withdrawn from circulation are offered at reduced prices. The catalogue is available to subscribers at 7*s.* 6*d.* and to non-subscribers at 15*s.*

NEW PREPARATIONS.

OLEOCAL: DRAGEES AND GRANULATE (Messrs. Wilcox, Jozeau and Co., Ltd., 15, Great St. Andrew-street, London, W.C.)—These two preparations of cod-liver oil in concentrated and solidified form are claimed by the Laboratoire des Produits Scientia, Paris, to contain the vitamins A, B, and D, salts of iron, and calcium and phosphorus. The great advantages of a form of supplying cod-liver oil which may be taken in all seasons and all climates with ready toleration need not be insisted upon. For adults the dose is 6 to 10 dragees, or 3 to 5 teaspoonfuls of the granulate each day in three doses with meals; for children the recommended dosage is 3 to 6 dragees according to age, or 1 to 3 teaspoonfuls of the granulate. The preparation may be broken up in the mouth or swallowed whole.

BAKOLYSE.—This preparation is distributed by the Anglo-French Drug Company, Ltd., 238A, Gray's Inn-road, London, W.C., and manufactured at the Sauvin laboratories in Paris, in accordance with the formula of Dr. Hervouet. It is a solution of amino-acids and creatinin for injection and in the hands of French physicians appears to have met, with success. The ampoules are supplied in boxes of ten, while the average dose is two ampoules weekly, the physician, however, watching the method of administration. The preparation is designed for states of malnutrition, especially tuberculosis. The formula seems to be a perfectly logical one, but the information supplied with the samples is not impressive.

ARCOLAX.—Messrs. Roberts and Co., 76, New Bond-street, London, W., call our attention to the properties of the seeds of psyllium plantago, which are sold by them under the name of Arcolax. The plant is found in the native state in many parts of the Mediterranean littoral, and the shining inodorous and tasteless little psyllium seeds, when ingested, expand to approximately four times their original volume. A quantity of mucilage is poured out, while the oil of the seeds is emulsified and fitted for absorption. The claim is that as a result, and without any interference with normal action, the mucous membrane of the intestine is lubricated and defæcation facilitated. Care has been taken that the seeds are sold in a clean state, and free from extraneous matter. The recommended dose for commencing a course of treatment for constipation is one teaspoonful, more or less as found necessary, in two or three times that quantity of water at bed-time. Arcolax is sold in boxes containing sufficient seeds to last a fortnight, if taken with the above dosage, while a point of some value is that the dose can be gradually reduced, and the times of administration spaced out until the preparation can be dispensed with.

PLASMONA.—This preparation, which is manufactured by Plasmon, Ltd., 66A, Farringdon-street, London, E.C., was analysed by us, and reported upon as recently as Dec. 15th last year. It claims to be a blood and nerve food containing the anti-anæmic principle of liver combined with lipoid compounds, together with the vitamin factors A, B, D, and E. We are informed that by a new process of manufacture a pleasant flavour is now imparted to the preparation, while its full strength is preserved. It may be mixed with either cold or warm milk, but boiling liquids should not be used as they destroy the efficacy of the preparation, which may be taken in place of tea, coffee, or cocoa.

GENOZO TOOTH PASTE.—We have received from Genatosan, Ltd., of Loughborough, Leicestershire, a specimen of this tooth-paste, which is designed to be antiseptic and therefore a preventive of pyorrhœa. The statement made by the firm as to the composition of a bacterial emulsion called Genovax is as follows: Streptococci, 15,000 millions per c.cm.; *M. catarrhalis*; 2000 millions per c.cm.; staphylococci, 2000 millions per c.cm.; *B. proteus*, 1000 millions per c.cm.; antiseptic content phenol, 0·5 per cent. Genovax is the "bacterial emulsion" alluded to in the formula for Genozo tooth-paste, which is given as glycerinum, 47·65; magnes. silic. and calcii carb. præcip., 49·22; bacterial emulsion and phenol, 0·76; ol. limonis and ol. menth. pip., 2·36; colouring, 0·01. The texture and flavour of the paste are very agreeable.

DIGIPAN; SICCOPAN.—These two preparations have reached us through the British agents, Messrs. Coates and Cooper, 41, Great Tower-street, London, E.C. For Digipan which is described as "physiologically standardised digitalis glucosides," it is claimed that through uniformity of composition and keeping qualities the drug can be used in a safe manner when the familiar indications for its employment are present. It is put up in solution, in ampoules, and in tablets by the manufacturers, the Temmler Chemical Works Berlin-Johannisthal, Germany, and is supplied to the medical profession only.

Siccopan is a nutritive food containing about 60 per cent. of dried hæmoglobin, with the addition of lecithin albumin, calcium lactate, and soluble silicic acid. The preparation is put up by the Sicco A.-G. Chemical Works, Berlin, which firm states that the slaughter-houses, whence the fresh blood is obtained, are in close proximity to their works, so that the process of drying can be carried out at a low temperature and fermentation avoided. The preparation might well be valuable in cases of anæmia and in convalescence after severe long illness or operation.

AT a special meeting of the Members of the Section of Odontology of the Royal Society of Medicine, held on July 17th, a bust of the late J. Howard Mummery was unveiled in the presence of the American Ambassador. The bust is a gift to the North-Western University, Chicago, from its London Alumni, and was formally received by Mr. A. D. Black, Professor of Dental Pathology in the North-Western University.

PAYING BEDS AT NEWCASTLE.—It is intended to provide a large number of beds for paying patients at the Royal Victoria Infirmary, Newcastle-on-Tyne. For this purpose three pavilions of the adjoining orthopædic hospital, which was recently taken over from the Ministry of Pensions, will be utilised, and it is expected that they will afford room for between 80 and 100 beds. The suggested charges will vary from 6s. per day upwards. At the moment the waiting-list of the Infirmary numbers 2000 persons.

An Address

[ABRIDGED]

ON THE

DEBT OF MODERN SURGERY TO THE ANCILLARY SCIENCES.

Delivered at the Annual Meeting of the British Medical Association at Manchester on Tuesday, July 23rd

BY ARTHUR HENRY BURGESS, M.B., M.Sc. VICT., F.R.C.S. ENG., D.L.,

PRESIDENT OF THE ASSOCIATION; PROFESSOR OF CLINICAL SURGERY, UNIVERSITY OF MANCHESTER; HONORARY SURGEON TO THE MANCHESTER ROYAL INFIRMARY.

[AFTER referring to the changes in the medical profession and in the hospital arrangements since the Association's visit to Manchester in 1902, and to the work of the 2nd Western General Hospital during the war, Prof. Burgess discussed the sharp dividing line between the history of surgery before and after the time of Lister. He explained how this extension had been particularly noticeable in the development of abdominal surgery. He gave a local illustration of this development by comparing the operations performed at the Manchester Royal Infirmary at the beginning and at the end of the first quarter of this century. During this period, the proportion of operations on the abdomen had risen from 11 per cent. to 57 per cent., the annual number of operations for acute abdominal conditions from 82 to 1241, while their total mortality had diminished from 36 to 8 per cent. Prof. Burgess continued :—]

This progress in surgery—which, I feel strongly, will compare favourably with that attained in any other branch of the arts and sciences—has not, nor could it have been, achieved without the material assistance of the contemporary advances in the allied sciences; it is, indeed, this which constitutes my main thesis to-night. Modern victories are rarely won single-handed, and the greater the number, the more effective the strength and the more vigorous the activities of the allied forces whence assistance is forthcoming, the more confidently may we look *forward* to a victorious issue. Prior to the time of John Hunter surgery was almost entirely an art—a glorified handicraft, taught and practised quite independently of all other arts and sciences, devoid of any physiological basis for its methods, and essentially empirical in its attempts at progress. Hunter, deeply imbued with the scientific spirit, introduced into surgery the method of careful observation, collection, and collation of facts, and their thorough testing by direct experimental investigation, rather than that of trusting to theories founded on insufficient and unproved evidence. "Don't think—try" was his favourite exhortation. He it was who first gave allies to surgery, urging that surgery should be regarded as a branch of natural science, to be studied in its appropriate relationship to all the other branches, thus bringing it into close association with chemistry, physics, biology, comparative anatomy, physiology, and pathology. Had the microscope been available in Hunter's day he would doubtless have added to these bacteriology.

Every important discovery in the natural sciences since Hunter's time has exerted its influence upon contemporary surgical thought and practice, and overwhelming indeed would be surgery's debt to its allies were it not offset by a corresponding counter-debt for the help rendered to them in return by the great advances that have been made in surgical knowledge.

Though the choice for consideration to-night of a few only of the numerous component factors of this debt of modern surgery to the ancillary sciences must necessarily prove an arbitrary and rather an invidious task, yet I feel that the concensus of surgical opinion will endorse my selection of physics and of physiology as the two sciences to which, in recent times, surgery is most indebted; and further, that of the many useful applications in surgery of the results of researches in physics three have established a special claim upon our attention—X rays, radium, and light therapy.

THREE APPLICATIONS OF PHYSICS.

1. *Radiology.*

The X rays, discovered by Wilhelm von Röntgen of Würzburg in 1895, were early applied to the diagnosis of pathological states in the human being, and thus was founded the science of radiology, whose subsequent brilliant achievements not only constitute one of the most important chapters of progress in medical affairs during the present century, but also open up vistas of still greater possibilities for the future.

The organs and tissues of the body vary in the degree of resistance they offer to the passage of the X rays, and it is upon the relative opacity of an organ to that of the tissues in its immediate vicinity that the possibility of demonstrating its shadow upon the radiographic plate or screen depends. The bones and teeth are very much more opaque than the soft structures, and cast the deepest shadows; the lungs are the most translucent, so that the heart placed betweem them is relatively opaque, and casts a very definite pulsating shadow. The kidneys are seen only to a very limited degree, since they are surrounded by tissues of approximately the same density as themselves; were they situated in the thorax their visibility would equal that of the heart.

Foreign bodies are displayable in proportion to their density, those of a metallic nature taking the first place. Had we not had available during the Great War the assistance of the X rays in the detection and accurate localisation of the bullets, shell fragments, and other metallic particles lodged in the tissues of so many of our wounded, war surgery would have had a very much less successful tale to unfold. Calculi are opaque to the X rays proportionately to the amount of lime salts they contain, those of the urinary tract being nowadays displayed with such reliability that operations for the removal of renal and ureteric stones are practically never undertaken unless the presence of the calculus has been previously radiographically demonstrated. In the bladder, it is true, stones are occasionally met with composed of uric acid only and quite translucent ("radiolucent") to the X rays; such may easily be overlooked even if of large size, but fortunately we have, in the cystoscope, a certain means of their recognition. Calculi in the salivary and other glands are readily displayed, while, with improving technique, gall-stones are being shown in a steadily increasing proportion of cases.

The assistance of the X rays in the diagnosis and treatment of fractures and dislocations has proved invaluable, and the advice given recently by the council of the Medical Defence Union in a circular letter to its members, to insist upon radiography in every case of suspected fracture, would appear to be extremely sound from several points of view other than the intended one of defence against a possible legal action for malpraxis. Radiography soon taught us that in a large proportion of what were formerly considered to be merely "sprains" of joints some definite bony injury was present, the overlooking and consequent failure to apply appropriate treatment to which explains the popular idea that a "sprain is worse than a break." Many incomplete and impacted fractures, and some of those without displacement, cannot be detected by any other means than radiography, and of this the general public is becoming aware. The public is, however, much too prone to estimate the success or failure of treatment of a fractured bone by the extent of the anatomical deformity displayed in the radiogram, rather than by the functional result; to the popular mind the "setting" of a fractured bone seems to imply that the radiographic picture should show the perfect apposition of the broken surface—an ideal which, though frequently most eloquently stressed by counsel for the plaintiff in an action for malpraxis, is, as the medical profession knows only too well, rarely attainable apart from open surgical operation.

X ray apparatus is now so efficient that the finest details of structure of the bones are easily shown, and the slightest changes therein induced by early disease can be readily detected. Thus the earliest manifestations of tubercle, of rickets, of syphilis, and of new growths as they affect bone are readily recognisable, and such knowledge conduces to earlier and more effective treatment. One of the commonest applications of radiography of the present day is that to the sockets of the teeth, and many a local source of origin of "local sepsis," otherwise inexplicable, has been thereby disclosed.

At an early stage of radiography its utility was vastly extended by the introduction of substances opaque to the X rays into parts of the body otherwise radiolucent, thus rendering them visible. The ramifications of sinuses in the soft parts were demonstrated radiographically by previously injecting them with bismuth paste. The introduction of the bismuth, and, later, of the barium meal has been *the* outstanding advance in radiology, and has completely changed many of our former ideas regarding the anatomical position, the form, and the physiological movements of the different parts of the alimentary tract, while it has added in a truly marvellous degree to our knowledge of their pathology. Radiology, to the infinitely greater safety of the patient, has entirely displaced the bougie in the diagnosis of œsophageal obstruction, and yields an accuracy of information as to the exact situation, extent, and nature of the cause of the obstruction previously quite unattainable. It thus differentiates readily between simple cicatricial stricture, malignant stricture, compression of the œsophagus by tumours from without, and the very imperfectly understood muscular obstruction at its lower end, to which the term "cardiospasm" is applied. The presence, situation, size, and shape of pharyngeal and œsophageal diverticula are demonstrated with certainty by means of the opaque meal, which has also taught us that diverticula of the alimentary canal, though most frequently met with in the pelvic colon, may occur also in the rest of the large intestine, in the appendix, the small intestine, the duodenum, and even in the stomach. The recognition of gastric and duodenal ulcers, of their complications, such as hour-glass contraction and pyloric stenosis; of gastric cancer, more particularly in its earlier stages; of obstructions of the intestines, especially that of carcinoma of the colon, by means of the opaque enema, either alone or in combination with the opaque meal; of displacements of the viscera such as are observed in diaphragmatic hernia or in visceroptosis, and the demonstration by Graham's method of the outline of the gall-bladder some 10 to 12 hours after the administration of tetraiodo-phenolphthalein, owing to the power of this viscus to concentrate the bile, in which the drug is excreted, to such a degree as to prove opaque to the X rays—all these constitute veritable triumphs of radiology, and have enormously facilitated the diagnosis of abdominal conditions.

Much the same may be said of the application of the opaque ureteral bougie and of the introduction of opaque media into some part of the genito-urinary tract during radiography—pyelography, ureterography, cystography, or urethrography, according to the portion of the tract concerned. Of these, pyelography has been most employed, and has disclosed alterations in the size, shape, and position of the renal pelvis, calyces, and ureters which have proved of the highest possible value in the diagnosis of renal pathological states.

The introduction into the trachea of the opaque medium lipiodol—a combination of 40 per cent. iodine with oil of poppy seeds—renders the bronchi and their ramifications visible upon a radiogram taken very shortly afterwards, and has been found useful in determining the relation of a foreign body in the lung to the nearest accessible bronchus, in demonstrating the outlines of lung abscesses, the presence and extent of bronchiectasis, the existence of a broncho-pleural fistula, and the extent of malignant growths involving the bronchi. Lipiodol was originally recommended by Sicard of Paris in 1921 for the localisation of the site of blockage of the subarachnoid space by spinal cord tumours. Introduced into the upper part of this space, as by injection into the cisterna magna, the medium falls by gravity to the level of the upper limit of the obstruction, and can there be radiographically shown. By injecting into the lumbar sac an "ascending" mixture of lipiodol and olive oil, of lighter specific gravity than the cerebro-spinal fluid, the lower extent of the subarachnoid block can be defined. The method is not altogether devoid of danger, and lipiodol once introduced, appears to remain unabsorbed for a long period, even for years. The injection of lipiodol into the uterine cavity has been used to indicate its size and shape, and any encroachment upon it as by a growth, while the failure of the medium to pass along one or both Fallopian tubes has been utilised in the diagnosis of their obstruction in cases of sterility.

Another method of altering the relative densities to X rays of adjacent soft structures, and thus rendering their outlines visible, is the introduction of a gaseous medium—air, oxygen, or carbon dioxide—as into the perirenal tissues, thereby allowing the outline of the renal shadow to be readily discerned; or into the peritoneal cavity, when the liver, spleen, and kidneys are rendered visible. The withdrawal by puncture through a drill hole in the skull of a small amount of fluid from one of the lateral ventricles of the brain and its replacement by air or oxygen has allowed the outlines of the ventricles to be rendered visible upon the radiographic plate; their increased size in internal hydrocephalus can thus be readily demonstrated, whilst the position relative to the ventricle of an otherwise obscure cerebral tumour can often be accurately ascertained.

The growing importance of radiology is evidenced by the steadily increasing proportion of patients who pass through the X ray department of our hospitals either for diagnosis or treatment. At the Manchester Royal Infirmary this proportion has gradually risen from 1 in 100 in 1908, to 1 in 24 in 1912, 1 in 11 in 1917, and 1 in 5 in 1928.

2. *Radium*

Radium was discovered in 1898 by Prof. and Madame Curie in a deposit of pitchblende from Joachimstal in Bohemia, and was at first a monopoly of the Austrian Government. This monopoly was transferred to the American Government in 1913 owing to the discovery in Colorado and Utah of carnotite—a mineral which, although the proportion of radium it contained was as small as 1 gramme in 400 tons, nevertheless proved profitable to work owing to the ease with which the radium could be extracted. The finding of some very rich lodes of pitchblende in the Belgian Congo in 1921 has now placed the monopoly in the hands of a Belgian syndicate, who, in their factory at Oolen, at present supply most of the world's demand. It requires from 30 to 40 tons of ore to yield 1 gramme of radium, and its extraction necessitates spacious premises, much labour, and many highly skilled operatives, all these factors being reflected in the present market price of about £12,000 per gramme. This monopoly seems likely to persist for some time, and only the discovery of a new source of really rich deposit can ameliorate the present situation.

Radium emits rays of three varieties—alpha, beta, and gamma—the last, similar to the Rontgen rays, and of high penetrative power, being those mainly used in deep treatment. Upon both animal and vegetable life radium has a decidedly detrimental effect, which is not, however, exercised equally upon all tissue cells, and even upon normal tissues radium has a decidedly selective action. Thus the cells of glandular structures, especially those of the ovary and testis, are much more susceptible than those of fibrous tissue, while muscle, cartilage, and nerve-cells are the least sensitive. Actively dividing cells are the most vulnerable, and the cells of malignant growths, in which activity of cell division is a prominent feature, are more readily affected by radium than the other cells of the body. Upon this selective action the therapeutic value of radium in cancer depends, and our problem is to determine the exact dose that will exert the maximal destructive effect upon the cells of the malignant growth with the minimal upon those of the other tissues. There is a minimal dose below which no destructive action occurs, and many believe that these weak irradiations can stimulate the growth of tumour cells, and even stir into activity cells actually quiescent. The total dosage of radium, calculated in milligramme hours, can be applied either as a large amount of radium acting for a short time, or a small amount acting for a long time, and opinion is not yet decided upon the optimal dosage for each type of growth. On the one hand, by prolonging the duration of exposure, a greater number of cells will be adversely influenced during the vulnerable stage of active cell division; on the other hand, it has been shown experimentally that repeated sublethal doses may actually increase the resistance of the tumour cell to radium, and radiation treatment should, therefore, be concluded within a reasonably short time, and not indefinitely repeated.

As a therapeutic agent radium has been found of considerable value in non-malignant conditions—such as nævus, keloid, lupus and other skin diseases, exophthalmic goitre, and benign tumours—but it is in the treatment of malignant disease (including rodent ulcer) that its chief interest to us lies. Restricted at first entirely to cases too advanced for radical operative treatment, its scope has within the last few years been extended, either alone or in combination with surgery, to the treatment of operable cases. There has arisen a special branch of surgical technique —"the surgery of access"—concerned with the planning of operative procedures for the appropriate exposure of deeply seated malignant growths in order that radium tubes may be placed in correct relation thereto—as when a rectal carcinoma is exposed by removal of the coccyx and lower portion of the sacrum, an œsophageal carcinoma through the posterior mediastinum after rib resection or across the pleural cavity by lateral thoracotomy, or an intralaryngeal growth through a "window" cut in the thyroid cartilage. Modern methods of radium application have met with such considerable success in cancers of the skin, of the cervix uteri, of the mouth and tongue, and of the larynx, that there is an increasing tendency in these cases to prefer radium to operative treatment, at any rate so far as the primary growth is concerned. The comparatively slight disturbance of radium tube insertion, or of radium bomb treatment, their lesser risks, and the absence of that mutilation necessarily associated with a radical surgical operation, and which, as in the case of the tongue, may prove a considerable and permanent disadvantage, are factors favourable to radium, and should tend to overcome the natural reluctance of the average patient to submit to early treatment. It is, however, upon the end-results that the question must be ultimately decided, and these are not yet sufficiently known in the case of radium for a conclusive judgment, although some promising series of five-year statistics have been reported. In many cases the best results are obtained by a combination of radium treatment with surgery, as when the radical operation for cancer of the breast is associated with the implantation of radium tubes or needles into the supraclavicular and anterior mediastinal regions. At the present moment expert opinion seems to favour reversion to the external application of radium, either alone or in combination with radium tube insertion and very short wave-length X ray irradiation. There are, however, two most important changes from the surface applications as originally practised: (1) the much larger quantities of radium used—up to 4 g., and (2) the much greater distance from the skin—as much as 10 cm.—at which it is applied, thereby ensuring a more uniform dosage to all parts of the area irradiated, with lessening risk of cutaneous damage. This "bomb" or "cannon" treatment—as at present carried out in Paris, Brussels, Stockholm, and on a smaller scale at the Westminster Hospital, London—is considered by many likely to prove the method of choice in radium therapy, and it certainly deserves to be tested very thoroughly, should a sufficiency of radium be forthcoming. The still very high cost of radium in spite of the removal of the one-third *ad valorem* Government duty, and its restricted supply, are matters requiring urgent attention, and every means must be taken not only to increase its production, but also to ensure that the most efficient and most economical use is made of such supply as is already available, having regard to the absolute necessity, in this connexion, of maintaining an intimate association between treatment and research. The technique of radium therapy is highly specialised, and such work should be centralised and restricted to the expert staffs of special institutions established in a few of the largest cities of a country. Until the supply of radium becomes less inadequate to cope with the increasing demand it may be advisable to arrange for a "night" as well as a "day" staff of workers at these institutions in order to minimise the number of hours ("radium-hours") during which any of the radium is unemployed in treatment.

3. *Actinotherapy.*

Heliotherapy—treatment by sunlight—is probably as old as human history. Hippocrates (460 to 370 B.C.), refers to the effect of sunlight in promoting health, and recommends sufferers from various ailments to walk about naked in the sun as much as possible—a simple remedy, which seems, however, to have been overlooked for many subsequent centuries. At the end of the last century a considerable proportion of the beds in the hospital wards of our large cities was occupied with cases of tuberculous disease of the bones, joints, and spine, and other forms of "surgical" tuberculosis, for which operations, often of a very extensive and mutilating nature, and frequently requiring repetition, were considered the only chance of a cure. How frequently they failed, and, even when successful in saving life, the unsightly deformities and fearful defects of function that resulted are some of the unpleasant memories of those of us who practised at that time. No more beneficent change has occurred in any department of treatment than in that of surgical tuberculosis during the past quarter of a century.

Thanks to the pioneer work of Bernhard and Rollier in Switzerland, and of Sir Henry Gauvain and Sir Robert Jones in this country, these mutilating surgical operations are things of the past. Surgical tuberculosis is nowadays treated by a general exposure of the body to sunlight in the open air in summer, and to artificial sunlight in the winter or whenever natural sunlight is not available. This should be combined with local treatment so designed as to ensure complete immobilisation of any active focus, the removal of any pressure or weight-bearing, the correction, so far as is possible, of any existing deformity, and the [illegible] care of any discharging sinuses. Active surgery is limited almost entirely to the evacuation of any cold abscesses that may develop, although in tuberculous spinal disease operations (Albee's, Hibbs's) are occasionally performed, not as a direct attack on the affected tissues, but to ensure better immobilisation of the morbid focus in the vertebral bodies by bony ankylosis of the spinous processes of the affected vertebræ and of those immediately above and below. Under this modern plan of campaign [illegible] [illegible]y assured in a much greater [illegible] [illegible] the bronzed and [illegible] [illegible] [illegible]der sunlight treatment [illegible] [illegible] waxen faces and wasted days, while the local focus of disease heals with the minimum of deformity and the maximum preservation of function.

Treatment by ultra-violet radiation (actinotherapy) is now being extended to rickets and other general diseases, to most forms of skin disease, and to many disorders of the circulatory, respiratory, alimentary, nervous, and genito-urinary systems, as well as to those of the special senses. It has, in fact, assumed the dimensions of a "boom" treatment, and "sun-ray" centres are being established all over the country, not only as private ventures, often controlled by laymen only, but also at the municipal bathing establishments of many of our cities and towns, while there are sunbaths in many factories and at "pitheads" in several of our coal-mining districts.

The ultra-violet rays are, however, far from being innocuous, and their correct dosage is a matter of great importance and of careful individualisation, since what is a safe dose for one may be dangerous to another. Over-exposure to their influence produces sleeplessness, restlessness, loss of weight, lassitude, and even sickness, while severe burns and serious forms of dermatitis may result in sensitive persons. Moreover, some ailments are adversely influenced by ultra-violet ray treatment—notably chronic nephritis, arteriosclerosis, and quiescent tuberculosis, the last of which may easily be stirred into renewed activity. It is therefore in the public interest that the prescription of ultra-violet rays be restricted to the medical profession, and that their application be undertaken only by those who have received a proper course of training for this special work.

In view of the risks to the public involved in the use of electricity and radiation as methods of treatment by untrained and unqualified persons, the Representative Body of the British Medical Association, at the last annual meeting, expressed the opinion that suitable courses of training should be organised under medical direction for persons wishing to administer this form of treatment; that persons who have satisfactorily followed such a course should be entitled to have their names entered on an approved roll; that they should undertake to treat only patients sent to them by medical men, and that medical men should refer their patients only to those persons whose names are on the approved roll. Along these lines the Society of Apothecaries of London, acting in concert with the British Medical Association, has recently agreed to set up a standard to which persons practising physiotherapeutic treatment should attain, to institute a diploma, and to establish a register of those found qualified to serve as "biophysical assistants," such registration to entitle the appendage of the letters "B.P.A." to their names. The unqualified, unregistered chemist, dentist, and midwife are forbidden by law, and it seems only logical that the unqualified electrotherapist, who handles therapeutic measures equally potential of danger, should be placed under similar legal control.

PHYSIOLOGY: THE ESSENTIAL FOUNDATION OF MODERN MEDICINE AND SURGERY.

Physiology has often been referred to in the past as the handmaiden of medicine, but such a description very inadequately represents its present status as a proud and independent branch of true science—the science of life itself. Rather must it be described as the essential foundation of modern medicine and surgery, as the means by which many of our former purely empirical methods of treatment have been placed upon a rational basis, and as the main factor by which the practice of medicine and surgery is daily becoming proportionately more of a science and less of an art. That the element of art must continue permanently to play a considerable part in surgery is self-evident when we remember how largely handicraft enters into its daily routine, but the merely artistic aspect of surgery has now, we may fairly claim, been brought to so high a degree of perfection that it is not so much upon outstanding advancements in surgical artistry that we must rely for future progress as upon a more thorough understanding of the physiological principles involved in our work, and their application to what is, after all, the great aim of surgery—the restoration of deranged function to the normal. The greater comprehension the surgeon obtains of what constitutes normal function the better equipped is he to achieve this aim, and to improve his methods by means which were not possible in the days when physiology was less advanced. The surgeon and the physiologist must tread the path of progress hand in hand, to the great advantage of each, since the debt between them is essentially a mutual one. For the success of his experiments upon animals the physiologist has to depend largely upon the methods of modern aseptic surgery, and has, therefore, a very vital interest in any improvements in surgical technique that may from time to time accrue. Moreover, though it is true that many discoveries made by physiologists which have found valuable practical application in medicine and surgery have originated purely in the search after truth and without any thought of their possible clinical utility, yet, on the other hand, there are many instances where clinical observation has been the starting point of physiological researches which have ultimately proved of the greatest benefit in the treatment of human disease. One of the most impressive illustrations of this is yielded by the development of our knowledge of the localisation of function in the cortex of the brain.

[Prof. Burgess gave a historical survey of the progress made in the localisation of cerebral function, and in our knowledge of the functions of the thyroid gland.]

New Methods of Study.

The progress of physiology during the present century has been characterised by many new methods of study, by the greater attention devoted to human physiology, and by the enormous strides made in the physiology of nutrition. If we look back to the beginning of this century and compare the state of physiological knowledge then with that of the present day it is wonderful to contemplate the discoveries that have been made. The use of X rays for the examination of the function of the stomach and small intestines, developed first of all by Cannon for physiological purposes, had only just begun to be applied to the diagnosis of alimentary diseases. The rôle of proteins in nutrition was imperfectly understood and their chemical constitution was only a conjecture. Vitamins had not been heard of. Insulin was still a hypothetical substance. None of the active principles of the ductless glands had been synthesised and their mode of action was very incompletely known. Micromethods for the biochemical examination of the blood and other body fluids were practically unknown. The buffering mechanisms of the blood were not dreamt of, and the close interplay between normal physiological functions such as secretion and respiration, and their part in the regulation of body neutrality, was not known. The relation of the capillary circulation to the production of shock is also a relatively recent discovery.

All these advances in knowledge, and many others that might be mentioned, have had their influence on surgery—directly, because they have improved methods of diagnosis and treatment, and indirectly on account of their influence on the attitude of the surgeon to his subject. It is impossible to deal in detail with each particular advancement which surgery owes to physiology, but a few examples may be mentioned.

[Prof. Burgess then outlined the pioneer work of Gowland Hopkins on vitamins, and of E. Mellanby on dietetic deficiencies leading to rickets, and traced the effects in medicine of the discovery of vitamin D in certain foodstuffs, and of its production by irradiation of ergosterol. He spoke of blood transfusion as one of the most useful of our emergency surgical therapeutic measures, which had been reintroduced on a sound physiological basis, when its dangers had been eliminated by the differentiation of the four now well-known blood groups. Another triumph of physiological research, which was useful to the surgeon as to the physician, was the isolation and standardisation of insulin. No patient was now refused any necessary operation because of diabetes, the mortality of operations upon diabetics had been reduced to that in cases without this complication, and it seemed likely that in the future, with a better knowledge of the part played by insulin in carbohydrate metabolism, it might find other surgical uses.

Prof. Burgess then discussed at greater length the physiology of the kidney as applied to surgical problems:—]

Assessment of Renal Function.

It is principally to the painstaking and persevering work of the American biochemist Folin that we owe the modern micro-methods of blood analysis whereby, using only a few cubic centimetres of blood, all the important constituents can be accurately determined. These methods have been particularly helpful in cases where prostatectomy is contemplated and where it is essential to know to what extent the excretory functions of the kidneys have been already adversely affected by back-pressure from the prostatic obstruction, as indicated by the abnormal retention in the blood of urea, uric acid, creatinin, and other waste products to an extent varying directly with the degree of renal derangement. It cannot, in fact, be too strongly stressed that the operative risks of prostatectomy are concerned infinitely more with the condition of the kidneys than of the prostate, and that by delaying the major operation until the renal functions have been improved by the relief from "back-pressure" afforded by adequate preliminary drainage of the bladder—either by the indwelling catheter or by suprapubic cystostomy—the dangers attending the removal of the prostate can be very materially diminished. Biochemists, by means of their tests of renal functional capacity, have enabled surgeons to estimate the power of the kidneys to withstand surgical intervention with a degree of accuracy that is truly remarkable. Would that the same could be said of the liver, and that we could "size-up" the functional state of that organ as simply and as correctly as we can that of the kidneys. So manifold and varied, however, are the functions of the liver, and so diverse the directions in which deranged hepatic function may become clinically manifest, that any reliable estimation thereof must necessarily involve more extensive and more complicated procedures than in the case of the kidneys.

Of other methods of applied physiology to which the surgeon is indebted, mention may be made of the use of fractional gastric analysis for investigation of the activity, both digestive and motor, of the stomach; the duodenal tube for the collection and examination of bile; estimation of the basal metabolism as a guide to over- and under-activity of the thyroid and pituitary glands, and to the nature of the operative procedures to be undertaken in connexion therewith; determination of the carbon dioxide combining power of the blood and its relation to the diagnosis of those conditions of acidosis and alkalosis that occasionally complicate surgical procedures; and the examination of the red blood corpuscles for "fragility" in cases of splenic enlargement, as in haemolytic jaundice.

In the past a large proportion of the discoveries of physiology has been the outcome of experiments upon animals, conducted in physiological laboratories, while the wide field for the investigation of its problems offered by the hospital wards and operating theatres has been comparatively little utilised. For the elucidation of many points man himself possesses many advantages over the lower animals as a subject of investigation, and a more active encouragement of clinical research in human physiology is one of the prominent needs of to-day. In Manchester the University professor of physiology has been placed along with his colleagues in anatomy, physics, and pharmacology, upon the consulting staff of the Royal Infirmary, so that the closest possible connexion is maintained between these ancillary sciences and the clinical aspects of medicine and surgery.

Application to the Human Machine.

Pregnant with promise, too, is the recent extension of physiological research to the whole field of human activity. Laboratory investigations have taught us much of the physical and chemical workings of the individual systems of the human body, and have supplied us with various measures by which these can be tested. But of the workings of the human machine as a whole under the varying conditions and stresses of industrial and other forms of activity comparatively little was known. Early in the war it was recognised that the methods of medical examination of recruits then in vogue were far from satisfactory, and their inefficiency was frequently shown up on the parade ground and in the training camps. Especially was this so in the case of individuals in the Royal Air Force, where it was soon recognised that perfectly "sound" men, in the usually accepted medical sense, might nevertheless be quite unfitted to control an aeroplane. New and more delicate tests were required of the functional activity of the various systems, especially the visual, circulatory, and nervous systems, and of their quickness of response to the constantly changing conditions met with in flying. The medical officers of the Royal Air Force have shown most praiseworthy ingenuity in devising methods for the more efficient testing of the body functions, and have given a great impetus to the study of the healthy human machine at work under conditions hitherto unknown. In the field of industry it is becoming more generally recognised that the test of health is the capacity to perform effective work, and researches are constantly being made into the effects of environmental factors—for example, fatigue, monotony, noise, high illumination—upon the productive efficiency of the industrial worker. It has been shown that the distribution of industrial accidents amongst workers exposed to similar conditions of risk is not a mere matter of chance, but that each has an individual proneness to accident which can be fairly exactly estimated by testing the rapidity and accuracy with which he reacts to certain visual, auditory, and tactile stimuli. Though much still remains to be accomplished, the valuable information thus acquired has already brought about vast improvements in working conditions in many of our industries, and in the standard of health and the productive capacity of those employed therein.

OTHER ANCILLARY SCIENCES.

Of modern surgery's debt to the other ancillary sciences that to bacteriology is assuredly the most fundamental, since it was Pasteur's discovery that fermentation and putrefaction were caused by minute living organisms and were, therefore, vital and not merely chemical processes, as hitherto believed, that led Lister to his great conception of the antiseptic treatment of that putrefaction then found in almost all wounds—a conception which constitutes, as we have seen, the very starting-point of modern surgery. Time permits me merely to mention other advances in bacteriology: the detection of the causative germs of almost all the infective diseases; the elucidation of the great principles of immunity, both "active" and "passive"; the preparation of vaccines and of antitoxic serums and their use in the prevention and treatment of bacterial infections; the therapy of systemic infections by the intravenous introduction of chemical antiseptics resulting, among other notable gains, in that brilliant conquest of the former scourge of syphilis that has been achieved within the present century—all of which constitute milestones along the highway of bacteriology's triumphal progress.

Nor have I time to refer to the great help that modern surgery has received from research workers in anatomy, pathology, and pharmacology, valuable as their contributions have been; nor yet to more general sources of assistance such as the greatly improved means of rapid intercommunication (the telephone, the wireless) and of rapid transport (the motor-car, the aeroplane), factors which have so materially facilitated the prompt application of surgical relief in cases of emergency, whether on land or at sea.

I trust, however, that enough has been said to indicate that modern surgery, with the aid of its allies, has made, and is still making, great progress towards that end we all so fervently desire—the prevention of those abnormal conditions, the late results of which to-day necessitate so much surgical attention of a destructive rather than a constructive character. Much yet remains to be done, and the natural sciences must continue to advance, each ready to assist and to accept assistance from its fellows, each along its own special path yet all in mutual friendly alliance working for the common good, all in zealous pursuit of that goal, unattainable though it must ever remain, that will-o'-the-wisp of perfect knowledge and complete understanding. In so doing they will but follow the precept and the spirit of that motto upon the crest of our beloved University, in whose venerable precincts this great Association will to-morrow enter upon its full scientific programme, and of which we in this city are all so intensely proud; "Arduus ad solem"—"leaping upwards to the sunshine"—"ever striving towards the very highest."

ON THE

Clinical Classification

OF

CONGENITAL CARDIAC DISEASE.*

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CLINICIANS do not always recognise the fact that congenital cardiac disease does not necessarily mean "blue baby" or *morbus cæruleus*, with its familiar symptom-complex of cyanosis, dyspnœa, and clubbing, and its progressively downward course. This condition gives little scope for the physician's skill, since the deficient oxygenation of the blood thus revealed is the result of unalterable structural changes in the heart. On the other hand, there exists a larger and clinically a much more important group of congenital cardiac patients to whom the word "acyanotic" applies, for the reason that these patients do not, under otherwise normal conditions in the body, present any raised oxygen-unsaturation at all, so that they show either no cyanosis, or cyanosis only as a transient or very "late" phenomenon. In this group are included those congenital lesions in which *no abnormal communication* between the two circulations exists, so that venous blood does not enter the arterial stream as a result of the anomaly—e.g., coarctation of the aorta—and also the localised cardiovascular septal defects, in which, in the absence of complications and under the physiological conditions of relatively higher pressure in the systemic circulation, blood passes from left to right through the defect. In these cases an *arterial-venous shunt* exists, which may, in the event of a pathological rise of pressure in the right chambers, be temporarily converted into a venous-arterial shunt, with the appearance of *transient* or *terminal* cyanosis.

ACYANOTIC CASES.

These so-called "acyanotic" cases are of great importance to the clinician, for such patients have a relatively good expectation of life, and may live to an advanced age without showing any sign of being hampered by their anomaly. On the other hand, the defect is almost always the seat of strain, and this renders these subjects peculiarly liable to serious complications, especially infective endocarditis or endarteritis usually of the subacute bacterial form, which commonly involves the margins or neighbourhood of the defect, and usually has a lethal termination; or, in another set of cases, the wall of the aorta may undergo spontaneous rupture, either from a concomitant congenital thinning of its coats, or from increased intra-arterial tension; or the myocardium itself may fail, leading to cardiac insufficiency or to the conversion of an arterial venous into a venous-arterial shunt. The fact that these acyanotic congenital lesions do present a fairly good prognosis in the absence of the grave complications which threaten them, makes their early recognition and the rigid preventive care of such patients imperative. The American Heart Association classifies patients with healed rheumatic lesions as "potential cardiacs," and prescribes for these the removal of foci of infection, proper rest, and careful supervision with a view to the avoidance of undue strain, and the elimination of unnecessary risks. It is surely desirable that acyanotic congenital cardiacs should be similarly classified, and as carefully safeguarded and watched.

DIAGNOSIS.

A congenital cardiac lesion of the acyanotic group may usually be "picked up" by detecting, in an otherwise apparently normal individual, the presence of pulsation murmur or thrill of unusual localisation and character in the cardiovascular area. Incidentally, these people often display the slender habitus characteristic of the hypoplasia of the aorta often associated with this congenital lesion. With the help of X rays a further differential diagnosis can often be made between such classic conditions as coarctation of the aorta, subaortic stenosis, and the various forms of cardiovascular septal defects (patent ductus, maladie de Roger, and so forth). In infants under one year, however, practically no differentiation into "cyanotic" or "acyanotic" types can be made with certainty because, excepting the most complex cases of extreme morbus cæruleus, cyanosis often does not manifest itself until after many months of postnatal life. So that one must here be content as a rule with the mere recognition of the presence of a congenital lesion, until sufficient time has elapsed after birth for the manifestation of cyanosis after the "threshold-value" of raised oxygen-unsaturation is reached.

THE CYANOTIC GROUP.

A word may be added regarding the diagnosis of the cyanotic group, though this is of much less practical importance. Once infancy is past, these subjects are readily recognised by their very striking symptomatology, especially the cyanotic hue, which deepens on exercise; and when to these appearances are added atypical physical signs over the cardiac area the presence of a morbus cæruleus is readily established. Differentiation of the exact lesion present in such a cyanotic case can scarcely be determined with certainty, but only a few combinations survive into adult life (see classification below), and of these that most commonly met with in cyanotic patients reaching early adult life is the "tetralogy of Fallot" (pulmonary stenosis, with associated ventricular septal defect and dextroposition of the aorta). These conditions exist in at least 75 per cent. of cyanotic young adults with congenital lesions. In cyanotic patients living beyond middle life one may suspect complete defect of the interventricular septum (cor triloculare biatriatrium) or pulmonary stenosis with closed interventricular septum, since statistics show that the average duration of life in these cases is relatively long.

CLINICAL CLASSIFICATION.

Under the classification set out below, which I have elaborated in the section on Congenital Cardiac Disease in the third edition of Osler and Macrae's

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* Abridged from an address delivered at the New Sussex Hospital, Brighton, on July 20th, 1929.

"Modern Medicine" (London, 1927), the principal cardiac anomalies are grouped in the order of their clinical importance.

A. Of Clinical Significance.

I. *Non-cyanotic Group.*

1. Cases in which no abnormal communication exists, but in which the defect may produce a *mechanical interference* with the circulation which become the seat of strain. These are: pericardial defect; ectopia cordis abdominalis; primary congenital hypertrophy; congenital heart-block; anomalous septa; pulmonary and tricuspid insufficiency; aortic and mitral stenosis; anomalies of semilunar and auriculo-ventricular cusps; coarctation and hypoplasia of the aorta; anomalies of the aortic arch; anomalies of coronary arteries; congenital arteriovenous aneurysm; certain anomalies of veins and anomalies of pulmonary artery.

2. Cases of *arterial-venous shunt* with possible terminal or transient reversal of flow (*cyanose tardive*): (*a*) Defects of the interauricular septum (persistent ostium primum; persistent ostium secundum; patent foramen ovale; multiple defects; complete defect (cor-biventriculare triloculare). (*b*) Localised defects at the base of the interventricular septum (*Maladie de Roger;* defects below; multiple). (*c*) Patent ductus arteriosus and localised defects of aortic septum (communication just above the aortic valve; congenital aneurysm of the right aortic sinus of Valsalva).

II. *Cyanotic Group.* (*Morbus cæruleus.*)

1. Cases of *venous-arterial shunt* (arranged in order of severity of shunt). (*a*) *Moderate cyanosis:* Dextroposition of aorta with defect at base of ventricular septum; complete absence of ventricular septum (cor biatriatrium triloculare); pulmonary stenosis of inflammatory type with closed ventricular septum and patent foramen ovale; tricuspid atresia with interauricular septal defect and transposition of the great trunks. (*b*) *Marked cyanosis:* Pulmonary stenosis with dextroposition of aorta and interventricular septal defect (tetralogy of Fallot); pulmonary atresia with ventricular septal defect, dextroposition of the aorta, and patent ductus; transposition of arterial trunks with ventricular septal defects and dextroposition of the aorta. (*c*) *Extreme cyanosis:* Complete absence of cardiac septa (cor biloculare); complete defect of aortic septum (persistent truncus); transposition of arterial trunks with patent foramen ovale and patent ductus but closed interventricular septum: pulmonary atresia with closed ventricular septum, patent foramen ovale and patent ductus; aortic and mitral atresia with defect of interventricular septum and aplasia of aorta.

2. *Cases of Raised Peripheral Pressure. Right-sided valvular lesions* with closed septa (pulmonary and tricuspid stenosis).

B. Cases of No Clinical Significance.

Diverticulum of pericardium; bifid apex of heart; diverticulum of heart; acardia, ectopia cordis pectoralis (non-viable); congenital rhabdomyoma; true (mirror-picture) dextrocardia.

[Dr. Abbott demonstrated with an epidiascope diagrams illustrating the course of the circulation in the different defects, and photographs of the corresponding pathological specimens.]

THE BACTERIOLOGICAL DIAGNOSIS OF WHOOPING-COUGH.

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and

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Since the original work of Bordet and Gengou (1906), in which they demonstrated the existence of a bacillus morphologically similar to, but distinct from the influenza bacillus, in the sputum of patients suffering from whooping-cough, there has been very little attempt, except in Denmark, to make a practical application of these findings. The medical profession has not resorted to the bacteriological diagnosis of doubtful whooping-cough. The reasons for this may be that a certain scepticism still prevails about the ætiological connexion of the bacillus which these observers described with this disease and that it has not been realised that the differentiation of this bacillus from the influenza bacillus is easily made.

Observations such as those of Wollstein (1909) and Scheller (1912), who found difficulty in repeating Bordet's serological observations in the disease, have probably contributed to this scepticism, and many of the statements in the text-books and elsewhere leave the impression that the differentiation between *B. influenzæ* and *B. pertussis* rests on some relatively fine points—e.g., Andrewes (1920), in discussing the influenza group of bacteria, says, "Many bacteriologists would agree that we may be confounding under the common term, *B. influenzæ*, a number of closely related species. Bordet's 'whooping-cough bacillus' would fall into such a group."

It is one of the purposes of this paper to emphasise afresh the facts already indicated by Bordet and more recently stressed by Kristensen (1922) that although these bacilli are probably related species there is little ground beyond that of microscopic morphology for confusing them. In the examination of the thick whitish exudate expectorated in the early stages of the disease, Bordet and Gengou demonstrated the presence of a small Gram-negative ovoid microbe, constant in size and appearance (1906). The medium used for successful cultivation was blood-agar with a basis of glycerinated extract of potato (1907). Even on this special medium their organism grew remarkably slowly, two–three days elapsing before the colonies appeared. In the examination of specimens of sputum from patients who had been affected with whooping-cough for some time, Bordet and Gengou found in almost every case and apart from the *B. pertussis*, an organism identical with or very similar to the bacillus found by Pfeiffer in cases of influenza. It was, however, smaller than *B. pertussis* and it showed a marked tendency to pleomorphism and to the development of involution forms. Bordet and Gengou also showed that this organism was met quite frequently in other respiratory affections besides whooping-cough. In a series of papers published subsequently Bordet elaborated and confirmed his original observations with Gengou on the morphological and cultural characters of the *B. pertussis* found by them in early cases of whooping-cough (1907, 1908, 1909 and 1912).

Kristensen (1922) has drawn attention to two additional points of contrast between these bacilli: (1) the capacity of *B. pertussis* to survive for considerable periods on suitable media at low temperature, a character lacking in *B. influenzæ* in his observations, and (2), more important still, the inability of *B. pertussis* to grow freely on the media best adapted for the growth of *B. influenzæ*, such as Levinthal's, "chocolate agar," &c. Convinced by these and other points of the ease with which *B. pertussis* can be differentiated from *B. influenzæ*, the staff of the Danish State Serum Institute has been carrying on the bacteriological diagnosis of whooping-cough for several years for the benefit of general practitioners and others.

So far as we are aware no attempt has been made to corroborate or reject Bordet and Gengou's findings in this country. At all events, we have been unable to find any record of it. It is not clear from the published records whether Freeman's work relates entirely to observations made with cultures obtained from Bordet or refers also to strains isolated by himself (1909). In view of this state of affairs it seemed desirable to find how far the results obtained in Belgium and Denmark could be corroborated in this country; and in case they should be, to control the observations by determining the frequency with which this bacillus could be detected in the trachea and bronchi of children dying from various causes other than whooping-cough. The last type of observations does not appear to have been made and has obviously an important bearing on the significance of the detection of the organism in cases of the disease.

Technique of Culture.

The medium of culture used for the isolation of the organism was the one in use at Copenhagen slightly modified.

500 g. of sliced potato were boiled down in one litre of water with 40 c.cm. glycerine. The mass was filtered through a sieve, then through lint. To one part of the liquid thus obtained, three parts 0·6 per cent. sodium chloride solution were added. The mixture was rendered slightly alkaline (pH 7·5), 4 per cent. agar was then added, and the whole was then sterilised in the autoclave and tubed off in 7 c.cm. portions.

In preparing plates the tubes containing the potato-glycerine-agar extract were liquefied and allowed to stand in a water-bath at a temperature of 50° C., 3–5 c.cm. of sterile defibrinated rabbits' blood previously warmed in a water-bath to a temperature of 40° C. were then added to each, and the mixture poured into a sterile Petri dish and allowed to cool. Before pouring, the tube containing the blood and agar mixture was gently rotated by hand to bring about a thorough admixture of the contents, with the result that the plates appeared smooth, uniform, and of a bright red colour.

Method of Obtaining Sputum.—A sterile Petri dish in a suitable box was left overnight at the house of the patient and kept in a cold place till ready for use. The specimen of sputum was obtained early in the morning, so as to prevent any possible mixture of sputum with vomited food material. At the end of a paroxysm of coughing the child expectorated into the dish, which was again returned to the cold place until called for. Great emphasis was made on obtaining, if possible, thick, tenacious sputum expelled at the end of a paroxysm of coughing. On the average there was a period of two hours between the collecting of sputum at the house of the patient and its removal to the laboratory and inoculation on Bordet-Gengou medium.

Method of Making Cultures.—A portion of the thickest part of the expectoration was emulsified in 2–3 c.cm. sterile saline, and a very light inoculation of this was made by means of a platinum loop on to the Bordet-Gengou medium and spread over the whole surface by a slender glass rod, the terminal portion of which was bent at a right angle. Another portion of sputum was spread over the surface of a second plate without the preliminary dilution in saline. These two plates were then incubated at 37° C. and examined at the end of 24, 48, and 72 hours.

Bacteriological Findings.

After 72 hours' incubation small, raised, pearl-like colonies made their appearance. These colonies were so characteristic that it was possible when they were numerous to conclude from examination of the plate with a lens alone whether the Bordet-Gengou bacillus was present or not. Microscopic examination of these colonies showed small, ovoid, Gram-negative bacilli uniform in size and subcultures made on "chocolate agar" and Bordet's medium respectively fully confirmed Kristensen's observations. The *B. pertussis* when recently isolated gave little or no growth on "chocolate agar"—a medium particularly well adapted to the growth of *B. influenzæ*.

Kristensen's other differential point between the two organisms was not so clearly confirmed, for although it was found that *B. pertussis* after a preliminary incubation of three days remained alive at least four or five weeks in the ice-chest at 4° C., the behaviour of *B. influenzæ* strains was variable. Some certainly died much more rapidly; but three strains isolated during the 1929 Leeds epidemic were peculiarly resistant, although they did not survive as long as the *B. pertussis*.

A further differential point which has been observed independently in Japan is that the *B. pertussis* is one of the bacteria which give an exceptionally active catalase effect, whereas *B. influenzæ* gives a weak catalase effect.

The Japanese worker, Nishibe (1926), maintains that *B. pertussis* is further distinguished from *B. influenzæ* by giving an oxidase reaction with a dimethyl *p*-phenylene diamine and α-naphthol reagent. Ellingworth, McLeod and Gordon (1929), however, using tetramethyl *p*-phenylene diamine, which is more sensitive to oxidation than the dimethyl compound, observed that both *B. pertussis* and *B. influenzæ* oxidised this compound, although the former was more vigorous in its action.

All these facts go to prove that the bacillus of Bordet and Gengou must be recognised as a well-defined bacterial species distinct from the *B. influenzæ*.

Description of Cases.

The sputum from 17 patients suffering from whooping-cough was investigated and the Bordet-Gengou bacillus was successfully isolated in ten cases (see Table). With one exception, J. D., they were obtained from private medical practice. With the exception of patient H. P., the sputum was obtained in the post-catarrhal stage of the disease. In general medical practice it is very difficult to obtain early cases because treatment is usually sought when the characteristic paroxyms are already present. In Denmark, however, as the result of the establishment of a diagnostic station connected with the State Serum Institute at Copenhagen, the culture medium is sent out in aluminium Petri dishes on the demand of medical practitioners. In this way it is possible to examine a large number of specimens of sputum from patients affected with whooping-cough in all stages of the disease and also from suspected cases.

Table giving Summary of Results.

Patient	Sex and age.	Stage of whooping-cough.	Isolation of bacillus.	Patient.	Sex and age.	Stage of whooping-cough.	Isolation of bacillus.
B. D.	F. 4 y.	2nd wk.	P.	D.M.D.	F. 7 m.	Catarrhal	P.
C. F.	F. 4½ y.	2nd ,,	A.	J. C.	M. 1½ y.	2nd wk.	P.
I. R.	F. 3½ y.	3rd ,,	A.	C. B.	M. 2 y.	3rd ,,	A.
D. A.	F. 4 y.	3rd. ,,	P.	H. P.	M. 5 m.	1st. ,,	P.
A. P.	F. 4 y.	2nd ,,	P.	J. D.	M. 4 y.	1st ,,	P.
F. S.	F. 4 y.	2nd ,,	A.	E. C.	F. 9 m.	2nd ,,	P.
T. W.	F. 3 y.	5th ,,	A.	A. C.	F. 5 m.	2nd ,,	P.
F. T.	M. 5 m.	Contact	A.	L. D.	M. 4 y.	3rd ,,	A.
I. W.	F. 7 m.	1st ,,	P.				

y. = years; m. = months. P. = present. A. = absent.

A second small series of cases examined two years later gave the following results:—

Two cases examined in the week in which the whoop developed—both positive.

Two cases examined in the third week of the disease—both negative.

Two suspected cases which had not developed a whoop—one negative and one positive.

Post-mortem Observations.

Fifty children under 10 years of age dying from various causes were examined post mortem to determine the incidence, if any, of the Bordet-Gengou bacillus in the upper respiratory tract.

A similar technique was adopted throughout. The larynx, trachea, and lungs were removed intact. Surface sterilisation of each part was effected by means of a heated spatula. A sterile pipette was introduced below the surface and then the point pushed out laterally beyond the heated area; the material thus obtained was inoculated on to a "chocolate agar" plate and a plate of Bordet-Gengou medium, one plate of each medium being used for each part of the respiratory tract examined. The "chocolate agar" plates were examined at the end of 24–48 hours' incubation at 37° C. and the Bordet-Gengou plates at the end of 72 hours' incubation at 37° C. Any colonies of Gram-negative bacilli appearing on the "chocolate agar" plates were subcultured on to "chocolate agar" and ordinary agar and incubated for a further 24 hours. Gram-negative bacilli which grew freely on "chocolate" and failed to grown on ordinary agar were accepted as *B. influenzæ*. The result of these post-mortem investigations brought out the following facts: Percentage incidence of *B. pertussis* was nil, and that of *B. influenzæ* was 26 per cent.

Discussion.

These observations very definitely support the contention of Bordet and Gengou that the bacillus which they described is the cause of whooping-cough. The practical question whether the institution of a bacteriological diagnosis of whooping-cough would be of real value to the community should, in our opinion, be answered in the affirmative. For it seems to us that good use could be made of bacteriological diagnosis in the case of patients clinically doubtful, who might be a serious source of contagion—e.g., school-children. The slowness with which the colonies develop and therefore with which the results are available is a drawback, but it is possible that a method of overcoming this will be found.

Summary and Conclusions.

(1) The Bordet-Gengou bacillus was successfully isolated in 12 out of 21 cases of whooping-cough and in all of five cases examined within the first week of the disease.

(2) The organism required for its successful growth a Bordet-Gengou medium freshly prepared and on this medium after three days' incubation gave a highly characteristic small pearl-like colony. Microscopic examination of such colonies showed small, ovoid Gram-negative bacilli, uniform in size.

(3) The bacillus of Bordet and Gengou and *B. influenzæ* are two quite distinct bacterial species. The characters which distinguish them are the following:—

(1) *B. influenzæ* grows quickly, *B. pertussis* grows slowly.

(2) The appearances of the colonies on Bordet-Gengou medium are quite distinct; those of the *B. pertussis* being unlike those of any other bacterium that is commonly found in the sputum, and therefore the bacteriological diagnosis can frequently be made by inspection of the plates alone.

(3) *B. pertussis* can be preserved without subculture for periods of four to five weeks at least at temperatures of 10°–0° C.; whereas many strains of *B. influenzæ* are not easily kept without subculture for more than a fortnight under any conditions.

(4) The media most suitable for growth of *B. influenzæ*—heated blood agar, &c.—are quite unsuitable for the growth of recently isolated strains of *B. pertussis*.

(5) *B. pertussis* gives a very active catalase effect, *B. influenzæ* only gives a slight one.

(4) Secretions taken from the larynx, trachea, bronchi, and lungs of 50 children under 10 years of age dying from diseases other than whooping-cough and cultured on Bordet-Gengou media were not found to contain *B. pertussis*, although *B. influenzæ* was quite often detected in them.

(5) The bacteriological diagnosis of whooping-cough if generally adopted would probably be found to be easier and more exact than that of diphtheria and could be of practical service to the community.

We are indebted to Dr. Angus Campbell, of St. James's Hospital, Leeds, for help in obtaining some of the specimens of sputum examined, and to Prof. M. J. Stewart, Leeds, for access to the material from autopsies.

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THE MANAGEMENT OF THE PSYCHOSES OF MIDDLE LIFE.*

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It has been recognised for many years by those in mental hospital practice that mental symptoms of a severe type frequently make their appearance in persons between the ages of 40 and 60 years. Recently however, with the growth of out-patient clinics for psychiatric cases, it has become clear that minor degrees of mental disturbance at this time of life may exist for many months before the patient is committed to a mental hospital, and that there were previously many such cases which never came under the care of psychiatrists at all. These cases appear to be a source of continued anxiety and distress to the relatives and the family physician, and their management is therefore of general interest.

It is the object of this contribution to indicate the methods of clinical approach to such cases as a whole, and to formulate criteria on which prognosis and management may be based. The title of this paper may have suggested the concept of a condition designated "involutional melancholia," and associated in some way with the menopause. Such a concept is misleading, for two reasons: in the first place, it is not in accordance with observed clinical fact. In many cases, the mental breakdown is separated from the menopause by a number of years on either side; and, furthermore, the symptoms of so-called involutional melancholia are often observed in men at the prime of life. In the second place, the name involutional melancholia implies the existence of a fixed symptomatology resultant upon some underlying fixed disease entity. The truth is that there are many clinical types of psychosis which may develop in the middle period of life. Some of them are associated with gross organic disease, some with functional physical changes, while in some it is not possible to demonstrate any physical change at all. The precipitating cause of a psychosis at this period of life may be one of many. It may be organic disease of the brain, or of the somatic field; it may be some environmental disaster, such as financial ruin; or it may be some inner difficulty of the patient's, about which he is unwilling to talk, or of which, even, he may be unaware, because such difficulties may have their true core in the subconscious.

The precipitating cause has but little effect on the symptomatology, for the symptoms are coloured and conditioned by the personality of the individual himself. This is concisely expressed by saying that when an individual breaks down mentally, he does so along the lines of his personality. The psychosis is, as it were, the distorted reflection of the individual as he was before he became ill. For this reason, the family physician can be of great help to the psychiatrist, and has, if he chooses to use it, a strong weapon of defence and prophylaxis against the psychoses. He knows the personalities of his patients. The psychiatrist knows what types of personality are liable to develop psychoses, and, further, of what nature these psychoses are likely to be.

Types of Psychoses Depend on Personality.

I will not dwell on personality descriptions, for their name is legion; but we may, I think, take two figures from literature for purposes of illustration. On the one hand, Cassius, with his lean and hungry look, and his propensity for thinking too much, typifies a personality which is prone to develop the malignant type of psychosis. At the other end of the scale is the fat, boisterous, jovial Falstaff, in whom a psychosis—if it occurred—would most probably be of the benign type. Between these extremes are infinite gradations; and it has been demonstrated clinically that the likelihood of recovery or otherwise corresponds closely to the position of the patient in the scale. Any attempt, therefore, to draw a composite clinical picture of the mental disorders of this period of life is unsatisfactory, because of their very nature. Clinical psychiatry is essentially the study of the individual patient. Psychotic symptoms, when they occur, are as variegated as the patients themselves; and this is true even of general paralysis. No disease is more protean in its early manifestations. Sometimes it is the patient, sometimes the relatives who seek advice; perhaps more commonly the latter. When this is so, there is a regrettable tendency on their part to embroil the medical man in some undignified subterfuge. One has heard, for example, of a psychiatrist being asked to call at the patient's house in the guise of the man who comes to wind the clocks. Cases are not unknown where the medical man has condoned such methods, by inviting the patient to come for a drive in his car and then depositing him within the precincts of a mental hospital, the true nature of which is not revealed. Such methods cannot be too strongly condemned; there is absolutely nothing to gain by them. Patients do not readily forget such deceitful practices, and they regard as an enemy not only their own physician, but possibly the profession as a whole, and thereby increase the difficulties of the case.

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* A paper read before the Cardiff Medical Society, Jan. 8th, 1929.

Examination of the Patient.

From every point of view it is desirable that the medical man should be open and frank. Let him tell the patient that his relatives believe him to be ill, and that he has come, in the capacity of a physician, to examine him. If the patient is truly psychotic, nothing that he may do will hide his symptoms from one trained to elucidate them; while, if he is not psychotic, there is no harm done.

A routine physical examination is, of course, essential; but it is generally desirable, if the case is not obviously one of gross physical illness, to make the mental examination first. There is only one satisfactory way to do this. It is to write down what the patient actually says and does, and the setting in which he says and does it. These are matters of fact, anything else is a matter of opinion. To say that a person is deluded, hallucinated, confused or irrational is merely to express the opinion of the examiner; but, if one writes down, for example, the question, "Do you seem to hear voices?" and the reply, "Yes, like electricity in the head"; or the question, "What year is this?" and the reply, "1899," when it is actually 1929, then one has a permanent record of fact, which may become incontrovertible documentary evidence should legal complications arise later.

The special fields we want to investigate in the mental examination are three in number: (1) The emotional state or mood of the patient. (2) What the patient is thinking about; that is, the content of thought or mental trend. (3) The state of his purely intellectual functions. By "intellectual functions" one means memory, ability to retain simple facts, ability to do calculations, and to orientate one's self in time and place.

1. *The mood.*—The indications of the state of the mood are the patient's facial expression, gesture and attitude, and his statement of how his feelings and spirits are. A psychosis may manifest itself in three ways in this field. They are as follows:—

(*a*) By exaggeration of the emotional state, with or without apparent cause. For example, a patient becoming profoundly depressed after some trivial financial loss, or for no apparent reason at all.

(*b*) By the presence of apathy or a mood which is not in harmony with the patient's thoughts. The commonest example of this is where the patient states that he is being annoyed or interfered with in some way and yet does not, in spite of superficial protestations, show any real resentment thereto.

(*c*) By instability of the mood—where, in the course of a few minutes, the patient will laugh or weep without apparent cause, and will change from laughter to tears very quickly.

The state of the patient's mood gives us some clue to the questions we should ask in the investigation of the next field, viz.:—

2. *The content of thought.*—For example: "Why are you unhappy?" "What do you think is the cause of your depression?" "What are you afraid of?" When investigating the content of thought, we must find out whether the patient's experiences are real or imaginary, and whether his personal beliefs are generally accepted as correct or erroneous. In other words, are his thoughts made up in part of hallucinations and delusions? This often involves the use of leading questions.

3. *Investigation of the intellectual functions of memory, orientation and reasoning.*—The proper mode of approach is to ask the patient about chronological events in his life, beginning with the time he left school following it through such events as employment, marriage, children, deaths of parents, &c., and public events, such as the war and the general strike. Make him give as many dates as possible; and when he tries to gloss over some period, go over it in particular detail, afterwards comparing notes with the relatives. In this way, instances of amnesia or confabulation become apparent. Be particularly on the look-out for incongruities, instanced by a patient who said she was employed as a nurse in 1921, and after that went to make munitions.

Orientation is simply tested by asking the patient if his head feels clear, if he knows the date, where he is, and identifies those about him correctly.

Reasoning is most readily determined by asking the patient to do a few simple calculations.

Having completed the mental examination in this way, we find in a psychotic case that, although there may be changes in all these fields (namely, the mood *the content of thought and the intellectual function*), the change in one of them usually overshadows the others and dominates the clinical picture. Thus, we have three broad types of psychoses: (1) Those in which some profound emotional disturbance dominates the picture. We call these the affective disorders. (2) Those where there are hallucinations or delusions, without much emotional change. These are the paranoid psychoses. (3) Psychoses characterised by impairment of the intellectual functions—the organic psychoses.

The Affective Disorders.

In the affective disorders, the prognosis is generally good. The more acute the onset, and the more dramatic the symptoms, the sooner will the patient recover. Acute cases recover in from three to six months, while cases of gradual onset and less profound change take from five to seven years to run their course. If, in addition to the emotional change, such patients have definite delusions of unworthiness, sinfulness, or fear of torture, then certification must be resorted to. Many cases of affective disorders, however, do not present definite delusions, but have mental trends of a self-depreciatory kind; they feel "no good," or wretched; the difference is only one of degree. In that event, the management of the case depends on the financial status of the patient. If he can afford it, he should go to a registered hospital as a voluntary patient; and the sooner he is in hospital the better. He will be in the hands of people who understand his illness; cared for by nurses trained to deal with such cases; in a place properly equipped for the treatment, by physical, psychological and occupational means, of the illness from which he suffers. There should be no hedging about going to hospital. The situation must be faced and dealt with. It is the duty of the profession to kill the old, fatalistic attitude to mental hospitals. The patient and the relatives should be made clearly to understand that the sooner the patient is in hospital the better his chance of early recovery. One hears all sorts of arguments about the unfortunate effect upon the patient of placing him among a lot of "lunatics." There are two answers to this: one is that these cases are often worse at home than in hospital; and the other is that one has never seen or heard of a patient being definitely, unfavourably affected by being in an environment of people suffering from a kind of illness similar to his own. Moreover, any psychiatrist can tell of innumerable cases which have become certifiable and have run a protracted course, when voluntary admission to hospital in the early stages would have resulted in recovery long since.

If the patient is in straitened financial circumstances he cannot go as a voluntary patient to the ordinary rate-aided hospital in England. Such patients must be treated at home, preferably with regular visits to some out-patient clinic for psychiatric cases. It is important that the sleep and weight be recorded carefully. To secure sleep and diminish agitation, veronal in 5 or 10 grain doses, thrice daily, is effective. It should not be continued too long; and, after a week or so, bromide in 30 grain doses, t.i.d., may be substituted. The gospel of fatness has stood the test of time; and by means of gastric tonics, cod liver oil, arsenic and iron, the weight should be built up. Drug therapy, however, only helps us in the alleviation of symptoms. The psychosis is a distortion of the individual as a whole. We all know how easily habits are developed. Now, psychotic behaviour and modes of thinking are apt to become a habit with the patient, and so set up a vicious circle. We should endeavour, therefore, to make the patient develop habits of ordinary behaviour and ordinary thought.

The two great means of doing this are occupation and persuasion. Make the patient do something—no matter how simple, be it sewing, reading, painting, carpentry; anything so long as he is occupied, preferably with some creative work; something he can look at and realise that he has done himself. In this way, nor only do we tend to keep the patient's thoughts off himself, but we restore his broken self-regard and feeling of usefulness. Occupation is not suitable for the more acute forms of these psychoses. It is a mistake to force the pace too much, but firmness is essential; and we must be guided by the condition of the patient. In any case, a patient who is suitable for home treatment is, in all probability, suitable for occupational therapy. Persuasion is more logical than crude suggestion, and less coldly intellectual than argument. It means not only pointing out to the patient that he is ill, that he must regard his distress as a symptom of illness, and that he will get well; but we must stimulate him; point out his duty to others; fill him with hope, and reason out his little troubles one by one as they arise. Make him feel that we understand him, and that we want to help him; give him some model on which to arrange his life; give him a daily programme, and let him take a pride in keeping to it; for discipline is of great help in restoring a feeling of self-regard in patients suffering from these psychoses. Finally, the possibility of a suicidal attempt in states of depression must never be forgotten; and the relatives should be warned not to let the patient be alone.

The Paranoid Psychoses.

The next group, the paranoid psychoses, with their lack of emotional disturbance, but profound change in the content of thought, are extremely unfavourable cases, usually of long and insidious onset, and eventually ending in a fixed delusional system. Early certification is desirable, not only from the point of view of the patient, but also from the social point of view. Many of these patients get themselves into difficulties with neighbours, the police and other public bodies, because they think they are being watched or persecuted, or because they believe themselves to have some great reformatory mission in life. As soon as one can write down some odd belief of the patient's, which, in non-technical terms, clearly demonstrates his lack of insight into his condition, he should be certified. Because of this lack of insight it is usually impossible to get the patient to go voluntarily to hospital. On the subject of certification it may be said, in passing, that the writer of the certificate, no matter how often he has written one, should bear in mind two things: (1) to read carefully and obey to the letter the marginal notes and instructions on the certificate form; (2) to put down only matters of fact—not opinion—and to avoid technical terms, remembering that his certificate has to convince a layman of the patient's unfitness to manage himself or his affairs.

The Organic Psychoses.

The last group are the organic psychoses, characterised by intellectual impairment. Now, intellectual impairment is an almost infallible criterion of actual disease, injury or poisoning of the brain. We may, therefore, usefully recognise two sub-divisions of this group. They are: (*a*) psychoses with organic brain disease. (*b*) Psychoses with other somatic disease. Both of these sub-divisions call for special physical investigation. We should, therefore, get the patient into a nursing home or general hospital—according to his financial status—in order to do the following: lumbar puncture; fundus oculi examination; blood pressure; microscopical urine examination and kidney-function tests; complete blood count. Our lumbar puncture will settle the question of general paralysis, cerebral syphilis and a few other organic nervous diseases. If we find evidence of general paralysis, then malarial treatment should be given if the cardiovascular condition is satisfactory. Many cases are sufficiently well mentally to permit of this being done in a general hospital. If syphilis can be ruled out, we should seek carefully for evidence of arteriosclerosis in the urine, blood pressure and fundus oculi. Many arteriosclerotic patients have exacerbations of mental symptoms from time to time, and sometimes, in such exacerbations, they are certified. Unless excitement is extreme, this is not a justifiable course to take without first trying the effects of free purgation, by saline purgatives, diminution of protein intake and exhibition of iodides. It is surprising how many patients, apparently with arteriosclerosis, show a great mental improvement under such treatment. If syphilis and arteriosclerosis can both be ruled out, alcohol should next be considered; and here the history should help us. The prognosis for acute attacks in alcoholic psychoses is very good, and most of them may be treated at home; but, of course, future attacks are extremely likely to occur, unless the patient is willing to go to hospital for a prolonged period. Lastly, if all these conditions can be ruled out, we must seek some gross infection. A leucocyte count should help us; and, in addition to the usual places of focal infection, the urine should be examined bacteriologically, because a *B. coli* infection of the urinary tract is not rarely the focus, and one can recall at least one miraculous cure of a psychosis by the exhibition of large doses of bicarbonate of soda.

Summary.

Three types of psychosis are seen in middle life. They are: (1) The affective disorders, where exaggeration of the emotional state is the cardinal symptom. (2) The paranoid psychoses, characterised by delusions and hallucinations, without much emotional change. (3) The organic psychoses, characterised by intellectual impairment.

In the affective disorders, the prognosis is good in direct proportion to the acuteness of the symptoms. Certification, voluntary admission and home-treatment are appropriate to varying degrees of the disorder. The paranoid psychoses are unfavourable, and call for certification. The organic psychoses may be associated with disease of the brain, or with other somatic disease. The presence of syphilis, arteriosclerosis, alcohol or gross infection should be determined by extended physical examination. Many cases in this group—particularly those associated with arteriosclerosis, alcohol and gross infections—are capable of being satisfactorily treated under home conditions.

A brief survey of a large clinical field is necessarily didactic. There are exceptions to the rules I have formulated, but I have endeavoured to present a large field as a whole rather than to side-track the issue by a wealth of minute detail.

Clinical and Laboratory Notes.

THE MEINICKE MICRO-REACTION.

BY G. DE M. RUDOLF, M.R.C.S. ENG., D.P.H., D.P.M.,
SENIOR ASSISTANT MEDICAL OFFICER, LEAVESDEN MENTAL HOSPITAL; LATE ASSISTANT MEDICAL OFFICER, CLAYBURY MENTAL HOSPITAL.

MANY tests have been devised with the object of obtaining some simple reaction for the detection of syphilis, but perhaps none is so simple as Meinicke's micro-reaction. The blood may be obtained from a prick, and the apparatus consists of platinum loops, microscope slides and cover-slips, a microscope and an antigen which is stable and can be bought ready for use. Although the reading of the test requires some experience, the technique is simplicity itself. Full details of the technique are sent with the antigen by Meinicke but will be found in English in a paper by Prentice in this journal.[1]

At the suggestion of Dr. G. F. Barham, medical superintendent of Claybury Mental Hospital, a number of sera have been examined by this test. The Wassermann reactions (W.R.) were performed on the same sera at the central laboratory of the London County Mental Hospitals Service by Mr. F. Partner under the direction of Dr. F. L. Golla, the director.

The accompanying table shows the results obtained together with those of some other workers. Of a total of 2750 specimens examined 89·4 per cent. agreed with the results of the W.R. The percentage of agreements varied in the different series from 74·4 (Claybury) to 93·3 (Prentice[1]). When it is recalled that all the workers used practically identical techniques for the Meinicke micro-reaction, but that different techniques would be employed for the W.R., the high percentage of 89·4 for the total series is striking. Rucker and Whitby[2] carried out two series of tests. Column 1 under their names in the table shows the results obtained with an antigen prepared by these authors similar to Meinicke's own extract but without previous extraction of the horse-heart muscle with ether, whereas Column 2 shows the results obtained by these workers when Meinicke's own extract was used. The agreements were 88·5 per cent. in Column 1 but 93 per cent. in Column 2.

—	Claybury.	Saunders.	Rucker and Whitby.		Kovacs.	Prentice.	Total.
			I.	II.			
W + M +	29	111	57	149	461	400	2461 (89·3 %)
W — M —	302	799	151				
W ? M ?	2	—	—				
W.A. M —	—	9	—	11	—	29	103 (3·7 %)
W.A. M +	—	13	—		—		
W ? M +	—	8	—		—		
W ? M —	4	7	—		—		
W + M ?	2	5	—		—		
W — M ?	42	13	—		—		
W + M —	22	16	15		11		186 (6·8 %)
W — M +	43	19	12		48		

W = Wassermann reaction; M = Meinicke micro-reaction.
A = Anticomplementary.
+ = Positive. — = Negative.
? = Doubtfully positive or doubtfully negative.

Rucker and Whitby point out that the chief difficulties in the reading of the tests occur in the sera from treated cases. Kovacs[3] believes that the test is definitely reliable in untreated cases and the statement has been made that the reaction is more sensitive than the W.R. Of 19 sera examined by Saunders[4] and giving negative W.R. with positive Meinicke micro-reactions, 11 came from patients who had had syphilis or had shown positive W.R. previously. Of 16 sera tested by the same author and giving positive W.R. with negative Meinicke micro-reactions 11 came from cases of general paralysis who had been given a course of two years' treatment with tryparsamide and salvarsan continuing up to two weeks before the tests.

In conclusion my thanks are due to Mr. F. C. Radley, laboratory assistant, Claybury Mental Hospital, for assistance in the work, and to Dr. Barham and Dr. Golla for permission to publish the results.

References.

1. Prentice, D.: THE LANCET, 1928, i., 493.
2. Rucker, E. A., and Whitby, L. E. H.: Brit. Jour. of Expor. Path., 1928, ix., 30.
3. Kovacs: See THE LANCET, 1926, ii., 875.
4. Saunders, A. P.: Arch. Path. and Lab. Med., 1926, i., 388.

A NEW METHOD OF MAKING A PERMANENT SUPRAPUBIC OPENING.

BY W. CUTHBERT MORTON, C.B.E., M.D. EDIN.,
HONORARY DEMONSTRATOR IN ANATOMY IN THE UNIVERSITY OF LEEDS.

PROSTATECTOMY leaves nothing to be desired when it succeeds; too often it either cannot be done or else fails. If the operation is performed the general practitioner must be prepared to lose a life otherwise good; if it is not performed, he may have to take part in the humiliating ritual of a painful catheterism or to stand by for a year while nature lines a suprapubic opening.

Two most unfortunate cases led me to wonder whether there might not be scope for a permanent opening lined by a tubular graft of the prepuce. At a first operation the distal margin of the protracted prepuce would be incised circularly and the inner layer inserted through a freshly made suprapubic opening so that its distal margin could be sutured around the incision in the bladder wall, after which the distal margin of the outer layer would be sutured around the cutaneous incision no raw surface being left exposed. At a second operation, when the graft should have taken, circumcision would free it and its cut edges would be joined by suture. Three or four weeks should be enough for obtaining the permanent opening, and contraction of the linea alba might enable the urine to be held for some hours. The catheter, should it prove necessary, would cause little pain since the nerves to the graft would have been cut by the circumcision.

FIG. 1.

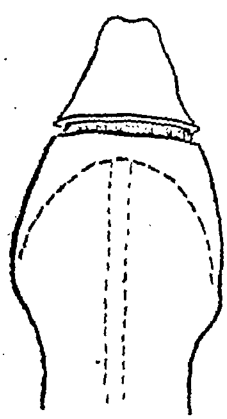
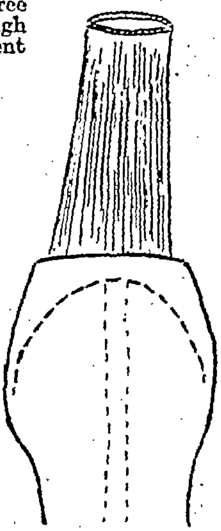


FIG. 2.

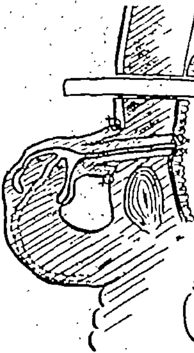


Diagrams showing incision in outer skin of the prepuce.

Description of the Operation.

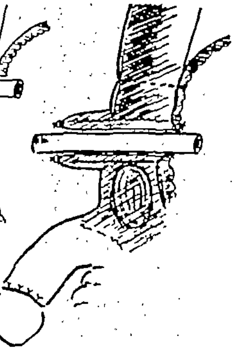
Mr. L. R. Braithwaite, with whom the question was discussed, at once arranged to try the method on the first suitable case. I am indebted to him for the following description of the operation and above all for the interest which he has taken in the method and for the successful issue which means so much to my patient.

FIG. 3.



Medial section.

FIG. 4.



Oblique section.

"The patient was a man 65 years of age, with a urethral stricture of such a kind that it was impossible to pass the finest bougie through. A radiogram of the injected track through the stricture showed it to be not only an exceedingly narrow one but also one of the 'corkscrew' variety, too extensive in its *length for successful excision or incision. Cystitis of* the foulest type had developed and the condition of the patient was so low that a suprapubic drainage had become essential two months before the new operation was attempted. As a result of drainage and lavage the degree of cystitis was much diminished.

"Provision must be made for temporary bladder drainage during the fixation of the pedicle graft. In this case the usual incision above and very close to the symphysis pubis had been already made and a self-retaining catheter was acting as a 'permanent' bladder drain.

"The catheter having been removed, the whole of the track from skin to bladder wall was excised, the wound being lengthened at the same time so that it was about two inches long. With a finger through the wound an incision was made through the abdominal wall into the bladder, one and a half inches above the level of the upper edge of the lower incision. Into this upper wound the temporary bladder drain was placed (Fig. 3). The prepuce, having been drawn out fairly tightly, was encircled by an incision about half-way along its length, dividing the outer skin of the prepuce only (Fig. 1). The distal cuff of skin was then drawn forwards (inverted) (Fig. 2), making a long tube, lined by skin on its inner side. This tube was to be made to lie in the substance of the abdominal wall from skin to mucous membrane of bladder. The elongated cuff of prepuce was now drawn through the prepared track and fixed by six fine catgut stitches accurately to the bladder edge (Fig. 3). The old abdominal wound was now stitched closely up to the preputial tube and that portion of proximal preputial outer skin left covering the glans was easily stitched to the abdominal skin at the margins of the old suprapubic wound, drawing the glans fully up to the abdomen.

"Some œdema of the prepuce developed outside the abdominal wall, but no evidence of impending gangrene. After 14 days a circumcision was performed and the penis allowed to fall back (Fig. 4). In three days the tube in the upper suprapubic wound was removed and another smaller tube placed along the new track now fully lined by preputial skin. In 10 days the upper suprapubic wound was completely closed by natural means. For three or four weeks the preputial graft remained swollen and œdematous, after that time it became normal and has shown very little, if any, signs of contraction. The skin-lined track has certainly become much narrower but no more than is necessary to keep it watertight. The result has been very gratifying. It is of interest to quote from the patient's letter to Dr. Morton, dated May 7th, 1929 :—

> "I find it only necessary now to pass water about once in five or six hours—never less than four hours—using a short silver or plated catheter, No. 8, which of course means getting a good night's rest. No leakage occurs unless, through force of circumstances, I am obliged to disregard the warning desire to relieve the bladder, and then a small quantity, say about a tablespoonful, is passed through the urethra only. Believe me, my best thanks will always be due to yourself as the inventor of the operation, and to the surgeon who performed it at the infirmary, and afterwards directed its treatment.

"Seen a few weeks ago the patient was wearing no dressing of any kind over the new opening, it was perfectly dry, and showed no sign of irritation. The new track was free from all pain or tenderness and the introduction of the short straight tube was accomplished with the utmost ease and celerity. There can be no doubt whatever that the operation has its use though obviously limited by reason both of sex and sect."

HEPATIC AMŒBIASIS SIMULATING CHOLECYSTITIS.

DRAINAGE OF ABSCESS BY CHOLECYSTOSTOMY: RECOVERY.

By IAN MACDONALD, M.D. EDIN.

IN a valuable paper on hepatic amœbiasis, based on a surgical experience of 252 cases, *Lacaze* and Melnotte[1] emphasise the difficulties of its differential diagnosis. Confusion with cholecystitis and appendicitis is apparently not infrequent when the attacks are periodic and associated with rigidity of the right side. In the case reported here, the preoperative diagnosis was cholecystitis and appendicitis, though the possibility of an amœbic abscess was not forgotten. Conservation of the gall-bladder fortunately allowed satisfactory drainage of the abscess.

The patient, a military man aged 39, was admitted suffering from acute pain in the right hypochondrium and right side down to the iliac fossa, with irregular fever, which had reached 103° F., accompanied by sweating and chills. Pain had been so severe that morphia had been necessary night and morning for a week. He had had one previous attack of dysentery 18 years before in Morocco. He had suffered in ten years from three similar attacks of pain, which had been diagnosed as biliary lithiasis. During the last eight months the attacks had been more frequent, but in all the intervals the patient had been quite well. He was a thin, sallow-looking man with a subicteric tint. Palpation elicited great pain down the right side as far as McBurney's point. Palpation for abscess laterally and posteriorly between the ribs was quite negative. The patient insisted on the severity of his subcostal and right-sided pain. Percussion of the liver seemed to show enlargement, but even light percussion was extremely painful and the right rectus muscle was continuously contracted. There were no urinary symptoms nor antecedent dyspepsia. In the attacks the pain radiated upwards towards the chest, shoulder, and back. On admission more morphia had to be given as the pain was so severe, but the pulse-rate was only 80.

Operation.—Under ether anæsthesia the abdomen was opened by a long Kocher incision with a short vertical prolongation upwards in the middle line. A large liver was exposed, and on lifting its anterior edge a very thin-walled, dilated gall-bladder prolapsed into the wound. The gall-bladder was about four times its normal size and had the colon fixed along its under surface. This adhesion, however, proved to be a fine flattish fold ; on cutting it the neck of the gall-bladder was easily reached. Palpation of the ducts revealed no stones and it was difficult to account for the obvious stasis in the gall-bladder. Palpation of the upper and lower surfaces of the liver showed no definite abscess, but needling was not employed. The gall-bladder was next opened after emptying it of foul-smelling, black bile; it contained no calculi. In view of the poor condition of the patient, the obviously enlarged liver, and the uncertainty of the nature of the cholecystitis, simple cholecystostomy was selected as least likely to cause trauma to the liver. A piece of omentum was fixed between the raw surfaces of the gall-bladder and colon and a large Pezzer catheter was placed in the gall-bladder. The appendix was then removed, without invagination of its stump, through a small McBurney incision. It was obviously diseased, contained two stercoliths, and was acutely kinked about the centre.

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[1] Lacaze, H., and Melnotte, P.: Rév. de Chir., 1935, lxvi., No. 10.

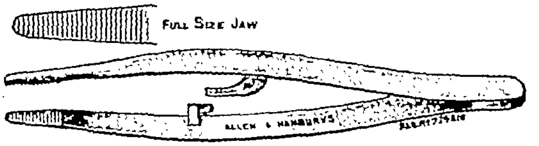
The immediate results of the operation were excellent. The acute crises of pain at once ceased and a large amount of black, fœtid bile was discharged by the tube. On the third day, however, the bile became turbid, and slimy pus, with pieces of necrotic material mixed with small blood-clots, was evacuated by the tube. Though a laboratory report of the pus and fæces was negative for amœbiasis, the clinical diagnosis was now clear. Four centigrammes of emetine were administered night and morning for twelve days, and 60 cg. of stovarsol were given daily by the mouth. The purulent discharge rapidly lessened and in ten days the bile was practically clear of pus. The tube was removed on the nineteenth day and the patient left, with the wound soundly healed, one month after admission, with instructions to continue the emetine treatment during a fortnight in each month. Three months later he was in excellent health.

Huelva, Spain.

New Inventions.

AN IMPROVED ARTERY FORCEPS.

THIS is a modified dissecting forceps having jaws similar to the standard Spencer Wells's artery forceps, and is fitted with an improved spring catch which locks, when compressed, and unlocks with further compression. The forceps can be readily manipulated in the hand, there being no delay in inserting digits into rings as in ordinary forceps and they can be gently and easily removed with either hand, even by an unpractised assistant.

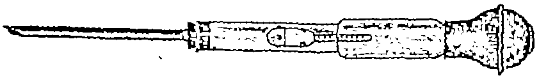


These forceps have been made to my special design by Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W.

HUGH DONOVAN, M.B., Ch.B. Birm., F.R.C.S. Eng. and Edin.

A LABOUR SAVER IN THE EXAMINATION OF URINE.

Disliking the task of filling test-tubes direct from a pot and having to wash up a greater number of pieces than necessary, I have had a battery hydrometer adapted for urine. This instrument, shown in the illustration, will pick up a specimen from any kind of vessel, give the specific gravity, and fill a test-tube without spill or mess. The usual cleansing of pipette urinometer and trial jar is reduced to the one simple operation of drawing in clean water and squirting it out again.



The hydrometer may be obtained from Messrs. A. Charles King, Ltd., 34, Devonshire-street, London, W.

G. RAMSEY PHILLIPS, M.R.C.S.

ROYAL SANITARY INSTITUTE.

CONGRESS AT SHEFFIELD, JULY 13TH–20TH, 1929.

THE fortieth annual congress of the Institute was in some ways the most successful of the long series. Its keynote was coöperation. One notable event was that the congress set its seal on the inclusion of mental hygiene within the purview of public health. The delegates who visited Sheffield for the first time and had heard it described as "a bit of hell dumped down in heaven" would not wonder at the beauty of its environment, made accessible to them by many excursions and much hospitality, but they may have been agreeably surprised at the evidences everywhere of a progressive municipality.

AMENITIES OF CIVIC LIFE.

Mr. W. J. HADFIELD, the city surveyor, described the great increase in the number of asphalt roads. In 1917 there were 1316 super. yards and in 1929 just on a million. Mr. Hadfield claimed for them greater cleanliness and silence and also durability and economy in construction, and received many congratulations from his engineering colleagues. Mr. WM. TERRY (general manager) described the excellent municipal water-supply, and incidentally put in a plea for "the effective control of both surface and underground waters by a properly constituted authority entrusted with the duty of husbanding the national sources of supply and allocating them to the best advantage."

Councillor W. ASBURY, chairman of the Sheffield Health Committee and of the Sheffield and Rotherham Joint Smoke Abatement Committee, presided over a good discussion on smoke abatement, and advocated that the whole country should be mapped out into regional areas, each controlled by a joint committee with statutory power. *When this had been done a* central committee could be formed to consider the best method of tackling the problem on a national scale and to conduct research work and arrive at a uniform standard. The Rogers Field medal, the principal award offered by the Institute, was won by Low Temperature Carbonisation, Ltd., for an exhibit of Coalite Radiant Smokeless Fuel. This medal has only been awarded twice previously during the past 25 years.

During the discussion Mr. H. G. CLINCH (chief sanitary inspector, West Ham) referred to a similar coke produced by the Gas Light and Coke Company and sold under the name of Gloco. The delegates who saw the Coalite fire burning in the exhibition must have agreed with Mr. Clinch that when such a smokeless fuel is available generally at a reasonable price no hardship will arise from the prohibition of the use of raw coal for domestic purposes and the domestic smoke problem will have been solved.

Most of the delegates utilised the efficient municipal tramway and motor-bus service, many visited the sewage disposal works to see a good illustration of the bio-aeration system, and the new municipal abattoirs received unqualified praise.

The discussions held and the papers read at the 12 sections and conferences were very numerous, and it is only possible to refer to a few of them in detail.

MENTAL HYGIENE.

The first session of this discussion was devoted to the interests of the child and the second was from the point of view of the adult. Prof. ARTHUR HALL, who presided, referred to the pioneer work of Wycliffe Wilson, who had always attached great importance to the moral and mental effect of the "scattered homes" for poor-law children, for the origination of which he would always be gratefully remembered. He went on to refer to the out-patient department of the South Yorkshire Mental Hospital, which was endeavouring to get hold of early cases, but also needed beds for short-stay cases.

The Child.

DR. RALPH H. CROWLEY opened the discussion on mental hygiene for the child. This was, he said, an extraordinarily difficult undertaking. The gaps in our knowledge as to the prevention of undesirable and *harmful mental states should warn us against undue* optimism. We needed to learn the significance of behaviour problems in general and for any particular child. Only after much patient work should we learn what abnormalities in behaviour were significant, at *what age and in what combinations; and what are* probably the forerunners of delinquency, of crime, of nervous disorder, of insanity. A public organisation would be needed to secure the team work of psychiatrist, psychologist, welfare worker, nurse, teacher, parent, and child. The retarded children, who formed 10 per cent. of the school population, would claim special attention. A child who was a failure at school early lost heart and made a bad start for his adolescent life. The specially trained staff was the crux of the matter. Hitherto we had devoted ourselves too exclusively to the manifestations of the mind through the intellect and had neglected the manifestations of the mind through behaviour, and there was in consequence much undeveloped creative activity. Men and women were not making their full contribution to the common life. Mental hygiene must take its place as part of the public health service. The resources of the community must be brought to the service of the individual at each stage of his life so as to give him the chance of the fullest and highest development.

Dr. WM. MOODIE (Child Guidance Council Clinic) referred to the anxieties of parenthood, which could be greatly minimised if the parent were warned beforehand and given confidence to face potential troubles. "Parent teacher" associations, pre-natal clinics, and nursery schools could do excellent work. For the effective working of child guidance clinics it was essential to have specially trained social workers, because parents and relatives could not accurately and impartially describe their problems, which had an effect on the child.

Dr. LETITIA FAIRFIELD referred to the large amount of obscure talk about psychology. At present they only dealt with end-results; yet naughtiness was more important, though perhaps less interesting than *criminology. They must spread the* knowledge of psychology to all who had to care for children. Consultant clinics for difficult cases were needed. The period under five years was the most important, but it would be ridiculous to have child guidance clinics *for that age, and they must work through the* mothers and the teachers, through maternity and child welfare centres and nursery schools. There was not enough character training in the maternity and child welfare centres and there were not enough "McMillan" nursery schools. At the age-period from 5 to 16 the child only spent a fraction of his life at school. In America they had endeavoured to fill this gap by appointing home-visiting teachers. An out-patient mental clinic could not work successfully without expert home visitors. In Canada the work of ascertaining mental deficiency was being extended to conduct troubles and problems, and the school nurse was specially trained in mental hygiene. Child guidance clinics would be a great disappointment if they were not conducted by real experts.

Dr. EVELYN FOX (Hon. Secretary, Child Guidance Council) stressed the importance of social workers being trained in this dangerous and difficult work. The medical profession did not yet appreciate what was meant by a mental hygiene social worker. They must create a demand for such workers, who would be the passers-on of the skilled advice of the psychiatrist to the family.

Dr. G. A. AUDEN (school medical officer, Birmingham) pointed out that nursery schools could not put right home maladjustments. The parents of only children needed instruction that their child had to live its own life and must learn to stand alone. The sense of inferiority in school work was often the beginning of trouble.

Dr. A. E. NAISH agreed that the mental upbringing of children was neglected, but said we must go slowly. Years of study were needed and mental hygiene would be an art and not a science for a long time. At early ages we must work through the mother. Unless we *had good instruction to give it was better to give* none at all. The child must be given its own reasons for controlling its emotions. Councillor OLDERSHAW (chairman of the Health Committee, Maidenhead) said that in his experience as a crammer he had to *deal with many* "*only child*" and "step-mother" failures. He sounded a note of warning as to the trouble caused by bad psycho-analysis.

Dr. HARVEY SUTTON (New South Wales) said that it would be necessary for the child guidance team to *keep an all-round view and not neglect the physical* side. For example, deafness might lead to incorrigibility. The school medical officer needed some training in psychiatric work. Dr. COLSTON WILLIAMS (Glamorganshire) asked how we were to make a beginning.

The Adult.

Dr. E. MAPOTHER (superintendent, Maudsley Hospital) said that in a wide sense the aim of mental hygiene was the abolition of madness, badness, and sadness. He found that mental disorders only had an organic origin in 25 per cent. of the total, and that there was a distinct decline in the cases caused by alcoholism and syphilis. As regards functional mental disorder there was no true prophylaxis as yet, only the possibility of early treatment. It was impossible to shelter the potential neurotic from injurious experience, and many of the world's greatest achievements had been made by the unstable facing the risks of a breakdown. Even from the neurotic's own standpoint it paid better to live dangerously than to play pawky. Dreary second-rate lives were a more frequent cause of mental disorder than overwork or disaster and the infliction of security through renunciation was the worst of services except on real proof of necessity. The pivot of the system of early *treatment was the psychopathic clinic, and at present* the only English example was the Maudsley Hospital. In its first six years this hospital treated 3000 in-patients and 7000 out-patients. None of these patients had ever been certified and less than 1 in 8 had left *against advice—just because they were free to do so.*

Dr. W. VINCENT (medical superintendent, Wadsley) said that every public hospital should have its special department for incipient mental disease. There should be beds available as well as an out-patient department, and specially trained home visitors on the staff. Dr. R. W. GILMOUR (lecturer in psychiatry, Middlesex Hospital) held a brief for the minor mental and functional nervous disorders. The alienist was more interested in the individual and the physician or hygienist in the case, but they were all coming together gradually. The wrong mental interpretation of sensations was a great source of misery and was not cured by saying "Don't be silly!" Early mental symptoms needed treatment just as much as early symptoms of physical disease. Mental defect due to birth injury was not transmissible to the children. Much was said about the inferiority complex, but he considered the superiority delusion just as important.

Mrs. C. B. S. HODSON (the Eugenic Society) said there was a distressing increase in mental disorder in *many countries. She showed charts to illustrate the* increase in this country from 1850 to 1913, and the fact that the increase was chiefly among pauper lunatics. She thought the eugenist should be linked up in the team and that the time would be ripe for a real consideration of sterilisation at their next meeting. The eugenists did not aim at the production of supermen, but rather wished to eliminate the non-adaptables, who could not afford to live dangerously.

Dr. G. MOULD (physician, mental diseases, Royal Hospital, Sheffield) spoke from 30 years' experience of a mental clinic at a general hospital of the value of such clinics.

Dr. A. GURNEY YATES (Sheffield) said the time was ripe for dealing with early cases by an organised scheme. The Royal Infirmary had just started a *mental clinic. In the treatment of early cases they* would be able to study causation.

Prof. **W. H. FROST** (Johns Hopkins University, U.S.A.) was much impressed with the fact that two sessions had been devoted to mental hygiene and that every speaker had made concrete proposals.

Councillor **WILLIAMS** (Sheffield) said we must have mental hospitals for mental breakdowns free from any slur or stigma. Other speakers dwelt on the bad effect of unemployment and a hopeless outlook, and that the public must be educated in the need for and use of mental hospitals.

Dr. **MAPOTHER**, in reply to a question as to the increase in mental disorders, pointed out that it was difficult to make a fair comparison with former years because the standards for discharge were now higher and the death-rate among the patients was lower.

LOCAL GOVERNMENT ACT, 1929.

Dr. **J. J. BUCHAN** (M.O.H., Bradford), in his presidential address to the Conference of Medical Officers of Health, which met on July 18th, dealt with the care of the sick under this new Act. He pointed out that Section 5, which exhorted councils to a certain course of action, was at present permissive in character. It enabled a council to declare in its scheme under the Act that any medical assistance shall not be of the nature of poor relief, but shall be provided under the Public Health Act of 1875. The mere change of ownership of hospitals from guardians to councils was of no moment, unless accompanied by detailed changes in working. Even the best poor-law infirmaries were seldom quite free from remnants of the old deterrent principle. Admission to the new hospitals must be made easy for persons that needed hospital treatment. The recovery of expenses must not be made in such a way as to deter sick persons from seeking hospital treatment. Hospital provision was an exceedingly onerous duty, and they must get what help they could from voluntary bodies.

Dr. **W. ALLEN DALEY** (M.O.H., Hull) detailed the advantages which would accrue to the maternity and child welfare and school medical services if the Act were properly worked. He referred to the "penal" clause, Section 104, which enabled the Minister to reduce the grant payable to any authority if satisfied that such authority had failed to achieve a reasonable standard of efficiency, and also gave a statutory right to voluntary bodies to make representations to the Minister if services in their area appeared to be neglected. Grants which had formerly been made direct to voluntary associations would now be made through the local authorities. In the case of rescue homes it was properly thought desirable to remove an unmarried expectant mother to a distance from her old surroundings. Such rescue homes should not lose their grant because they catered for persons from another district. The health committees ought to become the new public assistance committees. The health committees would run all institutions and have much responsibility for the provision of proper dietaries. They would also need to coöperate with the voluntary hospitals and be able to provide good hospital accommodation for tonsils and adenoids. Health visitors, who had hitherto acted as relief officers, without proper liaison with the poor-law officers, would now be relieved of the undesirable duty of making inquiry into the financial circumstances of the people they visited. Such inquiry for assessing relief must now be done scientifically by one body, and one register must be kept for the purpose of all kinds of assistance.

Dr. **W. M. ASH** (M.O.H., Derbyshire) described a scheme for a complete maternity service within his county which had been already initiated. The scheme made use of existing institutions, and his survey had shown that there were hospitals in existence within five miles of every home. He proposed that, in lieu of building new institutions, additional bed accommodation for maternity cases should be provided at these existing hospitals. The staff of these hospitals would [illegible] midwives for intern and extern services and [illegible]taff of nurses, separate from the midwives, who [illegible]ld do district work. An ambulance would be provided at each hospital and the services described would be available by use of telephone and motors for domiciliary purposes within a radius of five miles. Home helps would also be sent out from the hospitals when needed, and sterilised outfits. Married midwives and home helps might live near the hospital and not necessarily in it. All antiquated poor-law buildings must be discarded and the new medical services made attractive. They must endeavour to secure the full *coöperation of all voluntary institutions* and bodies such as the Red Cross.

ABORTION.

Mr. **C. J. HAWORTH** (coroner for the West Riding) brought to the notice of the medical officers of health the increasing number of procured abortions, followed by illness if not death. Into one hospital in one year from a village with a population of 15,000 some 67 women were admitted suffering from incomplete abortions. None of these died, but, following inquests on some deaths in a neighbouring village, the epidemic of abortions in the first village ceased. It was significant that when there had been a conviction there was a lull of miscarriages in the district where the offence had been committed. Miscarriages in his opinion should be made notifiable. It was the clear duty of any medical practitioner when he was called in to a case of criminal abortion to report the matter to the proper authority.

SYPHILIS IN PREGNANT WOMEN.

Mr. **JOHN ADAMS**, F.R.C.S., described his experience at Thavies Inn V.D. centre. All the patients admitted are pregnant women affected with syphilis. Mr. Adams quoted from a paper by Sir F. W. Mott in 1912 and from the report of the Royal Commission on Venereal Disease, 1913, to illustrate the disastrous results of antenatal syphilis. The report stated that in the case of untreated syphilitic pregnancies, 50 per cent. of the fœtuses were stillborn, 75 per cent. of the living children died within the first year, mostly in the first week, and most of the remaining 25 per cent. died in early childhood. As a contrast Mr. Adams submitted a table showing the results obtained in all the cases of syphilis treated at Thavies Inn from September, 1917, to June, 1929:—

Cases treated.	Expected mortality of untreated cases*	Babies born alive. W.R.		Actual mortality.	Fœtuses born dead from syphilis.
		Pos.	Neg.		
267	178	86	159	1917–1919..4 1928..1 } 5	14

* See Royal Commission, V.D. Report, 1913.
W.R. = Wassermann reaction.

The treatment of the syphilitic mother and of the living child born to her should begin at the earliest possible moment. He often began the treatment of the child within half an hour after birth. If the treatment of syphilitic babies was begun at once and continued for a sufficiently long time they compared favourably with ordinary healthy children. (Mr. Adams showed photographs to illustrate the results obtained.) The procedure usually adopted to obtain blood from babies for the Wassermann test was difficult, dangerous, and often unjustifiable. (Mr. Adams described his method which was quite easy, and showed the special needle with an arrow-shaped point which he used.) Of the syphilitic cases admitted to Thavies Inn from 1917 to 1929, 1 in 12 had gonorrhœa in addition, but the gonococcus was found microscopically in less than 10 per cent. of the patients so suffering. Mr. Adams went on to describe the treatment adopted for gonorrhœa and for the prevention of ophthalmia in the baby. During ten years at his centre there had not been a single case of gonorrhœa ophthalmia. With our knowledge of this power of saving infant life, it was almost criminal that more was not done by the setting aside of institutional accommodation for these cases, and arranging for teaching to medical students and practitioners the special measures needed.

THE POPULAR LECTURE.

"Many Men, One Aim."

Prof. W. W. JAMESON said that with some justice we spoke of ourselves as pioneers in public health, but that, with our record of past achievements, we were inclined to be just a little complacent, and to give insufficient heed to the doings of other nations. By studying other peoples' methods we should be able either to improve our own, or to feel assured that we were working on the best lines possible. Dr. Jameson went on to give a most interesting account of the work of the public health services in Germany, in Poland, and in the U.S.A., and concluded with a quotation from a speech of Dr. Vincent, the president of the Rockefeller Foundation, describing an ideal internationalism that can hardly be bettered, in which "a generous national rivalry plays an even larger part without weakening true patriotic feeling. To contribute to a common world fund of knowledge, skill, and idealism becomes the ambition of each nation. Patriotism gains a nobler significance."

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

THE OPENING OF THE NEW BUILDING.

THE new building of the London School of Hygiene and Tropical Medicine was formally opened on Thursday, July 18th, by H.R.H. the Prince of Wales. The building was fully described in THE LANCET last week (July 20th, p. 149), with illustrations showing the important façades on Gower-street and Keppel-street, and the splendid library, and at the same time the origin of the school, the part played by British workers in its organisation, and the immense debt incurred to the Rockefeller Foundation were recorded.

The proceedings commenced with the reception of the Prince of Wales at the main, or Keppel-street entrance, by Lord Melchett, Chairman of the Board of Management, Sir Holburt Waring, Chairman of the Court of Governors, and Sir Gregory Foster, Vice-Chancellor of the University of London. The Director of the School, Dr. Andrew Balfour, was presented to his Royal Highness, as were the architects of the building, Mr. Morley Horder and Mr. Verner O. Rees, who offered the Prince of Wales the key of the building.

The Address of Welcome.

In the beautiful library a large and representative group of visitors were assembled to hear an address of welcome to the Prince, offered by Lord Melchett. The speaker pointed out that those responsible for the management of the School had embarked upon an enterprise made possible only by the benefaction of the trustees of the Rockefeller Foundation, which had realised that the claims of London as a centre for the teaching of hygiene and tropical medicine were unparalleled, and that assistance to provide the building of a central institute was therefore urgent. Lord Melchett reminded the audience that when three years ago the foundation-stone of the building in which they stood was laid by Mr. Neville Chamberlain, then Minister of Health, the American flag was flying side by side with the Union Jack above their heads, and the same was occurring to-day as a fitting reminder of their debt to American generosity. The absence from the ceremony of any representative of the Rockefeller Foundation was, he said, characteristic of the self-effacing policy of that establishment, while the Ambassador of the United States unfortunately had another engagement which could not be cancelled. Lord Melchett continued:—

"The gift of the Foundation followed immediately upon, even if it was not the direct consequence of, the recommendations of a committee which met in 1921 under the presidency of a distinguished relative of your Royal Highness, the Earl of Athlone. The committee found the arrangements for teaching for the Diploma of Public Health in London scattered and inadequate. The great post-graduate teaching centre which the Athlone Committee visualised as a necessity at once became possible by the fact that the trustees of the Rockefeller Foundation offered the munificent gift of $2,000,000 for carrying out the project which the Athlone Committee recommended. In this way it became possible that hygiene and public health should have a university institution of its own. And when further in the course of our deliberations the Seamen's Hospital Society expressed their willingness that the old School of Tropical Medicine should become merged in the institution, we felt indeed that these great twin subjects of hygiene and tropical medicine had at last their long-sought opportunity, and that a new epoch in the history of medicine and related sciences, and in hygiene, was about to be opened. Mr. Chamberlain at the foundation-stone laying, reminded us of the distinguished part which his father, Mr. Joseph Chamberlain, had played in founding, at the instance of Sir Patrick Manson, the School for the study of diseases of the tropics, and it is a pleasure again to recall this fact. We shall continue to be indebted to the Seamen's Hospital Society for clinical and pathological facilities for the study of these diseases, now that we have entered into our new home." The speaker went on to point out that to-day the presence at their gathering of Mr. Chamberlain, the ex-Minister, and Mr. A. Greenwood, the present Minister of Health, was evidence that the School which, in union with the University of London, would be partly maintained by Parliamentary grants, and be open to all nations, would be in a position where party politics played no share, a position that was necessary for the establishment of the laws of health. It was, he concluded, the future duty of the British public and British Government to see that the School was adequately maintained.

The Prince's Speech.

The Prince replied to the address of welcome by formally declaring the building open in the following words:—

"You have right to be proud of the magnificent building in which we are, and if the museums and theatre and laboratories make good the promise of this library, you are to be congratulated upon a building that will be a notable addition to the homes of learning in London. While the part played by America has been described to you, the duty lies on both the British Government and the British people to see that this School is worthily endowed and maintained. The building is a sign that post-graduate education in medicine is about to come into its own. The establishment and endowment of this centre of teaching in preventive medicine is a signal example of the bond between the two great English-speaking races of the world. The chairman has rightly said that there are no territorial frontiers in hygiene. The instruction in the class rooms and laboratories of this building will be conveyed by medical practitioners of every nationality to the far corners of the earth. This research will find its results wherever man lives and moves and has his being.

"Three periods in medical science are stamped definitely, each with its own characteristics. The first, from 1870 to 1900, was a period of sanitary reform. The next period was marked by growing concern for the protection of the individual, which had been the basis of recent legislation, as evidenced by maternity and child welfare, the treatment of tuberculosis and National Health Insurance. We stand now in the early days of an era of preventive medicine in which the progress made in sanitation and care of the individual will be developed, and fresh research will lead to the solution of problems not yet solved and to the prevention of much ill-health. The establishment of this school is of special importance to the British Empire, and it has undertaken great responsibilities. In my travels I have learned personally the appalling loss of life and effort due to tropical diseases, and I realised the great need for research in tropical medicine and hygiene. In the cause of hygiene generally the school will help and develop the growing work that has already been done. For these reasons I believe that the establishment of this school provides a great opportunity for this country and for the whole world.

"If its work is properly conceived and carried out, there should follow a special development and interest, and a quickening of the public conscience, which will lead to a steady decrease in preventible diseases, suffering and death. By its work in this connection the school will be judged."

The Addresses of Thanks.

A fanfare of trumpets sounded by the Coldstream Guards followed, when an address of thanks was presented by Sir Holburt Waring. Sir Holburt pointed out that throughout the erection of the building, and in every stage of its rise, the notion of a workshop had been kept clearly in view all the time. He said that the London School of Hygiene and Tropical Medicine was intended to be a centre of Imperial effort, and alluded to the pertinent fact that already the Court of Governors, as part of a policy of future development, had taken over from the Government of Southern Rhodesia the research station there. It would, he knew, be the policy of the School to establish a chain of such research stations throughout the Empire as adequate funds were forthcoming, and to send out expeditions from time to time to the tropics. As Chairman of the building committee he recalled that at the conception it had been decided that the first condition laid down for competing architects should be "Let there be Light," and in the employment of half a million sterling real concern he believed and hoped had been shown to make the expenditure wide and judicious. The Director of the School, the professors, and the departmental heads had throughout been consulted in the construction of their laboratories and workshops, and it had not been found necessary, thanks to the generous measure of the Rockefeller gift, to refuse a single request for any piece of essential equipment. He associated the Director, professors, and staff with the governors and the board of management in thanking His Royal Highness for the encouragement and inspiration of his presence.

Sir Gregory Foster, also, in thanking the Prince, said that the new School would rank as a part of the University of the metropolis—the University of the capital city of the Empire—and that its work would be organised, not for London, and not even for the Empire, but for the world. In alluding to the many great men who had been educated at the University of London, and who had gone forth to make the world a better and happier place, he said he would mention one name only, that of Lord Lister, who was a graduate of the University of London, and received his education in London. The Vice-Chancellor described in humorous terms the curiosity that had been aroused in the neighbourhood by the new building, the reason for whose existence the local public had not yet grasped, while he was certain that the new School would increase the tradition of magnificent service in the cause of humanity which the University of London possessed, by sending back students, who had arrived from all parts of the world to be taught, as missionaries of health.

His Royal Highness then visited the museum, the laboratories, and the lecture theatre, and before leaving the building met the workmen employed in its construction who were having their mid-day meal in a tent adjoining the premises. Here the health of the Royal visitor was drunk in beer with musical honours.

A large number of those who were invited to be present at the opening ceremony remained to luncheon as the guests of Lord Melchett, and afterwards, under the supervision of the Director, professors and members of the staff were shown around the building, and were present at cinematograph displays in the lecture theatre.

Reviews and Notices of Books.

ENZYME ACTIONS AND PROPERTIES.

By ERNST WALDSCHMIDT-LEITZ, Institut für Biochemie, Deutsche Technische Hochschule, Prag. Translated and extended by ROBERT P. WALTON, Department of Organic Chemistry, Columbia University. London: Chapman and Hall, Ltd. New York: John Wiley and Sons, Inc. 1929. Pp. 255. 20*s.*

THERE are many books upon enzymes. Some of them are almost entirely theoretical and physicochemical; others are laboratory handbooks giving methods for the preparation of active ferments from their natural sources; others are largely catalogues of facts. This volume falls into none of these classes, but sets out to describe enzymes and their actions from a definite point of view—that of the Willstätter school. Prof. E. Waldschmidt-Leitz has played a considerable part in the brilliant series of researches on enzymes carried out during the last ten years by Prof. Willstätter and his associates at Munich, and his book has the value to be found only in the work of one who has himself had practical experience of the problems involved. In order to appraise the book it is necessary to consider in what respects the work of Willstätter differs from that of his predecessors. In the first place, he has set out to place the preparation of enzymes on a quantitative basis, such as is customary in experiments in synthetic organic chemistry, for example, and he has considered in all cases the number of units of enzyme activity recovered after purification as well as the unit-weight of the enzyme preparation. This outlook led to a greatly increased efficiency in the various steps used in purification. Many of the methods employed by Willstätter are based on selective adsorption of the enzyme on to various substances such as alumina and kaolin, and subsequent removal (elution), usually by alteration of the reaction of the medium. Such processes are not new, but in the hands of Willstätter and his colleagues they have led to some remarkable results, such as the separation of enzymes from their closely associated contaminants, from activators, and from other enzymes. Willstätter considers that the enzymes are composed of a colloidal bearer and a specific, active group, which enables them to be bound to the substrate, and the composition of the active group at the same time conditions the colloidal nature of the entire complex. One of the most striking facts which have emerged from Willstätter's researches is that the properties of the enzyme are often profoundly modified by their intensive purification. Thus the conventional view regarding the higher protein fission products as the specific substrate of trypsin, which only hydrolyses these substances in the presence of the activator enterokinase, has received a rude blow from some recent work of this school. Trypsin prepared by adsorptive methods did not attack ordinary peptides when activated by enterokinase; on the other hand, certain basic proteins, such as the protamines and also the products of peptic digestion, are rapidly broken down even by the non-activated enzyme. In other respects the conventional views receive short shrift from Prof. Waldschmidt-Leitz. Most text-books, even quite modern ones, state unequivocally that the gastric proteolytic enzyme is secreted as an inactive zymogen known as pepsinogen or pro-pepsin, which is converted to the active form by the action of the hydrochloric acid in the stomach. This view is based on the observed effect of acid (which may more logically be regarded as a pH effect), and the varying stability to alkali of the active and inactive forms. This variation of stability may, however, be due to different amount of associated substances in the enzyme solutions under comparison. In any case the evidence in favour of a zymogen precursor is very small.

The critical outlook of this excellent book will be clear from these examples. Its contents are well arranged and are divided into a general section, dealing briefly with the history of the subject, with enzymes considered as colloids and as electrolytes, and with the kinetics of enzyme action. The other half of the book deals with the various enzymes individually. Their preparation and properties are well described, again from the Willstätter standpoint.

To those who wish to read in a connected form the conclusions reached by this important body of scientific workers, this work can be strongly recommended. We dissent from the view of the translator that, among others, students of medicine will find the volume of service. In our opinion it is essentially a volume for the research worker, since though its pages show how unwarranted is the dogmatism of the ordinary text-books where enzymes are concerned, much of the teaching would hardly be well received by examiners at the present time.

VIRUS DISEASES.

Les ultravirus et les formes filtrantes des microbes. By Dr. P. HAUDUROY, Préparateur à la Faculté de Médecine de Paris. Paris: Masson et Cie. 1929. Pp. 392. Fr. 40.

THIS monograph, which is the first on the virus diseases to reach us from France, starts badly, but improves as it goes on. The first part consists of a catalogue of the diseases and a summary of the known properties of the filterable viruses to which they are attributed. The information is neither happily selected nor critically presented. This part of the book, in fact, illustrates well the lack of system which has characterised the investigation of the agents of these diseases. The second portion is better compiled, and provides a comparative survey which is well worth reading. The author's views as here presented are on the whole orthodox. A serious defect is the absence of a bibliography. In the third portion of the book more rein is given to the imagination, and a very interesting thesis is developed. It is pointed out that many diseases of this type are definitely associated with certain micro-organisms which in our present stage of knowledge are not believed to be causal but commensual—in the French phrase they are "microbes de sortie." One would instance the almost specific salmonella in hog-cholera, *B. bronchisepticus* in distemper and, perhaps, Pfeiffer's bacillus in influenza. Hauduroy holds, as a corollary to his belief in the existence of filterable forms of the visible bacteria, with which the third part of this volume deals, that these are really the causal organisms of the diseases which are initiated by the filter-passing phase of the microbe's life-history. The belief in such phases for the larger bacteria has obtained little adherence in this country, since it is held that no very convincing evidence of their existence has been produced. However, so long as we remember that the foundations of the edifice erected by Dr. Hauduroy are inadequate for its superstructure, no harm can result from a cautious exploration of its features.

CONJUGAL LIFE.

Ideal Marriage. By TH. H. VAN DE VELDE, M.D. Translated by STELLA BROWNE. London: Heinemann (Medical Books) Limited. 1928. Pp. 325. 25s.

IN view of the increasing tendency to seek for an elucidation of neurotic disorder in terms of disharmony of the sexual life, a good book by a responsible medical authority, written for medical readers, upon the physical aspects of marriage, should satisfy a need. Dr. Van de Velde has for some years been in charge of the Gynæcological Clinic at Haarlem, and this book has been written as a result of the experience gained in the days of his professional activity. This is the first of a trilogy of books and purports to deal with the sexual basis of married life. The second book of the trilogy will be called "The Prevention of Conjugal Aversion," and the third, "Fertility and Sterility in Marriage." "This first volume," it is stated in a preface, "deals with the physiology of conjugal life, because knowledge is the indispensable basis, both theoretical and practical, for success in marriage"; and its chief value rests in the frank and open way in which it discusses the conduct of marital relations.

It falls short of the ideal book for medical men in this, that whereas its sale is restricted to the medical profession in this country, it was not originally written, in German, for the medical profession alone. This is acknowledged in the preface, wherein it is stated that the book "attempts to help such married couples as have not recourse to doctors, without their intermediary advice." Actually this book has enjoyed a very considerable sale in Germany, where it could at one time be bought on most bookstalls. The result of this circumstance is that it contains some elementary anatomical descriptions that are likely to prove somewhat wearisome to the medical reader. Another drawback is that the style is pitched on a plane of ideality which is somewhat exalted for purely medical purposes. Thus, into the text are intercalated what the author, or the translator, has called three "Intermezzos of Aphorisms." These vary considerably in quality. They range from observations as excellent as "A husband's interest and honour alike enjoin that he should never permit himself a sexual gratification which he has not made his wife's desire as well," to other less edifying pronouncements.

In spite of these not very important defects, however, this book is to be recommended to those medical men who feel that disharmony in marriage is a source of mental stress or disorder to their patients, and who wish to equip themselves to give appropriate advice to remedy this disharmony, without having to read the ponderous volumes that are devoted to the study of sexology.

The Hygiene of Marriage. Second edition. By ISABEL EMSLIE HUTTON, M.D. Same publishers. 1929. Pp. 125. 5s.

THE first edition of this book was published in 1923, and an edition was also published in Dutch in 1925. To the practitioner who is asked by his patients for a work by a responsible author setting forth the facts of sexual physiology and psychology, this book is to be recommended. The anatomy and the physiology of the reproductive organs are explained in as much detail as is necessary, and the literary style is both simple and free from criticism. Despite its title, the book deals with the reproductive functions of woman as a whole. There are useful chapters on the onset of menstruation and the menopause which only very indirectly touch upon the question of marriage. Perhaps the most valuable feature of Dr. Hutton's book is that she makes the fullest allowance for the wide variations in sexual needs that occur in different people. Her method is to set forth the problem, and to leave the solution for the couple to reach in accordance with their personal characteristics. There are no generalisations made from religions or sociological preconceptions.

The book could offend no one seriously desiring knowledge and, suitably recommended, is capable of giving valuable help.

THE RHYTHMS OF LIFE.

By D. F. FRASER-HARRIS, M.D., D.Sc. London: George Routledge and Sons, Ltd. 1929. Pp. 185. 5s.

CERTAIN of these essays may have already met the eye of the reader, for they have appeared in well-known magazines and newspapers. They deal, in simple language, with such subjects—to select certain for example—as the eye as a camera, the comparative sensitiveness of the sexes, the analysis of tastes—i.e., of the true gustations, our debt to the microscope, and the cause of colour, the other themes being similarly large in their relation to life, and similarly likely to escape exact comprehension until attention is directed to their problems—scientific or social. The volume makes excellent reading, for in sound but colloquial manner it deals with fundamental questions arising out of physiology, chemistry, and physics. Dogmatism is necessary in order to deliver the messages with appropriate brevity, but on the whole the teaching that the author lays down would find scientific support, although there are places where modern developments of particular branches of science have somewhat altered our views. Such essays as that on the cause of colour and that on the analysis of tastes, as well as the opening chapter which gives a name to the book, have real educative value, supplying information where the imperfectly equipped are perpetually puzzled.

HANDBOOK OF ANÆSTHETICS.

Third edition. By J. STUART ROSS and H. P. FAIRLIE. Edinburgh: E. and S. Livingstone. 1929. With 60 illustrations. Pp. 339. 8*s*. 6*d*.

THIS excellent little book has grown somewhat since its last edition and has now the advantage of Dr. H. P. Fairlie's coöperation. He has added a chapter on ethylene and oxygen and has brought other matters in the book up to date. The character of this work, which stamped it from the first as a really valuable handbook, has not changed. It is distinguished by an enlightened insistence on a proper knowledge of the physiological changes involved as the true basis of competent anæsthetic work, rather than a mere familiarity with a collection of apparatus. At the same time the essentially practical nature of the anæsthetist's activities are not forgotten. There is no small book better calculated to guide an administrator on safe lines.

THE GROWTH OF REASON.

By FRANK LORIMER. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 213. 10*s*. 6*d*.

THIS is the study of the rôle of verbal activity in the growth of the structure of the human mind, and is the most recent volume in the International Library of Psychology, Philosophy and Scientific Method; it might well be read in connexion with an introduction to child psychology, contributed under the title of the Growth of the Mind, by Prof. Koffka to the same series. Mr. Lorimer, who is lecturer on "social theory" at Wellesley Psychological College, Mass., U.S.A., approaches the problem of the relation of thought and language through a study of verbal activity in children, acknowledging the inspiration derived from Prof. Dewey of Columbia University, while other authorities, whom he mentions by name, he credits with his ability to elucidate various technical and psychological difficulties with accuracy.

After sketching the evolution of thought prior to the employment of active language, the author traces the growth of verbal activity in the life of the child. Vocal activity we know to be a conspicuous feature of the infant's career, but here we have voice under its physiological description of a form of modified breathing acting conspicuously—and nothing more. Sounds can only become words by virtue of a social process, and a valuable section of the book illustrates this process and leads up to the three following sections showing that verbal processes, spoken or silent, supply the dominant system of human intellectual life. This conclusion, says the author, involves three things: (1) The establishment of fixed "symbolic relations" between unitary phonetic patterns and patterns of situation and behaviour (which are lacking in the fluctual relations of the "first words"), so that words may function as *foci* or *substitutes* for organic patterns in the processes of intellectual experimentation; (2) the development of fixed *relations of order* and sequence in the verbal processes themselves (systems of reference and inference in systematic thinking); and (3) the capacity for more and more intricate *correlation* of intellectual processes, including explicit symbolic systems." Mr. Lorimer's expositions are easy to follow, although his plan of work is not, and we have here a valuable book in which the relation of social to organic factors in thought development is traced, the argument being furnished for the general thesis that while animals may live well by instinct, and primitive communities by culture patterns, civilisation can live well only by symbols and logic.

ANTHROPOLOGY AND MODERN LIFE.

By F. BOAS. London: George Allen and Unwin. 1929. Pp. 246. 10*s*.

ANTHROPOLOGY studies groups of human beings in relation to their social setting. Prof. Boas has had a long and distinguished career as an anthropologist and in this book he summarises his views of the relation of his science to our life to-day. He deals with race, nationalism, eugenics, criminology, education, culture, and related topics throughout in an interesting way. As befits the real student, the author is evidently more impressed with the problems which remain to be solved than with what we have found out already, and the reader will be struck with the absence of dogmatism and the open-mindedness of the discussions. He has no quack remedies for our social evils and deficiencies; all we can do, he says, is to watch what we do in the light of what we have learned and shape our steps accordingly.

DISORDERS OF CHILDREN IN INDIA.

Birch's Management and Medical Treatment of Children in India. Seventh edition. By V. B. GREEN-ARMYTAGE, M.D., F.R.C.P., and E. H. VERE HODGE, M.D., M.R.C.P. Calcutta and Simla: Thacker, Spink and Co. 1929. Pp. 482. Rs.10.

THE publication of this edition perpetuates a work, the continuity of which has been maintained for 75 years. Originally written by H. H. Goodeve in 1844, it was remodelled by Brigade-Surgeon Birch about fifty years ago, since when it has been revised from time to time. The present authors have introduced much new material, and have brought the book thoroughly up to date.

The practicability of bringing up European children in India is the first question likely to be considered by those who have to decide whether to spend their married life in that country, and they are likely to seek advice first from their family doctor. It is thus not only medical men practising in India who may want to consult this work, the authors of which give clear information on the possibilities and limitations of family life in India. During the first year of life the child does not suffer injury; even up to the age of 5 or 6 the child's health may be perfectly satisfactory if special precautions are observed; but after this age the climate of the plains conduces to physical and moral degeneration. Children brought up entirely in the hills are in no way inferior to those brought up at home. The book contains short accounts of the disorders of childhood, and is not limited to purely tropical diseases. The chapter on rickets suggests that this disease is not as rare among any section of the Indian community as has sometimes been alleged. Infective bowel complaints are dealt with in some detail, and emphasis is laid on the extreme rarity of amœbic dysentery in children as compared with bacillary infections. The chapter on malaria is a particularly valuable one, the practical details of the treatment and its numerous difficulties being fully discussed. The authors disapprove of the routine use of quinine as a prophylactic.

This is a work for which there is likely to be a large demand, not only among practitioners but among educated Europeans who are faced with the problem of rearing children in India.

THE LANCET.

LONDON: SATURDAY, JULY 27, 1929.

AFRICA AND SCIENCE.

THE ninety-ninth meeting of the British Association for the Advancement of Science began in Cape Town on Monday; the concluding assembly will be held in Johannesburg on August 3rd, after which the members and visitors will disperse to visit some of the wonders of the continent. The whole affair will no doubt be a great success, and we can envy those who have been lucky enough to get there. While we wait their traveller's tales, we can get some idea of the atmosphere in which they are from the prints of the various addresses which are available. Nothing, perhaps, in these is more remarkable than the expression of the feeling that, just as facilities of travel have made a meeting in South Africa an easy possibility, so it has become the proper business of natural science to concern itself directly with humanity and its welfare; politics in the widest sense is now one of its disciplines. In his presidential address on the International Relationship of Minerals, Sir Thomas Holland, as might be expected from so practical a man, goes straight to the point, and shows how the control of mineral products means the control of war and peace as well as industry; it is a new departure to find the President's discourse leading to the conclusion that "the only two nations that can fight for long on their own natural resources are the British Empire and the United States; if they agree in refusing to export mineral products to those countries that infringe the Kellogg Pact, no war can last very long."

Africa is full of the varied problems raised by the intimate contact of advanced and backward peoples—by man's passion for interfering with the order of nature—and it is natural that the Association should pay a good deal of attention to these questions in the sections of anthropology, economics, and elsewhere. Philologists, economists, and cellular cytologists are all involved, and if their combined efforts can do something towards a happy issue, the advantages of such organisations as the British Association, which bring together workers and thinkers of so many different complexions, will be admirably illustrated. To consolidate the humanities of Africa into a coherent and harmonious civilisation will realise in the best way the doctrine of holism set out by General J. C. SMUTS—South African, botanist, philosopher, and statesman. The address of Vice-Chancellor J. H. HOFMEYR, with which the proceedings actually commenced, is perhaps of more local interest. He points out the opportunities which are available in Africa for opening up our knowledge of every branch of human interest. The apparatus and equipment—human and material—for the pursuit of natural knowledge, have been enormously increased since the last visit of the Association in 1905, and curiosity has grown with the chances of satisfying it; from the more narrowly economic as well as the wider scientific points of view, Africa is now at least as useful as any other part of the world. In our own extensive field, our readers will hardly need to be reminded on the one hand of the magnificent institutes for veterinary and medical research and on the other of the contributions which the study of trypanosomiasis, sleeping sickness and other diseases have made to our general knowledge of infections. South Africa is now being Africanised, it is acquiring a culture and outlook of its own, and in many ways it can and will help the rest of the world. Of the more immediately biological addresses, we give an epitome of Prof. W. E. DIXON'S discourse on Physiology the Basis of Treatment on another page; Prof. A. C. SEWARD deals with fossil botany and the correlation of African with more northern strata; in Zoology, Prof. D. M. S. WATSON points out that while the fact of evolution is now believed in more firmly than ever, the mechanism of it seems more and more obscure, and he suggests that it is time to get nearer the basis of adaptation by a more intensive study of comparative physiology. Dr. J. S. HALDANE, General SMUTS, Prof. D'ARCY THOMPSON and others will discuss the Nature of Life, and may or may not succeed in getting nearer to finding out what it is.

GLYCOGEN, INSULIN, AND EPINEPHRINE.

GREAT as is the therapeutic and scientific value of the discovery of insulin it has not as yet simplified the physiology or pathology of diabetes. The cause of metabolic failure in diabetes is still to seek and there are many other problems which have resisted solution in spite of the new knowledge. Insulin has not proved to be a master key, but it has opened many doors and it has closed others by showing how slender is the evidence upon which certain orthodox ideas about carbohydrate metabolism are based.

In the lectures recently delivered by Prof. J. J. R. MACLEOD at the London Hospital, and published in our columns,[1] the results of recent work are set out in some detail. The fate of ingested soluble carbohydrates is of particular interest and some remarkable differences have recently been observed in the rate of absorption of different sugars. When these are given by the mouth absorption occurs very rapidly from the upper level of the small intestine, and according to C. F. and G. T. CORI the amount absorbed per hour per 100 g. of body-weight has a definite value for each sugar. Peritoneal absorption, on the other hand, appears to depend merely on the concentration of the sugar solution. The effect of ingested carbohydrate on the blood-sugar is well known clinically from the use of the glucose tolerance test, and the ingestion of lævulose and galactose has been studied in tests of liver efficiency. The fact that the consumption of these substances has such a slight effect on the sugar content of the blood, if the liver is working efficiently, is assumed to be due to the rapid polymerisation of these sugars to form glycogen by the action of the normal liver. But even the explanation of the presence of glycogen in the liver is still unknown; is it a simple storage of carbohydrate or is it, as CLAUDE BERNARD thought, a type of internal secretion, by which the glycogen is produced in the liver cells from non-carbohydrate sources? It is well known that new formation of glycogen, from protein or fat, or both, occurs in the liver during starvation, but it has generally been thought that the liver glycogen disappears when the fasting animal is made to do muscular work. This result has not been confirmed by some recent work discussed by Prof. MACLEOD. It is also questionable whether in pathological conditions glycogen ever disappears completely. The storage hypothesis does not explain the action of epinephrine and insulin on the liver glycogen. Epinephrine causes deposition of glycogen in the fasting animal and the breakdown of glycogen in the liver rich in this substance. The mechanism by which insulin acts is not yet clear, though it is now seven years since its remarkable property of lowering blood-sugar was first used therapeutically with miraculous success. Diabetes has often been attributed to a failure of the organism to oxidise carbohydrate. This is supposed to be shown by the low respiratory quotient, lack of ability to store glycogen in the liver, and excessive new formation of glycogen from non-carbohydrate sources. This view, based mainly on determinations of the dextrose-nitrogen ratio, has not in all respects been confirmed by recent work, and there are objections to some of the arguments brought forward in its favour. There is, moreover, some evidence that the diabetic animal is able to utilise the blood-sugar at approximately the same rate as the normal animal, though perhaps not to oxidise it at the same rate. It is possible that much evidence based on measurement of the respiratory quotient is unsound in view of the over-ventilation of the blood in the lungs in the eviscerated preparations used. I. L. CHAIKOFF and MACLEOD have found that the respiratory quotient following increased muscular activity is the same in normal as in diabetic animals. The total evidence available does not support the view that insulin merely acts by direct stimulation of the oxidation of carbohydrate. Nor is it possible as yet to say what is the fundamental cause of the metabolic failure. One theory is that only the glucose produced in the liver is excreted in diabetes, and that the diabetic muscle is unable to oxidise this glucose, although it can use it for glycogen formation. This is, of course, contrary to the usual view that the diabetic animal derives its energy from the combustion of fat and protein. At present all that is definitely known is that insulin given to diabetics causes glycogen to appear in the liver, whether or not carbohydrate is given to the animal.

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[1] THE LANCET, July 6th, 13th, and 20th.

In normal persons the muscle glycogen seems to be dependent in some way on the liver, while C. H. BEST, J. P. HOET, and H. P. MARKS have shown that glycogen formation following the addition of glucose to the blood can occur in muscle in the presence of insulin. Insulin is not, however, essential to the process, since glycogen is formed in the muscles of depancreatised animals. Experimental evidence suggests that either glycogen formation in the liver or increased production of insulin from the pancreas may be an essential preliminary to the formation of glycogen in the muscles of normal warm-blooded animals. The breakdown of glycogen in muscle has long been associated with muscular exercise; in a spinal animal the glycogen content falls when the muscle is stimulated. MACLEOD and FRASER, however, have recently shown that in rats working steadily the oxygen requirements of the muscle are adequately met and the glycogen need is sufficiently provided for. Only when the activity is so great that the oxidation of carbohydrate is defective does the glycogen content become appreciably lowered. These are only a few of the problems raised by the conflicting results of experiments devised to test theories of carbohydrate metabolism and to explain or confirm clinical findings. Luckily the impetus given to this study by Prof. MACLEOD, to whom the original researches of BANTING and BEST owe their initiation, shows no sign of slackening and it is unlikely that its force will be spent until the pathology of diabetes is cleared up, even if the exact biochemical changes involved cannot be repeated in the laboratory.

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DROUGHT IN THE THAMES VALLEY.

THE effects of a dry summer following a dry winter are beginning to make themselves felt in the Thames Valley, although not to the same extent as in some other parts of England. With the recent memory of floods in the mid-reaches of the Thames it is difficult to visualise the fact that the rainfall of the past few months has been abnormally low, lower in fact than in any year since 1921, when the drought lasted until the end of August, to be succeeded by a gush of water which might have imperilled the public health, although it did not. Very little water is passing over Teddington weir, and the pool below consists practically of the same water which oscillates to and fro with the tide; the whole watershed of the Upper Thames is draining directly into the reservoirs which supply London with water; but even the immense new Littleton basin is not inexhaustible. We are assured that the Metropolitan area is not threatened with any immediate deficiency in supply, and although the Trafalgar Square fountains have stopped playing, as an object-lesson (they do not really use up water), local authorities have hesitated to issue appeals for economy because they feared to create an atmosphere of panic. We have not, in fact, arrived at the time when families must reduce their personal ablutions to a minimum, and use slop water for watering plants and garden, but the time has arrived when every patriotic householder will adopt altruistic principles in relation to public water-supplies, and avoid any unnecessary or luxurious use of tap water. To the majority of Londoners water only becomes attractive at the height of a heat-wave, and the consumption per head went up last week at least 25 per cent. over the average. Some time we must try to reach a tangible conclusion as to what is a reasonable rate of consumption per head of population in summer and winter, for the increased storage could no doubt be provided at a price, although the price might be so colossal that some adjustment of the personal water quota would be the thing to aim at. The way in which water was economised in the summer of 1921 was little short of amazing, and there was no evidence that the health of the community suffered in any way as a result of the drought, though their convenience and sense of well-being may well have been adversely affected by change of habits. Probably the restriction could have been carried much further than it was without serious harm. The violent outpourings of the last week-end should also remind the community of the risks of pollution when the dry period comes to an end, and the surface gathering grounds are subjected to sudden heavy rainfall. The value of chlorination under such circumstances has now been proved up to the hilt; it is far more effective than any possible injunction to the public to boil water when there

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[1] Metropolitan Water Board. Twenty-third Annual Report on the Results of the Chemical and Bacteriological Examination of the London Waters for the twelve months ended 31st Dec., 1928. By Sir Alexander Houston, Director of Water Examination. London: P. S. King and Son. 21s.

should be a doubt about its purity, an injunction which is sure to be unobserved just where the necessity is greatest.

Compared with many rivers of the Continent of Europe, *to say nothing of such streams as the Nile or* the Amazon, the Thames may be an inconsiderable stream, but Sir Alexander Houston[1] tells us that in its course from Staines to Hampton the Metropolitan Water Board abstracts 152 million gallons of water a day, or, to put it in pictorial form, more than enough water to supply at 85 gallons per head daily the needs of Bradford, Birmingham, Glasgow, Liverpool, Manchester, and Sheffield. River water, unfortunately, has to be filtered and disinfected, but it is gratifying to know that the two million people who have been supplied with chlorinated Thames water since May, 1916, have not complained about the taste of it. Treatment with liquid chlorine of the water on its way from the Staines reservoirs to Sunbury, instead of the old plan of adding bleaching powder at Staines itself, has not only been effective in eliminating the colon bacillus, but has been economical in practice, since it increases the volume of water which can be passed through a filter before it has to be cleaned out. It may be remarked in passing that it costs £40 to clean an acre of filter-bed. But although chlorine has thus come to be accepted by the London water drinker, there have been flavours and colours in the water which have troubled the Water Board. Several years ago the water from the Barnes works acquired a taste euphoniously described in the laboratories as "geranium-like," but more pointedly by the consumers as resembling rotten fish or castor oil. This taste was completely removed by the addition of 2½ to 5 pounds of potassium permanganate to every million gallons of water, the faintly pink tinge of the water soon disappearing, leaving behind only a slight brownish discoloration. The malefactor in this case was the troublesome but harmless tabellaria. A few years previously another harmless growth, oscillaria, developed to such an extent in the filter-beds that they looked as though they had been fouled with green paint; in this case a small dose of copper sulphate proved sufficient to eliminate the mischief.

Chlorination has not, it appears, been such a success in the other sources of London water. In the New River the colon bacillus, after its apparent removal at Crouch End, has reappeared by the time the water leaves the Stoke Newington reservoir and the cause of its reappearance is not yet clear. Of bacterial contamination the presence or absence of the typhoid bacillus is of the first importance, and it is reassuring to find from a long series of experiments with the glucose-bismuth-sulphite-iron medium described by Wilson and Blair, and later by Prof. Wilson at the Public Health Congress in 1928, that Sir Alexander Houston is convinced not only of the value of the medium, but of the practical absence of this organism in 100 c.cm. of raw river water, and by inference in one thousand times that amount of purified water.

THE KING.

It is satisfactory to learn that during the week following his operation on July 15th the King has made steady progress. The fact that purulent discharge from the abscess has already ceased shows that the measures taken to promote drainage were fully justified and have achieved speedy success. The inconvenience and discomfort of the first few days following any operation are not negligible, but the fact that the King was allowed to sit up for a short period as early as last Monday, and for some hours on Tuesday, shows how little his general health has been disturbed. We are entitled to hope that his complete recovery is now only a matter of time, and that no further interference will be required.

Annotations.

"Ne quid nimis."

THE ROCKEFELLER FOUNDATION: A NEW CHAPTER.

In 1909 the Rockefeller Sanitary Commission was established for the control of hookworm disease in the United States, and in 1913 the Rockefeller Foundation came into existence, taking over the Sanitary Commission. After 16 years of intense activity entailing the total expenditure of over 144 million dollars the Foundation has opened a new chapter by certain steps of extension and reorganisation.

These changes are recorded in a review for 1928 by the President of the Foundation, George E. Vincent. He describes how during 1928 a conference committee of four Rockefeller boards—the General Education Board, the Rockefeller Foundation, the Laura Spelman Rockefeller Memorial, and the International Education Board—sought ways of bringing the work of these organisations into close and more definitely coöperative relations. In the autumn the committee made a report embodying recommendations which were approved by all the groups, with the understanding that the new *régime* would take effect at the beginning of 1929. Among the essential features of the reorganisation is the merging of the Laura Spelman Rockefeller Memorial into the Rockefeller Foundation, which will begin as a new corporation. This new Foundation will extend its activities to include not only public health, but the advancement of knowledge in the medical sciences, in the natural sciences (taking over the foreign programme of the International Education Board), in the social sciences (previously administered by the Memorial), and in the humanities. The public health activities will be administered in future through an International Health Division with a group of seven scientific directors and a China Medical Board is to be incorporated, with independent trustees, to which the lands and buildings in Pekin, together with endowment funds and annual appropriations, will be given. The details of this vast amalgamation and reorganisation of resources appear to be fully worked out, and if it is possible to imagine a further extension of the activities of the Rockefeller Foundation such an extension should now take place. To anyone unacquainted with the work done by the Foundation under the glorious motto of "The well-being of mankind throughout the world" a study of the review for 1928 will be illuminating. In one almost breathless sentence in which a full-stop does not occur for nearly two pages, it is announced quite bluntly that the Foundation in 1928 expended over 21 million dollars on some 20 different forms of activity. Each of the 20 headings covers large areas of country and large pieces of work.

A sample of the methods and policy adopted is given in a description of the Lyon Medical Centre. At Lyon the municipal authorities have under construction a large new hospital; the Foundation was asked to coöperate in providing an adequate medical centre for education and research. The first step was to invite the dean with two of his staff and the university architect to visit medical centres in various countries as guests of the Foundation. The commission returned to Lyon, worked out a plan, and as a result of this a medical school building is being erected immediately across the street from the new hospital, while the project also includes an increase in the annual budget to improve teaching facilities and the provision in the hospital of laboratories for the clinical subjects. Towards the cost of this project, to which the Government, the municipality, the university, and private citizens contribute, the Rockefeller Foundation has appropriated or pledged 43 million francs.

HEALTH INSURANCE IN THE IRISH FREE STATE.

THE text of the National Health Insurance Bill recently introduced to the Dail was published last week. The only proposal of any importance in the Bill, writes our Dublin correspondent, is that to abolish county insurance committees and to transfer their functions to the county councils, which will be provided with funds to enable them to perform their increased duties. Certain other proposals tend to simplify the working of the Insurance Acts and to lessen the expense of their administration. The deposit contributors' fund is to be abolished, and members of this fund are to join approved societies within a specified period. The difficulties which have hitherto existed regarding insurable married women are surmounted by giving an insured female a marriage benefit, and providing that if she desires to work after marriage she will be treated as if she had never been insured. The Bill appears to be based on the recommendations of the Committee of Inquiry on National Health Insurance and the Medical Services, but it only touches on a few of the less important of the reforms suggested by that Committee.

AURAL DISEASE AND BATHING.

THE holiday season, which has now arrived, will doubtless be accompanied as usual by trouble—some minor and some serious, in the ears of bathers. Mammals such as the seal, which have reverted to an aquatic life, have a mechanism for closing the auditory meatus, and in some cases the nostrils also, when submerged; but man is not an aquatic animal and does not possess this form of protection. Water can reach the ear and cause damage to it either by way of the external auditory meatus or through the Eustachian tube. When water gets into the external ear it produces a disagreeable sensation, as every swimmer knows, but it runs out again quickly and does no harm in a healthy meatus. If, however, the ear contains much cerumen this imbibes the water, swells up, and blocks the canal. The sensation of "water in the ear," persisting long enough for advice to be sought, is nearly always due to wax, and can be cured by its removal. People with a tendency to excessive secretion of cerumen should have it removed before going to the seaside. This retention of moisture from the presence of wax readily sets up a dermatitis, and is the usual cause of external otitis in bathers, but apart from this people with a tendency to eczema of the meatus are apt to suffer an exacerbation of their trouble from bathing. Unskilful diving may rupture the drum by compression of the air in the canal, but in general the occasional entry of water into the meatus is harmless, as is evident from the comparative rarity of trouble among innumerable bathers. The most important cause of serious ear disease resulting from bathing is the entrance of water into an old, often quiescent, perforation of the drum; this event is liable to cause a very severe suppurative otitis with all its attendant complications. Patients with a perforated drum should never bathe without a really efficient means of preventing the entry of water into the ear. Ordinary cotton-wool is useless for the purpose, and, by giving a false sense of security, becomes a danger; to occlude the meatus a cast of the patient's concha specially made for each case can be obtained from instrument makers, but a plugging material made of a mixture of wool-fibre and plasticine or wax is very satisfactory and is sold by various chemists; a rubber bathing cap to cover the ears should be worn over any plug. Patients with a tendency to aural eczema may with advantage put in at night a few drops of mercuric nitrate ointment, 1 drm. to 1 oz. of equal parts of olive oil and liquid paraffin.

Nevertheless, people wit [illegible] ears may develop acute otitis me [illegible] s is caused by the entrance of [illegible] through the Eustachian [illegible] s favoured by swallowing while under water and, especially, by violent blowing of the nose, while the passages are full of water. It is when virulent micro-organisms are carried into the tympanum with the water that otitis ensues; these organisms may be present in the water, and it is obvious that the water of swimming pools and public baths is more likely to be heavily infected than that of rivers and the open sea. Much care has been devoted to the purification of the water of bathing places, but more attention has been paid, as evidence of contamination, to the intestinal flora of the *Bacillus coli* group, than to the pyogenic organisms which more frequently attack the ears; but it is probable that the swimming bath may play an important part in the spread of streptococcal infections when, for instance in a school, such diseases as tonsillitis or rhinitis are prevalent. Groups of cases, or small epidemics, of infection of the nasal sinuses have occurred under similar circumstances, and probably from the same causation. But micro-organisms can be carried with the water into the ear even when the water of the bathing place is perfectly clean; this occurs when the organisms are already present in the patient's own nose or throat, and is liable to result from bathing during an attack of sore-throat or coryza.

To sum up: Harmful results from bathing are very rare in proportion to the number of bathers; it is necessary to plug the ears only when there is an open perforation of the drum or when the canal is readily irritated by the water; ear complications are unlikely to occur from infection through the Eustachian tube if the bather refrains from swallowing while in the water and particularly from blowing the nose on emerging, and does not bathe at all while suffering from an active cold or sore-throat.

THE PROGRESS OF INDUSTRIAL PHARMACY.

IT would be hard to exaggerate the debt which modern medicine owes to the firms who manufacture the drugs and other preparations nowadays necessary for its practice. A century ago most clinicians and experimenters had to mix their own medicines and solutions; nowadays they can draw upon an arsenal of products compounded with the utmost care and standardised with extreme accuracy. If the activities of manufacturing pharmacists could be taken as a measure of the advance of medical science in modern times, that advance can hardly have been surpassed by any other branch of human activity. The annual special issue of the *Chemist and Druggist*[1] aims at providing a survey of the industry from all its aspects year by year, and should not be missed by anyone with a sense of the importance of this great auxiliary. Great pains have been taken with the reproduction of the many unique photographs. The chief articles in the industry of to-day deal with the manufacture of cotton-wool and lint at the mills of Messrs. Vernon and Co.; solid spirituous preparations, and the cultivation and preparation of the soya bean, a seed of ever-increasing value as a source of vegetable oil, and as a foodstuff. The issue also contains three first-class historical essays. Dr. Charles Singer contributes the second part of his "Sketches in the History of English Medicine," in which he describes the Anglo-Norman Period, and the advent of the learning of Salerno and the Arabs. This is illustrated with a large number of excellent contemporary pictures, including two splendid coloured plates. He gives an interesting quotation from the Prologue to Chaucer's Canterbury Tales; one which perhaps marks the first mention in English of the manufacturing pharmacist: "Full ready had he his apothecaries to send him drugs and his electuaries." Another article describes the pharmacological history of Dublin, where this year's British Pharmaceutical Conference was held, and the history of druggists' weights and measures through the ages is set out in an encyclopædic contribution illustrated with 84 photographs. Dr. Giovanni Carbonelli, of the National Medico-Pharmacological Institute in Rome, describes and illustrates the private pharmacy of Pope Alexander VII. The Editors are to be congratulated on an admirable production.

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[1] 42, Cannon-street, London, E.C. *2s. 6d.*

AN INDEX OF RENAL EFFICIENCY.

It has long been recognised that in certain types of advanced renal disease the ability of the kidney to excrete inorganic phosphates is impaired. In such cases the fall in phosphate excretion is accompanied by a corresponding increase in the concentration of phosphate in the blood and more than one attempt has been made to devise a criterion of renal efficiency based on the rate of elimination of injected phosphates. Working with dogs, Bolliger[1] has given intravenous injections of sodium phosphate solutions, of varying pH, and has found that the normal animal is able to excrete from 80 to 100 per cent. of the amount injected within two hours. After destruction of the major portion of the renal tissue, by exposing one kidney to X rays and ligaturing the opposite ureter, the excretion falls as low as 21 per cent. These results with dogs support the conclusions of R. T. Brain and H. D. Kay,[2] who have used intravenous injections of sodium glycerophosphate as an index of renal efficiency in human nephritis and claim that this test gives more valuable information than either the urea concentration or the phenol sulphonphthalein methods. Sodium glycerophosphate has the advantage over sodium phosphate of greater solubility and does not require adjustment of the pH. Since the acidosis which so often accompanies uræmia has been ascribed to the retention of acid phosphate, the wisdom of injecting phosphate solutions in nephritis may be called into question. Brain and Kay, however, find no ill-effects from glycerophosphate, while Bolliger finds that repeated injections of inorganic phosphate actually have a consistently beneficial effect in "nephritic" dogs, and suggests that similar injections may be of value in human nephritis. An adequate explanation of this anomaly is at present lacking, but Haldane, Wigglesworth and Woodrow have shown that large quantities of phosphate buffers help the kidney to excrete acids. It seems that the prevalent view, that phosphate injections are harmful in nephritis, must be revised and, if clinical trial bears out Bolliger's experimental results, we may find a new therapeutic weapon to delay the progress of nephritis.

THE LEPROUS REACTION.

The acute phase of leprosy has been the particular study of Dr. Richard Green, who has been in charge of the inmates of the Federal Leper Settlement at Kuala Lumpur, in the Federated Malay States, during the last three years. In a paper communicated to the Royal Society of Tropical Medicine and Hygiene, and published in their transactions (1929, xxii., 307), he notes his conclusions. He finds that the leprous reaction, especially in the so-called second stage of Muir, leads to rapid progress of the disease; rarely, the reaction may be of such severity as to lead to death. This acute phase of the disease may recur from time to time in both treated and untreated cases; it appears, however, to be more frequent in patients undergoing treatment with the oils of hydnocarpus and their derivatives. During the past three years about 20 per cent. of the patients undergoing treatment in Kuala Lumpur have had one or more reactions. The Kuala Lumpur Chinese leper patients appear to know and to fear the occurrence of the reaction. Their recognition of the phase is suggested by their native term for it, which means "the rising up of leprosy." Dr. Green has initiated experiments with intradermal tests, using *B. lepræ* obtained from freshly ground nodules under aseptic conditions, which appear to indicate the presence of specific sensitiveness of the tissues towards *B. lepræ* in cases suffering from leprous lesions, with an absence of this phenomenon in quiescent cases. The evidence collected in the course of his investigations seems to show that the leprous reaction may have its origin as an acquired condition of allergy towards *B. lepræ* in the tissues. This supposition appears to be strengthened by observations on the action of adrenalin, on the analogy of desensitisation in serum sickness and other allergic conditions. The continued administration of ephedrine seems to have little effect on newly formed skin lesions, though a number of patients complaining of nerve pains were given single doses of ephedrine hydrochloride gr. 1, with relief lasting twenty-four hours or more. In the absence of a specific for leprosy, any drug securing relief of pain, even for a short spell, is welcome, but continuous search is being made for one which will give a more prolonged spell of amnesia.

IN DEFENCE OF THE R.M.O.

The lively attack upon the habits, manners, and accomplishments of the resident medical officer, markedly in the special and medium-sized general hospitals, which appears over the signature of "Juno" in the current issue of the *Hospital Gazette* would be more wounding if it was plausibly true to life, while the suggestion that the average house surgeon is discourteous and inconsiderate to the extent that the reputation of the institution he serves is liable to suffer is simply fantastic. The article will, however, have served a useful purpose if it leads to a more sympathetic study of the problem of the young resident. The house surgeon—we include under the term any resident in the institution—by his training, his contact with suffering and the intimate human problems of sickness is usually years in advance of his peers in other realms of activity. In the early twenties he is called upon to shoulder responsibilities and make vital decisions, the parallel of which it is difficult to find in other walks of life. Indeed they are only to be discovered in such callings as that of the young airman pilot, but here the judgments needed are those of rapidity of thought and action, the quick estimate of distance and movement; they are not the decisions which come from long mental deliberation, and the careful sifting of evidence, the true province of the mature intellect. Yet this is what we call upon our youthful house surgeons to do, and any unbiased critic must admit that they acquit themselves with credit. In any body of men there must of necessity be some who lack the tact which is required in dealing with sick persons and their distracted relatives, whose sense of values is often disturbed by the strain to which they are subjected. Yet the average house surgeon realises their disability, and adjusts his conduct to it in a manner which often fills his elders with admiration. "Juno's" criticism reflects not so much indeed upon the character of the average house surgeon as upon the election committee of the institution which is so unhappy in its choice among the ranks of applicants. She complains of trouble that has arisen through negligence or lack of knowledge of the legal responsibilities of a house surgeon, instancing the notification of infectious diseases and other aspects of medical law, and advocates a test of knowledge in regard to these matters before appointment. Now every doctor receives such instruction before qualification, but it would be simple for any institution to call the attention of its officers, say by a small printed pamphlet, to legal obligations, the neglect of which is liable to cause unnecessary work and perhaps friction with the local authorities. Liberality in thought and action is a natural and desirable attribute of youth, but waste would undoubtedly be diminished by soliciting the collaboration of hospital residents who do not, we feel sure, suffer from the instinctive lack of sympathy and the unhelpful attitude to the general working of the institution with which they are credited. No body of young men work under such circumstances of stress and strain, night and day, for very meagre immediate (or financial) reward, with such loyalty and devotion and efficiency as do the residents of a hospital. Owing to economic factors, and the voluntary system, much of the most responsible and onerous work of hospitals is carried out by newly qualified men and women on the threshold of life. Some of it could be done more tactfully, no doubt, by men of long experience and mature judgment, but such labour costs money, which hospital boards refuse to pay. They now get much of their skilled work done at an absurdly low cost, by an army of young and enthusiastic men, who are learning to add to the knowledge acquired in their academic career the wisdom accumulated through daily contact with sick people, their relatives and attendants. This is the system which, as Mr. Percival Mills pointed out recently,[1] results in the general practitioner being the all-round man he is. It is typically British to give the house surgeon a degree of responsibility which, in a foreign clinic, would only be held by a man of many years' experience. In general, as Mr. Mills said, he responds to this trust extremely well.

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[1] Med. Jour. of Australia, May 18th, p. 650.

[2] Quart. Jour. Med., 1929, p. 203.

THE MEDICAL PROFESSION AND THE MINISTER OF HEALTH.

THE Minister of Health, Mr. Arthur Greenwood, informs us that he proposes to enlarge the very wide range of the various forms of consultation which already subsist between the Minister and the medical profession. This extension of contact between the Government and medical opinion takes shape in the appointment, in a purely personal capacity, of Sir John Rose Bradford, Lord Moynihan of Leeds, Lord Dawson of Penn, and Dr. H. B. Brackenbury, as a small informal committee to confer from time to time with Sir George Newman, the Chief Medical Officer of the Ministry of Health. The object of the conferences will be to give ample opportunity for the committee to place before the Minister their views on any current medical matters about which they desire him to be specially informed, and for the Minister to consult the committee with the same ease.

Mr. Greenwood hopes to find in this arrangement a ready means of communication between the committee and himself as occasion arises, believing that it will contribute to the close, continuous, and sympathetic association which he desires to see maintained between the medical profession and the Minister.

THE LEGAL ASPECTS OF MEDICINE AND DENTISTRY.

A THESIS approved for the degree of doctor of laws in the University of London, recently published in book form,[2] combines considerable research into ancient history with a clear account of the statutes and case law, including the most recent decisions affecting the practice of medicine, dentistry, and veterinary surgery. Treating three cognate professions comparatively, Mr. Bullock is able to underline the differences in the latitude allowed by each to the unqualified practitioner. He does not hesitate to criticise the law which, while conferring a professional monopoly on the registered dental surgeon, allows any unqualified person to treat cancer, epilepsy, or paralysis, among other things. Considering the defects of the Medical Acts, he notices the weakness of the General Medical Council's control over the prospective medical student's preliminary educational tests and over the examining bodies' medical examinations; the Council maintains a register of medical students but cannot compel registration. The conflicting decisions under Section 40 of the Act of 1858 (recently invoked in the proceedings against Lieut.-Colonel Kynaston) are discussed, and a chapter on the law of professional negligence ends in an excellent exposition of the unprotected state of medical practitioners called upon to examine patients under the Lunacy Act machinery. Mr. Bullock is not concerned to deal specially with professional etiquette or to advise upon the day-to-day difficulties encountered by general practitioners. He has approached the subject rather from the legal side, to which his thesis provides a sound and faithful guide.

ÆTIOLOGY OF WHOOPING-COUGH.

THE article by Dr. Sugare and Prof. McLeod which appears on p. 165 of our present issue is a timely reminder how little we know of the causative agent of a prevalent and often devastating disease. Since Bordet and Gengou announced the discovery of *Bacillus pertussis* in 1906, opinion has fluctuated about the exact identity of the organism and its precise relationship to the disease. The actual association with whooping-cough was demonstrated by its discoverers, but subsequent workers have been unable to confirm this, neither have serological studies been of assistance, except, perhaps, to throw doubt on the view that *B. pertussis* is the incitant of whooping-cough. Prof. Bordet's contention is, we understand, that the failure of other workers to confirm his work depends on their not using the correct medium, and that if they were to do so the isolation of *B. pertussis* would present no difficulties. This view is now confirmed by the work done in the Leeds laboratory, in which the bacillus of Bordet and Gengou was isolated in 12 out of 21 cases. Moreover, Sugare and McLeod are able to show that *B. pertussis* is culturally different from *B. influenzæ*, can survive cold much longer, and gives a strong oxidase reaction. Interesting and instructive as these results are it remains to be proved that there is more than an association between this organism and the disease; and there is much to be done before Bordet's views can be accepted. Recent work at M.A.B. hospitals in London has shown a very small percentage of *B. pertussis*, and has failed to show any serological relationship of the organism to the disease. In France, however, Debré, Marie, and Prétet[1] have obtained cultures of *B. pertussis* by exposing plates of Bordet-Gengou medium, made with defibrinated horse blood, in front of the mouth of a patient towards the end of a paroxysm of coughing, and appear to have had no difficulty in isolating the organism after two to three days incubation at 37° C. It was shown by Krumwiede, Mishulow, and Oldenbush in 1923 that there were two types of the organism; serum made from type "B" only slightly agglutinated type "A," whereas type "A" serum agglutinated both organisms equally well. But Debré and his colleagues failed to find any type "A" organisms amongst their strains, whereas all their cultures of *B. pertussis* were agglutinated by type "B" serum. These results show that in Paris at least the strains of the Bordet-Gengou organism isolated from actual cases of whooping-cough were homologous. Leaving open the question of the exact role of *B. pertussis* in whooping-cough, we gather from the work here cited that (1) *B. pertussis* is found in a good proportion of whooping-cough cases; (2) that this organism is distinguishable biologically from *B. influenzæ*; (3) that in Paris all strains isolated were homologous. These results, if meagre, should help to clarify our knowledge of the ætiology of whooping-cough.

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[1] Queen's Hospital Gazette, February, 1929.

[2] The Law relating to Medical, Dental and Veterinary Practice. By Fred Bullock, LL.D. London: Baillière, Tindall and Cox. 1929. Pp. 317. 12*s.* 6*d.*

[1] Debré, R., Marie, J., and Prétet, H.: Annales de Méd., 1929, xxv., 434.

THE LONDON LOCK HOSPITAL.

A QUESTION asked in the House of Commons on July 22nd elicited the definite statement that the Minister of Health does not propose to publish the reports of the committee of inquiry into the management, administration, and staffing at the London Lock Hospital. The public is asked to be content with the assurance that the drastic revision of the laws and rules of the institution which, according to the Majority Report signed by Sir John Eldon Bankes and Dr. John Fawcett, is imperatively needed, is being made. The new laws passed by the govenors of the hospital on June 6th are not set out in detail in the letter to the Minister of Health from the Board of Management of the hospital, which is included in the incomplete documents now presented to Parliament.[1] The essential administrative changes made appear to be the inclusion of a number of women (amounting to one-third) on an enlarged Board, and the appointment of House and Finance committees with definite duties. The House committee will be responsible for the general supervision of the institution and for constant and regular visitation. The position of women acting on the honorary staff is to be officially recognised, the duties of the registrars defined, and the matron is to have a proper status and free access to the Board. The recommendation that each ward should have a fully trained sister in charge, to be relieved when off duty by a fully trained staff nurse, is met by the statement that each *floor* has a fully trained sister in charge, but that though the Board has tried continuously during the last few months to obtain the services of fully trained nurses, it has not yet been possible to fill all the posts. Meanwhile, the salaries of the nursing staff have been augmented by 10 per cent. and the hours off duty increased. The recommendations in the Minority Report, signed by Mrs. H. J. Tennant, suggest strongly that the amenities hitherto offered to patients in the way of privacy, accommodation, and washing facilities are inadequate for modern requirements. Mrs. Tennant expresses the hope that the adoption of her proposals, which are quite explicit, would entitle the hospital again to be recognised by the London County Council and the Ministry of Health. It will be remembered that the L.C.C. grant to the hospital ceased on March 31st, 1928, so that whereas in 1926 the hospital received the sum of £12,000 from this source, and in 1927 the sum of £10,000, in 1928 the grant was only £2300, and this year so far has been nil. The restoration of the grant would do much towards the re-establishment of public confidence, but the publication in full of both reports would, in our view, do even more. Mr. Neville Chamberlain held (see THE LANCET, 1929, i., 953) that the stipulation of the Board for a *private* inquiry would in any case preclude publication of the evidence taken; but even this difficulty could be surmounted by the goodwill of all parties concerned. Names of individuals mentioned could be withheld, if this were considered desirable. Since vigorous action has been taken to remedy many of the defects in administration which have been disclosed, the decision to withhold the full story need not be criticised on grounds of public policy. But a voluntary hospital, competing with other institutions for support from the charitable public, can only succeed against its rival claimants if enthusiasm can be kindled by reports of the work it is doing and the way it is doing it. Such enthusiasm is not damped by frank exposure of old-fashioned or inadequate organisation, but it is incompatible with a state of uncertainty of the degree to which an institution has been found wanting. The shadow of distrust cast by reflections on internal and domestic management is not cleared by assertions that reforms are being instituted. But in our view distrust would not long survive the publication in full of the reasons which moved the Board of Management to demand an inquiry and of the evidence on which the reports of an impartial committee were based, especially as the documents already available give ample guarantee of the zeal with which a complete reorganisation is being pursued.

FROM a field of 150 applicants Dr. J. A. Brincker, Dr. W. Brander, and Dr. W. A. Daley have been chosen to fill the three posts of principal medical officer of the divisions in which the public health department of the London County Council is being organised. Dr. Brincker, who will take charge of the division concerned with infectious diseases, is promoted after many years' service in the department. Dr. Brander, formerly medical superintendent of the hospital belonging to the Hackney Guardians, will take charge of poor-law medical administration, while Dr. Allen Daley, medical officer of health and school medical officer of Kingston-upon-Hull, comes south to take over general public health administration, including housing and school medical service. Ninety-three candidates applied for the post of matron-in-chief to supervise the nursing staff at the hospitals transferred to the Council. From these Miss D. E. Bannon, formerly matron of St. Mary's Hospital, Paddington, has been selected.

Public Health Services.

DEATHS FOLLOWING VACCINATION.

AT the resumed inquest at Stepney on a girl of five, who died on July 11th, it was stated by the medical officer of Mile End Hospital that the child was convalescing from pneumonia when, two days before the time appointed for discharge, another child in the same ward came out with a small-pox rash and all the contacts were vaccinated, so far as the parents' consent could be obtained. Vaccination was done with Government lymph on June 25th; on July 9th the child's temperature rose to 100° F., after being very excitable on the previous evening; drowsiness and headache followed, with increasing stupor ending fatally on the 11th. One other child was vaccinated with the same lymph. Dr. D. L. Thomas, medical officer of health for Stepney, said that this was the first case of encephalitis following vaccination reported in the borough. During the present year 285 cases of small-pox had been reported with two deaths, and 10,000 vaccinations had been done by public vaccinators. Mr. R. L. Guthrie, the Coroner, recorded a verdict of death by misadventure, adding that there was a certain risk from vaccination which doctors did not recognise until recently.

A boy of 12, whose father had objected to his vaccination in infancy, was vaccinated on July 3rd, since this was a condition of his participation in a holiday. His arm was in a satisfactory condition when examined a week later. On July 17th he became drowsy; he was taken to Poplar Hospital on July 18th and did not recover consciousness before he died. The inquest opened by the East London coroner on July 22nd was adjourned until July 29th for further medical evidence.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 13TH, 1929.

Notifications.—The following cases of infectious diseases were notified during the week:—Small-pox 115 (last week 153); scarlet fever, 1071; diphtheria, 1012; enteric fever, 58; pneumonia, 912; puerperal fever, 40; puerperal pyrexia, 80; cerebro-spinal fever, 13; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 20; dysentery, 16; ophthalmia neonatorum, 145. No case of cholera, plague, or typhus fever was notified during the week.

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[1] Papers as to the Administration of the London Lock Hospital and Home. London: H.M. Stationery Office, 1929. Cmd. 3363. 3d.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on July 16th–17th was as follows:—Small-pox, 198 under treatment, 11 under observation (last week 209 and 6 respectively); scarlet fever, 1364; diphtheria, 1652; enteric fever, 10; measles, 201; whooping-cough, 410; puerperal fever, 29 (plus 11 babies); encephalitis lethargica, 125; "other diseases," 30. At St. Margaret's Hospital there were 18 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were 2 deaths from small-pox, 1 (0) from enteric fever, 37 (6) from measles, 4 (2) from scarlet fever, 27 (7) from whooping-cough, 22 (8) from diphtheria, 32 (8) from diarrhœa and enteritis under two years, and 27 (3) from influenza. The figures in parentheses are those for London itself.

The two deaths provisionally classified to small-pox were assigned to Stepney and Willesden. Liverpool reported 4 deaths from measles; Bootle, Bradford, and Tynemouth each 3. Liverpool also reported 3 deaths from whooping-cough; Bradford 3 from diphtheria. The highest figure for deaths from diarrhœa comes from Birmingham, 5; Liverpool following with 4, and Leeds with 3.

The number of stillbirths reported during the week was 281 (corresponding to a rate of 40 per thousand births), including 40 in London.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCVI.—THE TREATMENT OF STERILITY IN WOMEN.

PART II.—LOCAL MEASURES.[1]

THE methods of examination discussed last week may show some generalised condition of the pelvic tract, a general under-development or inflammation, or a gross lesion such as multiple fibroids with chronic inflammatory degeneration of the tubes and ovaries. One or more of the following conditions may call for treatment.

Intact or Painful Hymen.

Quite apart from vaginismus, the amount of obstruction caused by the hymen is relative and has to be treated on this basis. Comfort and confidence must be assured to the patient. In dealing with minor trouble the passage of vaginal dilators may be sufficient, but in my experience it is usually worth the patient's while to undergo operative measures under anæsthesia. The hymen is incised to its base in the mid-line posteriorly and the tips of two fingers of the left hand introduced to stretch the orifice to the required extent, the musculature at the base of the hymen being nipped meanwhile until sufficient room is obtained. The remains of the hymen are then removed, and the diamond-shaped space produced by the incision is sutured from its upper to its lower limit. Sometimes a large vaginal dilator is left in situ for some hours. The patient need not be kept in bed for more than two or three days. At the end of a fortnight a very important part of the treatment is performed. A series of vaginal dilators is passed not so much to dilate the parts as to prove to the patient what can be achieved without pain.

Vaginal causes of sterility are comparatively infrequent. Malformations and narrowings occur, and must be treated when they are considered to be factors in the prevention of conception.

Malposition or Abnormality of the Cervix.

The position and health of the cervix are of the first importance. If, as already indicated, the spermatic fluid is deposited elsewhere than on the cervix, its rapid deterioration, due to the acid reaction of the vagina, is assured. Malposition of the cervix occurs most frequently in association with retroflexion, when its position is always forward. The condition of retroflexion of the uterus may be directly associated with a further cause for sterility, kinking of the tubes, and tends to be associated with their further degeneration. Retroflexion is a frequent cause of secondary sterility. When a retroflexion appears to be the cause of sterility, if it is otherwise symptomless and the uterus and appendages are free from any suspicion of adhesions, the simplest treatment, well worth while before operative measures are suggested, is readjustment of the position with a sound and the insertion of a Hodge pessary. This can be done in many cases without anæsthesia. It is best to introduce the sound, with the help of speculum and volsellum, while the patient lies on her back, manipulate the uterus into its right position, and then turn the patient into the knee-elbow position before removing the sound and introducing the pessary. Air pressure maintains the uterus in its new position until the Hodge is suitably placed. The pessary can remain in situ for three to four months without douching, and must be retained for three to four months after pregnancy has occurred. I have no faith in the method often practised of "pushing up" the uterus or adjusting it bimanually without anæsthesia and without a pessary, as giving anything but the most temporary relief. I have, however, known the uterus to retain an improved position after such treatment long enough for pregnancy to occur.

If the uterus is fixed in retroflexion (in which case there are adhesions also of the tubes and ovaries), or persists in falling back in spite of the support given by a Hodge pessary, abdominal operation must be resorted to. It is not always easy to be sure whether or not a uterus is fixed. If adhesions are of old standing there may be no tenderness, though movement of the cervix from side to side usually elicits pain; on the other hand, the retroflexed body without adhesions may be very sensitive from congestion.

Acute anteflexion also results in a bad position of the cervix. It lies forward and points forward and is often poorly developed. Dilatation is indicated with the use of a uterine stem, which should allow of drainage, for a few days. These cases are less satisfactory to treat than are retroflexions. A long, pointed cervix may need dilatation and partial amputation.

A normal cervix with pin-hole os may need dilatation. Apart from this, the operation of dilatation of the cervix with or without curettage, according to the condition of the uterine body, gives good results in many cases for no obvious reason. The opportunity should always be taken to test the patency of the tubes under the same anæsthetic. If curettage is considered necessary, it should be done after the insufflation. Further, the cervix may have been pushed completely out of place by pelvic tumours or dragged out of place by scarring from old tears.

Any lesion involving the health of the cervix must be dealt with. Cervicitis may be present, following infection by gonococcus or other septic cocci, or lacerations may be associated with erosion. It is true that pregnancy may occur in spite of such lesions, but any lesion that interferes with the normal alkaline reaction of the cervical canal or alters the normal mucous secretion to pus is a definite obstacle to penetration of spermatozoa into the uterus. The fact that the methods of treatment advocated for cervicitis and erosions are so numerous is an index of the difficulty of curing these conditions. For success are needed patience, persistence and variation of the methods adopted, rest if possible in the early stages of treatment, and security from risk of further infection.

Uterine Body.—Inflammatory changes in the mucosa and fibroids of the submucous type are potent causes of sterility. Given normal tubes, myomectomy may give positive results, sometimes even when the uterus is considerably distorted by the operation.

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[1] Part I. appeared last week.

Blockage of the Fallopian Tubes.

Treatment of the tubes is of value, varying with the site of the lesion. If there is blockage of the fimbriated extremity, which can be released, the prognosis is good. Hence, from the point of view of sterility, in all acute inflammations of the tubes it is important to operate as soon as possible after the temperature has finally settled at normal. Then one finds the tubes closed by adhesions, easily separable, to the *back of the broad ligament or the pouch of Douglas.* One or both tubes can often be saved by separating them carefully, opening up the fimbriæ, milking out the pus, and lifting the tubes with the uterus, which often needs suspension. I have been astonished at the number of patients who have become pregnant after such treatment. If an artificial opening must be made in a tube permanently blocked at the fimbriated extremity, it is important to evert the edges, exposing as little raw surface as possible, and leaving a strand of catgut through the new opening. There is reasonable hope of pregnancy ensuing in these cases. Where obstruction exists at the uterine end of the tube the prognosis is bad, though some surgeons have achieved success even here.

Ovarian Dysfunction.

Ovarian function is manifold and by no means completely understood. Where gross lesions exist, associated with sterility, their surgical treatment has sometimes resulted in pregnancy. When under-development is suspected, from evidence of irregular, infrequent, and scanty menstruation or adiposity, gland products containing thyroid, anterior pituitary and ovarian substance are indicated, although it is very doubtful whether the two last-named extracts have any action unless they are injected hypodermically. Injections of the female sex hormone, prepared commercially from the placenta and standardised as "œstrogen" are under trial. The great objection to this line of treatment is the number of intramuscular injections which have to be given to produce results. Small doses of X rays to the ovaries have given good results. The average dosage is 10 per cent. of the skin erythema dose, and is usually repeated two or three times. Menstruation has appeared where amenorrhœa existed, increased frequency and loss in cases of oligo-menorrhœa, each being followed by pregnancy after a short interval.

Treatment by Artificial Insemination.

This is only indicated or likely to give good results when there is impotence on the side of the male partner, his semen being healthy, and when the wife is normal. It may also be tried with hope of success in those cases where, the husband being normal, repeated post-coital examination shows no living spermatozoa on the cervix. It is important to choose the time of greatest fertility, to obtain a condom specimen under conditions as normal as possible, to retain the temperature of the specimen, *and to inject as soon after emission as possible.* In cases of impotence injection on to the cervix may be sufficient; otherwise a few drops of semen should be injected at low pressure into the uterine cavity. In any case, it is likely that repeated injections will have to be made.

Conclusion.

There still remain numbers of sterile marriages, where no treatment can be defined with confidence because the cause is so obscure. If a full investigation has been made, the cervix has already been dilated in association with insufflation. Attention should be paid to the general health of both man and wife, and advice given on change of scene, temporary abstinence, or any other detail suggested by the history of the individual case.

FRANCES M. HUXLEY, M.D., Ch.B. Manch.,
Surgeon to the South London Hospital
for Women.

Special Articles.

PHYSIOLOGY—THE BASIS OF TREATMENT.*

BY PROF. W. E. DIXON, F.R.S.

The Omission of Treatment from Text-books of Medicine.

WHEN the sciences of physiology and pathology a century ago passed from the realms of natural history to deduction and experiment, they naturally attracted the more original and eager minds in medicines, and the text of the writings of the nineteenth century deals with changes in structure and function. Treatment became neglected, the old shibboleths and rituals of treatment which had held sway for centuries were discarded, and there was nothing with which to replace them.

In the middle of the last century S. Skoda and K. Rokitansky (in Austria) perfected a system of physical diagnosis which has had a practical bearing on medicine ever since. Skoda made many experiments with drugs on the patient without any expectation of producing benefit; the patients were not improved and Skoda thought it mattered little how the patient was treated. It is right to say, however, that these experiments were deficient in many respects according to modern views. At this period the Vienna School held a prominent position in scientific medicine and the new doctrine rapidly spread. The physician studied disease in the patient: its beginnings, its progress, its effects, and the scars it left, as shown at autopsy. Scientific medicine looked askance at treatment; text-books spent many pages in describing the symptoms, diagnosis, and pathology of disease, but two or three lines dismissed the treatment; and even in our times the "scientific" physician is apt to be a diagnostician rather than a healer. The study of disease as an entity was the object aimed at, and a complete case was one which went to autopsy. *That most admirable and popular text-book* of medicine by the late Sir William Osler was typical of the text-books of the time. Dr. Simon Flexner once told me that Osler's book, characterised by its almost complete lack of indications for treatment, was largely responsible for the Rockefeller millions given to medicine. The text-books of the period told with considerable precision what was happening in the body during disease and what was likely to happen, but little or nothing on prevention.

This state of affairs was unavoidable; there was no specific treatment, there was no science of treatment, *for such a science could only come into existence* when physiology and pathology had reached some degree of precision. Diagnosis was then and is now far ahead of treatment; diagnosis is often accurate where there is no satisfactory treatment and yet diagnosis is only a means to the end.

[Prof. Dixon explained that the science of pharmacology was comparatively new, being the climax of physiology and pathology devised to subserve a practical end. He gave his reasons for depreciating the study of physiology only from the aspect of chemistry and physics. He said:—]

The Deflection of Physiology from Medicine.

I am by no means averse from the vast amount of academic research on these lines which is published annually, often by workers with little biological knowledge or training, but it surely should not precede the more immediate practical aspects of the subject. The modern attitude is expressed by a distinguished young biochemist who, in reviewing a well-known book on chemotherapy in 1928, asks "Might not the time and resources spent on chemotherapeutic research be diverted more profitably to the study of chemical and physical mechanism?" The same attitude is reflected in the awards of Fellowships and Scholarships for Medical Research. Formerly all the recipients were primarily biologists with a medical training: now a medico-biological training is unusual. Physiology in the broad sense in which it was used by Claude Bernard and Huxley has given place to a new physiology of physicochemical reactions: I might go beyond this and say that physiology is getting further and further from practical medicine, and this is the more regrettable as most of the Chairs in Physiology are connected with the Medical Schools and because the science of treatment is largely dependent on experimental physiology. Prof. J. S. Haldane clearly had this in mind in 1923 when he wrote: "We may say without serious misrepresentation that the official present-day view of physiologists is that physiology . . . aims at investigating the physics and chemistry of life, and might properly be called biophysics and biochemistry."

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* Part of the Presidential Address delivered to the Section of Physiology of the British Association for the Advancement of Science at Capetown on July 24th.

[Prof. Dixon deplored the fact that biology had lost ground as an educational subject in the last twenty years, and urged that renewed attention should be paid to this science and also to pharmacology. He proceeded :—]

The Neglect of Pharmacology.

No branch of experimental biology has received less consideration in Great Britain than that of pharmacology; it is also the most neglected branch of medicine. And although the object of medicine is the healing of the sick, it is amazing that medical schools in Britain, often equipped with all other modern laboratories, lack departments of therapeutics. I was once asked at a meeting, by a leading medical man, what has pharmacology ever done? The answer is, of course, that it has formulated and brought reason and knowledge into treatment of the sick; so much did it impress that great pathologist, Ehrlich, that he left his sera and turned his attention to drugs, and with the unlimited resources at his disposal gave the world, amongst other drugs, salvarsan: so much did it impress the brilliant French chemist, Mr. Fourneau, that he has confined his studies to those of drugs, a study which has resulted in the synthesis of many valuable arsenical compounds and dyes. In America many centres, including the Rockefeller Institute, have turned to the study of drugs; and Italian pharmacology is doing the same.

Stereotyped Prescriptions.

I have heard it said by a leading official of our Ministry of Health, speaking to panel practitioners, that they, in the Ministry, do not want stereotyped prescribing in treatment. Surely there was never such nonsense. If there is a best treatment, let us have it whether it is stereotyped or not. In this respect the British Medical Association has given the profession a lead and shown by the experience of a great number of doctors that there is a best way of treating varicose ulcer in which the patient gets well quicker than by other ways, an advantage both to the patient and to the community who have to keep him whilst he is unfit for work.

Separate Physicians for Diagnosis and for Treatment.

The British physician is a skilled diagnostician and is in the forefront in all that pertains to this subject. The literature is so extensive that it is impossible for the average clinician to do more than this. But how few of them do, or perhaps the more correct word is "can," occupy the same time in the study of recent advances in general therapeutics? The successful physician has, generally speaking, to be content with such references to treatment as are to be found in clinical reading. The general physician must always be a necessity for diagnosis; but the details of treatment of patients will, I believe, in the future be handed over to those who have made a special study of the treatment of that particular group of diseases from one of which the patient is suffering. This is already the position in tuberculosis.

Experimental Methods in Therapeutics.

But the advent of institutions for experimental therapeutics is upon us, though Britain has taken little part in the movement. In this connexion we welcome the magnificent buildings of the University of Capetown, and when the new hospital with its medical school is completed I confidently anticipate that adequate accommodation will be provided for that important branch of applied physiology, pharmacology, and that this will include laboratories of physiology and organic chemistry, which must be in close and direct association with the wards. The enormous importance of one branch of treatment to Africa, chemotherapy, I will refer to later. From what has been said, it is not surprising that British pharmacology should be so much behind that of other countries in the production of new curative remedies; practically all come from abroad; I may mention ephedrine for spasmodic asthma, liver extract for pernicious anæmia, insulin, the organic arsenicals, the dyes such as 205, the new anæsthetics local and general, hypnotics, and many others.

Fallacies in Experiments on Healthy Men.

It has been often stated that the action of remedies may be best determined by experimenting with them on healthy men. This is not true; quinine is used to treat malaria, yet not one of the subjective symptoms induced in man has the remotest connexion with its curative properties. The same is true of the use of the iodides in syphilis and salicylates in rheumatism. The experiments of Joig and his pupils in 1825 with camphor, digitalis, and other drugs on healthy men added nothing of value to pharmacology. Subjective sensations are, it is true, produced which are erroneously attributed to the drug which has been taken. The late Dr. Rivers and myself were nearly the dupes of such an experiment which I will give in full because it illustrates the imaginary sensations and effects produced by S. Hahnemann and his pupils, by Perkin with his retractors, and by more modern physicians with their mystic apparatus.

Our experiments were made on healthy men under a regular régime as regarded sleep, exercise, and diet. The men were practised with the use of the ergograph during several weeks at the same hour daily, until their output of work was constant. We found that the administration of a dose of caffeine dissolved in water one hour before the experiment greatly increased the output of work for that day. This was repeated on several occasions, always with the same result, and we naturally regarded the effect as due to the caffeine. This, however, was not the case: the effect was due to the ritual of taking a drug; the drug day assumed an enhanced importance in the mind of the operator and the mental effect sometimes referred to as suggestion was principally responsible. We had no difficulty in showing that water made bitter with a trace of quassia or other simple bitter had a similar effect.

Few, if any, experiments made on man without the most careful controls are of any real value. Properly controlled experiments have been made, however, with many substances. Precise experiments, for example, have been made both in Germany and America with bromides in epilepsy. In these experiments half the epileptics were given potassium chloride and the other half sodium bromide; after several weeks' use the bromide had decreased the number of attacks, whilst the chloride had no distinct action.

[Prof. Dixon discussed the applications of chemotherapy in parasitic diseases and described recent preparations of the ductless glands in disorders of the endocrine system. He then spoke of civilisation as leading to an exaggerated nervous sensibility, which was a much commoner feature in those engaged in a mental indoor life than in those engaged in an outdoor physical life. He drew attention to the effect of tobacco in diminishing nervous sensibility and to the circumstance that though beer was a soothing beverage, and caffeine was a stimulating one, it was the supersensitive people who drunk caffeine and not beer in excess. It seemed to him not unlikely that this substitution of tea for beer was not wholly unconnected with the tendency of highly civilised nations to become supersensitive and neurotic, for this was the groundwork upon which drug addiction was built. He concluded :—]

I have endeavoured to show that all precise knowledge in therapeutics is based upon controlled experiments on animals or man, and that the elucidation of the action of medicaments by the methods and data of experimental physiology is one of the most important steps taken to place medicine on a scientific basis. How important this is may be gauged from the fact that all fundamental advances in treatment in the last 30 years have originated directly or indirectly from experiments on animals. There can be no doubt then that the future of therapeutics, and therefore of medicine as a whole, is intimately connected with physiology; there can be no doubt that advance in the practice of medicine is dependent on those trained in the methods and fundamental truths of physiology, who devote themselves in the ward and biological laboratory to investigating how best to prevent or cure disease and so relieve suffering. Britain for 50 years has every reason to be proud of her progress and achievements in physiology; it is acknowledged that she can show records second to none and that her savants have included some of the world's greatest investigators. It remains for us to hope that in the future she may attain equal success in the associated sciences directly concerned with the relief of suffering and cure of disease.

MENTAL HOSPITALS ASSOCIATION.

THE eleventh annual meeting of this Association was held on July 17th, with Alderman Sir WILLIAM HODGSON (Cheshire) in the chair. The Chairman, in the course of his address, referred to the difficulty of suggesting new legislation at a time of political crisis, but declared that the problems of lunacy and mental deficiency were above party and truly national. Some of the suggestions of the Royal Commission might be taken as sure of general acceptance and would supply urgent needs. He referred to the paramount importance of treatment for incipient mental disorder without certification, and suggested that a conference of local authorities should be called to consider the greatly overdue Lunacy Bill, which would meet with general support if formed on enabling rather than compulsory lines. It was most desirable that the Government should realise that the spirit of local government must be protected from excessive arbitrary interference by central officials. The Association's advance in strength and influence had been based upon steady insistence on efforts to gather information and on the absence of any interference with the absolute autonomy of visiting committees. Organisation for mutual helpfulness was the keynote of their work, which was too humanitarian for isolation or personal or political preference.

The first business on the agenda was an expression of regret that another year had passed without legislation to reform the lunacy laws. The Committee hoped to see a Bill introduced very soon, and the meeting cordially endorsed this hope.

The Committee drew attention to the serious shortage of accommodation and the prohibitive cost of building. Councillor W. M. CLARK (Durham) said that Durham had saved £3000 on an outside estimate by utilising material and labour available within the institution, but Councillor HOPKIN (Nottingham) pointed out the objections which the trades-unions would raise if this plan were widely followed. He thought there was no hope of obtaining the required accommodation in reconstituted poor-law hospitals, because the institutions were needed for old age pensioners unable to live at home on their pensions. If they could be helped to live outside, the beds they occupied might become available for mental cases. Alderman E. H. MOLE (Glamorgan) pointed out that this might be true in industrial areas, but agreed with Alderman R. BRUFORD that the problem of accommodation in other areas would solve itself when one authority was responsible both for poor-law and mental hospital work.

The Mental Nurses' Examination.

This vexed problem again came up for consideration, and an acute difference of opinion became manifest. For thirty years the examination and certification of mental nurses was in the hands of the Medico-Psychological Association, and the syllabus was drawn up by medical superintendents with reference to the special needs of the work they control. With the incorporation of the General Nursing Council a difficult situation arose. As Dr. G. H. GRILLS expressed it in proposing a motion, the G.N.C. did not want the advice of medical superintendents, and would not have it, and in his opinion most medical superintendents found the syllabus proposed by the Council quite impracticable. His motion was:—

> That this meeting views with some apprehension the existing unsatisfactory conditions regarding the national registration of mental nurses, and urges the General Nursing Council for England and Wales to provide that the possession of the certificate of proficiency in mental nursing awarded by the Royal Medico-Psychological Association shall entitle the holder thereof to be registered, on payment of the fees, in the mental section of the register of nurses of the General Nursing Council.

He pleaded strongly the difficulty of sparing nurses from a mental hospital to go to a distant centre for examination, and of their finding the money for fares and lodgings, as well as the five-guinea fee, and declared that a first-year probationer trained on M.P.A. lines was more use in a mental hospital than a fully registered general nurse. She must acquire in her first year an elementary knowledge of mental nursing and of first-aid, or she was useless in the wards; the G.N.C. syllabus postponed these subjects to the final examination. It was impossible, he thought, to have a single portal of entry for every kind of special nurse. Not more than two mental hospitals in England and Wales made the G.N.C. examination compulsory, and soon there would not be a single registered nurse in the mental hospital service, which would be a serious situation.

On the other hand, Dr. J. I. RUSSELL (N. Riding, Yorks.) and Dr. J. F. FRANCIS (Leicester), supported by Dr. D. RICE (Norwich) and Dr. R. EAGER (Devon), took the attitude that the position must be accepted and some compromise found by the medical superintendents. The General Nursing Council, they argued, was a statutory body, and its formation had undoubtedly been a forward step. It had now decided finally that it would not delegate its powers to any voluntary body, and that it regarded control of examinations as a part of its duties. This being so, its examination was the legal one and must be accepted sooner or later, and the medical superintendents were, in a sense, deceiving their probationers by encouraging them to take another diploma and dismissing them if they did not. Dr. FRANCIS said his committee had recognised the inevitability of the situation, and had given up training for the M.P.A. certificate. The examination fee was repaid by the bonus given to the nurses who had passed the examination. He had found no insuperable difficulty in teaching the requisite special subjects during the first year while training probationers for the G.N.C. examination, or in sending the nurses to the examination centre. He suggested that the M.P.A. might organise a higher special examination, to be taken by mental nurses after registration. Finally, it was decided to refer the matter to the executive Committee for consideration and report.

Other matters briefly discussed included the degree of control of mental hospital finance which should be exercised by the local authority; the degree of control that should be exercised over minor items in the uniform dress of members of mental hospitals' staffs; the facilitation of removal of patients to mental hospitals near their homes or relatives; and the reduction of railway fares for relatives visiting patients in mental hospitals. Alderman R. BRUFORD (Somerset and Bath) was elected chairman, and

Alderman W. E. **Lovsey** (Birmingham) vice-chairman, and Alderman C. **Hornby** (Lancs) was reappointed hon. treasurer for the ensuing year. The Committee was re-elected, with the addition of the retiring chairman, of Miss **Briscoe** of Fulham, and of Councillor **George Hunt** of Leicester.

The Salaries of Medical Officers.

During the morning the meeting went into committee to discuss a memorandum on the salaries of whole-time medical officers, which was accepted and confirmed. This scale of salaries was the outcome of a conference held at the Ministry of Health between representatives of the County Councils Association, the Association of Municipal Corporations, the Urban District Councils Association, the Rural District Councils Association, the London County Council, the Association of Education Committees, the Mental Hospitals Association, the Metropolitan Boroughs standing joint committee, and the British Medical Association. Briefly, the annual salaries agreed upon are as follows:—

Officer	Minimum commencing salary	Annual increment	Maximum	Emoluments
Resident medical officers and assistant M.O.'s. in mental hospitals	£350	£25	£450	Board, lodging, laundry, and attendance
Medical officers with at least 3 years' post-graduate experience	£500	£25	£700	
Senior medical officers—i.e., those in charge of services or departments	£750–£1100†	£50 every 2nd year	£1100	
Medical superintendents (excluding mental hospitals)—i.e., institutions with more than 100 beds	£750–£1100‡		£1100	Included in salary
Medical officers of health*	£800–£1800‖			

* Assistant M.O.H.'s 60 per cent of this scale.
† According to responsibility and scope. ‡ An additional £50 for each 100 beds over 200. ‖ According to population.

After an office has been held at the maximum salary for four years, the employing authority is to consider whether the officer's remuneration should be increased beyond the maximum. The scale is not to apply to posts limited to a term of one year, or to officers without previous professional experience. There is to be no differentiation of salary on account of sex, and any intention to dismiss on marriage should be specifically stated in the advertisement. The memorandum mentions the desirability of providing married quarters for assistant medical officers in mental hospitals, and of allowing at least four weeks' annual leave. An additional £50 per annum is recommended for officers who hold the Diploma in Psychological Medicine. Only the first annual increment is to be allowed to officers who, in the opinion of their medical superintendent, do not take advantage of the opportunities offered them for obtaining the diploma. Temporary medical officers should not ordinarily be employed, the conference advised, for more than twelve months, and clinical assistants should not be appointed to undertake the duties of junior medical officers. An advisory committee is to be constituted to deal with any difficulties arising out of the working of this agreement, which is to come into force on April 1st, 1930, and to remain in force for five years, and thereafter from year to year, subject to one year's notice from any of the contracting parties. These recommendations meet, in practically every respect, the requirements of the British Medical Association, out of which the conference arose in the first place.

MEDICINE AND THE LAW.

Shewry v. Maybury.

The lengthy litigation in the case of Shewry *v.* Maybury has ended in a manner satisfactory neither to plaintiff nor defendant, and presumably satisfactory neither to judge nor jury. The special jury, it will be remembered, after a trial lasting a week, failed to agree on the question whether the condition of the infant (Leslie Shewry) was caused by Dr. Maybury's treatment. The jury had agreed in its answers to a string of other questions already summarised in these columns,[1] and on July 9th Dr. Maybury's counsel asked that judgment might be entered for him since the plaintiff had failed to establish his case. The point at this stage for the Lord Chief Justice to decide was not how he would himself have answered the question on which the jury disagreed. Had that been his duty, Lord Hewart would, he said, have answered in Dr. Maybury's favour. The point he had to decide was whether or not there had been evidence to go to the jury upon which the jury might have answered the question in the opposite way. Lord Hewart, therefore, reserved judgment in order to give himself the opportunity of carefully re-reading the whole of the evidence; eventually (on July 19th) he gave his considered decision. He decided that, notwithstanding his own personal view, he would not have been entitled at the original trial to rule that there was no case to go to the jury. He would not have been entitled to direct the jury to find a verdict for the defendant. "There was, I think, some evidence, including some medical evidence, which, if the jury were prevailed on to accept it, was sufficient to entitle them to answer affirmatively the question 'was the condition of this infant caused by the treatment administered by the defendant?' . . . It may well be that, in view of the intrinsic nature of that evidence, and of the contrast between it and the cogent evidence adduced on behalf of the defendant, such an answer would have excited legitimate surprise. But all such considerations appear to me to be quite irrelevant if, in fact, there was a conflict of evidence for the jury to determine. Here, I think, there was such a conflict, and the jury having disagreed, it is not possible for me to enter judgment."

The result is that, notwithstanding that the Lord Chief Justice has now on two occasions made known his opinion that on the merits of the evidence the verdict should be in favour of Dr. Maybury, the disagreement of the jury upon a fundamental question vitiates the patient trial before Lord Hewart and leaves the plaintiff at liberty to start his action afresh. If this latter course is taken, twelve laymen will once more be selected to decide a technical issue; plaintiff's counsel will once more seek to inflame their natural sympathies by a terrible story of a healthy baby subjected soon after birth to unnecessary and improper treatment resulting in incurable mental deficiency and epilepsy; expert witnesses will once more come forward to say that whatever a medical practitioner decided to do nine years ago was wrong though he saw the patient at the time and they did not; "cogent" evidence will be given again on Dr. Maybury's behalf that he was right, and finally the jury will be expected to reach the mediæval standard of unanimity in the face of a puzzling series of questions framed by the judge with an eye to possible legal arguments in the Court of Appeal. The death of the child is the only new fact to be considered upon a re-hearing, and, unless there is a post-mortem examination, this fact may be without significance. Nothing, it is agreed on all sides, could have been more lucid or impartial than the Lord Chief Justice's summing up. But, as he has himself explained in his judgment, a judge cannot be placed in the position of a jury; unless he found himself able to declare that a verdict by the jury against Dr. Maybury was impossible he cannot supply the deficiency which the jury's disagreement has caused. Comparison between the judicial faculties of judge and jury is otiose—on the one side a man expert in the knowledge and application of the law, familiar with previous actions depending upon allegations of negligence, and trained to weigh evidence and exclude irrelevancies; on the other side twelve casually chosen laymen who have none of such gifts. The Lord Chief Justice, it must be reiterated, has twice declared that, had he had the power, he would have decided in Dr. Maybury's favour; the jury has not been able to decide unanimously against Dr. Maybury. No recent case has so flagrantly exhibited the occasional discrepancy between a judge's and a jury's view of identical facts, or the disadvantage of leaving technical issues (affecting a defendant's professional reputation and livelihood) to a jury of laymen. It will stimulate and justify the demand for some other form of tribunal. The use of medical assessors would at least abbreviate the length of such a trial. In any case it would seem reasonable that there should be some form of protection for a medical practitioner against charges of negligence relating to treatment given as much as eight years ago.

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[1] See The Lancet, 1929, i., 1375.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Medical Curriculum.

ON Thursday, July 18th, the graduation proceedings took place in connexion with Edinburgh University; the ceremonies were held in the M'Ewan Hall, and Prof. J. T. Mackie, Professor of Bacteriology in the University, delivered an address to the new graduates in which he outlined the defaults of the system, of which they were the most recent victims. Once again the curriculum was indicted as over-loaded—in Prof. Mackie's eyes it "resembled a building originally compact, extended in the course of time by new storeys and annexes, always commodious, but tending to become somewhat rambling, and—worse still—top-heavy on its foundations." Accordingly he concludes that "the time has perhaps come when it should be razed to the ground, and rebuilt on a new plan." He followed this expression of policy, which must be regarded as summary when applied to the outcome of (say) seventy-five years of developments, by stating that, while the study of medicine might be regarded as that of a great branch of biology, so that medical workers might be expected to furnish the world with supreme biologists, the graduated approach between biological studies and the minutiæ of anatomy and physiology was wanting in the curriculum, which, in this place therefore was irrational. Is this a weakness in the curriculum which can be met by extension of time? Or can it be met by an alteration of the examinational system, by which certain subjects, or the developments of certain subjects, are relegated to post-graduate work? Or, without altering the time of the medical course proper, can pre-medical studies be framed so as to lighten subsequent studies, while being available for the mass of students? Prof. Mackie, in his comprehensive survey of medical education, did not ask precisely those questions, but they are the questions which have to be faced, and towards a reply he made the suggestion that, on the analogy of the honours degrees in other Faculties, the University graduate in medicine might be able to take a pass or an honours degree.

Cowan House, Edinburgh.

A further £20,000 has been presented to the University of Edinburgh by Mr. Thomas Cowan primarily for scholarships to promote the entry of students of small means as residents into Cowan House. This House, which is now nearing completion, is designed to be a social centre for male students of British extraction, and to attract as residents young men who, in respect of intellectual force or other personal characteristics, are likely to have a useful influence on their fellow-students and to become a credit to the University.

Since it is difficult to foresee how far the provision of scholarships may be necessary or desirable, Dr. Cowan is leaving the University full powers to apply the fund in any other way that will develop the usefulness of Cowan House.

Housing Conditions in Edinburgh.

Since the inauguration 30 years ago of a Sanitary Department in Edinburgh over 5000 uninhabitable houses have been closed. The housing policy of the Corporation is now making good progress in the abolition of the slums by means of improvement schemes and the re-housing of the occupiers in more congenial and hygienic surroundings. At the end of 1928, 1034 houses had been inspected under the Housing Regulations (Scotland) 1928, and of that number 971 were considered to be in a state so dangerous or injurious to health as to be unfit for human habitation. In connexion with 57 houses closing orders were made. A reduction in overcrowding was reported. In the last three years the number of cases of overcrowding brought to the notice of the Department has fallen from 1640 in 1926 to 1542 in 1927, and 1323 in 1928. In 140 cases the overcrowding was due to or aggravated by the keeping of lodgers or the sub-letting of rooms. In the one-apartment overcrowded houses as many as 8 to 11 persons were found in residence, and in the two-and three-apartment houses as many as 10, and in one case 19, persons were found.

Animal Diseases.

At the annual meeting of the Animal Diseases Research Association of Scotland, held at the Moredun Institute, Gilmerton, a year of progressive work was reported. The Association now possess a well-equipped Institute with facilities for all kinds of research, but the lack of trained observers is still felt; there is, for example, urgent need for a clinician on the staff of the Association. As lamb dysentery can now be controlled, its general nature being understood, it has been possible to cease intensive work on it and take up louping-ill and the braxy-like diseases of sheep. Grass sickness in horses is the outstanding unsolved problem in front of the Association; information concerning the disease has been collected and distributed to the numerous collaborators. A scheme for the investigation of bovine abortion disease is under the consideration of the Empire Marketing Board. Transmission experiments with scrapie are in hand, and Calmette and Guérin's tuberculosis vaccine is being used, although with due reserve about its value.

Tuberculosis in Fife.

Dr. Pratt Yule states that the mortality-rate from tuberculosis in the County of Fife in 1928 was less than half what it was in 1914, the present rate being 0·70 per 1000. Various factors are responsible for the lessening grip of tuberculosis on the community, but Dr. Yule regards as most important the steady campaign that has been waged against the disease since 1912. The Fife scheme differs from that usually accepted as necessary for the control of tuberculosis. Hitherto, dispensaries had not been established in the county, the patient being visited, examined, and supervised in his home. The mortality-rates compare favourably with those of other Scottish counties of like industrial characteristics.

New Scientific Institutions in Aberdeen.

The notable additions during the past year to the medical and scientific resources of Aberdeen were recorded by Sir George Adam Smith, Principal of the University, on Graduation Day. The new Hospital for Sick Children has been completed and opened. An Imperial Bureau is being founded in close connexion with the Rowett Institute for Research in Animal Nutrition, which is to be the centre for recording and classifying researches in progress on animal nutrition throughout the British Empire. The National Department of Scientific and Industrial Research is to open another laboratory in close connexion with the University departments of physiology and bacteriology, and the Scottish Department of Agriculture had arranged for the establishment in Aberdeen of an Institute of Soil Research to be named the MacAulay Research Institute. This Institute will be run by a committee of 11, representative of the University, of the three Scottish Colleges of Agriculture and of the Scottish Department of Agriculture. The capital expenditure will be met by Mr. MacAulay, an Aberdonian now resident in Canada, up to a maximum of £10,000.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. H. M. Langdale is placed on Retd. List with the rank of Surg. Capt.

The following appointments are notified:—Surg. Lt.-Comdr. N. B. de M. Greenstreet to *President*. Surg. Lt.-Comdrs. (D.) M. F. Hopson to *Rodney;* and W. E. A. Sampson to *Vivid*, for R.N. Barracks, Devonport; J. L. Jean to *Vernon;* E. C. Bevis to *Victory*, for R.M. Infirmary, Portsmouth; H. J. Luck to *Victory*, for R.N. Barracks, Portsmouth; L. M. Hughes to *Pembroke*, for R.N. Barracks, Chatham; and F. W. Watt to *Victory*, for R.N. Barracks, Portsmouth; Surg. Lt. A. J. Burden to *Cockshafer*. Surg. Lts. D. Duncan to *Cambrian;* and H. N. V. Barnes to *Vivid*, for R.N. Barracks, Devonport.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Sub-Lt. V. S. Hughes-Davies to be Surg. Sub-Lt.

Prob. Surg. Lt. A. L. Gunn to be Surg. Lt.

The following appointments are notified:—Surg. Lts. T. C. Stevenson and G. A. C. White (D.) to *Victory*, for R.N. Hospital, Haslar, for training; Prob. Surg. Sub-Lt. F. W. Chippindale to *Victory*, for R.N. Hospital, Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Capt. I. F. MacKenzie, late R.A.M.C. Spec. Res., to be temp. Capt., and temporarily relinquishes the rank of Capt.

Lt. (on prob.) R. R. Leaning, from the secd. list, is restd. to the estabt.

Lt. D. A'Brook is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion.

TERRITORIAL ARMY.

Lt.-Col. J. S. Y. Rogers having attained the age limit retires and retains his rank, with permission to wear the prescribed uniform.

Lts. F. W. Bury and A. Barr to be Capts.

Hon. 2nd Lt. B. Reid (late R.A.F.) to be Lt.

ROYAL AIR FORCE.

H. C. S. Pimblett is granted a short service commission as a Flying Officer for three years on the active list.

Flying Officer C. Crowley ceases to be seconded to the Manor House Hospital, Golders Green.

Flight Lt. J. Twohill is transferred to the Reserve, Class D ii.

DEATHS IN THE SERVICES.

Deputy Inspector-General Charles William Buchanan-Hamilton, R.N., retired, who died on July 13th, entered the Royal Navy as surgeon in 1878 and reached the rank of Fleet Surgeon in 1894. He served throughout the Egyptian War, 1882, as surgeon to the *Beacon*, and was present at the bombardment of Alexandria, the seizure of the Suez Canal, the occupation of Port Said, Suez, and Ismailia, and at the surrender of the Aboukir, Damietta, and Ghimileh Forts (Egyptian Medal, Alex. Clasp, Khedive's Bronze Star). He also served as surgeon with the Royal Marine Battalion in the Soudan Expedition of 1884, and was surgeon of the Royal Victoria Hospital, and of H.M. *Sphinx*, at Suakin, until the close of the campaign (Suakin Clasp). He was surgeon of the Naval Brigade in the Burmese War, 1885, and was attached to the Burma Field Force in the advance to Upper Burma, and in the Indian Marine ship, *Tigris*. He also took part in the occupation of Mandalay and deposition of King Theebaw, and in subsequent operations (India Medal, Burma, 1885–87, Clasp). Previous to his retirement with the rank of Deputy General of Hospitals and Fleets in 1907 he was fleet surgeon of Sheerness Gunnery School and Dockyard.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

THE annual Representative Meeting of the British Medical Association opened in Manchester on July 19th with Dr. C. O. HAWTHORNE in the chair. The President-elect, Prof. A. H. BURGESS, introduced the President-designate for 1930-31, Prof. W. HARVEY SMITH, of Winnipeg, and a short address of welcome to Manchester was read by the Lord Mayor.

Part-payment by Hospital Patients.

Much of the first day was devoted to considering the Association's hospital policy, which the Chairman said would be for some years the most important business of the Representative Body.

In 1927 the Council was invited to prepare a special "middle-class hospital policy," but it has preferred the alternative of suggesting amendments calculated to bring the present "voluntary hospital policy" into line with the new requirements of the public. These amendments involve, first of all, a change in the classification of the patients, who have hitherto been placed in three groups: (1) those unable to contribute in any way; (2) "private patients" who pay for special accommodation and who arrange for treatment fees independently of the hospital; and (3) an intermediate group of "tariff patients" who directly or indirectly pay part or all the tariff charges of the hospital. On behalf of the Council, Sir RICHARD LUCE proposed that a distinct group of "aided patients" should be recognised. It was to be hoped, he said, that there would be a steady growth of the class who did not want charity and who paid the full cost of their keep in hospital, including fees for medical attendance. This class, to which it was suggested that the term "tariff patients" should henceforth be confined, included those for whom payment was made by public authorities, approved societies, employers of labour, insurance companies, or under contributory schemes. Meanwhile, however, there was undoubtedly a large body of people who were able to pay only part of the cost of maintenance and treatment, and the Council held that these should be placed in a definite category. Fees for medical attendance on such patients would be paid to the visiting staff according to what proportion of the full tariff was received by the hospital from the patient or on his behalf.

The proposal to recognise an "aided" class of this kind was vigorously opposed. Sir ROBERT BOLAM, for Newcastle-on-Tyne, argued that some 80 per cent. of the industrial population could pay 2*d.* or 3*d.* a week to contributory schemes and thus pay the full tariff scale. But they would never be brought to do so if they were given a chance of paying a little as and when they thought fit. To admit that this large proportion of the public could never be expected to pay its way was to vitiate the whole position from the start. Small contributions should certainly be accepted, but it should never be suggested that they were adequate.—Mr. BISHOP HARMAN did not approve of making categories or policies cover exceptions which were disadvantageous. It was better to have an ideal than to accept the present conditions under which perhaps the majority of patients would fall into the "aided" class.—Dr. J. C. MATTHEWS feared that this amendment of the hospital policy would lend colour to the theory that hospital staffs ought only to get fees for patients who were paying full tariff charges, and Dr. PETER MACDONALD said it would certainly put an obstacle in the way of arranging full contributory schemes at York.

Among other speakers some support was found for the proposal, and Sir RICHARD LUCE argued to the effect that it provided a stepping-stone between those who were purely objects of charity and those who paid for themselves. But the meeting, by a large majority, decided to send this part of the new policy back to the Council for further consideration.

Private Patients.

The Council's new suggestions about private patients were accepted with but little alteration. The Association's policy tentatively sets out a scale of incomes, rising to £300 a year, over which no one should be admitted to hospital on a tariff basis. Where special accommodation is available at a voluntary hospital, persons earning more than £300 may be admitted as private patients, but as in the case of tariff patients this is not to be done (except in emergency) without the recommendation of a practitioner. The policy now approved provides that when the special accommodation takes the form of private wards in a hospital which has both public and private wards in one building then:—

> (*a*) If the hospital has a resident medical officer or officers and also a visiting staff which is ordinarily responsible for the care of all patients in the public wards, the patient should be under the responsible care of a member of the visiting staff in association with his own private practitioner. The latter should have free access to the patient and should have such share of responsibility and treatment as may be agreed upon between him and the member of the visiting staff concerned. This does not apply where the governing body has made special arrangements permitting practitioners not on the staff to have responsible care of their own patients.
>
> (*b*) If the hospital has not such resident officers and/or visiting staff the patient should be admitted under the responsible care of a private practitioner and should be allowed, if necessary, to call in any consultant of his choice.
>
> (*c*) The fees payable by the patient may be determined either by a scale agreed between the medical staff and the board of management, or by private agreement between the medical attendant and the patient.

When, on the other hand, there is in connexion with a voluntary hospital a separate home or annexe exclusively for private patients, then the patient should be allowed to select any available medical practitioner as his attendant, though the latter may be required to show evidence of special knowledge or experience if these are likely to be needed. In the case of cottage hospitals it is recommended that membership of the medical staff should be open to all practitioners in the district and that the patient should have the right to be attended by his usual medical adviser, to whom he would be responsible for fees in the usual way.

Discussion of these proposals failed to reveal any significant cleft of opinion, though on one point, Dr. E. R. FOTHERGILL persuaded the meeting to take legal advice. What would be the position, he asked the Association's solicitor, if the governors of a hospital were sued because they allowed a doctor to maltreat a patient on their premises without previously satisfying themselves of his competence? Would they not be liable for damages?—The fact that the Representative Body has come to take a wry pride in Dr. Fothergill's pertinacity did not prevent it from enjoying Mr. OSWALD HEMPSON's forensic reply that in the particular circumstances under discussion the patient had himself assumed full responsibility when he called in the doctor.

Services of the Radiologist.

After accepting certain recommendations by the Council concerning the representation of the medical profession on the governing bodies of "separate hospitals or institutions for paying patients not connected with voluntary hospitals," the meeting settled down to consider a memorandum on radiological services. This has been prepared at the instance of the British Institute of Radiology and in the form now approved by the Representative Meeting is likely to be adopted as the policy of the Institute also. It provides, inter alia, that an agreed share of fees received by a hospital for radiological services, or an agreed honorarium, shall be placed at the disposal of the medical staff.

> A hospital may, on the advice of the visiting radiologist, arrange a schedule of modified charges for radiological services within a specified scale of income limits, and based upon an average of one half the fees commonly charged for similar private work in the district; but the schedule so arranged is not to be published or exhibited publicly.
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> A hospital in a district where medical practitioners are privately practising radiology should not provide radiological services for patients able to pay private fees. Where there is no such practitioner the radiologist to the hospital may be allowed to see private patients at the hospital, receiving not less than two-thirds of the fees paid by them.
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> "The normal approach to the radiologist," says the memorandum, "is through the medical officers of other departments of the hospital, but in exceptional circumstances cases may be referred direct to the radiologist by private practitioners . . . Fees for services to patients in pay beds should be paid to the visiting radiologist in each individual case according to the service rendered, less an agreed proportion to the hospital to meet costs."

The suggestion that in exceptional circumstances the private practitioner may send his cases direct to the radiologist did not pass unchallenged, and Dr. MACDONALD said it would be unwelcome to most members of the visiting staffs of hospitals.—Sir RICHARD LUCE explained that radiologists set great store by it, and it was accepted after Dr. H. B. BRACKENBURY had emphasised the exceptional nature of the circumstances to which it was intended to apply.

Hospitals and Private Practice.

A further appendix to the Council's report, consisting of a "model contributory scheme for hospital benefit" was also agreed to with minor emendations. Brighton argued that such schemes were being worked out for the benefit of hospitals to the detriment of specialist practice; because a private practitioner could not give the services required it did not necessarily mean that the patient should go straight to a hospital. But Dr. H. G. DAIN, whilst admitting that the whole profession would sympathise with this opinion, believed that arrangements for payment of private practitioners could not be embodied in a model contributory scheme for hospitals. And this view carried the day.

Another aspect of the hospital's encroachment on private practice was illustrated in a picturesque speech by Mr. F. C. PYBUS on industrial accident cases. After pointing out that the apparently generous contributions of industrial firms were not always as handsome as they seemed, in view of the services rendered, he remarked that these cases constituted an abuse of the medical staff as well as of the hospital funds. He had recently saved a firm £500 by restoring a patient who was about to be compensated to that extent. Why should such work be done for the many firms who dumped their accidents at the hospital doors, paying amounts which barely covered their keep, and leaving the rest to be made up, perhaps, by pulpit appeals? Why should not such cases be admitted to private wards so that the very expensive labour put into some of them could be recognised by suitable fees? "Going home footsore and weary from my hospital after having saved a few lives and a few limbs," said Mr. Pybus, "I contrasted my position with that of the officer of the law whom the city provides with a State coach and a fanfare of trumpets, going to the courts to award possibly £1000 to one of those persons who had been damaged."

A resolution was passed to the effect that there are two ways by which industrial accidents need not be a charge on voluntary hospitals or on the services of the medical staff: (1) making a charge on industry, which would require legislation; and (2) the development of contributory schemes in connexion with which the services of the staff are recognised in accordance with the policy of the Association.

Pay Beds and the Improvement of British Hospitals.

Dr. CHRISTINE MURRELL, for Kensington, moved:

> That the annual representative meeting, on behalf of the British Medical Association, wishes to emphasise the

conviction that pay bed accommodation is wanted not only for those patients who require operative or specialist treatment, but also for those whose need for such accommodation is due to the fact that they cannot receive suitable nursing and domestic attention in their own homes, so that they may receive the attention they require whilst still remaining under the medical care of their own private practitioner.

Supporting this resolution Mr. H. S. SOUTTAR said that everyone was now asking for hospital treatment and it ought to be made available to the whole community. The next few years would see an enormous development; the poor-law hospitals were to be taken over and brought up to date. Before a recent visit to Sweden he had thought he knew what an up-to-date hospital was, but he had discovered there that his ideas were 30 years behind the times. The hospitals of Sweden were as fine as they could be made; everybody had access to them, and general practitioners could use them for their own patients. We too should have first-class hospitals open everywhere to the public and to medical men, but this would be impossible without help from public sources. He was certain there was no X ray apparatus in this country as good as what he had seen in Sweden. The reason was simple. To keep such apparatus up to date it had to be scrapped every five years and no voluntary hospital could afford that.

Mr. W. MCADAM ECCLES spoke of the need for peripheral hospitals in addition to the great centres of education and specialist treatment. A hospital charging six guineas a week would need 150 beds to pay its way.

The motion by Kensington was approved.

Salaries in the Public Health Services.

Sir ROBERT BOLAM reported that since the beginning of this year the scale of salaries in the public health services has been under consideration by a conference composed of representatives of the profession and of local authorities and that a provisional agreement had been reached for presentation to the Representative Body and the various associations of local authorities.

The more important recommendations agreed to at conferences between representatives of local authorities and the British Medical Association on the salaries of whole-time public health medical officers are as follows:—

1.—Resident Medical Officers. £350, rising by £25 a year to £450, with emoluments to include board, lodging, laundry, and attendance.

2.—Medical Officers employed in Departments (three years' professional experience). £500 rising by £25 a year to £700.

3.—Senior Medical Officers (not being M.O.H.) in charge of services—e.g., school medical officer. £750 rising to £1100.*

4.—Medical Superintendents of Institutions other than Mental Hospitals. £750 (not exceeding 150 beds) to £1100 (over 750 beds), these salaries to include housing accommodation and board.*

5.—Deputy or Chief Assistant Medical Officers of Health. Sixty per cent. of the appropriate minimum commencing salary of the scale for M.O.H.*

6.—Medical Officers of Health. Population not exceeding 50,000, £800. Population exceeding 750,000, £1600 (County Councils and certain rural and urban districts), £1800 (County Boroughs and Metropolitan Boroughs and certain urban districts).*

7.—Salaries for combined posts, £800.

8.—Assistant Medical Officers to Mental Hospitals. £350, rising by £25 a year to £450, with emoluments to include board, lodging, laundry, and attendance. Suitable provision for married assistant medical officers should be made. An additional £50 per annum to those with a diploma in psychological medicine.

9.—General Conditions applying to all appointments. These include provision that travelling and other reasonable expenses incurred in the performance of duties shall be paid; the operation of this scale shall not result in reducing the salary of any medical officer; if the right to terminate a medical appointment on marriage is desired, a specific statement to this effect should be inserted in the advertisement of the appointment; no differentiation of salary shall be made on account of sex.

10.—An Advisory Committee, consisting of eight representatives of various associations of local authorities, eight representatives of the B.M.A., and a chairman appointed by the Ministry of Health, to consider the merits of any case of proposed departure from this agreement, or of difficulty in its application.

11.—Duration of Agreement. From April 1st, 1930, for five years, and thereafter from year to year.

This scale, while it is more inclusive, does not differ substantially from that set out on p. 159 of the Annual Handbook of the British Medical Association. The commencing salary in Section 2 (Medical Officers employed in Departments, who have had three years' experience subsequent to qualification) is agreed at £500 (formerly £600). No scale for the medical superintendents of mental hospitals is set out.

Sir Robert recommended that this agreement, set out above, be accepted as a basis of any further negotiations. It was a compromise, and he would not pretend that he was altogether satisfied with it. In some ways the profession might do better with the present system under which constant watchfulness could enforce the offer of salaries attractive to certain sections of medical men. It seemed desirable, however, especially in view of the forthcoming changes in local government, to meet the local authorities in a conciliatory spirit, and it was hoped that the proposed agreement would give the country for the next five years the type of public health service it ought to have. It would make it possible to say to a young man that the question of entering this service was worth careful consideration.

Mr. E. W. G. MASTERMAN criticised details of the agreement but said that the general feeling must be one of great gratitude to Sir Robert Bolam for doing so much to negotiate it.—Dr. MIDDLETON MARTIN thought it marvellous that any conference should have achieved such a document.—Dr. J. T. D'EWART said it would greatly improve the position of junior members of the public health services, but wished that more could have been done for older men.—Dr. H. W. POOLER and Dr. H. KERR drew attention to certain anomalies in the payment of medical officers; Dr. EUSTACE HILL said that the Society of Medical Officers of Health was not entirely satisfied with the agreement but regarded it as a great advance; and in the course of further discussion, Dr. FOTHERGILL said he had observed a great improvement during recent years in relations between private practitioners and medical officers of health.

The draft agreement was accepted by the meeting.

Motor Accidents.

Dr. J. W. BONE (chairman of the Medico-Political Committee) said it had become a misfortune for a medical man to live near one of the great roads of this country. He had to work by day and by night with very little chance of payment and his lot was all the worse if he happened to be on the staff of the local hospital. All the same the Council felt that it was not the function of a body of doctors to initiate a solution of this problem. He therefore moved:

> That the Representative Body is of opinion that failing the creation of a central fund by some extra tax on motorists or some system of compulsory insurance, including a priority for charges for medical attendance on any claims made, either of which methods would require legislation, probably highly contentious in nature, no satisfactory solution can be devised of the difficulty experienced by doctors in recovering the amount of their charges for treatment rendered to patients meeting with accidents on the road; further the Representative Body is of opinion that no greater case can be made out for dealing specially with the non-payment of fees incurred by persons involved in road accidents, than for those incurred in the treatment of the victims of any other form of accident.

Dr. C. FORBES, for Aberdeen, produced arguments against nearly all these contentions and proposed that the question should be sent back for reconsideration.

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* In classes 3 and 4 an increment of £50 to the salary every two years to 75 per cent. of commencing salary, provided that no salaries in these classes shall exceed £1100. In classes 5 and 6 it is understood that suitable increases for capability and length of service will be given.

This opinion got spirited support from Dr. J. B. MILLER, who said that Lanarkshire were astounded at the Council's recommendation—in so far as they could understand it. He thought the Council was "shelving the matter in an avalanche of words," and he drew a pathetic picture of the medical man summoned urgently to a motor accident—as often as not to find the smiling face of the countryside unchanged when he got there. Sometimes the patient removed himself; sometimes he was removed by another car; and in any case no doctor would think of attending accidents except from a sense of duty. At the end of the proceedings a constable would often emerge from cover, the reason for his previous modesty being that if he had sent for medical help himself the police would have been liable for a fee. Most motorists were insured against third-party risks. Why, then, should not the insurance company pay the doctor direct, just as (he understood) fire-brigades were paid direct for their salvage?

Dr. R. M. MANWARING-WHITE said he knew that in some areas the police had definite instructions not to send for a doctor so that they should not be liable for a fee; their custom was to ask Tom, Dick, or Harry in the crowd to send for help.

After a brisk discussion, Dr. BONE said he was now convinced that the question was worthy of the Council's further attention, and agreed that it might be desirable to get the views of the big motoring organisations. The resolution was therefore referred for reconsideration—a fate which also overtook the next of the Council's recommendations, namely:

That although it is unsatisfactory that fitness for driving a mechanically propelled vehicle should, as at present it is, be ignored entirely in the granting of a driving licence, the practical difficulties in regard to the position, including that of obtaining a consensus of opinion as to what the disabilities should be, are such that it is inadvisable for the Association at present to make a pronouncement in the matter; further, that no scheme in this respect so far proposed is free from great practical difficulties.

In trying to get the meeting to accept this motion Dr. BONE lucidly set out the practical difficulties with which, he said, the subject bristled, but Dr. FORBES remarked that these had been surmounted in other countries and Dr. DAIN thought the Association should be prepared for future legislation. Mr. BISHOP HARMAN suggested that an ad hoc committee should be set up to consider what, if any, standards of fitness for driving were desirable, and the meeting as a whole clearly favoured this course.

The Noise Nuisance.

An instance of the general desire to set many things right was provided by West Suffolk, who proposed that the Council be instructed to "take steps to secure legislation for the abatement of unnecessary noise." Dr. GRACE GRIFFITH admitted that West Suffolk was the quietest place on earth, but explained that its rural peace only served to emphasise the nerve-shattering noise now made by mechanical pig-feeders and similar devices. Why, she asked, were moving motors obliged to have silencers, whilst stationary oil-engines, from which there was no escape, could be as noisy as they liked? Could not offensive and unnecessary noise at least be scheduled as a nuisance under the Public Health Act? To which Dr. BONE replied that they had tried to do this last year, but Mr. Neville Chamberlain had astutely insisted on knowing just why noise was bad for health, and had eventually referred them to the Minister of Transport as a more appropriate authority. As for fresh legislation, said Dr. Bone, the Representative Body seemed to think its promotion was very easy; but really it was nothing of the kind. This time his plea was successful, and the meeting passed on to the next item on the agenda, which was the Council's new maternity scheme.

A National Maternity Service.

This scheme is intended to reduce maternal mortality and morbidity by ensuring adequate supervision before, during, and after confinement. It is based on the view that not more than 5 per cent. of women require admission to an institution on medical grounds, and it therefore provides for childbirth at home in all save complicated cases, and those needed at hospital for teaching students and midwives.

The midwife will be engaged early in pregnancy, and will thereafter keep the patient under observation. Not later than the thirty-sixth week she will arrange for one or more examinations by the doctor (chosen by the patient), who is to supervise the case, and if any abnormality arises before or during confinement she will call him in at once. The Council holds that the usual routine work of the antenatal centres can be done quite as well at the doctor's consulting room or in the patient's home—an arrangement which secures a continuity of supervision and treatment not at present obtained.

An essential part of the scheme is that medical men should be able to get their patients into institutions and "should, where possible, be allowed to treat those of them so admitted." Such institutions are to be paid for accommodation and nursing of these abnormal cases admitted on the practitioner's certificate, the cost to the service being estimated at £3 per bed for an average of three weeks for 5 per cent. of the total number of women delivered.

Arrangements are further outlined for a postnatal consultation in every case by the doctor, and for the fees of anæsthetists and consultants where these are called in. The proportion of patients who are likely to need the doctor's services during confinement is given as one in ten, payment being at the scale rate of 5s. per case now paid by local authorities. For each case the practitioner will further receive an average of 11s. 6d. for antenatal and 5s. for postnatal examination, whilst the midwife will probably get about £2 10s. for her services. The "handy woman" has no place in the proposals, but a "home help" will still be required and will usually be paid for out of maternity benefit under the Insurance Acts.

The scheme is intended to apply to all women now entitled to this benefit—i.e., insured women and the wives of insured men—together with other women of similar economic status. The estimated cost on an assumption of 500,000 deliveries per annum is about £2,022,000, which would be offset by the saving of the fees at present paid by the patients or on their behalf. It is suggested that the service should be provided on an insurance basis via the National Health Insurance machinery, and it is stated that an additional contribution on behalf of employer and worker together of 0·4*d.* per week for each insured person, with 0·2*d.* per week from the State, would provide all the money needed. For participants outside National Health Insurance the necessary premiums would be otherwise arranged.

A Brisk Discussion.

Dr. DAIN described the proposals as an attempt to reproduce throughout the country the essential features of maternity services which had shown excellent results in practice. Modern teaching favoured confinement in an institution, but the figures supplied by some of these services showed that labour could be conducted equally safely in the houses of the poor. The scheme permitted free choice of doctor and midwife; it provided that one medical man should see the patient through from start to finish; and it was cheap in the sense of being efficient and economical. It would improve the status of the midwife and encourage a better class of woman to take up this work, and it emphasised the importance of antenatal examination, to which some practitioners were not yet fully alive.

Dr. B. H. PAIN, for Tunbridge Wells, objected strongly to a note in the scheme which says that any woman who wants a doctor to attend her in normal labour must engage him at her own expense. No national scheme, he said, should prevent a woman having her own doctor in attendance. Moreover, the delegation of all normal childbirth to midwives meant that medical men could never acquire the experience necessary for the proper conduct of difficult cases. The proposals were simply proposals for endowing midwives and they would not attract a single medical man to the practice of midwifery. He could have understood their being presented by the Central Midwives' Board or the Society of Medical Officers of Health; but to find them put forward by the B.M.A. was not only disappointing but disillusioning.

Dr. D. Roxburgh traced the decline of midwifery to the passing of the Midwives Act. The wise practitioner no longer undertook confinements, for instead of having 100 cases a year—the rough with the smooth—he got ten difficult cases without any compensating change in the rate of payment.

Dr. James Young pointed out that at all events the maternal mortality-rate was not increasing, and spoke of the work of the Queen Victoria Jubilee Nursing Institute, which recorded a rate of only 1·3 to 1·5 per 1000—one-third of the average. He held that the proposed scheme provided in an unprecedented way for coöperation between doctor and midwife.

Dr. C. M. Stevenson said it was true that the scheme did not benefit the profession financially, but that could not be helped. Midwives were taking over more and more of this branch of practice, and on the whole they could do more for their patients than a doctor could. It would be well to accept a scheme like this which at least gave medical men a share in the work.

In further discussion it was pointed out that a woman in childbirth has a right to ask for alleviation by anæsthetics and drugs which at present can be given only by medical men. More than one speaker said the profession must make up its mind whether it does or does not want to do midwifery. Advertisements of practices suggested that it did not; and it was no good to pass resolutions at the Representative Meeting if they were not going to be backed up at home when the night bell rang. Dr. Brackenbury said the object of the scheme was to make childbirth as safe as it could be made, but if it was proposed that a doctor as well as a midwife was to attend every confinement—or even every confinement in which the patient asked for a doctor—then the scheme would never be accepted by those responsible for the national finances. This argument was reinforced by Dr. Dain's remark that at the moment there is no public demand that a medical man should be available in every case. So long as the present maternity benefit was available he was satisfied that no injustice would be done to any woman who particularly wanted a doctor to attend her. He said that one of the merits of the scheme was that it had nothing to do with endowment of the profession, and that all along they had been looking at it from the point of view of the women who were to benefit.

With minor emendations the scheme was approved by the meeting.

The Maternal Mortality Inquiry.

A brief exchange of opinion on the reaction of practitioners to the questions of a departmental committee drew from one representative the epigram: "What is worth doing is worth being paid for, and what is not worth being paid for is not worth doing." But this was far from reflecting the spirit of the hour, and the following recommendation of Council was approved:—

> That as the giving of information to the medical investigator who will fill up the form of inquiry issued by the Departmental Committee on Maternal Mortality is regarded by the Association as a voluntary contribution on the part of the medical profession to a scientific inquiry on a question of pressing public importance, the Association is of opinion that no fee should be charged for the service and none accepted if offered.

Psycho-analysis and its Critics.

Four years ago Dr. L. A. Parry raised this subject because experience of certain unfortunate cases had persuaded him that psycho-analytical methods were capable of doing a great deal of harm, especially to young people. He asked the Association to issue a public warning against these dangers, and in 1926 a committee was appointed under the chairmanship of Dr. R. Langdon-Down to investigate psycho-analysis in all its bearings. (When the report of this committee was issued last month we gave some account[1] of the findings and explained that the terms of reference were held to cover only the views and methods of Freud and his school.)

Dr. R. Langdon-Down proposed that the report of the Committee on Psycho-analysis appointed in 1926, should be accepted as discharging their instructions. The Representative Body was prepared to agree with Dr. F. H. Bodman's opinion that in the course of wide reading he had never come across a fairer exposition of the subject. At the same time it listened sympathetically to Dr. Parry's objection that not enough stress was laid on the dangers he had in mind. He moved a resolution regretting "that more emphasis has not been laid [in the Report] on the very real and serious dangers, specially to children and adolescents, of any system of mental therapy which postulates a sexual basis as the sole or preponderating cause of nearly all neuroses and pathological mental conditions." As a member of the Committee during its four years' deliberations Dr. Parry declared himself more than ever convinced of the harm that might be done by psycho-analysis, which postulated, he said, that sex was at the bottom of almost all mental and nervous departures from the normal. The Freudians thought that head-nodding, thumb-sucking, and similar disorders were associated with the Œdipus complex, and to treat children on this basis must obviously put sexual thoughts and desires into their heads and thus promote objectionable conduct later on. Mr. E. B. Turner warmly assented and told of the trouble he had had in "cleaning up the mess" in the minds of young people who had been psycho-analysed. He thought that perfectly healthy adolescents sometimes suffered both physical and mental damage by being encouraged to "think of things they had never thought of, and dream of things they had never dreamt of," and if he was told that those he had in mind had gone to the wrong kind of psycho-analyst—well, all he could say was that there were a lot of the wrong kind about. Similar views were evidently held by a considerable number of those present, many showing themselves suspicious of psycho-analysis, but after Dr. Parry's opening speech no time was lost before Dr. M. G. Biggs, one of the senior members of the meeting, pointed out that in scientific discussion there should be no question of prejudice. A more detailed defence of the report was offered by Dr. R. G. Gordon, hon. secretary of the investigating committee, who admitted that harm had been done in the name of the method, but urged that this did not condemn it any more than antiseptic surgery was condemned by the errors of its earlier practitioners. Dr. Parry was not fair, he said, in stating that Freud and his followers "postulated" a sexual basis for nervous disorder. They did not; they said they *found* it—which was a very different thing. It was not the business of the committee to adjudicate on the dangers of psycho-analysis unless definite evidence was laid before them; none of the cases brought to their notice had supported the statements made by its opponents, and he doubted whether Mr. Turner's cases would hold water if properly criticised. This brought the sharp rejoinder from Dr. Parry that it was almost impossible to prove damage in such a case, especially to a committee; "but suppose I hand a boy a tin of gunpowder and a match, must I produce his charred body before I am believed?" Dr. Parry was again equal to the occasion when Dr. C. M. Stevenson asked the meeting to stop its heresy-hunting and think of the verdict of posterity. If the theory was true it must be accepted, said Dr. Parry; but was all criticism a heresy hunt? When the French Government 100 years ago set up a committee to investigate morphia, would they have shown intolerance in drawing attention to the dangers of this drug? As for the verdict of posterity, Dr. J. T. D'Ewart pungently remarked that he was thinking not of posterity, but of his own patients and of how they were to be protected from psycho-analysts who were not properly trained. Whether or no the best practitioners of psycho-analysis were safe, there were people going about under the same flag who were undoubtedly a public danger here and now, quite apart from questions of posterity. A cognate view was taken by Dr. C. E. DOUGLAS, who objected to the widespread assumption that Freud had discovered the psychological influence of sex and had invented the subconscious mind. The difference between schools of thought on the subconscious was, he said, that James separated it from the conscious by a threshold which was clean, whereas the threshold recognised by Freud was covered with muddy footmarks. Dr. DOUGLAS vigorously disapproved of certain aspects of the report, and this and other critical opposition to it might have carried the day but for opinions expressed by three of those who had served on the committee. Dr. PETER MACDONALD said that he was clear, at any rate, on two points: First that psycho-analysts (in the true and proper sense) were not charlatans, and secondly that "proof of the dangers of psycho-analysis appears to disappear when probed." After sitting on the committee for three years he did not *know* whether the method was dangerous to children and adolescents, but he was sure that the representatives ought to be in the same position and he begged them not to commit themselves to what Dr. D. CLOW called a pontifical announcement when they did not know, and they knew that they did not know. Dr. LANGDON-DOWN admitted that there must be dangers in any form of exploratory mental therapy, but thought that none had done more than the psycho-analysts themselves to point out these risks and guard against them. Lastly Dr. E. K. LE FLEMING, in giving further approbation to the report, wondered why no case of damage done could be produced if they were indeed so common.

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[1] The Lancet, July 6th, 1929, p. 31.

It will be seen that woven among strong feelings about a practical problem there was in this discussion a very general desire to keep an open mind. After serving on the investigating committee Dr. LE FLEMING summarised his feelings in the quotation, "Oh what a dusty answer gets the soul, hotfoot for certainty in this our life"; but this was a negative attitude compared with that of Dr. J. S. MANSON and several other representatives who obviously (like Matilda's aunt) kept a strict regard for truth. With so many adorning the tale it fell, perhaps, to Dr. L. W. BATTEN to point the moral of greatest practical importance. The meeting was very nearly being asked, he said, to declare that nothing so unpleasant as psycho-analysis could possibly be true, and this was an attitude of mind concealing dreadful dangers. People who thought experiments on animals particularly unpleasant were apt to say that such experiments were therefore wrong, and that deductions from them must be unsound. Hence came the necessity to argue that staphylococci did not cause boils, or tubercle bacilli tuberculosis. "We must not do things like that," said Dr. BATTEN; and perhaps because they saw this hideous abyss in front of them the representatives by a large majority threw out Dr. PARRY's resolution calling attention to the dangers of psycho-analysis. The Psycho-analysis Committee were thanked for their services without comment on the nature of the report.

Election of Chairman and Vice-Chairman.

Dr. HAWTHORNE was re-elected chairman of the Representative Body for the coming year, and Dr. ARNOLD LYNDON vice-chairman.

(To be concluded.)

RATING OF SUNDERLAND HOSPITALS.—Under the new scheme for the unification of rating, the assessment of Sunderland Royal Infirmary was increased to £700, while that of the Aged Seamen's and Widows' Homes at Bishopwearmouth was raised to a point which threatened their closure. The local assessment committee has now decided to rate the Infirmary and the Children's Hospital at the nominal figures of £16 and £5 respectively, with similar large reductions for the other institutions.

Correspondence.

"Audi alteram partem."

THE SCOPE OF CANCER INQUIRY.

To the Editor of THE LANCET.

SIR,—The report of the British Empire Cancer Campaign (summarised in your issue of July 13th) is, as usual, an admirable record of excellent work, but, if I may be allowed a criticism, it seems to me that progress in the investigation of the causation of cancer might be more rapid if the tacit assumption that cancer and sarcoma are different from all other kinds of tumour were dropped, and the scope of the inquiry were enlarged to embrace the mode of origin of all tumours.

Tumours start either from a single cell or from a group of cells which have the same origin, serve the same function, and live under the same conditions. For some reason as yet unknown, these cells at different stages of their development suddenly cease to do any work or to develop any farther, and instead devote the whole of their energy to indiscriminate multiplication. The cause is the sudden assertion of the power of asexual reproduction which is inherent in every cell, more or less in virtue of its descent, but which is kept under control, unable to exert itself so long as the cell continues to expend its energy in doing its own special work. The result is the formation of a growth with a life of its own, distinct from that of the parent that gave it birth, though absolutely dependent on it, drawing all the nourishment it requires from the parent, and doing nothing for it in return, capable of growing and thriving while the parent starves, and only dying when the supply of nourishment is cut off by some local cause, or by the death of the parent—in other words, what may be regarded as a parasite.

The germ cell, whether of the race or of the individual (which, in the course of its development, recapitulates the evolution of the race), possesses the power of growth and reproduction in its fullest measure. It can divide into two and each half can form a separate and perfect individual. Or the separation may be incomplete, or the division may be unequal, when some monstrosity will result. Every part of it possesses this power, and the earliest cells into which it divides inherit it, and can behave almost as independent organisms, capable of moving from one part to another. But as the cells continue to multiply, and the organism to increase in size, this stage of semi-independence comes to an end. Certain groups of cells become marked off by their position or relation to the rest as specially adapted to carry on certain kinds of work, and organs with definite functions begin to make their appearance. One of the earliest of these groups to be marked off in this way is that to which is assigned the function of reproduction and the preservation of the race.

At once the organism becomes divided into two parts, very unequal in size. One, the smaller of the two, is concerned solely with the function of reproduction and the preservation of the race. It does nothing else. It has no other kind of work, and as it is restricted to this one function, it becomes more and more efficient, until bisexual reproduction is evolved, and ultimately the sexes become separate. The tumours that grow from these cells are imperfect representations of organs or tissues, arranged, so far as circumstances permit, in a more or less orderly manner. Many of them are capable of a certain degree of development, and some can carry on a useless kind of work. The reproductive energy of the cells has been released in some way from the control that held it in check, and they are free and unfettered to develop as far as the influence of surrounding structures allows them.

The other, by far the larger of the two, has nothing to do with the preservation of the race, and is given up altogether to the maintenance of the individual. The cells of which it is composed undertake everything that is necessary for this purpose. The work is of the most varied character, and their structural development, which is determined by the character of their work, is naturally equally varied. Little by little, as they become more and more highly specialised, the reproductive power which they originally possessed in common with their fellows grows less and less. Traces of it may be seen in larval forms, especially of aquatic animals in which the reproduction of limbs is still possible, and in a much more rudimentary form, even in mammalian embryos, but so far as the higher animals are concerned reproduction is limited to the formation of simple tissues, and even in these to those that are not too highly specialised. Structures such as the elements of the organs of the special senses or of the nervous system have lost all power of reproduction, and tumours formed from them are almost unknown.

As the reproductive power is limited in this way, the only tumours that can be formed by these tissues are composed of simple elements, without order, arrangement, or shape, other than is imposed upon them by surrounding structures. Their clinical character depends upon the stage of growth reached by the parent cell before its development came to an end. If it had reached, or almost reached, its final adult form, as for example in the case of fibrous tissue, the tumour is formed of similar adult tissue, and increases slowly in size, pushing surrounding structures to one side. But if on the other hand it was still in the embryonic stage, with all its primitive powers of multiplication and migration unimpaired (and myriads of such cells are constantly being produced throughout life), the tumour is composed of similar rapidly growing cells, capable of invading surrounding tissues and of being carried, partly actively, partly passively, to other regions of the body, where they can grow into tumours like the original one. As development is a continuous process without break or interruption from the very earliest age up to the perfection of specialisation, and this sudden arrest can apparently take place at any stage, the tumours that grow from these cells necessarily shade imperceptibly into each other, and no line of separation can be drawn between them, no matter how much they may differ from each other clinically. Characteristic types can be, and must be, described, around which the majority of these growths can be ranged, but in between these there are numberless gradations of which no one can say whether they belong to one or the other, or whether they may not belong at one time to the one and at another to the other. The distinction is a clinical one.

The simultaneous occurrence of these three phenomena which appear to be essential to the growth of tumours—viz., the cessation of all functional activity, the arrest of development at whatever stage the parent cell may have reached, and the output of all the reproductive energy it still retains, must be associated with, if not caused by, a profound change in the metabolism of the cell. But the agent that can bring about this change is still unknown. Mechanical irritation undoubtedly plays a part, for tumours develop most frequently in places exposed to irritation, but it is open to question whether it is sufficient by itself. Information is more definite about chemical substances such as soot, some forms of tar, and mineral oils, especially when their action is long-continued and associated with irritation. There is no doubt as to what they can do. Very possibly the occurrence of tumours of the bladder in those engaged in aniline dye works, and the development of epitheliomas in cases of unrelieved congenital phimosis are instances of purely chemical action. X rays, which can kill cancer cells and are at the same time the most certain agent for producing cancer known, must act by influencing the metabolism of the cells exposed to them. The first change is an interference with the function of the skin. It becomes dry and harsh. Then the development of the epidermic cells becomes imperfect. Little irregularities appear upon the surface. Definite warts and papillomata follow, and if exposure is continued epithelioma is certain. That these and certain chemical substances are capable of effecting changes in cell metabolism cannot be denied, but as yet too little is known to allow even speculation upon the nature of these changes. Hope seems to point in the direction of tissue culture, and it is not impossible that the problem of the causation of cancer will ultimately be solved by the study of the conditions that influence the function of reproduction.

I am, Sir, yours faithfully,

C. MANSELL MOULLIN, C.B.E., M.D., F.R.C.S.

July 21st, 1929.

THE DEVELOPMENT OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Dr. Morlock's valuable paper in your issue of July 13th and Dr. Toussaint's letter in the following issue draw attention to the simulation of influenza by incipient phthisis. Radiology has, indeed, placed beyond dispute the statement that the onset of pulmonary tuberculosis, especially in young persons, is usually an acute process. It is therefore not surprising that the earliest manifestations of the disease are often lightly dismissed by the patient and occasionally by the doctor as the effects of an "influenzal cold" or "chill." Mistakes of this kind are indeed inevitable unless the possibility of tuberculosis is kept constantly in mind. The results may be disastrous alike to the doctor's reputation and to the patient's chances of recovery.

Inquiries as to the first symptons of disease in a series of 50 adolescent and young adult female consumptives who came under my observation in the period 1927–28 gave the following results: Cough (accompanied by lassitude in nearly half the cases) 64 per cent.; haemoptysis, 18 per cent.; influenza, chill, 12 per cent. During the winter rush it is impossible for many practitioners to examine carefully every patient complaining of cough. I think, however, that mistakes in diagnosis might be reduced to a minimum in the busiest urban practice if the following points were remembered:—

1. Cough in a young person, especially in one of the female sex, should always be regarded as a possible danger signal. If persisting for more than a week the spit should be tested for tubercle bacilli. If the result is negative and symptoms continue the test should be repeated on at least two further occasions.

2. A hæmoptysis of one teaspoonful or more should be regarded as evidence of tuberculosis unless other cause can be demonstrated. The only other common cause of pulmonary hæmorrhage in young persons is bronchiectasis. A hæmoptysis which the patient seeks to minimise is almost always of sinister import, one that a patient delights to describe is seldom of any great significance.

3. In physical examination auscultation is more important than percussion—despite the text-books. Moist râles in the upper half of the lung should be regarded as presumptive evidence of tubercle. Dry crackles or superficial rustles should be disregarded. A crepitation is a sound heard not a sound imagined. The common site of early infiltration, as Dr. Morlock has emphasised, is below the clavicle, where in a typical case the skiagram shows a roughly triangular shadow with its base outwards towards the axilla. The infraclavicular and axillary regions should therefore be auscultated with special care, as also the region internal to the vertebral border of the scapula which includes the *zone d'alarme*. If the patient is instructed to give a short cough and take a breath every time the stethoscope is applied the whole chest can be auscultated in a couple of minutes.

The average practitioner cannot command radiograms of the fine quality necessary for chest work, and though a skiagram is always valuable and sometimes essential for correct diagnosis, a poor film is worse than useless. Temperature, pulse, and weight records are obviously desirable but not always obtainable. If, however, due regard were always paid to the criteria indicated above, very few cases of incipient tuberculosis should be missed. A history of possible exposure to infection is not likely to be ignored by a family doctor.—I am, Sir, yours faithfully,

W. BURTON WOOD.

Park-square West, N.W., July 21st, 1929.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.—We are, Sir, yours faithfully,

J. AND A. CHURCHILL.

40, Gloucester-place, W.1, July 18th, 1929.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

LOCAL GOVERNMENT (SCOTLAND) ACT AMENDMENT BILL.

REPLYING to Mr. BALDWIN (Leader of the Opposition) in the House of Commons on Wednesday, July 17th,

Mr. MACDONALD, Prime Minister, said that the Local Government (Scotland) Act Amendment Bill was circulated for the information of the House so that they might see what was best to be done in the circumstances, and he had made it clear that unless there was some chance of getting the Bill through Parliament within a reasonable time it would be quite impossible to proceed with the measure. He wished to have an opportunity to pursue his investigations further in order to see whether it would be possible to proceed with the Bill, and he promised to make a final statement as to its fate on the following day.

On Thursday, July 18th, in reply to Sir ARCHIBALD SINCLAIR,

Mr. MACDONALD said that he had made further inquiries about the chances of the Bill in relation to the business which must be finished this month. He had also had representations of both sides of Scottish opinion. With very much regret he saw no prospect of this Bill passing all its stages in this House and in the House of Lords in time to be effective, and, therefore, he did not propose to ask the House to discuss the measure further.

Miss LEE asked if there was any insurmountable reason why the House should not sit a little longer to consider this Bill. Profound disappointment, and indeed indignation, would be caused in Scotland if it was dropped at this stage, especially as many members on the Labour benches felt that they had a full assurance in that House that this matter would, above all others, be given consideration before the summer recess.

Mr. DUNCAN MILLAR: Is it not the case that on Wednesday last the Prime Minister gave this House an undertaking that he was going to save the education portion of the Bill, and is the right hon. gentleman aware that his action will cause great disappointment to the authorities and the people in Scotland who were relying on what the right hon. gentleman had said?

Mr. MACDONALD said that the description of what he had said in the previous week was most inaccurate. He said exactly the opposite. What the Government had to face was whether the Bill could be got through in time.

Mr. MACPHERSON: Are we to understand from my right hon. friend that there will be no further inquiry into Scottish local self-government, or into Scottish local government?

Mr. MACDONALD: That part of my statement (which was a definite statement) remains.

Sir A. SINCLAIR: If the inquiry is going to take place in October, surely it will be a *post mortem*?

Mr. MACDONALD: In any event, four-fifths will be.

Mr. HARDIE: Is the Prime Minister aware that this was a major subject at the General Election?

Mr. MACDONALD said that at the General Election he had stated that there was a possibility of education being separated from the rest of the Act, but that he was not sure and would look into it, and if anything could be done a Labour Government would do it. He had made it clear that, as far as the Act itself was concerned, it could not be annulled or changed, but as regarded the whole of the altered Scottish local government machinery the Labour Party, if it had the enjoyment of power during a full Parliament, would certainly before going to the country complete the inquiries on the subject and take action.

Mr. MACPHERSON asked leave to move the adjournment of the House for the purpose of discussing a definite matter of urgent public importance—namely, "the failure of the Government to suspend the operation of the Local Government (Scotland) Act, 1929, or to proceed with its Bill to amend the said Act."

Fewer than the requisite 40 members intimated their support of Mr. Macpherson's request, and the House therefore proceeded to the Business of the Day.

COLONIAL DEVELOPMENT BILL.

On Wednesday, July 17th, Mr. LUNN, Under Secretary for the Colonies, in moving the second reading of the Colonial Development Bill (a measure to enable the State to grant financial assistance to schemes of development overseas with a view to helping employment in this country), said that when the financial resolution on which the Bill was based was being discussed several speakers had raised the question of medical services, and had urged that they should be considered in any scheme of colonial development. There had been many schemes undertaken not only in this country but by other countries in recent years on which that matter had been considered very seriously, and taken in hand, and they had proved the wisdom of giving attention to the health conditions of those who laboured in these great enterprises. It was equally important that health conditions should be considered even in smaller enterprises. He could assure the House that in any schemes of colonial development the medical services and medical research for the improvement of health conditions would find a very important place.

Lord EUSTACE PERCY said that the Lord Privy Seal and the Under Secretary for the Colonies had both laid stress on the grants for health purposes. Those grants, if they were to be permissible under the Bill, would be so under the words "any other means" in Section 1. If they mentioned "any other means" and specified one of those other means, "including surveys," they ran great risks of finding that health would be excluded. That was a Committee point, but he would ask the Government to give their attention to it.

Sir OSWALD MOSLEY, Chancellor of the Duchy of Lancaster, said that quite clearly under the wording of the Bill animal health was included, because anything relating to agriculture concerned animal health, and therefore animals were within the purview of the measure. He thought that Lord Eustace Percy, however, had referred to human diseases. He (Sir O. Mosley) was advised that within the framework of the Bill it was possible to include diseases affecting those engaged in industry and which impaired their efficiency. Certainly such diseases as hookworm, which notably impaired the efficiency of those engaged in industry, could be dealt with under the Bill. In fact, whenever they came to the consideration of industrial efficiency they must at once be led to the physical condition of those engaged in the industry, and it would be a very narrow and very mistaken reading of the purposes of the Bill if the great human element upon which, after all, all industrial efficiency rested in the first degree, was excluded from its purview.

Dr. VERNON DAVIES: Why not include it specifically?

Sir O. MOSLEY said that he had been trying to explain that it was included.

Dr. VERNON DAVIES: With great respect to the hon. baronet, I do not agree with him.

Sir O. MOSLEY said that after the explanation he had given he could only assure Dr. Davies that his fears were not justified.

The Bill was read a second time.

On Thursday, July 18th, the House went into Committee on the Colonial Development Bill, Mr. R. YOUNG in the chair.

Power to Make Advances for the Purposes of Colonial Development.

On Clause 1, Dr. MORGAN moved an amendment to make it clear that schemes for benefiting health or labour conditions were included under the clause. He said that on the second reading debate Sir O. Mosley had stated that he thought that health matters were included in the Bill. The word "health" was not mentioned in the whole of the Bill. Health was a very important subject in the Crown Colonies, and especially in the West Indian Islands. The only possible reference in the Bill which could be included under health was the question of the drainage of land and swamps for the removal of malarial conditions. The disposal of sewage in many of these islands was very primitive at present, and he wanted to make it possible for sewage schemes to be brought within the scope of the measure, as such schemes affected tourist traffic, trade, and the general health of the community. He also wanted to make sure that if a company started a new industry, or to develop an old one, such company should provide proper housing and working conditions for the people engaged in the industry.

Sir O. MOSLEY said that since the second reading debate he had looked closely into the question of whether this matter was covered by the Bill. The impression which he had already stated to the House was confirmed, and he was satisfied that health was included. He was quite prepared, however, if hon. Members desired it, to consider the inclusion of specific words at a later stage to cover this point.

Dr. MORGAN withdrew his amendment.

Later Sir O. MOSLEY moved to include the words "the promotion of public health" in the clause. He said that indigenous inhabitants would be covered by the words of his amendment, as well as all forms of settlers, and he hoped that hon. Members on both sides of the House would be satisfied that it definitely established the principle of public health.

The amendment was agreed to.

The Committee stage of the Bill was concluded.

THE HOUSING SUBSIDY.

The Housing (Revision of Contributions) Bill was read a second time.

On Monday, July 22nd, Mr. A. GREENWOOD, Minister of Health, in moving the third reading of the Housing (Revision of Contributions) Bill said that it was a modest measure which proposed merely to continue for the present the existing housing subsidy under the 1924 Act and to discontinue, as the late Government suggested, the subsidy under the Act of 1923. He said that he had been criticised by Sir Kingsley Wood for not having done more. He had not done more because he was primarily concerned to avoid discontinuity of building and to give the Government time to produce a Bill of a much larger kind. The prolongation of the subsidy under the 1924 Act did not prejudice in any way what might happen in the future. If he could get local authorities, as he understood he could, to continue their building pending a larger measure, then he would consider this Bill had been amply justified.

Mr. T. SNOWDEN said he took exception to the speech of Lieut.-Colonel Fremantle in which he said that medical officers of health urged as strongly as they could that the Treasury should reduce the vast sums which were spent by the late Government on housing in order to provide more money for other important health services which were calling out for treatment. He (Mr. Snowden) regretted to hear that speech, because if the subsidy would encourage housing—and he believed it would—it would remove evils caused by bad houses and in consequence reduce possible expenditure on the other matters to which Colonel Fremantle had referred.

Lieut.-Colonel FREMANTLE: I only said that it was an extremely extravagant way of doing it.

Mr. SNOWDEN said that it was rank waste to have to spend so much money on evils which were caused directly by bad housing. It was better to spend money on housing than have to spend it on building hospitals.

Lieut.-Colonel FREMANTLE: The whole point is waste. So far as it goes to improving housing we are all in favour of it.

Mr. SNOWDEN said he differed from Colonel Fremantle and he would like to think that the hon. Member did not represent the views of other medical officers of health, or even of the medical profession.

Miss RATHBONE urged that after the lapse of ten years a Select Committee was needed to consider the housing problem from the tenancy side, to see how far they could erect enough houses and to see that those houses passed into the hands of those whose housing needs were the sorest. At present the housing policy of this country might be compared to our having built at vast cost a reservoir intended to relieve the thirst of people who were dying of thirst and then allowing the first call on the water to go to those who wanted water only for the watering of their roses. The problem of incapacity to pay an economic rent was a personal problem and could never be solved, whatever the subsidy might be, by so mechanical a device as a flat-rate arithmetical equal reduction of rent by the amount of the subsidy upon the houses built by the local authorities.

Dr. VERNON DAVIES said that Mr. Chamberlain, the late Minister of Health, as a result of his prolonged experience, came to the conclusion that a subsidy had a distinct effect on the cost of houses; that if the subsidy was raised there was a tendency for the cost to rise, and, on the other hand, if the subsidy was reduced there was a tendency for the cost of houses to be reduced. The present Minister of Health took exactly the opposite view. Although the Minister would not deny that subsidies might have some effect upon prices he was not concerned so much with the matter of prices as with the building of houses as quickly as possible. That helped the building of houses, but it did not help to let them at an economic rent which people could afford to pay. He (Dr. Davies) would suggest that the Minister of Health had a sufficient amount of information to enable the House to come to a considered opinion on the subject, and when the scheme which was germinating in Mr. Greenwood's brain came before the House next session it might be well if a White Paper was laid before Parliament giving the whole arguments for and against a subsidy, what it had done in the past, and what it was expected to do in the future. If the Minister of Health was right in his theory it would be to his great advantage and to the advantage of the country. If, on the other hand, the argument pointed in the other direction he was sure that Mr. Greenwood was a big enough man to acknowledge it. His (Dr. Davies's) belief up to the present time was that Mr. Chamberlain was right in his theory, and that the Government were making a grave mistake.

The Bill was read the third time and passed.

HOUSE OF LORDS.

TUESDAY, JULY 23RD.

The Problem of Slum Clearance.

Lord ARNOLD, Paymaster-General, moved the second reading of the Housing (Revision of Contributions) Bill. He said that it was a temporary measure. The whole question of housing and slum clearance was receiving the constant and earnest attention of the Government. In due course their plans would be made known.

The Earl of ONSLOW said that the Bill was a mischievous and retrograde measure.

The Bishop of SOUTHWARK said that the problem of slum clearance had never really been tackled. It never would be tackled until a large number of new houses, at low rents, were built within reach of their occupants' work. If the problem was to be solved they would be driven back on the policy of giving special children's allowances for rent. Any scheme for dealing with the slums would cost large sums of money, but when the conditions under which the people lived were realised it would be felt that almost any expenditure was worth while. A recent survey of housing conditions in Southwark, by competent and experienced investigators, showed that the condition of affairs was horrible. In street after street they found people living under conditions of darkness, dampness, and overcrowding. Sometimes a man, his wife and his children would be found living in a basement which had long since been condemned as unfit for human habitation. The investigators quoted the fact that the Medical Officer of Health for Southwark had stated that in one year there were 10,000 houses in Southwark which were not in a reasonably fit state in all respects for human habitation. The matter, the Bishop of Southwark continued, was far too large for any borough or Medical Officer of Health or any individual to deal with; it must be tackled by the nation as a whole. He was glad that the Government had decided not to reduce the present subsidy. The present Bill would give the Government time to prepare their plans for a measure dealing with the slums which, he hoped, would be comprehensive and courageous.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JULY 17TH.

Medical Service in Tristan da Cunha.

Mr. SCURR asked the Under Secretary for the Colonies how often the island of Tristan da Cunha was visited officially; what arrangements were made to meet any emergency medical or other call from the inhabitants; and if there was a wireless station on the island.—Mr. LUNN replied: There is no regular programme of visits to Tristan da Cunha. His Majesty's Government, however, have endeavoured to arrange that at least one steamer carrying supplies, &c., calls at the island each year. On learning in April last of a threatened food shortage, His Majesty's Government provided the funds necessary to ensure the call at Tristan of a vessel carrying relief stores. I understand that a wireless apparatus, capable of receiving messages from England, Buenos Ayres, and New York, was installed on the island last February.

Prohibition of Night Baking.

Mr. MANDER asked the Home Secretary whether it was the intention of the Government to include in the forthcoming Factories Act a clause prohibiting night baking.—Mr. CLYNES replied: This question will be considered by the Government in connexion with the Factories Bill, but I am not at present in a position to make any statement.

Private Mental Hospitals.

Mr. SORENSEN asked the Minister of Health how many private lunatic asylums and mental hospitals existed in England and Wales; the number of patients therein, and the number of discharges therefrom during last year.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: On Jan. 1st, 1929, there were 69 private institutions under the Lunacy Act, and 4640 patients therein. There were 742 discharges during 1928.

Use of White Lead Paint.

Mr. MANDER asked the Home Secretary if the Government were prepared to ratify the International Labour Office Convention, 1921, concerning the use of white lead in painting.—Mr. CLYNES replied: Ratification would have to be preceded by legislation for the amendment of the present law, and all I can say on the subject at the present moment is that it will be considered with other questions in connexion with the proposed Factories Bill.

THURSDAY, JULY 18TH.

Pensions Medical Officers.

Dr. MORGAN asked the Minister of Pensions the total number of medical practitioners now employed by the Ministry on a sessional basis, and how many of those were specialists.—Mr. ROBERTS replied: The number of medical officers employed by the Ministry on a sessional basis was, during the latest period for which information is available, on an average 363, of whom approximately two-thirds were specialists.

Treatment Allowances in Tuberculosis Cases.

Mr. SIMMONS asked the Minister of Pensions whether he would reverse the present practice regarding tuberculosis cases, whereby ex-Service men who were knocked off work by the pensions doctor were not granted treatment allowances until they entered an institution, by ordering that the payment of such allowances should date from the day of relinquishing work under the advice of a pensions doctor.—Mr. ROBERTS replied: My hon. friend is, I think, under a misapprehension. In any case where the Ministry's medical adviser considers it desirable, in the interests of treatment which has been recommended, that a man should abstain from work pending admission to an institution, it has always been the practice to pay treatment allowances in the interval, subject to the usual conditions.

Pensions Final Awards.

Dr. MORGAN asked the Minister of Pensions the total number of final awards made in the half-year ending June 30th last; the total number of pensioners now receiving final award pensions; the number of such cases who had appealed for re-assessment in the last two years; and whether he would consider application for review if such cases were now submitted to him.—Mr. ROBERTS replied: The total number of final awards made in the six months ending June 30th last was 24,077. The number of pensioners now receiving final awards of life pension is about 390,000. During the past two years 7529 appeals have been made to the Assessment Appeal Tribunals. The arrangements which I was enabled to make five years ago for the correction of serious errors of final award are still in operation.

Unqualified Nurses in Mental Hospitals.

Mr. AYLES asked the Minister of Pensions the number of unqualified nurses at present employed in the mental hospitals under his control; and whether he would take an early opportunity to see that only certificated male nurses were employed in State institutions.—Mr. ROBERTS replied: The male nursing staff employed in institutions dealing with cases of mental and severe nervous disorder is required, to the utmost extent possible, to be qualified by experience in the handling of such cases, and 25 out of the 62 male nurses employed in nursing *certified* cases have the additional qualification of a certificate. With regard to the second part of the question, I understand that the Board of Control have not found it practicable or desirable to advise in public mental hospitals the standard suggested by my hon. friend.

Asylum Workers' Superannuation.

Mr. RAMSBOTHAM asked the Minister of Health whether, in view of the need for the coördination of superannuation of officials both in asylums and mental deficiency institutions as well as in the mental wards of poor-law institutions, and as these would in the main in future come under the same control, he would consider the desirability of ensuring that no superannuation provisions should militate against free interchange of qualified mental nurses between one type of institution and another.—Mr. GREENWOOD replied: I will consider the question raised by the hon. Member in connexion with any proposed legislation amending the relevant Superannuation Acts.

Mental Defectives.

Mr. SORENSEN asked the Minister of Health to state the ascertained number of mental defectives under and above 16 years of age, respectively, in England and Wales, and the number of each category in suitable institutions; and whether he proposed to take steps to ensure the provision of adequate accommodation for these persons.—Mr. GREENWOOD replied: The total number of mental defectives ascertained by local authorities was 66,468 on Jan. 1st last. Of these 19,188 were maintained in institutions. I regret that the available statistics do not enable me to differentiate between those under and those over 16 years of age, but the total given does not include feeble-minded children for whom the local education authorities are responsible. The problem of ensuring the provision of adequate accommodation is receiving constant attention.

Water Shortage.

Mr. LONGBOTTOM asked the Minister of Health if his attention had been called to the serious shortage in water-supplies; and what steps he proposed to take to temporarily amend the regulations regarding compensation water to riparian owners so that local authorities might be helped to overcome their difficulties during this time of emergency.—Mr. GREENWOOD replied: My attention has been drawn to this matter. In the memorandum on water shortage which I have issued this week, I have advised that, where shortage exists or is threatened, and compensation water is supplied, the water undertakers should enter into immediate negotiations with the riparian interests with the object of securing agreement for the temporary reduction or intermission of discharges of compensation water. I trust that all interests will recognise that in the present exceptional emergency, essential domestic needs must have the first consideration, and that reasonable concessions immediately may be the only way to avoid a very serious situation within a short time.

Street Noises and Public Health.

Mr. FREEMAN asked the Minister of Health whether he was aware of the increase of street noises, particularly in London, caused mainly by traffic, inflicting considerable suffering, and being a general menace to health; and what steps, if any, he proposed to take to abate the nuisance.—Mr. MORRISON (Minister of Transport) replied: This matter was considered by a conference convened by my predecessor in October, 1928, and as a result of the recommendations contained in their report, the Motor Car (Excessive Noise) Regulations were made on June 3rd, and will come into operation on August 1st.

League Maternity Convention.

Mr. R. S. YOUNG asked the Secretary of State for Foreign Affairs if he would, at an early date, ratify the League of Nations maternity convention, which had already been ratified by nine European nations.—Miss BONDFIELD (Minister of Labour) replied: I have been asked to reply. As regards this and other International Labour Conventions which have not been ratified, it is proposed to examine each of them in the light of the existing law and practice in this country, and it is not possible as yet for me to say what action may be decided upon in any particular case.

Deposit Contributors and Insurance Benefits.

Sir CHARLES CAYZER asked the Minister of Health whether his attention had been called to the position of deposit contributors to the national health insurance, and to the fact that these contributors could not receive dental or optical treatment, while in the cases of those who had been rejected by an approved society through no fault of their own, and often as a result of war service, they needed such assistance more than the ordinary members of the community; and whether he proposed to consider the general improvement of their condition.—Mr. GREENWOOD replied: The position of deposit contributors as regards title to benefits under the National Health Insurance Acts is as stated by the hon. Member. Deposit contributors who can show that they were unable by reason of ill-health to secure admission to an approved society are now, however, entitled to receive the ordinary benefits without limitation to the amount standing to their individual credit, and I consider that the guaranteeing of these benefits is the best method of meeting the needs of this class of insured persons out of the limited funds available. Men discharged in ill-health from the forces of the Crown can be admitted to the Navy, Army, and Air Force Insurance Fund, and become entitled, in addition to the ordinary benefits, to dental and ophthalmic benefits free of cost.

Small-pox Hospitals.

Mr. BEAUMONT asked the Minister of Health if he would state in which counties there were small-pox hospitals; what provision was made for dealing with small-pox outbreaks in counties which had no such hospitals; and whether it was the policy of the Ministry to encourage county small-pox hospitals as the best and most economical method of dealing with outbreaks.—Mr. GREENWOOD replied: Small-pox hospital accommodation has been provided in every county with the exception of two in England and one in Wales. In these three counties arrangements have been made for the treatment of such cases of small-pox as may occur in hospitals situated in adjoining counties. With modern means of transport there are undoubted advantages in providing small-pox hospitals to serve wide areas, and for this purpose it is often convenient that the accommodation should be provided by the county council.

Venereal Disease Clinics.

Dr. MORGAN asked the Minister of Health the total number of venereal diseases clinics at present in Great Britain and the number administered by municipalities; the total number of new cases since Jan. 1st last, and the total number of attendances; and whether he was considering an extension and more adequate facilities for such treatment in the near future.—Mr. GREENWOOD replied: The total number of venereal diseases clinics approved by my department in England and Wales is now 188, of which 60 are administered directly by local authorities. No information is at present available in regard to the second part of the question, but during the year 1928 the total number of new cases dealt with at these clinics was 85,908, of whom 27,507 were found not to be suffering from venereal disease, and the total number of attendances of patients was 2,422,749. A number of proposals for the provision of new clinics, or for the extension and improvement of the present facilities for treatment, have been approved or are now under consideration.

Panel Practitioners' Prescriptions.

Mr. REMER asked the Minister of Health if his attention had been called to the prescribing of Dr. Tomlinson, of Dukinfield, and Dr. Cooper, of Altrincham; if he was aware that the Cheshire insurance committee, representing 200,000 insured people, were unanimously of the opinion that the penalties imposed by the Ministry were harsh and punitive, and likely to result in a lowering of the standard of medical benefit of insured persons; and would he state the reasons for overruling the decision of the Cheshire insurance committee.—Mr. GREENWOOD replied: I am aware of the facts in these cases, which were decided in December last, and of the views of the insurance committee on the decisions. The decisions, which rest with the Minister and not with the committee, were taken because he was satisfied that the doctors had imposed charges upon the available funds in excess of what was reasonably necessary for adequate treatment.

Phototherapy and Light Treatment.

Mr. HARRIS asked the Minister of Health whether his department had had any inquiry into the subject of phototherapy; whether he had any information as to the proof of actual physical benefits in curing to the recipient of artificial light treatment as administered by the ultraviolet lamp; and whether he would consider holding an inquiry into the efficacy of light treatment generally, especially in welfare centres.—Mr. GREENWOOD replied: Special inquiries have been made during recent years by medical officers of my department into the application of phototherapy (including artificial light) to the treatment of disease, and the results have been published in the annual reports of the chief medical officer. These observations are being continued, and I do not see any necessity for a further inquiry. As regards the second part of the question, I am advised that the best results of this form of treatment appear to have been obtained in cases of rickets and of certain forms of non-pulmonary tuberculosis.

Health of Women Teachers.

Commander SOUTHBY asked the President of the Board of Education whether he was aware that the number of women teachers who broke down in health every year between the ages of 55 and 60 was increasing; and if he would consider the introduction of a scheme whereby women teachers could be granted optional retirement to begin at the age of 55.—Sir CHARLES TREVELYAN replied: The figures in my possession do not suggest that there is any substantial increase in the number of women teachers who break down in health between the ages of 55 and 60. Provision for such cases is already made in the Teachers (Superannuation) Act, 1925, and I cannot undertake to initiate legislation to provide for optional retirement on pension at an age less than 60.

Disturbances at Antivivisection Meeting.

Mr. DAY asked the Home Secretary whether he had now received the report from the Commissioner of Police upon the incidents which happened with regard to the disturbances at the meeting of the British Union for the Abolition of Vivisection at Caxton Hall on June 20th; whether he had considered this report; and could he now make a statement upon it.—Mr. CLYNES replied: I have now received a report from the Commissioner of Police regarding the meeting in question. The duty of police who may be present at public meetings is to prevent so far as possible any breach of the peace, and no special instructions were required or given on this occasion. It must be recognised that the task of the officer in charge in such cases is often a difficult one, as precipitate action is just as likely to provoke complaint as undue delay. The Commissioner of Police is satisfied, however, after considering a large number of statements made by persons who were present, that the officer in charge of the detachments sent to this meeting committed an error of judgment in not acting sooner. The Commissioner has taken appropriate action in respect to the officer concerned, and has communicated fully with the Union named in the question.

Industrial Diseases.

Mr. MORLEY asked the Home Secretary if his attention had been called to cases of chronic fibrosis of the lungs contracted through inhaling coal dust whilst working in ships' bunkers; and if he would consider the desirability of placing this complaint on the schedule of diseases coming within the scope of the Workmen's Compensation Act.—Mr. CLYNES replied: No such cases have as yet been brought to my notice, but if any cases have come to the knowledge of the hon. Member and he will furnish me with particulars of them, I shall be glad to have the matter investigated.

Mr. PHILIP OLIVER asked the Home Secretary whether he would consider the making of an order extending the provisions of the Workmen's Compensation Acts dealing with industrial diseases to the disease of cancer of the bladder as affecting workers in aniline factories.—Mr. CLYNES replied: An order can only be made in respect of a disease which is due to the nature of the employment, and I am advised that it has not yet been definitely established that cancer of the bladder is caused by employment in aniline works. The matter is at present the subject of a research by the London Cancer Hospital, and I will consider whether any steps can be taken by my department to facilitate this investigation.

FRIDAY, JULY 19TH.

Artificial Silk Factories and Public Health.

Mr. KELLY asked the Minister of Health what complaints had been received by his department as to injury to the health of people residing in the neighbourhood of artificial silk factories.—Mr. GREENWOOD replied: I have received a number of complaints. I would refer my hon. friend to the report by the chief alkali inspector of my department on the emission of fumes from artificial silk works which was published in January last.

Conservation of National Water-supplies.

Mr. AYLES asked the Minister of Health whether, in view of the growing shortage of water and the need for conserving the national water supplies, he would have a survey made of the actual and potential supplies of the country as a whole, with a view to their effective organisation and use.—Mr. GREENWOOD replied: A survey of potential supplies would involve a great amount of detailed investigation and would by itself be of doubtful value. The most practical course is the formation of more advisory regional water committees on the lines advocated in the booklet issued by my department last October. By means of these committees not only the available supplies, but also the needs, of all the districts in the region can be ascertained and a definite policy recommended for meeting requirements over a long period. The findings of these committees can then be coördinated in the general interests, and a national policy formulated.

MONDAY, JULY 22ND.

Methyl Chloride in Refrigerators.

Commander BELLAIRS asked the Minister of Health whether he was aware that refrigerators were in use in this country using methyl chloride; and, in view of the danger to life, if any action was to be taken to prevent its use.—Mr. SHORT, Under-Secretary to the Home Office, replied: I am aware that methyl chloride is used in a number of these machines, but I have no evidence at present in my possession which would justify interference with its use. I understand that it is the practice of the makers to issue instructions with these machines, and so far as I have been able to ascertain these instructions have proved sufficient. If, however, the hon. and gallant Member has any information to the contrary, my right hon. friend will be glad to consider it.

Accommodation of Civil Service Staffs.

Mr. WILLIAM BROWN asked the First Commissioner of Works whether he was aware that certain staffs in the Office of Works and the Ministry of Health were obliged to work in sub-basements and basements much below ground level and lit in the main by artificial light; that it was now proposed also to put Board of Trade staffs in these basements, and that the chief medical officer of the Ministry of Health had reported adversely on the use of these basements for this purpose; and whether he would provide alternative accommodation and so avoid the employment of the staff under these conditions.—Mr. LANSBURY replied: A small number of the staff work, during part of the day only, in the sub-basement, which is lit by artificial light. Other staffs work in the basement courts which enjoy good natural light, and it is proposed to utilise other similar courts for Board of Trade staffs. I am informed that the chief medical officer of the Ministry of Health has not reported adversely on the use of the basement, but, on the contrary, this officer and an officer of the Medical Research Council, reported that, subject to the execution of certain works, the basement courts were quite suitable for occupation by clerical staffs. Effect has been given to the recommendations of these officers. Under ordinary circumstances I should prefer that all staffs worked above the ground level, but at present we have no other available accommodation. My hon. friend may be assured that everything possible has been done, and will continue to be done, to keep offices as light, airy and healthy as possible.

Opium in India.

Mr. CECIL WILSON asked the Secretary for India whether all the committees appointed in the autumn of 1927 by five provincial governments to inquire into the high consumption of opium in certain areas had presented their reports; whether the local government which arranged to make a similar inquiry had presented its report; what action the government of India had taken or proposes to take upon the reports; when reports not yet presented might be expected; and whether all the reports were to be published.—Mr. BENN replied: Four of the six inquiries have been completed. As soon as the remaining two are finished the government of India propose to convene a conference to collate and compare the results obtained before the local governments pass orders. The publication of each report is a matter for the local government concerned. The Bengal report has been published.

TUESDAY, JULY 23RD.

Sterilisation of Mental Deficients.

Commander BELLAIRS asked the Minister of Health whether his department had full information as to the success of measures for the sterilisation of mental deficients in Switzerland, the United States of America, and other countries; and, if not, whether he would appoint a committee to investigate the matter and the increase of this class throughout the country.—Mr. GREENWOOD replied: The department has certain information regarding the sterilisation of mental defectives in other countries; but the measures in some countries have been introduced so recently, or applied on so limited a scale, that the data at present available do not warrant any deductions from them. I am not in a position to indicate at present whether it will be practicable to initiate an investigation on the questions to which the hon. Member refers.

New Water-supply Schemes.

Sir GEORGE PENNY asked the Lord Privy Seal whether he would consider the desirability of approaching local authorities in areas likely to suffer from water shortage in the event of drought to suggest schemes for the provision of catchment areas and reservoirs, which besides proving of great utility would provide work for the unemployed.—Mr. THOMAS replied: My right hon. friend, the Minister of Health, has recently drawn the attention of local authorities to the necessity of initiating schemes for new water-supplies in advance of requirements and has emphasised the advantages of regional water committees. Approved schemes of the character indicated would be subject to the appropriate unemployment grant.

Food Council and Milk Prices.

Mr. WISE asked the President of the Board of Trade what action was being taken by the Food Council in view of the 80 to 100 per cent. margin for distribution as compared with the farmers' price, in the scheme now under consideration for fixing milk prices by the National Farmers' Union and the milk distributing interests.—Mr. W. GRAHAM replied: I understand that the Food Council will have this matter under examination at their meeting to-morrow, and I have asked them for a report.

Chemical Warfare.

Brigadier-General CLIFTON BROWN asked the Secretary for War whether the War Office had ceased all work on chemical warfare; and if he had any information as to whether similar action had been taken by America, Germany, Italy, France, or Russia.—Mr. T. SHAW replied: His Majesty's Government have declared their intention of ratifying the Geneva Gas Protocol at an early date. In the meantime no change has been made by a departure from the research work which has been for a long time in progress. It is understood that similar research work is being carried on in the countries referred to.

Closing of Unfit Dwellings in Scotland.

Dr. FORGAN asked the Secretary for Scotland whether he was aware that the closure of houses in Elderslie, Thornliebank, Neilston, and elsewhere in the county of Renfrew, represented by the medical officer of health as unfit for human habitation, is being held up by legal difficulties, and that houses which had been made the subject of closing orders were still occupied; and what steps he proposed to take to remedy these matters.—Mr. ADAMSON replied: The answer to the first and second paragraphs of the question is in the affirmative. As regards the last part I understand that out of 51 tenants affected by closing orders in the area referred to by my hon. friend, 13 have not obeyed an order to quit. In view of the poverty of those 13 tenants no proceedings for recovery of the penalty imposed by the statute have been taken. I am in consultation with the Lord Advocate as to the steps that should be taken.

Hours of Work of Juveniles.

Mr. GRAHAM WHITE asked the Home Secretary whether he had in contemplation the introduction of legislation to regulate the hours of work of juveniles in occupations in which such hours of work were at present unregulated.—Mr. SHORT, Under Secretary to the Home Office, replied: My right hon. friend has been looking into this matter and he hopes to bring proposals before Parliament, but is not able to make a more definite statement at present.

Children and Bovine Tuberculosis.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he was aware that over 2000 infants died every year from bovine tuberculosis; that this was mainly conveyed by milk; that the expenditure on treatment, convalescence, and after-care of this disease in infants amounted to over £9,000,000 a year; and if he would consider the advisability of introducing measures to secure that no milk other than that free from tubercle should be given to infants attending the 3000 infant welfare centres.—Miss SUSAN LAWRENCE replied: I am not aware from what source the hon. Member obtained the figures mentioned in the first part of the question. My right hon. friend is advised that it is not possible to ascertain precisely how many infants die each year from bovine tuberculosis, but such evidence as is available suggests that the number is less than that given in the question. The answer to the second part of the question is in the affirmative. I am not aware of any information to support the figure of £9,000,000 a year mentioned in the third part of the question. As regards the last part, dried milk is supplied at the majority of infant welfare centres, and this is recommended by my department in any case in which the ordinary milk supply is of doubtful quality. A few local authorities supply tuberculin tested milk, but it would not be practicable to require such a supply in every case nor would such a requirement be justified having regard to the many available supplies of dried milk of reliable brands.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on July 21st, the following degrees were conferred:—

D.M.—P. J. Bach, New College.

B.M.—J. C. Nicholson, New College; and W. J. Walter, Brasenose.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on July 20th the following degrees were conferred:—

M.D.—E. A. B. Pritchard, W. R. F. Collis, and R. A. McCance.

M.B., B.Chir.—G. E. Lewis, F. H. McCay, C. L. Stote, C. E. Woodrow, R. W. Windle, and D. M. Stern.

M.B.—P. B. Kittel.

B.Chir.—Sagarajasekaran Tyagaraja, F. Bush, C. P. Campion, F. W. J. Wood, and C. J. Grosch.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the subjects indicated:—

Surgery.—C. E. P. Davies, Guy's Hosp.; W. M. Hamer, Manchester and Charing Cross Hosp.; A. Hamid, Middlesex Hosp.; C. Hortop, Guy's Hosp.; V. J. Lopez, St. Mary's Hosp.; W. McDermott, London Hosp.; K. M. Seedat, Charing Cross Hosp.; V. J. C. Vandenbosch, Louvain; and T. K. White, Bristol.

Medicine.—A. Campbell, Edinburgh; V. N. Datta, London Hosp.; A. N. De Monte, St. Mary's Hosp.; C. Parthasarthe, Birmingham; C. F. H. Quick, St. Mary's Hosp.; P. U. Rao, Charing Cross Hosp.; and A. Somerville, Sheffield.

Forensic Medicine.—V. N. Datta, London Hosp.; E. T. Garthwaite, St. Bart.'s Hosp.; J. Gordon, St. Mary's Hosp.; C. Parthasarthe, Birmingham; C. J. Poh, Edinburgh; C. F. H. Quick, St. Mary's Hosp.; and P. U. Rao, Charing Cross Hosp.

Midwifery.—A. R. Edwards, Liverpool; R. W. Goldsbrough, Leeds; P. D. Kapur, Glasgow; E. Marks, St. Mary's Hosp.; C. J. Poh, Edinburgh; S. V. S. Rao, Madras; T. G. Robinson, Guy's Hosp.; and G. W. Sturgess, St. Bart.'s Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery and midwifery: A. Campbell, V. N. Datta, C. J. Poh, C. F. H. Quick, P. U. Rao, and K. M. Seedat.

UNIVERSITY OF LONDON.—Prof. H. H. Woollard, M.D., B.S. (Melbourne), has been appointed from Sept. 1st, 1929, to the University Chair of Anatomy tenable at St. Bartholomew's Hospital Medical College. He was educated at the University of Melbourne and at University College, London. He served during the war, being mentioned in despatches, and awarded the Croix de Guerre avec palme for his services, and from 1919–23 was senior demonstrator and from 1923–27 assistant professor of anatomy at University College, London. He has held a Fellowship under the Rockefeller Foundation, and has obtained the Symington prize for anatomical research. Since 1927 he has been professor of anatomy in the University of Adelaide.

The University Studentship in Physiology for 1929–30 (value £100) has been awarded to Miss Margaret Hill, B.Sc.

Dr. E. Graham Little has been elected chairman of the Council for External Students.

At recent examinations the following candidates were successful:—

M.S. EXAMINATION.

Branch I., *Surgery.*—Ralph Brooke, Guy's Hosp.; H. I. Deitch, Middlesex Hosp.; and J. R. M. Whigham, St. Mary's Hosp.

Branch IV., *Oto-Rhino-Laryngology.*—S. A. Beards, London Hosp.: and Mildred Warde (University Medal), London (R.F.H.) Sch. of Med. for Women.

M.D. EXAMINATION.

Branch I., *Medicine.*—A. R. Balmain, Univ. of Birmingham and Middlesex Hosp.; Samuel Berman, Guy's Hosp.; M. H. C. Dyson and L. I. Henzell, Univ. Coll. Hosp.; J. C. Hoyle (University Medal), Univ. of Manchester; R. H. Knight, St. Bart.'s Hosp.; Lucy M. T. Masterman, London (R.F.H.) Sch. of Med. for Women and St. Mary's Hosp.; S. K. Montgomery, Univ. Coll. Hosp.; Thomas Robson, St. Thomas's Hosp. K. S. Smith, Middlesex Hosp.; R. G. R. West, St. Bart.'s Hosp.; and Katharine G. L. Williams, London (R.F.H.) Sch. of Med. for Women.

Branch IV., *Midwifery and Diseases of Women.*—Elaine Œnone H. Earengey, Univ. Coll. Hosp.; Phyliss V. L. Epps, and Dorothy E. Stewart, London (R.F.H.) Sch. of Med. for Women.

Branch V., *State Medicine.*—W. E. Snell, Univ. Coll. Hosp.

Branch VI., *Tropical Medicine.*—J. A. Carmen, London Hosp. and London Sch. of Hyg. and Trop. Med.

DIPLOMA IN PSYCHOLOGY.

Winifred C. P. Abraham, Bedford Coll.; Doris I. Huband, King's Coll.; Dorothy M. Lemerle, Univ. Coll.; Norah K. Satow, King's Coll.; Ethel K. Taylor Bedford Coll.; S. E. W. Taylor, London School of Economics; Clara P. Thomson and Ellen M. Walford, King's Coll.; and W. R. Watson, Univ. Coll.

DIPLOMA IN BACTERIOLOGY.

Robert McC. Burnie, R. D. Mackenzie, R. S. Marshall, and A. F. B. Standfast, London Sch. of Hyg. and Trop. Med.

UNIVERSITY OF MANCHESTER.—The following awards have been made: Sheridan Delépine Fellowship in Preventive Medicine: Lois Stent. Robert Platt Physiological Scholarship: Eli Davis. Dr. Robert Angus Smith Scholarship in Sanitary Science: Rupert Lyth. Prof. Tom Jones Exhibition in Anatomy: J. F. Heslop. Entrance Scholarship in Medicine: G. Israëls and W. C. Barber. Sidney Renshaw Prize in Physiology: C. H. Gray. Turner Medical Prize: Donal Sheehan. Dumville Surgical Prize: Donal Sheehan. Wild Prize in Pharmacology: E. D. Portman.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial on July 17th the following degrees and diplomas were conferred:—

M.D.—*G. G. Allan, *H. M. Anderson, †J. M. Bassett (*in absentia*), ‡G. I. Boyd, E. H. Brindle, †W. R. D. Fairbairn, *G. B. Flint, Alice J. Gray, J. W. Hunter, ‡C. F. W. Illingworth, *J. B. King, Shona Macvicar (*in absentia*), R. J. Matthews, W. J. F. Mayne, *K. T. Moir, J. R. Murdoch, A. M. W. Rae, ‡C. M. Seward, Alice B. S. Smith, and Florence L. Telfer.

* Commended for thesis. † Highly commended for thesis.
‡ Awarded gold medal for thesis.

M.B., Ch.B.—R. D. Aitken, Deborah M. Alcock (*in absentia*). D. M. Alston, L. W. Banks, R. F. Barbour, H. S. A. Bishop, ‖T. P. Bliss, W. J. Brandon, K. M. Brower, J. A. Burgess, J. A. P. Cameron, A. F. K. Clarkson, E. A. Cormack, Mary E. Crowley, Timothy Crowley, J. A. Cuthbert, W. S. Dalgetty, J. M. Davidson, S. O. M. Downing, E. F. J. Dunlop, T. J. Eason, M. A. B. Fenton, John Fletcher, J. M. Fosbrooke, D. A. Fowler, Donald Fraser, J. A. Gemmel, ‖W. H. Gillespie, Kamel Girgis, ‖E. L. Godfrey, George Graham-Cumming, G. M. Greig, Alexander Haddow, Robert Hardy, ‖Robert Harkness, David Harley, R. A. K. Harper, ‖C. P. Hay, Winnifred N. Henderson, Emma L. Howard, J. M. Howie, Jean M. Huggins, William Irvine, ‖James Laurie, J. K. Law, L. R. Levy, D. K. L. Lindsay, Joyce M. Lister, Sydney Livingstone, G. A. Macarthur, R. P. A. Macaulay, M. O. Macdonald, J. P. M'Gibbon, D. J. M. MacKenzie, Margaret B. M'Laren, Dileas Maclean, Archibald Macmillan, John K. Macpherson, A. G. G. Melville, J. B. Methven, A. A. Miller, Jean M. Milne, A. St. J. Moffat, Clement Muir, J. M. Muir, William Murray, Helen R. Neve, W. E. Orchard, D. S. Patton, J. R. H. Peat, Samuel Pinkinsky, L. T. Pollard, J. R. M. Read, A. I. Rosenthal, R. A. T. Rouse, R. M. Saleh, ‖Agnes Y. Savage, Walter Schlapp, V. V. Schoeman, J. M. Scott, Agnes D. Sloan, D. A. Smith, W. H. M. Smith, Richard de Soldenhoff, Bernard Stein, W. A. R. Thomson (*in absentia*). A. J. L. Turnbull, A. B. Wallace, E. J. G. Wallace, H. J. Weir, Mary M. A. Whittet, J. L. Wilkie, W. E. Willis, Jessie R. Wilson, and J. F. A. Wood.

‖ Honours.

Diploma in Radiology.—G. O. Field, A. J. G. Mackay M. J. S. Pillai, Sher Singh, Elizabeth Thompson (*all in absentia*).

The following awards of fellowships, scholarships, and prizes have been made:—

The Cameron Prize in Practical Therapeutics has been awarded to Lieut.-Colonel Sir Leonard Rogers, F.R.S., in recognition of the discoveries he has made in the treatment of several tropical diseases, and in particular in the treatment of Cholera, Amœbic Dysentery and Leprosy.

Thesis Gold Medallists: Dr. G. I. Boyd, Dr. C. F. W. Illingworth, and Dr. C. M. Seward. Ettles Scholarship and Leslie Gold Medal: Dr. James Laurie. Gunning Victoria Jubilee Prize in Chemistry: Mr. R. W. Armour, Ph.D. Allan Fellowship in Clinical Medicine and Clinical Surgery: Dr. C. P. Hay. Murchison Memorial Scholarship in Clinical Medicine: Dr. I. G. W. Hill. M'Cosh Graduate's and Medical Bursaries: Dr. R. M'K. Honey. Mouat Scholarship in the Practice of Physic: Dr. Robert Harkness. Buchanan Scholarship in Midwifery and Gynæcology: Dr. James Laurie. James Scott Scholarship in Midwifery: Dr. E. L. Godfrey. Beaney Prize in Anatomy and Surgery: Dr. E. L. Godfrey. Conan Doyle Prize: Dr. R. D. Aitken. Annandale Gold Medal in Clinical Surgery: Dr. R. F. Barbour. Murdock Brown Silver Medal in Clinical Medicine: Dr. C. P. Hay. Royal Victoria Hospital Tuberculosis Trust Gold Medal: Dr. A. G. G. Melville. Scottish Association for Medical Education of Women Prize: Dr. Agnes Y. Savage. Dorothy Gilfillan Memorial Prize: Dr. Agnes Y. Savage. Wightman Prize in Clinical Medicine: Dr. R. D. Aitken. Pattison Prize in Clinical Surgery: Dr. J. A. P. Cameron and Dr. R. A. T. Rouse (equal). Cunningham Memorial Medal and Prize in Anatomy: C. A. Green. Whiteside Bruce Bursary: Mr. Alexander Brown.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting was held on July 16th, the President, Dr. Robert A. Fleming, being in the chair. Dr. G. S. Brook, Dr. F. W. Woolrabe, Dr. A. Rae Gilchrist, and Dr. Rutherford Dow were introduced and took their seats as Fellows of the College. Dr. F. T. Bowerbank and Dr. W. T. Munro were elected Fellows of the College. Dr. S. A. Kinnier Wilson had been appointed Morison Lecturer for 1930.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—The following candidates have passed the final professional examination for the diploma of L.D.S.:—

W. C. Craig, R. T. [illegible], A. A. McNish, J. D. Johnstone and J. N. K. Clarkson.

Pathology, Medicine, and Surgery.—W. P. Neilson.

Dental Subjects.—W. A. E. Duncan and G. M. S. McGibbon.

DONATIONS AND BEQUESTS.—Among other bequests the late Mr. John Hughes, of The Lache, Clifton Park, Birkenhead, left £1000 to the Birkenhead and Wirral Children's Hospital for a John Stanley Hughes Cot Fund; and £1000 to the Birkenhead and Borough Hospital, of which the income is to be applied for the maintenance of the hospital.—The late Mrs. Caroline Tremlett, of Highlands, Exeter, left £500 each to the Royal Devon and Exeter Hospital, the Convalescent Home, Exmouth, and the Institution for the Blind, St. David's Hill, Exeter, as well as other charitable bequests.

BRITISH SOCIAL HYGIENE COUNCIL.—The Summer School, the fourth of its kind, which is in session at Westminster College, Cambridge, remains open until Thursday, August 1st. Social problems affecting standards of sex conduct are being considered in relation to the biological sciences; on the preventive side the protective education of young people in industry and the special problem of the adolescent unemployed, the coöperation between parent and teacher in the training of children, come under discussion. Dr. F. A. E. Crew, professor of animal genetics at the University of Edinburgh, is giving a course of six lectures on Biology and Human Affairs, and Col. P. S. Lelean, professor of public health at the same University, a course on Public Health and Social Hygiene. Evening meetings to be followed by discussion will be addressed by Dr. I. Feldman, Miss V. D. Swaisland, B.Sc., Sir Basil Blackett, Mrs. C. Neville Rolfe, and Mr. P. G. Cam ray, director of Messrs. Stanley Jay, Ltd. A course in evolutionary biology, with special reference to work in school classes, with practical work, will be given under the supervision of Dr. E. Watkin at the West Riding of Yorkshire Education Committee's Summer School at Bingley from July 31st to August 14th.

Naval Medical Compassionate Fund.—At the quarterly meeting of the directors, held on 3rd July, Surgeon Vice-Admiral Arthur Gaskell, C.B., Medical Director General of the Navy, in the chair, the sum of £40 was distributed to the only applicant.

New Wing to Hitchin Hospital.—On Saturday last the Duchess of York opened a new wing of the North Hertfordshire and South Bedfordshire Hospital at Hitchin. Since the war £35,000 has been spent on the enlargement and the development of the institution, and the new wing has cost £7000.

East Sussex Hospital.—A new children's ward in the Royal East Sussex Hospital at Hastings has been opened by Lord Rothermere, who marked the occasion by a gift of 2000 guineas. The ward is the gift of Mrs. Whitefoord, of Battle, in memory of her son, Esmond.

London Foot Hospital.—This institution has just moved into new quarters in Fitzroy-square, and an appeal is being made for £12,800 to free it from debt. Last year free treatment was given to over 12,000 patients, and Sir A. Henry McMahon, the chairman, states that the number could be doubled this year if more money were available.

Post-graduate Course in Orthopædic Surgery.—A special two weeks' course will be held at the Royal National Orthopædic Hospital from Nov. 18th to 30th. Lectures and demonstrations will be given and those taking the course will have access to operations and the practice of the hospital. Application should be made to the Secretary of the hospital, or to the Secretary, Fellowship of Medicine, 1, Wimpole-street, London, W.1.

Medical Tour in Czecho-Slovakia.—A tour of the principal towns of Czecho-Slovakia has been arranged between Sept. 8th and Sept. 17th, 1929. The party will meet at Eger on Sept. 8th and will proceed to Franzensbad, Marienbad, Carlsbad, Jachymov, and Prague, where a stay of two days will be made. Macocha and Pistiany will then be visited and the party will reach Vienna on Sept. 17th. Further particulars and a detailed programme can be obtained from the organisers of the tour, Mon Voyage Société de Voyages Internationaux, 9, Rue de la Michodière, Paris, 2°.

Metropolitan Asylums Board.—Dr. E. W. Todd, D.P.H., has been appointed bacteriologist at the antitoxin establishment of the Board at the Belmont laboratories, Sutton, Surrey, of which Dr. R. G. White is the director. Dr. Todd is at present research assistant in the inoculation department, St. Mary's Hospital, a position which he has held since January, 1924, and has had eight years' experience in pathological work, including a Rockefeller Medical Fellowship held at the Rockefeller Institute in 1927–28.

Enlargement of Stornoway Hospital.—Mrs. Macaulay, of Montreal, Canada, recently opened a new wing of the Lewis Hospital, Stornoway. The wing, which consists of two maternity wards, with accommodation for nurses, has been given by her husband, Mr. T. B. Macaulay, President of the Sun Life Assurance Co. of Canada, who has endowed the hospital with the sum of £16,000. The endowment fund has just been increased by a gift of £3000 from Mr. John Bain, of Chicago, a brother of the Provost of Stornoway.

Birmingham Hospitals' Contributory Scheme.—The remarkable success of this scheme grows progressively. Since it came into operation in January, 1928, it has paid £165,000 to the Birmingham hospitals, nursing societies, and kindred institutions; there are 270,000 members employed by 4400 firms, 2500 of which add 25 per cent. to the amounts contributed at their works.

A "Sunshine" Convalescent Home.—Recently Prince George opened the first wing of a new Children's "Sunshine" Convalescent Home at Shoeburyness.

Motoring and Excessive Noise.—The regulations prohibiting excessive noise in the use of motor cars, of which notice was given by the Minister of Transport on June 3rd, are to come into force next Thursday, Aug. 1st. These regulations make it an offence for any person to use, or permit to be used, a motor car, or a trailer drawn by a motor car, which causes any excessive noise as a result of any defect in design or construction, or lack of repair or faulty adjustment. It is also an offence under the regulations to use a vehicle or trailer which makes an excessive noise due to the faulty packing or adjustment of the load.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

All Saints' Hospital, Vauxhall Bridge-road, S.W. Special Course in Urology, Afternoons and Evenings, duration of course one month from July 29th. Further information from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE. Prince of Wales's General Hospital, Tottenham, N.

Monday, July 29th.—2.30 to 5 p.m.: Medical, Surgical and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 p.m.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 p.m.: Medical, Skin, and Eye Clinics. Operations.

Thursday, August 1st.—11.30 a.m.: Dental Clinics. 2.30 to 5 p.m.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

Friday.—10.30 a.m.: Throat, Nose and Ear Clinics. 2.30 to 5 p.m.: Surgical, Medical, and Children's Diseases Clinics. Operations.

Appointments.

Fletcher, T., M.B., Ch.B. Glasg., has been appointed Surgeon under the Factory and Workshop Acts for Kirkcowan, Wigtown.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen, County of, P.H. Dept.—Jun. Asst. M.O.H. £500.
Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.
Birkenhead General Hospital.—Cas. S. £100.
Birmingham and Midland Eye Hospital, Church-street.—Res. Surg. O. Also Two H.S.'s. £150 and £110 respectively.
Birmingham Children's Hospital.—Res. M.O., £175.
Bradford Children's Hospital.—H.S. Also H.P. Each £120.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Cairo, Egyptian University.—Prof. of Clinical Pathology. £E.1500.
Colonial Medical Services.—Vacancies.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Croydon Mental Hospital, Upper Warlingham.—Second Asst. M.O. £350.
Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.
Glasgow Royal Cancer Hospital.—Pathologist. £100—£500.
Great Yarmouth General Hospital.—Sen. H.S. £150.
Hertfordshire County Council.—Two School Dentists. Each £500.
Huddersfield Royal Infirmary.—Jun. H.S., at rate of £150.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Ilford Emergency Hospital.—Sen. and Jun. H.S.'s.
Indian Medical Service.—Commissions.
Infants Hospital, Vincent-square, Westminster, S.W.—H.P. at rate of £75.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. At rate of £120.
Liverpool, Alder Hey Children's Hospital, West Derby.—Res. Asst. M.O. £200.
Liverpool and District Hospital for Diseases of the Heart.—H.P. At rate of 50 guineas.
Liverpool County Borough.—Jun. Asst. School M.O. £600.
Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. At rate of £200.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.
London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.
Longton Hospital, Stoke-on-Trent.—H.S. £120.
Lowestoft and North Suffolk Hospital.—H.S. £120.
Manchester, Ancoats Hospital.—Orthopædic H.S. Also H.P. Each at rate of £100.
Manchester Royal Infirmary.—Jun. Asst. M.O. for Radiological Dept., £350. Also Jun. H.S. £100.
Miller General Hospital, Greenwich-road, S.E.—Hon. P. to Skin Dept. Also Cas. O. At rate of £150.
Nottingham City Education Committee.—Sen. Asst. School M.O. £600.
Oldham Royal Infirmary.—Three H.S.'s. Each at rate of £75.
Philadelphia, Hospital of the Women's Medical College.—Hospital Resident.

Plymouth, City and Port of.—Asst. M.O.H. £600.

Plymouth, Udal Torre Sanatorium, Yelverton.—Res. M.O. £450.

Preston and County of Lancaster, Queen Victoria Royal Infirmary. H.S. £150.

Queen Mary's Hospital for the East End.—Hon. Asst. Radiologist.

Radcliffe-on-Trent, Notts County Mental Hospital.—Sen. Asst. M.O., &c. £520.

Rotherham, County Borough of.—Deputy M.O.H., &c. £650.

St. John's Hospital, Lewisham, S.E.—Res. House Appointment, £100.

Salisbury General Infirmary.—Res. H.P. £150.

Salisbury Municipality, S. Rhodesia.—M.O.H. £900.

Sheffield Royal Hospital.—Ophthalmic H.S. At rate of £80.

Sheffield Royal Infirmary.—Surg. Reg. £200. Also Asst. Cas. O. H.S., Ophth. H.S., and Asst. Ophth. H.S. Each at rate of £80.

University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.

Warrington Infirmary and Dispensary.—3rd Resident. At rate of £150.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Jun. H.S. At rate of £125.

Worcester General Hospital.—Sen. and Jun. Res. M.O.'s. £180 and £120, respectively.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Banchory (Kincardineshire), Chipping Sodbury (Gloucestershire), at Harlow (Essex), and at Colwyn Bay (Denbighshire).

Births, Marriages, and Deaths.

BIRTHS.

Ennion.—On July 16th, at Harlech House, Burwell, the wife of Dr. E. A. R. Ennion, of a daughter.

Franklin.—On July 15th, at Banbury-road, Oxford, the wife of Dr. K. J. Franklin, of a daughter.

Harvey-Kelly.—On July 17th, at Clonhugh, Co. Westmeath, to Sybil Harvey-Kelly, M.B., B.S., D.P.H., wife of Lieut.-Colonel Charles Harvey-Kelly, D.S.O.—a daughter.

Kitcat.—On July 16th, the wife of Dr. C. de Winton Kitcat, St. Leonards-on-Sea, of a son.

Reynolds.—On July 18th, at Aldershot, the wife of Major W. L. E. Reynolds, M.C., R.A.M.C., of a daughter.

Wallace.—On July 16th, at Murrayfield, Horsham, Sussex, the wife of John Hugh Wallace, L.D.S., of a son.

MARRIAGES.

Abbot-Anderson—Porter.—On July 17th, at the Parish Church, St. Michael the Archangel, Lyme Regis, Dorset, William Maurice Abbot-Anderson, C.V.O., M.B., B.S., to Muriel Violet, only daughter of the late Mr. Percy Charles Porter and Mrs. Porter, of Abercorn-place, N.W.

Bowers—Baker.—On July 16th, at Holy Trinity Church, Brompton, Captain George Percy Farmar Bowers, I.M.S., to Winsome Mary Bassett, younger daughter of the late Mr. and Mrs. Frank Edwin Baker, of Northampton.

Osborne—Hall.—On July 17th, at St. Nicolas and St. Faith, Saltash, Surgeon-Lieutenant L. B. Osborne, R.N., of Bexhill, to Marie Kenley Hall, of Saltash, Cornwall.

DEATHS.

Beale.—On July 12th, at Roman Tower, Broadstone, Dorset, Hanway Richard Beale, M.D. (Lond.), M.B., M.R.C.S., L.R.C.P., D.P.H. (Sheffield), of Bridgegate House, Retford, Notts.

Johnson.—On July 17th, at Church-road, Hove, Sydney Perrins Johnson, L.D.S., R.C.S., Ireland, in his 74th year.

Parker.—On July 15th, at Thames View Cottage, Flackwell Heath, Bucks, George Dines Parker, M.R.C.S., L.R.C.P., M.B. Lond., aged 64.

Whitton.—On Friday, July 19th, at a nursing home, Aberdeen, Dr. Alfred Bell Whitton, Towie House, Turriff, and late of Aberchirder.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

Inland	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
Abroad	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

FOUR MILLENNIUMS OF CHINESE MEDICINE.

By K. C. WONG.

Part II.—The Historical or Classical Period (*continued*).

Three Great Pioneers.

Chinese medicine begins properly in the Han Dynasty and its scientific advancement centres in the figures of Tsang Kung, Chang Chung King, and Hua To—three of the greatest Chinese doctors of China. Tsang Kung, who lived about 170 B.C., was the first to record personal observations of clinical cases; a detailed list is extant of a group of his case-histories, revealing the medical philosophy of the time Of the 25 cases he has left on record—almost the only record of its kind for the next 1500 years—ten are reported as fatal. Tsang Kung was modest, for he admitted that his prognosis was not always accurate and that he could not cure any disease unless the pulse indications were favourable. He kept his case-notes for a double purpose—to estimate the percentage of failures and successes and to guide him in future predictions. The case-histories are not to be compared with those of Hippocrates—indeed, they are not of much scientific value, and after Tsang Kung this practice of taking clinical case-histories died out until the Sung Dynasty, when it was resumed fervently, and, of course, continues to be the method of the present time.

Chang Chung-King, the greatest of the trio, was also a doctor of literature. Little is known of his life except that about A.D. 195 he was Mayor of Changsha for some time, but he is often spoken of as the Chinese Hippocrates and is venerated as a sage. His fame rests chiefly on his work upon typhoid fever, which is one of the medical classics, ranking with Huan Ti's Canon of Medicine in importance. It was the first book of the kind in Chinese, but does not, as the title implies, deal with typhoid only, but with other fevers as well. In it are found 113 prescriptions, scientifically written, and containing only a few potent drugs, instead of being the "shot gun" formulæ of later practice, containing perhaps a dozen inert ingredients. Chang Chung-King was perhaps the first to employ enema to evacuate the bowels, and his antipyretic treatment of fever by cold baths antedates James Currie's method by 1700 years. Treatment which was chiefly confined to acupuncture, moxa, massage, and the administration of draughts and medical writings which were entirely philosophical, underwent change with the advent of Chang Chung-King. A new era was inaugurated and diseases were studied from a clinical standpoint, emphasis being laid on the physical signs, the symptoms, and the course of an illness; the methods of treatment and the action of drugs were studied rather than the theories of disease. Chang Chung-King stands above the crowd not only on account of his keen powers of observation but also because of his lofty ideals. He gave to the profession of medicine a high conception of its dignity and mission. But after his death scientific medicine degenerated again into dogmatic formalism, and no writings of any value or originality appeared until the Sung Dynasty, a gap of nearly one thousand years.

The last of the trio, and a contemporary of Chang Chung-King, was Hua To, the most famous surgeon of China. To him is usually attributed the discovery of anæsthetics, though Pien Chiao is credited with having employed it about four hundred years before him. It is said that he administered to his patients an effervescing powder in wine which produced complete unconsciousness, and that he performed all sorts of operations ranging from venesection and acupuncture to laparotomy, excision of the spleen, and various operations on the intestines and liver. A pioneer of hydrotherapy, he was also an exponent of systematic exercise and invented a system called the "frolics of the five animals." Most of the nobles of that period were his patients. Among them was Kwang Kung, a famous general, now deified as the god of war, on whom he operated without an anæsthetic for a poisoned arrow wound of the arm. King Tso Tso was another of his patrons. Hua To offered to cure the King's headaches by opening the skull under hashish. Accordingly he was arrested, thrown into prison, and later was executed. Just before his death he offered his manuscripts to a warder, who dared not take them, when Hua To burnt them. Legend, however, has it that a few leaves of his written work were recovered from the ashes, and that these described the method of castration, which is the only operation still known to the Chinese. The books extant bearing his name are two—viz., "Inner

Reflection Diagrams," and "The Internal Organs," and in the latter is a prescription which marks the earliest occurrence of the internal use of mercury in therapeutics.

The Four Methods of Diagnosis.

A prominent feature in this age of science was the introduction of the four methods of diagnosis—namely, observation, auscultation, interrogation, and palpation, but in course of time the first three methods fell into disuse, entire reliance being placed on palpation. The greatest importance was attached to this procedure, and it came to be believed *that any internal diseases can be revealed by feeling the* pulse alone. The supposed sympathy that exists between the different points and the pulse and the internal organs are set down in the following table:—

		Left wrist.	*Right wrist.*
Inch when lightly pressed	indicates the state of the	small intestines.	large intestines.
,, ,, heavily ,,		heart.	lungs.
Bar ,, lightly ,,		gall-bladder.	stomach.
,, ,, heavily ,,		liver.	spleen.
Cubit ,, lightly ,,		urinary bladder.	three passages.
,, ,, heavily ,,		kidneys.	gate of life.

The last two are imaginary organs.

Alchemy.

Buddhism was introduced into China by Ming Ti in A.D. 66 with unfortunate results for science. At first making but little progress it gradually gained a firm foothold, when the Taoists, realising their declining influence and wishing to stem the tide of opposition, became active. Chang Tao-Ling, popularly known to foreigners as the Taoist pope, invented charms and incantations for the curing of diseases and, seeing the lucrative income brought in by these devices, the Buddhist monks invented their system of charms, with the result that the people were steeped in superstition.

As in Europe 1200 years later, the search for the philosopher's stone and the elixir of life reached their height during the Tang Dynasty, an age of superstition. Magicians, doctors, and alchemists were found everywhere experimenting with herbs and minerals in an attempt to discover a substance which could confer on the person drinking it everlasting beauty or life. Of 23 *rulers of this period* seven experimented with these elixirs and died from the effects, and in these vain pursuits the time, the health, and *the fortunes of thousands were wasted. Chief among the* alchemists was Koh Hung, A.D. 281–300, who wrote the famous "Handbook of Emergencies." This book contains an authentic *description of small-pox—the first in the world* —Rhazes' account, which is regarded as the earliest record, being between A.D. 880–932. Another famous doctor was Tao Hung-ching, the author of "Formulæ of Famous Physicians," which is a work on medical plants. The previous materia medica contained only 365 kinds of herbs; Tao included *in his treatise* 365 additional drugs, exactly doubling the original number.

The Literature in the Tang Period.

The most important works on medicine in the Tang Dynasty were the "Thousand Gold Remedies" (A.D. 652) and the "Medical *Secrets of an Official.*" The former is a book of 60 volumes by Sun Su-moh, a doctor of literature, who is immortalised as one of the genii. There is a supplement of 30 volumes, *containing a full* collection of incantations. The latter was compiled by Wang Chu, who was not a doctor by profession. Many formulæ for demoniacal possessions and other peculiar diseases are found scattered among its pages. It consists of 40 volumes. These two works sum up the teachings and discoveries up to that time. *Treatment forms the chief feature of* these books. In fact, they are *collections* of prescriptions and remedies corresponding to the modern system of treatment.

The *fame of Chinese* medicine during the Han and Tang Dynasties spread far and wide. It is recorded that in A.D. 600 Japan sent Dr. Fuyiwaiyi and others to study medicine in China, where *they stayed* for 16 years.

While Nelaton, in Paris, invented the catheter in 1860, in China the instrument was known in the seventh century A.D. In the "Thousand Gold Remedies" the hollow leaves of *Allium fistulosum* are recommended to be inserted into the urethra to a depth of three inches, when air is then *blown into them. One doctor mentioned* in another treatise, the "Precious Mirror of Hygiene," used an empty pig's bladder with a quill tied to it for a similar purpose, but for obvious reasons such crude technique, attended with risks, soon *fell* into disuse. *The* idea of vaccine therapy seems to have been promulgated, and an instance is recorded in which the patient's own pus was taken and injected under the skin around the original sore. Organotherapy, formerly much ridiculed and now hailed as a valuable modern discovery, was known to every Chinese housewife. The use of sheep *thyroid* for cretinism, goitre, &c., is mentioned in the sixth century. Even psychotherapeutics, so much in vogue nowadays, was practised as early as the second century B.C. in the form of charms and incanta*tions.*

III. THE MEDIÆVAL OR CONTROVERSIAL PERIOD.

The Chinese have a great reverence for authority. What the ancient authori*ties assert is* regarded as always right; the accuracy of their statements is unquestioned, and this veneration of the ancients amounts almost to a worship and is the chief cause *of the scarcity of original* writings and *the petrified fixedness of Chinese medicine.*

Literature.—In the beginnings of the Sung Dynasty a marked change is noticed. Monographs on particular diseases began to appear. The number and variety of publications in this dynasty exceed that of all the previous dynasties put together; many of them are quite original. A selected *list* of the most important works is given below.

1. Tung Keh: Treatment of Beri-beri. 2 vols. The first and only monograph on this subject.
2. Shen Chi: Care of the Aged. The earliest treatise on hygiene with special reference to the care of feeding of old people.
3. Chen Chi-Ming: Text-book of Women's *Diseases.* 24 vols. A special work on diseases peculiar to women. The first of its kind in this branch of medicine.
4. Obstetrics. 2 vols. Author unknown. This is the earliest monograph on this important subject.
5. Chen Yin: Three Causes of Diseases. 18 vols. A standard work on pathology.
6. The Fontenele. 2 vols. Anonymous. It is said that the success of Chien Yueh, the greatest doctor on children's diseases, was due to a thorough knowledge of this book, which is the earliest special treatise on diseases of infants.
7. The Copper Model. 7 vols. Also anonymous. The first practical handbook on acupuncture.
8. Li Shun: On Carbuncle. 1 vol. An interesting monograph.
9. Royal Infirmary Model Essays. 0 vols. Author unknown. It is a collection of examination papers.
10. Chang Kuo: Medical Miscellany. 10 vols. Contains much that is of interest. Useful for reference.
11. Imperial Cyclopædia of Medicine. 200 vols. Compiled under imperial orders by a staff of medical men. A remarkable work, but unfortunately most of the volumes have been lost.

The distinct features of this dynasty are the inoculation against small-pox which was discovered in 1022, the establishment of medical schools, and the holding of State medical examinations in 1068. Gradually the schools declined and *then ceased to exist* until 1280 *when they were revived* by Imperial decrees. State examinations were also discontinued for some time but reintroduced in 1317.

In the Ming Dynasty another change is noticed. The publications became controversial, attacking old writings as well as contemporary literature. Four distinct schools may be recognised. Liu Shou-Cheng propounded the theory that diseases were caused by excessive heat in the body and advocated the use of cooling medicines. Chang Tzu-Ho was famous for his "attacking" policy. He compared diseases to a foreign substance in the system which should be attacked and driven out by drastic drugs such as purgatives, *emetics, and diaphoretics. Li Tung-yuan emphasised* the importance of the spleen and stomach, and put down the causes of all diseases as due to derangements of the digestive tract. Chu Tan-chi thought that malnutrition was the root of all troubles; hence he extolled the value of tonics. These famous men are called the "Four Great Doctors of the Kin Yuan Period." Later writers, like Sih Lih-cha, Chou Hsiu-yuan, Chang Ching-yo, and others only revolved round the different schools.

Literature.—An important contribution to medical science in the Ming dynasty was the publication of the "Pen Tsao Kang Muh or Synopsis of Ancient Herbals." This is a *standard work, compiled* by Li Shi-chen, a district magistrate, who was born at Ki-chan, a town in the east of the province of Hupeh. It consists of 62 books and took the author 30 years to complete. All known works on materia medica, to the number of 41, were consulted, while references to 360 medical treatises and 591 other scientific and historical works were freely made. There were 71,000 formulas given in this work and the substances enumerated numbered 1892 kinds. These are arranged in 60 great classes under 16 orders. This treatise is one of the most popular and important books in Chinese medical literature and merits the praise accorded to it by doctors as well as laymen. The "Synopsis of *Ancient Herbal*" was published in 1590. Another valuable book is Wu Yiu-Ko's "On Plague," which is a special treatise on fevers and epidemic diseases. It contains many original observations and suggestions.

Syphilis.—In some quarters it is declared that syphilis originated from China, but this is not supported by fact. Most Chinese writers of this period maintained that it was unheard of in China till the middle of the sixteenth century and that it was introduced into Canton by Portuguese from India. These statements, though not strictly true, as there are other references recording its presence earlier than this date, show that syphilis was prevalent in the Ming Dynasty. Indeed, the descriptions of this disease were very accurate and illuminating, and in one interesting monograph written in 1631 the various manifestations and the hereditary transmission of syphilis are mentioned in full detail.

(To be concluded.)

THE LITERATURE OF FOOD INVESTIGATION.

A NEW INDEX.

THE problem of food storage is far older than human civilisation, and was successfully tackled by plants and animals before man appeared on this earth. The density of modern industrial populations has created, however, difficulties in respect of the storage and transport of food which are being overcome only by the application of scientific studies covering wide fields in the domains of chemistry, physics, biology, and engineering. The value of such scientific studies becomes clear when we realise that they alone have made it possible for us in Great Britain to purchase at a reasonable price all the year round a variety of fruits and vegetables, abundance of meat, fish, and dairy produce, including dried and condensed milks, as well as eggs and butter. But the facilities created by such investigations not only enable the urban populations of the home country to enjoy a more varied, and, in certain seasons of the year, more wholesome diet, but they help to create a vast field of enterprise in food-producing countries abroad, and are therefore of fundamental importance to us as an empire which theoretically should be capable of producing and distributing all the food its enormous populations require.

The practical importance of investigations connected even remotely with the principles and methods of food transport and storage was discussed at the Imperial Agricultural Research Conference held in 1927 and it was then decided that a list of publications dealing with such matters should be issued at regular intervals, so that those engaged in any particular branch of the work might be enabled quickly to become acquainted with what has already been accomplished in that sphere. The first of these lists has just been issued under the title of "Index to the Literature of Food Investigation," and it is proposed to continue their publication bi-annually; they are compiled by the Low Temperature Research Station of the Department of Scientific and Industrial Research at Cambridge. The preface to the present number contains a brief account of the development of modern knowledge concerning cold storage, and illustrates the necessity of detailed investigations of a vast number of points in connexion with every variety of food product. For example, egg-yolk frozen without any particular regard to the temperature conditions may undergo an irreversible change which causes it to turn into an unpalatable pasty mass; this change does not take place at temperatures above −6° C., which is therefore to be regarded as a critical temperature for egg-yolk. Critical temperatures have been found for other food substances and are of obvious commercial importance since they define the limits within which foods can be chilled. Again, it has become clear that fruits under storage conditions must be regarded as living tissues which are continuously respiring and therefore altering the percentages of oxygen and carbon dioxide in the enclosed space which they occupy; the latter factors, in conjunction with the temperature, in turn influence their rate of ripening and their liability to disease. These two examples may help to illustrate the complexity of the problems that have to be studied to ensure the delivery to the customer of food in first-class condition. This issue of the index contains references to some 700 papers, most of which have appeared during the last two years, and a brief outline of the scope of each paper is appended below the title. One of the largest sections into which the subject-matter is divided is concerned with dairy produce, and some idea of the comprehensiveness of the investigations reviewed may be obtained by noting the subjects included under this heading—namely, heat treatment and cold storage, dehydration and canning, the bacteriology of putrefaction, and methods of analysis, with subsections dealing with patent specifications. Cheese-making and butter-making are considered from various aspects which include modern methods of manufacture and studies of the conditions affecting the qualities of the final products.

It is clear that a periodical of this kind will prove of value, not only to those engaged in the production, transport, and storage of food, but also to those interested in the study of human and animal nutrition, whether from the practical or from the scientific standpoint. Copies of the index (the price of which is two shillings) may be obtained from the usual agents of H.M. Stationery Office; special arrangements have been made for its sale in the United States at the British Library of Information, French Buildings, 5, East 45th-street, New York.

OCCUPATIONAL CANCER IN COTTON WORKERS.

AN address on cancer in relation to occupation was given to a conference of Trade Union Approved Societies in Manchester, on July 16th, by Dr. S. A. Henry. He pointed out that certain classes of skin epithelioma may now be regarded definitely as occupational in origin. So far as it affected mule-spinners, the spray of mineral oil reaching the clothing of the worker was the cause in the majority of cases. The Factory Department of the Home Office had now record of 869 cases of epithelioma of the skin in cotton mule spinners; 714 (82·2 per cent.) in those who were employed as spinners when the disease was recognised, 33 (3·8 per cent.) in those who had retired from work from one to sixteen years previously, and 122 (14·0 per cent.) in ex-spinners who had passed into other occupations for periods varying from a few months to thirty years. Cotton mule spinning was sixth in the list of the occupations with the highest comparative mortality figure from all forms of cancer. The earliest age at which the disease had been recognised was 22, and the latest 77. Of the persons affected, only 1 per cent. were under 30 years of age, and 4·2 per cent were under 35 years of age. The disease did not usually occur until the person afflicted had been employed in the mule room for some considerable time. In 1911, deaths from scrotal epithelioma in mule spinners made up 9 per cent. of the number of deaths from this cause in England and Wales, in 1924 they made up 40·3 per cent. Dr. Henry also dealt with the use of various types of mineral oil, and cited Dr. Twort's recent experiments in Manchester, which showed that of all samples of oil he had examined, shale was the most likely to produce cancer. Further research into occupational cancer of the skin was urgently needed.

OBJECTIONABLE ANAEROBIOSIS.

MANY experiments on micro-organisms are conducted under anaerobic conditions, or, at least, conditions which are believed to be such. The essential sought is complete absence of oxygen, and, incidentally, of all active gases. As a counsel of perfection the use of argon might well be advised, but this does not seem to be done. In the current issue of the *Biochemical Journal* Mr. H. Nicol calls attention to a well-known but little heeded objection to the use of alkaline pyrogallol as a means of removing oxygen. The evolution of carbon monoxide when oxygen is absorbed by this reagent has long been known to occur, although the proportion formed can be kept down to amounts which are negligible for purposes of gas analysis by proper precautions. In bacteriological work it is not easy to observe these precautions, and in any case small traces of carbon monoxide may have a toxic effect on the organisms experimented with or possibly may serve as a source of oxygen. It is not of course difficult to free nitrogen from carbon monoxide, but this means the introduction of the gas into the apparatus containing the culture, and is more troublesome than the usual plan of absorption in situ. The use of oil on the surface of a liquid medium is not effective, for oils absorb oxygen from the air and allow it to pass downward to the liquid beneath.

A NEW POCKET ELECTRIC AURISCOPE.

AN auriscope which carries its own illumination and is suitable for the waistcoat pocket has been put on the market by Messrs. John Smith and Son, of Glasgow, at 32*s.* 6*d.*, who claim that it is British made throughout. The design is that of a small "fountain-pen" type of electric torch, with a dry battery in the handle; the usual bulb and reflector are removed, and a special adapter fitted, into which the auriscope plugs. This is provided with a detachable speculum, different sizes of which can be supplied and would be necessary in practice. The lens is removable, to permit of working through the speculum, and there is a second smaller lens on a swinging arm which can be brought into position without interfering with the use of a probe or paracentesis knife. The apparatus is well made and convenient for use at the bedside. It has a fault which is common to many of these instruments. The lenses focus an object at the tip of the speculum and give good definition at this level; but when the patient is being examined the membrana tympani lies about half an inch beyond the tip of the speculum and is decidedly out of focus. This defect should be remedied by an alteration of the focal length of both lenses.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which was completed with the issue of June 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Fifty Years
OF
DERMATOLOGY.

A MALCOLM MORRIS MEMORIAL LECTURE

Delivered on May 16th, 1929, under the Auspices of the Chadwick Trust,

BY SIR NORMAN WALKER, M.D., LL.D., F.R.C.P.,
CONSULTING PHYSICIAN FOR DISEASES OF THE SKIN TO THE ROYAL INFIRMARY, EDINBURGH.

THOSE who decided that the Malcolm Morris Memorial Lectures (of which this is the third) should be concerned alternately with dermatology and public health made a very wise and far-seeing decision. The subjects are closely interwoven, and to both of them Morris gave of his best.

I propose to sketch the progress of dermatology during the last 50 years, during most of which Malcolm Morris was an active force. When, after qualifying as a Member of the Royal College of Surgeons of England in 1870, and after a period of study in Vienna, Morris commenced practice in Goole, I question whether there were many inhabitants of the East Riding who had ever heard the word dermatology. Skin diseases were, at that period, commonly attributed to dirt (and my native country had an unenviable reputation in that respect), to some mysterious humours which no one could satisfactorily explain, or to gout, which, being a fashionable complaint of the better classes, was itself sufficient for the climbers of those days. It is so nearly 50 years since I commenced the study of medicine that I make no excuses for using that as another reason for the round figure. Nor, I think, do I need to make any when I begin these reflections with special reference to Edinburgh.

DERMATOLOGY IN EDINBURGH.

In 1880, dermatology in Edinburgh was in a state of hibernation. In the middle of the nineteenth century it had had quite an active period. Hughes Bennett, whose name is best known as a physiologist and as a physician, and to whom belongs the credit of having been the first to introduce the use of the microscope into the teaching of clinical medicine in Edinburgh, took an active interest in dermatology, and his writings on many dermatological subjects are still well worthy of perusal by even the youngest of our craft. He was not alone in his interest, for his colleague, Laycock, the Professor of Medicine, was also, to use the quaint wording of the Anatomy Act, "addicted" to dermatology. In those days, every professor in the Faculty of Medicine had the right to a share in the medical wards of the Royal Infirmary, for the purpose of giving clinical instruction to his students. But as there were not enough wards to go round there was an in-and-out arrangement, under which each took charge for periods of three months. Chance brought it about that the charge of the wards allocated to the diseases of the skin alternated between Laycock and Hughes Bennett, and I have heard from many old friends, now passed to their rest, of the enjoyment of the students who had the opportunity of going round with each when he took over charge from the other, and of hearing very candid accounts of the blunders in diagnosis and the inadequate treatment which had occurred during his absence. They had no direct followers and when I began medicine in 1880 there were no skin wards in our new Royal Infirmary. There was, however, one ward in which there were usually some skin cases. I alluded a few minutes ago to the fact that any professor in the faculty could claim opportunities for teaching clinical medicine, and that in the past these opportunities had been exercised by occupants of the chairs of botany, chemistry, anatomy, pathology, materia medica, physiology, and medical jurisprudence. In the days I speak of the last of these chairs was occupied by Sir Douglas Maclagen, a member of a famous Scottish family which supplied southerners with an Archbishop of York. Sir Douglas, before he was appointed professor, had served his time as an ordinary surgeon to the infirmary but, curiously, the privileges granted to the physicians were not extended to the surgeons. In his youth, Maclagen had spent a good deal of time in postgraduate study in Paris, then the Mecca of dermatology and, on his return to active duty as a physician in the infirmary, he filled many of his beds with skin cases, and when his turn came round to give a clinical lecture he usually selected his subject from some of them. Several of the ordinary physicians and surgeons took some interest in skin diseases and it was my good fortune to commence clinical work—as Chairman of the Examination Committee of the General Medical Council I should almost blush to confess it—in my very first year under one whose personality is known the whole world over, thanks to Sir Arthur Conan Doyle, as Sherlock Holmes. Dr. Joseph Bell was the last of a long line of Bells, surgeons in Edinburgh. To his out-patient clinics came patients with all sorts of diseases, not a few of them dermatological, and no one would have appreciated more intelligently the detective skill which Joe Bell showed in investigating these cases than Malcolm Morris. It was from Bell that I first learned to distinguish between lupus and rodent ulcer, a distinction not made and not regarded as seriously important by some of his colleagues. A happy inspiration led me to ask the clerk of the Royal College of Surgeons of Edinburgh to search the minutes of the College, and I learnt with great interest that Malcolm Morris was proposed for the Fellowship of the College in 1882 by Sir Joseph Fayrer and seconded by Dr. Joseph Bell. Morris often used jokingly to refer to the fact that a part of his success was to be attributed to the fact that, owing to his Christian name and to the fact that he was a Fellow of the Royal College of Surgeons of Edinburgh, some people assumed that he must be a Scotsman and therefore capable.

When Morris commenced practice in London the dominant personalities were Erasmus Wilson, Jonathan Hutchinson, and Tilbury Fox. In many hospitals the skin appointment—if there was one—was held by some member of the staff—usually the junior staff—in addition to his ordinary duties, and he had to make his own opportunities for investigation. I have a vivid recollection of a day spent with my old friend, Colcott Fox; we lunched at the National Liberal Club, went to Westminster Hospital at 2 o'clock, and from then until nearly 7 he saw a constant stream of patients and I know that, long before the end, my mental capacity was exhausted! Two or three students looked in at various periods during the afternoon and, no doubt, picked up some crumbs from Fox's sage comments. While much yet remains to be done, the contrast in the present day is very remarkable. It no longer remains a chance whether the person whom circumstances put in charge of the skin department was interested or whether he regarded it as a duty to be discharged in order to get back to his own job. Almost every teaching school in the country is now supplied with a well-trained dermatologist, and the students of to-day get regular, careful, systematic instruction.

My own immediate chief in Edinburgh was Allan Jamieson. He had a career interestingly like that of his friend Morris, for they met at Hebra's feet in Vienna and lit their torches at his altar. They each spent some useful years in general practice in a seaport town—as a residence, I should place Berwick-on-Tweed before Goole—and each, having spent some time in study abroad, settled as a general practitioner in the town where he was educated. In these larger fields they found more scope for their special interests. Their experience and their influence grew, and each played a notable part in forwarding the art of dermatology. Jamieson had at first one—later extended to two—out-patient days in the week and his Saturday clinics were often attended by as many as 300 just as orchid fanciers do! There did not seem to be much practical value to come out of it, and the pessimists and the cynics said many cutting things, but it directed attention to the subject and was one of the many to which Sir Malcolm devoted his energies. His book, "Ringworm in the Light of Recent Research: Pathology, Treatment, Prophylaxis," published in 1898, was an important contribution. But the most zealous organiser had a hard row to hoe! The disease was regarded as a nuisance but, as it did small harm to health, was but little considered. I heard from my mother that, when she was 10 years old, 87 years ago, she was discovered to have ringworm. She was removed from the better-class school which she was then attending, but attended, for over a year, without any difficulty being raised, what she described as the "Keelies'" school in Stockbridge! I think we owe the immense change which has come over the situation mainly to two things: the inspection of school-children, and an action of the Russian government which sent Jews and favus from Russia to London many years ago. We were painfully familiar with favus in Edinburgh, but it was the Russian immigrants who opened your eyes to its seriousness in London. The problem was almost at once realised, and the organised arrangements made at the London Hospital have restored favus in London to its old place of a curosity. One can look back from the now universal and universally approved inspection of school-children to the attitude with which it was received when it was introduced in the first decade of this century. Some of the older inspectors can still amuse us with stories of the crowds of angry mothers who waited outside the doors of the school to see the inspector. An immense amount of feeling was aroused; once, breaking a journey between London and Edinburgh to spend a night with an old assistant in the Midlands, I was invited to attend a public meeting, which was to be held that evening, with the vicar in the chair, to protest against this interference with the liberty of the subject. Some of you may be familiar with the local patriotism of our border towns; the spirit of competition between them affects everything, and when the inspector reported that the percentage of "dirty heads" in the schools in Burgh A was 54, local feeling was aroused, not at the figures, but at the fact that the same inspector reported that in Burgh B it was only 48!

After a good deal of persuasion the Edinburgh School Board established, in 1912, a special school for children affected with ringworm and favus. I remember very vividly the storm which its opening aroused. The columns of our evening papers were filled with letters of protest. It so happened that for convenience the school was established close to the Royal Infirmary and accidentally it happened to be near two of our largest public schools for boys. The correspondents drew attention to the risks that the pupils of these schools would run, and, with that tendency of newspaper correspondents to follow the mentality of the auction room, higher and higher objections were raised until one imaginative person warned the university that the risk to the students attending the infirmary would be so great that parents in the colonies would no longer send their sons to Edinburgh. When the schools was opened in January, 1912, about 60 pupils were admitted, most of whom had been absent from school for periods varying from a few months to four years; several had never been to school, [amongst them two boys 12 years old. The increasing number of cases—I draw attention to this—necessitated enlargement of the school, and three years later the next-door house was acquired and accommodation provided for 160 pupils. In the session 1920–21 290 pupils were discharged cured; the greatest number in any one session. In 1924 the numbers began to decrease rapidly and in 1926 the staff was reduced to its original number of three teachers, eight having been at one time necessary. Over 2300 children have passed through the school and now the majority of those attending are under school age. The detailed figures are instructive: 1912, 67; 1913, 97; 1914, 88; 1915, 143; 1916, 260; 1917, 262; 1918, 347; 1919, 381; 1920, 430; 1921, 402; 1922, 351; 1923, 344; 1924, 265; 1925, 214; 1926, 143; 1927, 117; 1928, 109. To-day there are only 20 pupils in the school. I have given details of this, firstly because it was under my own direct supervision, and secondly because it points the useful lesson that organised attention directed to such a disease invariably, at first, seems to increase the number of cases. What it does is to bring them to light; then a level is reached, and then the number begins to decline. It is of interest to know that the educational level attained was higher than the average in the schools under the authority, probably owing to the fact that the children got their dinner in the school and that the classes were smaller.

More striking still is the school's record of favus, a disease which used to provide from 20 to 40 new cases annually in the infirmary skin department; many of these, of course, were adults and "incurable." A year or two ago I asked our Central Education Authority to give me what information they could about the existence of the disease in Scotland and, after careful inquiry through their official channels, they reported to me that in the whole of Scotland there were 15 cases and none of them in Edinburgh. This success could not have been attained had it not been for the discovery that in X rays we had a remedy which, properly used, could be trusted to remove all the hairs from the affected scalp—diseased as well as healthy. I do not remember who was actually the first to use the rays in ringworm, but it is undoubtedly to Sabouraud that the general adoption of the method was due. Here, again, we owe an advance to the combination of laboratory and clinical methods. It was through scientific study of the fungus that the way lay to the cure of the disease. When one reflects that in the past, even in well-organised institutions, the average time required to cure the disease was over three years, and that it is now reduced to less than three months, the dermatologists need no longer smart under the gibes of their critics but may point to the thousands of years of education that have been saved in a little over 20 years.

It looks as if the X ray treatment of ringworm might, in its turn, have to give way to the thallium method. The history of thallium as a remedy is interesting. It has long been known that its administration was followed by alopecia, but it did not occur to anyone that it might possess such selective powers as to confine its action to definite areas, and it is indeed a very remarkable fact that it does so. Attempts were made to utilise its depilatory action in the treatment of ringworm quite early in this century, but were discontinued on account of the severe toxic symptoms produced. It was only in 1918 that Cicero published the results of his successful use of it in a series of cases. Since that date it has been quite extensively employed, and there are now records of over 3000 cases in which it has been proved efficacious. In the ringworm school in Edinburgh it has proved very satisfactory in shortening and simplifying treatment. The method has met with an unfortunate set-back on account of a recent calamity. The moral I draw from that is that it is unfortunate that the metric system used in the British Pharmacopœia of 1914 and long in use in all the scientific branches of medicine is so slow in spreading into practice.

While we have been prevailing in our struggle with ringworm of the scalp, another form of ringworm has made great strides in this country. I allude to the fungus infection of the skin long known in the East as dhobi itch—epidermophytosis. Many people think that the prevalence of this is a sequel of the war and, indeed, many brought home the infection with them from the East. But it had made considerable progress before the war, particularly wherever collections of young men were gathered together. The very slight symptoms which it produces are largely responsible for its spread. A little irritation of the skin of the hands or between the toes does not always send the patient to a doctor for advice; it is only when the symptoms are more severe that advice is sought. Nevertheless, the condition is all the while infectious, and I am sure that cases are becoming increasingly numerous. In a certain proportion of cases the nails become infected and I know of no fungus infection which one approaches with more respect than fungus infection of the nails. We have gone a long way to conquering ringworm of the scalp by organisation. I plead for its application to this condition! If an hour were set apart for a clinic for this malady alone I should look for the same measure of success as has been achieved in lupus, in ringworm of the scalp, in favus, and in diabetes. I think the most promising *feature of the campaign against asthma is that cases* are to be collected in clinics and studied in groups.

SCABIES, IMPETIGO, AND PEDICULOSIS.

The teacher of dermatology may, from time to time, regret the diminution of his opportunities for teaching students to become familiar with what used to be very common diseases. This is particularly true of the commonest diseases, and there is no doubt that the teacher of to-day does not have the same superabundant opportunities of demonstrating cases of scabies, impetigo, and pediculosis as his predecessors had. In my own days it was almost always possible to demonstrate to students the close relationship between impetigo and pediculosis capitis. Thanks to school inspection, all these diseases have markedly diminished. They are still numerous, but I venture to prophesy the advent of a time when the teacher of dermatology will welcome the appearance of a really good example of impetigo to demonstrate to his students.

URTICARIA, ERYTHEMA, DERMATITIS, AND ECZEMA.

With one exception, all the diseases I have dealt with fall obviously into the preventable category, for in all of them the cause is recognisable and determinable. But there remains a great mass of disease where the progress recorded, marked though it be, is not so dramatically presentable as in those already dealt with. To only two groups of these diseases have I time to refer. The first comprises the conditions known as urticaria (nettlerash), and erythema (redness), while the second includes the vast number of affections of the skin which, according to our fancy, we label "dermatitis" (inflammation of the skin), or "eczema," which is the Greek word for an eruption. It must be conceded that the labelling of a patient's ailment with one or other name does not greatly help, and it has become more and more evident that it is the cause that is important, and not the name. The one group, speaking generally, has characteristics which suggest that it arises from some internal cause, and the other, also speaking generally, rather suggests external irritation. It is along the lines of concentration on the possible cause, rather than on the appearance of the eruption, that marked progress has been made in these 50 years. It had long been known that the ingestion of certain foods—I merely instance oysters, lobsters, strawberries, and cherries—was followed in certain individuals by an outbreak of nettlerash. Some of the older authorities, in their condemnation of all fish and of all fruits, rather obscured the truth, but nevertheless there is evidence in some of their writings, and perhaps most of all in the works which, like Morris's, went through several editions, of something instinctively suspected but beyond their ken, a spirit like that of the old Athenians, who erected an altar to the Unknown God. "One man's meat is another man's poison" is an old proverb, and it is in the application of this that advance has been made. Even the oyster, perhaps the most notorious sinner, only affects a small percentage of humanity, and as one goes down the list the percentage decreases. But the list of substances to which some people react is being daily lengthened, and now that outbreaks of urticaria have been traced even to milk, it is obvious that the matter is one of importance. It is quite often possible, by starving a patient for a few days and then adding one article of diet after another, to alight on the cause, but this is often a very slow process. The hunt for the peccant article has been made much simpler by the introduction of the cutaneous tests. By their means, the sensitiveness of a particular individual to a particular substance can be at least suggested, and much time thereby saved. Some people, in my judgment, have adopted these tests too enthusiastically and expect that it will be possible to relate every case of urticaria to its cause if one only perseveres long enough. The relationship between urticaria and asthma, long remarked but little understood and not infrequently scoffed at, has been clarified by the demonstration that certain substances may produce one or other *type of reaction*. I do not wish to be thought to belittle the enthusiastic cutaneous tester; it is worth many hours of work if one can free a patient from a very troublesome symptom by simply advising him to avoid, in future, Findon haddock, some particular variety of cheese, tomatoes, chestnuts, or damson jam. There are other causes of urticaria than foods, and these must be sought with the same diligence.

I next come to that conglomerate assemblage of reactions of the skin which goes by the name of eczema. For two or three centuries authors have sought for a satisfactory definition. The fact is that it is impossible to define a condition which may be due *to any one of hundreds of causes. It is rather* remarkable that so many who sat at Hebra's feet did not carry further his researches into external causes! Their search was too often directed to some other organ of the body; eczema, it was held, had its manifestations on the skin, but the attitude was to seek for its cause anywhere rather than in the skin itself. It is to some extent unfortunate that Hebra devoted so much attention to the reaction produced on the skin by one or two irritants (notably croton oil) and assumed that all irritants would produce the same reaction. It is to the recognition of the fact that different irritants may produce apparently similar reactions in some persons, and that the same irritant may produce *different reactions in others*—in short, to a wider appreciation of the importance of idiosyncrasy—that we owe most of our recent advances. The skin and the stomach are wonderfully alike in this respect: there are a few persons who boast that they can eat anything, but most of us are aware that there are some things which agree with us better than others. So it is with the skin. There are very few who have a skin that nothing will irritate, and very few chemicals, using the word in a wide sense, which will not irritate some skin if brought into contact with it. Fifty years ago bakers' itch, bricklayers' itch, and washerwomans' itch were familiar. The work of my friend, Dr. Prosser White, on the industrial diseases of *the skin shows an imposing list of over a* hundred varieties, and we discover new ones every year. I agree with Hartzell when he says: "Many, if not most, of the cases of so-called acute eczema are, in fact, due to some plant, dye or drug with which the patient comes in contact." The search for the cause in a suspected case is an enthralling pursuit. I learned recently from Sir Harold that his father and I shared a common zest for those cases that required something of the detective instinct of Sherlock Holmes. Perhaps the most intriguing cases one has to deal with are those connected with the vegetable kingdom. The most familiar vegetable poison in this country is the Chinese primrose. It may be familiar, but it *is astonishing* how many cases one sees in enthusiastic floriculturists who are entirely ignorant of its irritant effects. No treatment, however skilfully directed, is of much use when the patient is innocently and ignorantly exposing himself to a noxious irritant.

EQUIPMENT.

The dermatologist of to-day has a vast armoury compared with that of his predecessor 50 years ago. He has scores of new weapons; some of them are very potent, and many are double-edged. Chemical and bacteriological warfare is waged against the germs which infest the skin. New remedies are showered upon us with bewildering frequency, and, if many of them have but a short career, the good ones remain. The use (and no less the abuse) of vaccines is of great importance, but they require judgment and experience in their administration and their value is best tested and estimated by those whose knowledge and practice is not limited to these new remedies. I would counsel the younger generation not altogether to neglect old remedies and the principles which lie behind their use; to clean the skin, to keep it at rest, and to let nature do the cure, is as important as ever it was. I would not give up the use of the starch poultice (which Allan Jamieson learned to use in Paris and spent all his active life in advocating) for any dozen vaccines.

It is recorded of Hughes Bennett, whose name I mentioned earlier, that he treated all his acute cases with weak alkaline soaks and all his chronic ones, as Noah did the ark, with pitch within and without. It takes years of experience to understand exactly when and how to use tar, but it and its derivatives remain among the most useful of applications.

The older dermatologists perhaps took human nature more into consideration than do some of their successors. Possibly I am speaking from the maturer mind, and human nature has changed as well as remedies. I have often followed, with benefit to the patient, the spirit of a bit of advice Malcolm Morris once gave me; we were discussing the advantages and the rather manifest disadvantages of chrysarobin in the treatment of alopecia areata and the importance of interesting the patient in the treatment to be used. Morris said: "Instead of the conventional ointment or lotion I sometimes find it helpful in this condition to advise patients to cut a lemon in two, to sprinkle the cut surface with Goa powder and rub the part. If I am anxious to make the patient specially attentive to the treatment I advise him that limes are even better than lemons."

If I were to endeavour to find an explanation for the advance I would put it on four grounds:—

1. The improvement in school education; we get better-trained students than our predecessor did. I do not refer to the geniuses of the past or present, but to the average level.

2. The marked improvement in medical education and, not least, the introduction to what our American friends call the fundamental subjects. The students of to-day are far better grounded in chemistry, physics, biology, physiology, pathology, bacteriology, and pharmacology than we were, and are a more receptive soil for sowing the seed of the advances in medicine and surgery and their branches.

3. Next I would put research; everyone recognises the importance of research in every branch; in every laboratory and in every large hospital it is constantly going on, either as some special research or as an integral part of properly done routine work. Not the least important factor in the advance is the increasing combination between the clinician and the laboratory worker. I have no sympathy with and little belief in the assertion that these are two rival camps. Here and there it may be true that a narrow-minded individualist in a laboratory regards all other than laboratory workers as mere children at play, and here and there clinicians are still prepared to back their "clinical instinct" against any laboratory finding. But these are exceptions, and in all active centres throughout the world there is closer and closer combination between the two branches and, as the results continue to show the advantages of coöperation, it may be prophesied that the exceptions will get fewer and fewer.

4. Then there is coöperation. Special departments no longer work in little water-tight compartments. They touch, on the one side, their medical colleagues on the staff, and on the other those public authorities who are responsible for the health of the community. I have not, I think, stinted my expression of appreciation of what the community owes to the inspection of school-children. School-children are not the only class who would benefit from closer coöperation and organisation. Not long ago I had the pleasure and satisfaction of participating in an organised inquiry into a disease of the skin which had been known for over half a century to attack certain workers in the shale oil industry. The combination of the Home Office, an exceedingly capable local doctor, and an expert, was able to suggest a method which, in a few months, practically abolished a condition which meant suffering to many and death to some. In the reorganisation of local government, now in train, there is much hope that such methods will spread.

The dermatologist of the future has a wide field before him. He must come to it well equipped. Some used to argue that he should approach it through ten years of general practice, as Malcolm Morris and Allan Jamieson did. Here is a description of his qualifications from America: "He must of necessity be an internist (physician) and pathologist—if such a thing is possible, a better-trained internist than the internist himself. He must be a bacteriologist, a physiologist, an embryologist, and a physicist." That is the American ideal. Translated into our more practical form, it means that he must be thoroughly trained in all these subjects, and be capable of appreciating the work done by the experts in each and of applying such of it as is applicable to his own special work.

I close, in the spirit of what I have tried to make the theme of this lecture, with a quotation which I believe would have been appreciated by the man whose memory we recall to-day. As befits the son of a Scottish manse, I take it from the Bible and I think you will agree not inappropriately, from the Book of Job. There, in verses 15 and 16 of the twenty-ninth chapter, you will find these words: "I was eyes to the blind, and feet I was to the lame. I was a father to the poor, *and the cause I knew not I searched out.*"

A CONTRIBUTION TO THE STUDY OF RENAL GLYCOSURIA.

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WHEN a reducing substance is found in the urine two questions naturally arise: (1) Is the reducing substance glucose? (2) Is the patient affected with true diabetes mellitus? To the first question a satisfactory answer can usually be given by carrying out the phenylhydrazine and fermentation tests for glucose. To the second question an affirmative answer may be given when the history and symptomatology are sufficiently characteristic; a negative answer, on the other hand, can only be given after careful investigation.

Glycosuria is said to be relatively uncommon and although its incidence may possibly vary in different classes of society, there can be little doubt that the excretion of glucose in the urine is more common than is generally supposed. This may be partly due to the not uncommon practice of requesting or accepting for routine examination a morning specimen of urine—that is, one passed after several hours' fast. It is obvious, therefore, that the accidental discovery of glucose in the urine of a patient who has no definite diabetic symptoms demands a careful investigation of the cause of the abnormality, since it is well known that a certain proportion of glycosuric patients are not true diabetics.

Of the conditions included in the group of non-diabetic glycosurias an important one is renal glycosuria, now recognised as a distinct clinical entity. A considerable amount of literature has already appeared on the subject, and various other names have been applied to this interesting anomaly, names such as "diabetes innocens," "glycosuria without hyperglycæmia," and "negligible glycosuria," all of which may be regarded as synonymous.

Joslin[1] defines renal glycosuria as "a persistent glycosuria which is relatively independent of the diet, and in which there is absence of hyperglycæmia as well as of the symptoms of diabetes." Graham,[2] in 1916, described two types: the common one, in which less than 10 g. of sugar were excreted daily, and another type in which 10 to 30 g. were excreted. In 1923 he described another type[3] in which no sugar is detected in the urine when the patient *abstains from food for a short time*, but sugar is excreted when carbohydrates are eaten. This type he regarded as a link between normal people and patients with a typical renal glycosuria. Many other cases, of varying type and severity, have been published. Leyton[4] records 18 cases of which 7 had histories of glycosuria averaging 18 years. Garrod,[5] MacLean,[6] and Graham,[2] [3] record numerous cases, and several papers have appeared, chiefly in American journals, describing cases in which glycosuria only appeared after a meal (Goto,[7] Strouse,[8] Murlin and Niles,[9] Lothrow,[10] John,[11] Goto and Kuno[12]).

Normally the kidney does not excrete glucose so long as the concentration of blood-sugar remains below 0·18 per cent. and this figure is generally accepted as the normal renal threshold for glucose. In renal glycosuria the threshold for glucose is lowered; it may be slightly, moderately, or greatly below the normal, and the kidney continues to excrete glucose so long as the blood-sugar concentration remains above the threshold level. Persistent glycosuria is not, therefore, a sine qua non in the diagnosis of renal glycosuria; and furthermore, in a certain number of cases the glycosuria is not relatively independent of the diet, but is, in reality, dependent upon it. Joslin's definition, therefore, is only applicable to certain cases. An important question thus arises, whether the different types of renal glycosuria are merely varying degrees of one type of abnormality, the variation depending upon the degree to which the kidney leak-point is removed from the normal, or whether they represent abnormal states differing in nature and ætiology.

FIG. 1.

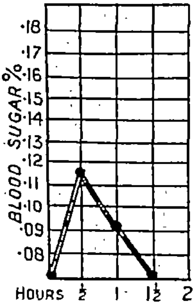
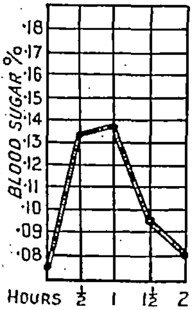


FIG. 2.



It is generally stated that renal glycosuria is more or less harmless and requires no treatment. The study of the condition, however, brings to light certain problems which demand further elucidation. These problems have occurred to me in the course of a personal investigation and will be discussed after a brief description of six cases.

Clinical Histories.

CASE 1.—Male, aged 39, complained of feeling "over-strung" and nervous, due in his opinion to overwork. A general physical examination proved negative, with the exception of a slightly increased blood pressure, the figures being: systolic 150, diastolic 85. The Wassermann reaction was negative. The urine, however, contained a fair amount of glucose. Further investigation showed the morning urine (fasting) to be sugar-free, while the *urine passed an hour and a half after a mixed meal contained* a fair amount of glucose. A glucose tolerance test (50 g. of glucose) showed the blood-sugar curve to be not only well within normal limits, but abnormally low (Fig. 1). At the beginning of the test (fasting) the urine was sugar-free, while at the end of the test there was a moderate glycosuria.

CASE 2.—Male, aged 25, complained of general weakness, irritable temper, and headaches of four months' duration. A general physical examination proved negative. The urine, however, was found to contain glucose. A glucose tolerance test (50 g. of glucose) showed the blood-sugar curve to be well within normal limits (Fig. 2). At the beginning of the test (fasting) the urine contained a trace of glucose, while at the end of the test it contained 2 per cent.

CASE 3.—Female, aged 30, complained of attacks of tinnitus and giddiness accompanied at times by nausea and vomiting. She had been examined by an aurist, who formed the opinion that the symptoms were not due to any aural disease. The symptoms first appeared after a long period of harassing work and mental strain. The patient was debilitated and neurasthenic and her urine was found to contain a small quantity of glucose. Further investigation showed the morning urine (fasting) to be sugar-free, while the urine passed an hour and a half after a mixed meal contained a moderate amount of glucose. A glucose tolerance test (50 g. of glucose) showed the blood-sugar curve to *be well within normal limits (Fig. 3), but* at the end of the test the urine contained a small quantity of glucose. In this patient the troublesome symptoms disappeared after a prolonged holiday and it was then noted that a carbohydrate meal failed to produce glycosuria.

FIG. 3.

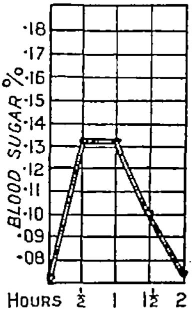
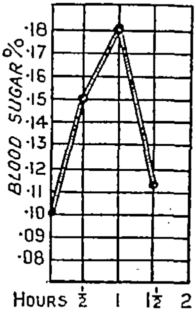


FIG. 4.



CASE 4.—Male, aged 48, complained of headache, insomnia, weakness, and loss of weight. He was much engrossed in business and believed his symptoms to be due to worry. Examination showed a moderate degree of arterio-sclerosis. The systolic blood pressure was 148; the diastolic 90. The Wassermann reaction was negative. The urine was *found to contain* a moderate amount of glucose. Further investigation showed the morning urine (fasting) to be sugar-free, while the urine passed two hours after a carbohydrate meal contained 1·3 per cent. of glucose. A glucose tolerance test (50 g. of glucose) showed a normal curve (Fig. 4). At the beginning of the test (fasting) the urine was sugar-free. Half an hour after the administration of the glucose the blood-sugar had risen to 0·15 per cent. and the urine contained 0·63 per cent. of glucose. At one hour, when the blood-sugar had risen to 0·181 per cent., the urine contained 1·18 per cent. of glucose. At two hours the blood-sugar had dropped to the starting level of 0·1 per cent. and the urine then contained only a trace of glucose.

CASE 5.—Male, aged 51, was rejected at a life insurance examination on account of glycosuria, the urine being found to contain 0·9 per cent. of glucose. He was a well-developed, healthy looking man and felt in excellent health. A morning specimen of urine (fasting) was found to be sugar-free, while the urine passed two hours after a mixed meal contained a definite but small quantity of glucose. A glucose tolerance test (50 g. of glucose) showed a normal curve (Fig. 5), but one hour after the administration of the glucose, when the blood-sugar had reached a level of 0·168 per cent., the urine contained 1·25 per cent. glucose.

CASE 6.—Male, aged 40, was rejected at a life examination on account of glycosuria. He appeared to be in perfect health. A glucose tolerance test (50 g. of glucose) showed a curve suggestive of early diabetes, but with a definitely lowered renal threshold (Fig. 6). At the beginning of the test (fasting) the urine was sugar-free. Half an hour after the administration of the glucose the urine contained 0·9 per cent. glucose although the blood-sugar had only reached 0·137 per cent. The highest level of blood-sugar obtained during the test was 0·182 per cent. at one hour, yet the urine at one and a half hours contained 0·6 per cent. of glucose.

FIG. 5.

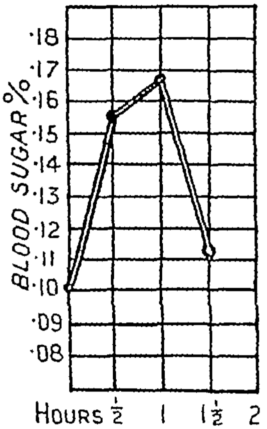
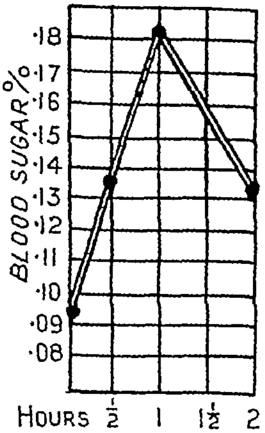


FIG. 6.



In these six it will be noted that in one case (Case 2) the morning urine contained a trace of glucose, while in the other five the morning urine was sugar-free. They would all appear, therefore, to belong to that type of renal glycosuria in which the glycosuria only appears when carbohydrates are eaten.

Cause of the Lowering of the Renal Threshold in Certain Individuals.

MacLean[13] in 1923 stated that the exact condition of the kidney which caused renal glycosuria was obscure, and recently he has expressed the opinion that the problem is still unsolved. There are, however, certain interesting observations of other investigators which are worthy of note. Hamburger and Brinkman,[14] experimenting on dogs, found that the kidney threshold for glucose could be altered by varying the amounts of calcium and potassium in the perfusing fluid, an observation which raises the question whether the lowering of therenal threshold is dependent upon abnormalities in the composition or physical characters of the blood. This interesting hypothesis has been studied by Cammidge and Howard,[15] whose observations tend to confirm this view, and they accordingly define renal glycosuria as "a condition in which there is excretion of sugar in the urine that is relatively independent of the diet and occurs in an apparently healthy person whose blood is found to contain a subnormal or normal percentage of sugar no matter when it is examined, and shows an absolute and not merely a relative reduction in the proportion of calcium." In their experiments they *found that the condition* could be controlled, for some time at least, by the daily administration of calcium and parathyroid. In Case 1 of my series no special treatment was adopted when the abnormality was discovered. Seven months later the urine, passed two hours after a mixed meal, was found to contain 2 per cent. of glucose. The patient was then advised to take each day grs. 22½ of calcium sodium lactate and gr. 1/10 of parathyroid. Three weeks later there was no reduction in the glycosuria and after five weeks the urine still contained 1·1 per cent. of glucose two hours after a test-meal. In Case 4 the administration of calcium lactate and parathyroid appeared to bring about a reduction in the amount of glucose excreted. The effect, however, was only temporary, as the glycosuria increased when the drugs were discontinued.

Possible Relationship to Disturbances of the Vegetative Nervous System.

The possible relationship between renal glycosuria and disturbances of the vegetative nervous system has been studied experimentally by several Continental workers, who have approached the subject by investigating the nature of phloridzin glycosuria. It is well known that the administration of phloridzin (a glucoside), orally or by injection, results in the excretion of glucose by the kidneys. The glycosuria thus produced is at least considerable and may be enormous. The interesting point is that it is associated with a hypoglycæmia, so that the glucose is excreted with a lowered renal threshold. In that respect it is analogous to ordinary renal glycosuria. But the full explanation of the action of phloridzin is as yet unknown, since the glycosuria produced by it continues on a carbohydrate-free diet and when the liver is empty of glycogen. One view is that the kidney simply splits off and excretes sugar from the glucoside phloridzin, which re-combines with the blood-sugar, thus forming a cycle. On the other hand, it is held by some authorities that phloridzin acts by antagonizing the influence of insulin.

Zuntz[16] demonstrated many years ago that the injection of phloridzin into the renal artery of a dog resulted in the immediate elimination of sugar from the injected kidney, while the other kidney did not excrete sugar until a definite interval had elapsed, and then only in much smaller quantity. From this he concluded that phloridzin glycosuria was of purely renal origin. Later investigators, however, have raised the question of whether phloridzin acts directly on the renal cells or through the medium of the nervous system. It now appears to be definitely established, from the experiments of a great number of observers, that individuals with an increased irritability of the vegetative nervous system show an increased sensitiveness to phloridzin. Caro has demonstrated this in Graves's disease, and Grote[17] likewise has pointed out that individuals suffering from abnormalities of the vegetative nervous system, and above all from so-called sympatheticotonia, show an increased sensitiveness to phloridzin. Dünner and Mecklinberg[18] have also demonstrated that the parasympathetic exercises an influence on phloridzin glycosuria. They show that the parasympathetic depressors, calcium and atropine, have a restraining influence on phloridzin glycosuria, while the parasympathetic stimulators, potassium and pilocarpine, have the opposite effect. Goldberg[19] has studied the influence of sympathetic and parasympathetic depressors on phloridzin glycosuria and finds that the subcutaneous injection of ergotamine (a sympathetic depressor) or of atropine (a parasympathetic depressor) controls the glycosuria following phloridzin administration. When both drugs are injected together the controlling influence is more marked. Goldberg concludes, as a result of these experiments, that phloridzin glycosuria depends upon vagal and sympathetic stimulation, and that, since phloridzin glycosuria is a representative of the renal glycosurias, the dependence of ordinary renal glycosuria on *similar* disturbances of the vegetative nervous system is established.

The hypothesis thus formulated is interesting and attractive and may be the probable explanation of a certain number of cases. Four of my patients sought advice on account of nervous symptoms which might reasonably be attributed to disturbances of the vegetative nervous system. If increased irritability of the vegetative nervous system can influence the level of the renal threshold for glucose we may find herein an explanation of the view that renal glycosurics have a deficiency of blood calcium. Chiari and Fröhlich[20] have shown that the excitability of the vegetative nervous system is markedly augmented by diminishing the calcium content of the body. It is probable, therefore, that the therapeutic administration of calcium to a renal glycosuric may produce a beneficial effect, not merely by altering the chemical and physical characters of the blood, but by diminishing the excitability of the vegetative nervous system.

In the present state of our knowledge it is not possible to state definitely what is the actual cause of the lowering of the renal threshold. There may be more than one cause, but it will be readily admitted that the hypothesis of disturbances of the vegetative nervous system marks a distinct advance in the study of a difficult problem.

Symptoms due to or Associated with Renal Glycosuria.

Cammidge and Howard have found that the subjects of renal glycosuria are easily tired and are incapable of prolonged exertion, probably owing to the low proportion of circulating sugar. Other writers describe various symptoms such as nervousness and debility. Four of my patients sought advice on account of definite symptoms of ill-health, symptoms mainly of the nature of functional disturbances of the nervous system. On the other hand, it is well known that renal glycosuria is frequently discovered in individuals who are apparently in excellent health.

Generally speaking the condition is regarded as permanent and cases have been recorded in which the glycosuria has persisted for many years with no apparent effect on the general health. In Case 3 of my series the patient was debilitated and suffered from various nervous symptoms. After a prolonged holiday the general health improved greatly, the nervous symptoms disappeared, and it was then found that a meal containing a good proportion of carbohydrate failed to produce glycosuria. In Case 6 also, in which the kidney leak-point for glucose was found to be below 0·138 per cent. in November, 1924, the blood-sugar curve suggested that the patient might be a potential diabetic. Recently, however, his family doctor reported to me that the patient was in good health and that a meal containing bread and sugar had failed to produce glycosuria. It is possible, therefore, as has been suggested by others, that there may be cases of renal glycosuria which are of a temporary nature.

Renal Glycosuria and True Diabetes.

Some writers sound a warning note regarding these cases, and suggest that they may develop true diabetes mellitus. It is not clear on what grounds this assumption is made. Renal glycosurics are probably just as likely to develop true diabetes as normal people are, but there is no evidence that they are more liable. A few cases of diabetes mellitus have been recorded in which the renal threshold was low. Shapland[21] reports one case in which the diabetes was complicated by gall-stones. Cholecystectomy produced a remarkable improvement in the diabetic condition, but had no apparent effect on the level of the renal threshold. Voigt[22] reports one case in which a fractional gastric analysis revealed a total absence of free hydrochloric acid. In his patient, the administration of dilute hydrochloric acid with meals, begun after three weeks of active anti-diabetic treatment, had no effect on the glycosuria. Lawrence,[23] in a recent paper in which he describes eight cases of diabetes mellitus with renal leak-points lying between 0·08 and 0·15 per cent., expresses the view that "there seems no reason to think that the combination of diabetes mellitus with a lowered renal threshold is not a mere coincidence." So far, then, as our present knowledge goes, there is no known relationship between renal glycosuria and diabetes mellitus. Renal glycosuria has been known to persist for many years without any apparent deterioration in health. Whether the condition is liable to variations or fluctuations, or can be in any way influenced by disturbances in the general health, are questions which can only be answered by the repeated examination of a large number of cases over a prolonged period.

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SELECTIVE ACTION OF X RAYS ON THE BLOOD CELLS OF THE CAT.

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THE changes in the cells of the blood which follow exposure to heavy doses of penetrating X rays have been studied in the cat. The entire body of the animal was irradiated at 57 cm. distance for varying periods, the spark gap being 10 cm. between spheres 5 cm. in diameter, 1 mm. of aluminium being the filter. In our experience if the duration of the irradiation is 75 minutes or over, death invariably results within 5 to 12 days; with exposures of 60 minutes a proportion of the animals survive; if the period is less than 60 minutes practically all the animals survive. In the experience of this laboratory, it takes 150 minutes' exposure to X rays of this type to kill, in vitro, the cells of Jensen's rat sarcoma (i.e., this dose equals 1 rad.).

The White Cell Count.

White counts made on a series of over 30 animals brought into the laboratory showed a wide range of variation, from 6000 to 35,000 per c.mm.; the usual range was from 9000 to 20,000. Considerable day to day fluctuations may occur in the same animal (see Figs. 1 and 2); large variations occur during the course of each day, commonly less than 5000, but sometimes as much as 9000. The differential count usually shows that the polymorph cells exceed 60 per cent., but sometimes the lymphocytes may preponderate.

Effects of Irradiation.—(1) The total white count may show a transient increase during the period of irradiation, but the figures obtained may be within the normal range of variation for the animal. The count then falls, as a rule steadily, sometimes with a slight transient recovery. On the third to the fifth day the white cells may have completely disappeared from the circulating blood or may be reduced to a few hundreds per c.mm. Following exposures of 75 or 90 minutes' duration this intense leucopenia persists till death, which occurs 3 to 9 days later (Fig. 1). In animals which survive a 60 minutes' exposure, some recovery in the white count occurs on about the eighth or ninth day and this continues slowly with irregular fluctuations. With doses of 30 minutes, the total white count does not usually fall below 1000 per c.mm. and signs of recovery are shown early (Fig. 2).

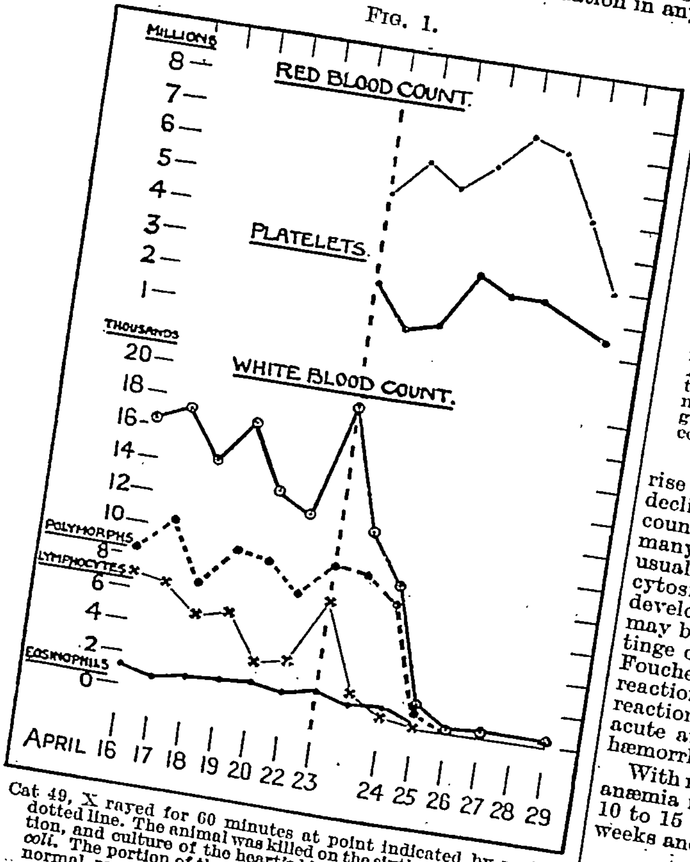
(2) The lymphocytes decrease from the onset of the irradiation; the fall continues as a rule steadily, occasionally with a slight temporary recovery. On the second or third day the lymphocytes have practically completely disappeared from the blood, even with doses of 30 minutes (Figs. 1 and 2).

(3) The polymorphonuclear leucocytes may show a transient initial increase during the irradiation. The initial changes in the total white count depend on the extent to which this inconstant increase in the polymorphs outweighs the regular decrease in the lymphocytes. The polymorphs then decrease, but more gradually than the lymphocytes; on the third to the fifth day the polymorphs may be reduced to a few hundreds or less and constitute 95 per cent. or over of the total count. With doses of 30 minutes the polymorph count does not fall below 1000 per c.mm., and tends to recover more rapidly than the lymphocytes (Fig. 2).

The Red Cell Count.

The range of variation noted in the series of animals studied was 5 to 13 million per c.mm., the usual range being 7 to 9 million. The range of fluctuation in any individual animal is commonly 1 million, and may be as high as 3 million.

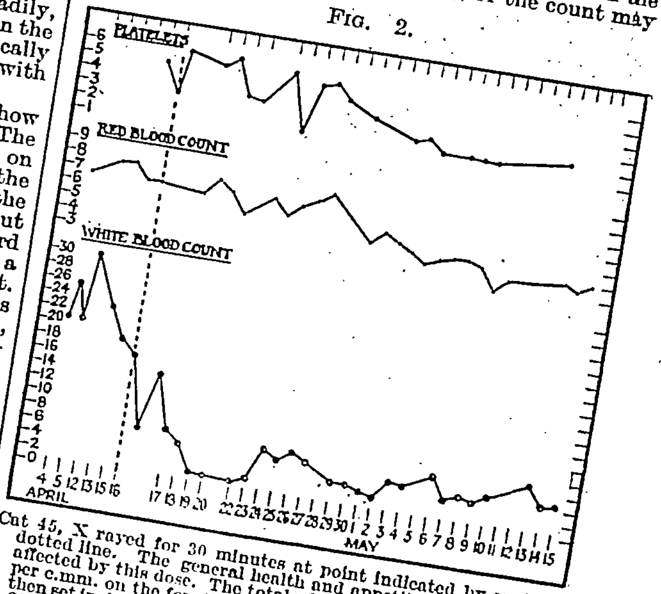
FIG. 1.



Cat 49, X rayed for 60 minutes at point indicated by vertical dotted line. The animal was killed on the sixth day after irradiation, and culture of the heart's blood showed infection with *B. coli.* The portion of the chart to the left of the arrow shows the normal range of fluctuation of the white count. The red count shows an initial increase and a terminal acute decrease, the final figure being 3 million per c.mm. The platelets show irregular fluctuations and still numbered 1·5 million when the animal was killed. There is a progressive decrease in the total white count, which fell to 200 per c.mm. on the third day after irradiation and remained at about this level to the end. The lymphocytes (normal range 3200 to 7200 per c.mm.) fell to 250 per c.mm. 24 hours after irradiation; the polymorph and eosiniphil counts decreased more slowly.

Effects of Irradiation.—The immediate effects are variable. There may be little change apart from the expected daily fluctuations (Fig. 2), or the count may rise for some days (Fig. 1), or show a steady mild decline (not illustrated). An increase in the total count is frequently associated with the appearance of many microcytes in the circulation. The red cells usually show crenation, poikilocytosis, and anisocytosis. With fatal doses a marked anæmia usually develops several days before death (Fig. 1). That this may be due to hæmolysis is suggested by the greenish tinge of the plasma which frequently gives a positive Fouchet reaction and a positive indirect van den Bergh reaction for bilirubin. The direct van den Bergh reaction in these cases was always negative. The acute anæmia may, however, result from widespread hæmorrhages.

FIG. 2.



Cat 45, X rayed for 30 minutes at point indicated by vertical dotted line. The general health and appetite were not much affected by this dose. The total white count fell to about 1000 per c.mm. on the fourth day after irradiation; slight recovery then set in, interrupted by temporary remissions. On the thirty-fifth day (not shown in chart) the count had risen to 7600 per c.mm. There was a rapid initial decrease in the lymphocytes and a more gradual decline in the polymorphs. During the recovery period the polymorph count exceeded the lymphocyte count. The red count showed irregular fluctuations (between 5·2 and 7·8 million for the first 12 days after irradiation.) From the fourteenth day the count steadily declined, the lowest value reached being 2·7 million on the twenty-second day. Slow recovery then set in; on the thirty-fifth day (not shown in chart) the count had risen again to 5·1 million, and on the 100th day it was 8 million. The platelet count before irradiation was between 3 and 5 million per c.mm. (citrate method). Observations made by the direct method for two weeks previously gave similar results (not charted). After irradiation the platelet count showed irregular fluctuations for 12 days and then sank steadily, the lowest value noted being 0·55 million per c.mm. on the twenty-second day; gradual recovery then commenced. On the 100th day the count had been restored to 3·5 million.

With non-fatal cases (Fig. 2) the development of the anæmia is more gradual, but is usually definite after 10 to 15 days. The count remains low for about two weeks and then recovery slowly sets in.

Platelets.

The range of normal variation noted in the small series studied is from 0·75 million to over 5 million. The latter figure is, of course, very much higher than that noted in man or the rabbit, but the counts have been made by two methods and repeated daily for many days so that we feel that they are substantially correct.

Effects of Irradiation.—(1) In animals that succumb the platelets have *not* shown any marked decrease before death. Thus cat 49 was killed on the seventh day when it was very ill; blood culture was positive showing *Bacillus coli communis*, but the platelet count on that day was about 1·5 million (Fig. 1). Cat 53 died on the tenth day with a platelet count of 0·75 million (see protocol); post-mortem examination showed pus in the pleura and multiple abscesses of the lungs. This is contrary to the experiences of Cramer, Drew, and Mottram[1] with the rat, who found a marked decrease in the platelet count following gamma-radiation in animals that died of intercurrent infection.

(2) In animals that survive, the platelet count generally follows the same course as the red count. For the first 12 days irregular fluctuations occur; a definite decline is then noted (Fig. 2), which continues for a number of days. The count remains at a comparatively low level for some weeks and then recovery sets in.

PROTOCOL.—*Cat 53.*

Day in May.	R.B.C. in millions per c.mm.	W.B.C. per c.mm.	Platelets in millions per c.mm.	Plasma chloride.*	Remarks.
7th.	7·4	14,400	1·2	0·605	Coagulation time 7·5 min. Wt. 2360 g.
8th.	7·9	12,000	1·1	0·605	—
	Irradiate whole animal for 60 minutes.				
9th.	7·0	7,000	0·95	—	Coagulation time 2·5 min.
10th.	8·1	1,200	1·2	0·625	—
13th.	7·9	200	—	0·625	—
14th.	8·0	800	0·9	0·625	—
15th.	7·5	600	0·63	0·615	Poikilocytosis and anisocytosis. Many very small red corpuscles.
16th.	10·2	0	1·1	0·625	Red cells very crenated and empty-looking. Very many minute red cells.†
17th.	6·6	0	1·3	0·625	Crenation and poikilocytosis less. Small red cells no longer present.
18th.	6·2	0	0·75	—	Animal very ill.
19th.	—	—	—	—	Dead.

* g. NaCl per 100 c.cm. † Evidence in counting chamber of fragmentation of red cells.

The white count showed the usual decline; no white cells were visible from the eighth day onwards. The rise in the red count to 10 million on the eighth day was associated with intense poikilocytosis and anisocytosis and the appearance of numerous very small erythrocytes. The platelets showed irregular fluctuations and numbered 0·75 million before death.

The plasma chlorides (as NaCl) fell from an initial value of 0·605 g. per 100 c.cm. to 0·615 g.

Post-mortem examination.—Pleural cavities contained much pus; multiple abscesses of both lungs. The endocardium and pericardium were turbid; there was a hæmorrhagic effusion into the pericardial sac. Minute hæmorrhages in cortex of kidney, in the spleen, and in the mucous membrane and musculature of the small and large intestine.

Summary.

This paper illustrates the selective action of X rays on the blood cells of the cat. The doses of irradiation employed were definitely less than the lethal dose for Jensen's rat sarcoma cells, approximately ¼ rad. or under.

The following is a summary of the more important changes observed.

(1) The lymphocytes are decreased early and markedly.

(2) The polymorphonuclear leucocytes after an inconstant initial increase, decrease more slowly and sometimes to a smaller extent.

(3) Marked changes in the red cell count occur later still: (*a*) in fatal cases, an acute anæmia develops in the final stages associated with evidence of hæmolysis or the presence of widespread hæmorrhages; (*b*) in non-fatal cases the anæmia develops very slowly and recovery is similarly gradual.

(4) The blood platelets are apparently unaffected in the cases that have ended fatally within a short time of irradiation, even when there is evidence of infection. In cases that survive the platelet count declines parallel with the fall in the red count, and then shows a gradual recovery.

These results form part of a more extensive research which will be published more fully elsewhere. We are deeply indebted to Prof. Sidney Russ for his advice and help throughout this work.

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[1] Cramer, W., Drew, A. H., and Mottram, J. C.: Proc. Roy. Soc. B., 1922, xciii., 449.

Clinical and Laboratory Notes.

THE COLORIMETRIC ESTIMATION OF VITAMIN A.

BY THOMAS MOORE, D.Sc.

(*From the Medical Research Council's Nutritional Laboratory, Cambridge.*)

THE original suggestion of Rosenheim and Drummond[1] that the well-known colour reaction of cod-liver oil with sulphuric acid was attributable to the presence of vitamin A has been approved with increasing confidence during the past eight years. More delicate reactions, notably with the antimony trichloride reagent,[2] have since been evolved, and by the use of a specially adopted form of the Lovibond tintometer[3] this reaction has been made the basis of a very convenient method of titration. The report of the Accessory Food Factors Committee published in THE LANCET[4] stated that in so far as concerns the grading of cod-liver oils the colorimetric method afforded information consistent with that derived from biological tests carried out in several independent laboratories. Drummond and Baker[5] have gone so far as to suggest that the vitamin may be assayed more accurately by colorimetric than by biological methods.

In other quarters, however, the specificity of the colour reactions has been questioned. On the one side Steudel and Peiser[6] have stated that the "vitamin" reaction is given by inactive crude cholesterol, while in the opposite direction Steudel[7] has also encountered a substance which although active in doses of 1·0 g., produced no colour reaction. These criticisms, although indicating certain difficulties which might arise in the application of the colorimetric technique, can be readily answered on theoretical grounds. For in the first instance chromogens derived from cholesterol may usually be readily distinguished from the vitamin chromogen by their inability to produce colorations when dissolved in natural oils; in the other direction very weak sources of the vitamin may produce colorations so faint as to escape observation unless the test is carried out on the unsaponifiable fraction rather than on the whole oil. Further criticism of the specificity of the reaction has been put forward by Hawk,[8] who has claimed that the chromogenic value of cod-liver oil may actually increase in samples exposed to climatic conditions calculated to cause destruction of the vitamin. Jones, Briad, Arzoomanian, and Christiansen[9] have also reached a similar conclusion, having found that in certain samples of cod-liver oil the colorimetric assay might exceed the biological assay by as much as 600 per cent.

Recently Euler and his co-workers,[10–14] who in a series of papers have claimed that vitamin A activity is not the property of a single substance, but may be possessed by several carotinoids or "polyenes," have indicated certain other objections to the general application of the colorimetric method of estimation. Different "polyenes" have been found to give colour reactions with varying intensity and shade, and no correlation has been found between the intensities of the colorations produced and the activity of the various polyenes. Certain polyenes—xanthophyll, lycopin, α crocetin, bixin and capsanthin—have, in fact, been found to produce colorations, although biologically inactive. Colorimetric data can therefore only be used as a basis of comparison when they are given by the same "polyene," or by a mixture of "polyenes" in constant proportions.

Preliminary experiments by the writer in confirmation of the claim that recrystallised carotin may possess intense vitamin A activity have already been mentioned in THE LANCET.[17] In view of the work of Duliere, Morton, and Drummond,[18] who have found after very thorough purification the pigment (M.P. 184·0°) becomes much less active, the main question of a possible relation of vitamin A to carotin must for the time being present a very open aspect. Nevertheless, the chromogenic properties of such samples of carotin (M.P. 174°) as have been found in my experiments to be consistently active, and also of the colourless inactive products which may be derived from them by mild oxidation, must be of immediate practical interest in illustrating certain difficulties which stand in the path of a universal application of the colorimetric technique.

It will be recalled that the well-known reaction of cod-liver oil with antimony trichloride is characterised by an absorption band at about 610 μμ, and until the discovery of the activity of carotin samples it seemed probable that the danger of the simulation of the test by casual inactive bodies could be ruled out by a spectroscopic confirmation of the position of the absorption bands. With highly active samples of carotin, however, the shade of colour produced is noticeably duller and more green, and is characterised by the appearance of an absorption band at 590 μμ. Any trace of the 610 μμ band, if present, is too weak to be detected, although judging by the biological activity well marked adsorption at this position would be expected. Vitamin A activity cannot therefore be restricted to materials producing adsorption at a specific position. Is the production of a blue coloration of any shade a sign of vitamin A activity?

In addition to the findings of Euler, experiments by the writer on the oxidation of carotin prove that this is not the case. When carotin in chloroform solution was treated in the cold with benzoyl peroxide[19] an almost complete bleaching was effected, which was accompanied by disappearance of physiological activity. Nevertheless it was found that the chromogenic value remained unaltered, and in common with vitamin A a transient blue coloration was still given even after dissolving the reaction products in arachis oil. In this case, therefore, a colorimetric assay of vitamin activity by the tintometer method would have furnished a completely deceptive result. Subsequent spectroscopic examination disclosed that the absorption band attributable to the original carotin was no longer in evidence. Selective absorption was much less clearly defined but appeared to be mainly at about 640 μμ.

The above results lend force to the suggestion of the Accessory Food Factors Committee that before a conclusion can be drawn as to the general validity of the colorimetric method of assay, tests should be made on substances other than cod-liver oil which contain vitamin A, such as butter, palm oil, cereal oils, &c. While the colour reactions of cod-liver oils, confirmed by rigid spectroscopic tests, probably provide a reliable means of estimation, the colour reactions of vegetable extracts and of some less familiar animal sources remain an almost unexplored field. Who would care to predict on purely colorimetric data whether cayenne pepper or an extract of boiled lobster shells (both rich in carotinoids) would prove effective as a source of vitamin A?

For the present it seems safe to assume that materials which give no blue coloration with antimony trichloride, even after the removal of saponifiable matter, must be devoid of vitamin A activity. Materials of liver oil origin giving colour reactions characterised by absorption at 610 μμ may be considered active. But, on the other hand, materials which give colour reactions characterised by absorption at other positions may be either active or inactive, or mixtures of inactive and active chromogens, and the biological technique still remains the only satisfactory method of assay.

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AN UNUSUAL CASE OF URINARY FISTULA.

BY ALFRED C. TURNER, M.B. BELF.,

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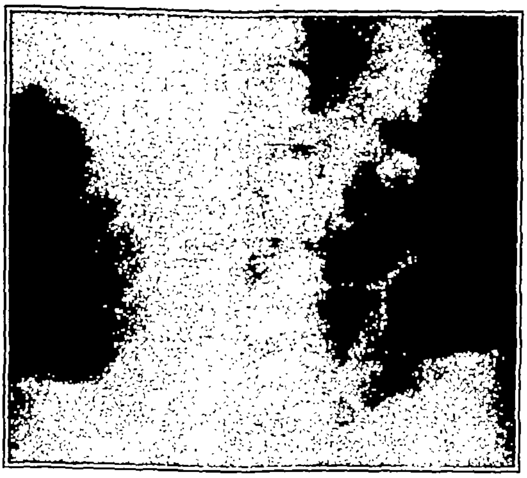
MODERN methods of diagnosis are so reliable that the end-results of neglect are rarely seen, and therefore the following case is interesting.

In February, 1929, a tribesman, aged 36, was referred to me on account of a discharging sinus in the upper part of his left thigh. He gave a history of an attack of pain in the left iliac fossa four years previously; this had occurred every spring. Nine months earlier a swelling had appeared in the upper part of the thigh, and this had been incised by his

FIG. 1.

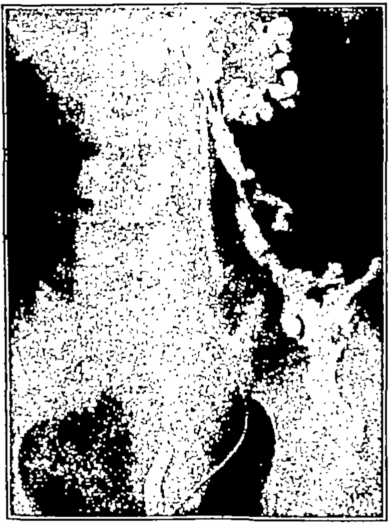


Calculi in the left kidney.

doctor and a discharging sinus had resulted. Periodically he had noticed a thick deposit in his urine, but no blood was ever present.

The discharging sinus was situated in Scarpa's triangle, immediately below the centre of Poupart's ligament, and had an orifice large enough to admit a No. 10 catheter. A probe passed without meeting any obstruction, running upwards and backwards for a distance of 6 inches. The vertebral column and hip-joint appeared normal. In the region of the left kidney, although the organ was not tender, there was a slight fullness which drew attention to it. The urine contained large quantities of pus. X ray and cystoscopic examinations were made, and the accompanying figures illustrate the condition. Fig. 1 shows the presence of renal calculi in the left kidney. Fig. 2 shows a ureteric catheter in the left ureter, arrested at the brim of the pelvis. An opaque injection has been made into the fistula and, having reached the kidney, is descending the ureter to a point a short distance proximal to the tip of the catheter, but in a more medial plane. A further radiogram showed a later condition in which the opaque emulsion, having traversed the "S" shaped course taken by the ureter was running down the ureter alongside the catheter.

FIG. 2.



Opaque emulsion in the fistula. Catheter in the left ureter.

The left kidney was explored by the usual approach. It was found fibrosed, half the normal size, and densely adherent to the surrounding structures. Numerous calculi could be felt. Owing to the adhesions to peritoneum and viscera, a nephrectomy was impossible. As decapsulation also proved unsuccessful, the kidney was split from pole to pole, and six calculi removed. A thick fibrous cord was felt joining the pelvis of the kidney at the junction of the inferior calyx, and on removal of a calculus from this calyx a large quantity of pus welled up. No normal tissue could be demonstrated in the kidney, which was left open and drained. Two months after operation the sinus had closed, the nephrotomy wound healed, and when the patient was discharged he had no symptoms and had gained weight.

My explanation of the sequence of events which led to the condition found at operation is that, owing to delayed diagnosis, the chronic inflammation caused such dense adhesions that an abscess formed within the psoas sheath and tracked down to Scarpa's triangle.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

PROCEEDINGS OF THE REPRESENTATIVE BODY.

(Concluded from p. 197.)

Heroin: An "Oppressive Restriction."

THE Dangerous Drugs Acts, and especially the new regulations about heroin, produced a crop of protesting resolutions, and Dr. J. W. BONE took the opportunity to explain how the situation had arisen. The Act of 1920, he said, under which the profession had worked quite happily, required that practitioners should keep a record when prescribing drugs containing more than 0·1 per cent. of morphine or heroin, or 0·2 per cent. of cocaine or opium. In 1925 Great Britain pledged herself at Geneva to apply the Dangerous Drugs regulations to all preparations of heroin, of whatever strength, and this provision of the 1925 Act came into force on Jan. 1st of the present year. The Association had actively objected to it in 1925 and was still in correspondence with the Home Office. Sir Malcolm Delevingne's principal argument now seemed to be that nothing could be done in face of the international agreement, but in point of fact the Convention stipulated that the requirement to enter the quantities distributed need not necessarily apply to supplies dispensed by medical practitioners or to sales by duly authorised chemists. Unfortunately, the Act of 1925 which applied the Convention to this country contained no such proviso and said definitely that any strength of heroin must be recorded. Dr. Bone had always thought this an oppressive and unnecessary restriction on medical practice and at last he was finding wide support for his views. He thought the meeting might well suggest that legislation to amend the Act in this sense should be encouraged. It was commonly said, he added, that Great Britain was the only country which had honourably tried to carry out the terms of the Convention and that the United States had taken no steps to ratify it. America was, however, in a fair way towards cutting heroin out of the pharmacopœia of every doctor; and with good reason, for in the States heroin addiction was undoubtedly a serious problem and justified measures which he saw no reason to enforce in this country.

Dr. R. M. MANWARING-WHITE spoke of the great value of heroin in such conditions as dry irritable cough, and suggested that its use might be diminishing under the present exacting restrictions. He understood that there were practically no heroin addicts in this country.

Dr. JOHN STEVENS held that there was no reason for extending the restrictions to this valuable drug for which there was no really adequate substitute—and proposed for Edinburgh and Leith a motion which strongly supported the Council "in its effort to obtain amendment of Section 8 of the 1925 Act," and recommended that "heroin and its salts should come under the same conditions as morphine and its salts." This motion was passed by the Representative Body, with the following addition made at the instance of Dr. F. TEMPLE GREY:—

> Also that the Council should on all possible occasions urge the Government not to enter into international conventions involving medical questions until the opinion of the medical profession has been ascertained.

Dangerous Drugs and Record-keeping.

Dr. STEVENS got little support for his complaint that it is impossible for a practitioner to have his stock of dangerous drugs under lock and key and at the same time have them available for inspection in his absence, but a discussion arose on the third proposition which he brought forward for his Division.

The Regulations say that no record need be kept when a drug or preparation is *administered* by, or under the direct supervision and in the presence of, a doctor. Dr. Stevens suggested that a similar exception might be made when it was administered "under his authority given to a nurse or other responsible person."—Mr. DAVID LEES supported this proposal on the ground that it provided an alternative to the present system under which a medical man might prescribe 50 or 100 tablets and send them to a nursing home where they could be used ad lib. by the patient.—Dr. F. RADCLIFFE said he understood that if nurses in a home administered doses of morphia and entered these doses in a book, kept at the home, this would cover what the doctor had ordered by lots of 50 or 100.—Dr. BONE, in reply, described the practice mentioned by Mr. Lees as quite irregular, and made it clear that a record must certainly be kept if a dose is given in the absence of a doctor. In the case of a hospital or nursing home a book must be provided for the purpose by the institution; where, on the other hand, the drug is given by a nurse to a patient in a private house, the practitioner who has supplied it must enter the doses on his own register.

The amendment proposing an alteration in this rule was lost by a large majority.

Relation of the Private Practitioner to the Public Health Services.

Last year the Representative Body viewed with concern "the insidious inroads continually being made on private medical practice under the auspices of the State, voluntary bodies, and others," and recorded its opinion that "the increasing tendency to transfer the treatment of many diseases and conditions to whole-time medical officers" is detrimental to the public health. Dr. Alfred Cox, the Medical Secretary, has since reported personal investigations into the working of maternity and child welfare centres and school clinics, and the Council has prepared an elaborate report whose conclusions and recommendations were presented to the meeting by Dr. BONE.

After stating that the main sphere of the private practitioner is the giving of medical advice and treatment to individuals, whereas the main sphere of the public health officer is the promotion of healthy conditions for the community, the Council goes on to point out that there is no definite line of demarcation between these spheres and that in both there is need and opportunity for clinical and preventive work. So far as possible the private practitioner and the medical officer should associate themselves, and be interested in, each other's work; nevertheless "the general direction of services established by or under the auspices of the local authority should be entirely within the province of the public health medical officer; and equally no clinical work should be undertaken by public health medical officers which can, with due regard to administration, be done as well by private practitioners." The profession, says the Council, recognises the propriety of central departments and local authorities making provision for medical advice and treatment, but public centres and clinics should not be developed in such a way as to militate against or interfere with suitable developments of a contributory National Health Insurance scheme for the appropriate sections of the population.

> "The work of such clinics should therefore be primarily directed to education in the general rules of health and of hygiene; medical or surgical advice or treatment for the individual should be confined (*a*) to such treatment as can be actually given therein, and should not include any treatment that makes domiciliary attendance advisable or involves a stay of more than 48 hours at any clinic where beds are provided; and (*b*) to those patients who are unable for some reason to obtain treatment from a private doctor and those who, as a result of supervisory medical work undertaken by the local authority, are discovered to be ailing, and for whose ailments treatment would not be sought unless it were provided by the local authority."

The question of the existence of a family doctor, or of the possibility of securing one, should be raised, the Council maintains, in respect of every case attending a clinic, and such officers as health visitors and midwives should be actively discouraged from sending direct to a clinic any cases which can be dealt with privately. The question how far private practitioners can undertake the work of the clinics should be seriously considered in each locality in conference with local practitioners, and wherever practicable "all medical advice and treatment at local clinics should be given on a part-time basis by private practitioners, whether it is within the sphere of general practice or whether it is of a specialist character." Those who accept such service must, it is emphasised, be genuinely interested in the work they undertake to do and must look on it as the first call on their time.

Dr. EUSTACE HILL, supporting these recommendations, cited instances in which maternity and child welfare work was very well done by private practitioners on a part-time basis, but pointed out that some medical men did not like sending their patients to clinics run by other doctors practising in the same district. The work of a welfare centre was seriously interrupted if a practitioner failed to attend because he was looking after his own affairs, and it could not be conducted on this basis. Despite undoubted administrative difficulties Dr. Hill felt that part-time work had many advantages.—Dr. E. R. FOTHERGILL spoke of the revolutionary changes in medical work since the beginning of the century, and said that the Council was hoping to present to the next Representative Meeting an ideal scheme for medical service in this country, showing the lines further changes ought to take.

A number of details arising out of the report were referred to the Council for consideration, but the conclusions and recommendations outlined above were accepted without much discussion.

Dr. C. FORBES, for Aberdeen, proposed "That the functions of the health visitor and district nurse could with advantage be fulfilled by one and the same person or public nurse; and that this public nurse, for purposes of domiciliary health education and propaganda, should be under the immediate direction of the family doctor, where such exists." This plan, he said, had been successfully tried in Aberdeenshire. But it did not commend itself to the Representative Body, and Dr. EUSTACE HILL described it as an encroachment on the sphere of preventive medicine which would certainly not be acceptable to local authorities in England.

Reform of the Poor-law.

Dr. BRACKENBURY reminded the meeting that under the new Local Government Act the councils of counties and county boroughs were now preparing schemes for carrying out the functions which would be transferred to them next year. If they liked to do so these councils could go a long away towards getting unified public health services. On the other hand, they need not. The Association was anxious to get them to break up the poor-law so far as they were able and use their other legislative powers instead. It also felt that the work would not be done as efficiently as possible unless medical men and ex-guardians were coöpted as members of the new poor-law committtees. The Council of the B.M.A. was therefore scrutinising the schemes as they appeared. There was a very unfortunate circumstance, however, which made one section of the Act almost a farce. It was laid down that the schemes had to be submitted by Sept. 27th, and as most of the councils did not meet in August or September the result was that many had already been published, whilst many others would appear shortly. The schemes were open to criticism for only four weeks after publication, and the effect of submitting them at this time of year was to prevent their consideration by local district councils or by central bodies such as the B.M.A. This had certainly not been the intention of Parliament, and he appealed to local authorities to defer the actual submission of their schemes until the last possible day.

Dr. Brackenbury also referred to Section 13 of the Act, which says that before making any additional hospital provision, or any different use of transferred hospitals, local authorities must consult any body which they regard as representing the voluntary hospitals of their area—including both the medical staffs and the governing bodies. It was highly important that in every area there should be such a body and the Council earnestly asked members of the profession to take immediate steps to promote the formation of these consultative committees. If there were cottage hospitals in the district they too should be represented.

Representation of Profession on Local Authorities.

Speaking on another section of the Council's report Dr. Brackenbury pointed out that more and more members of the medical profession were being drawn into contractual relation with the work of the local authorities. This meant that more and more were being legally deprived of the right to take part in public health work as members of those authorities. The Local Government Act would greatly swell the numbers of those whose medical experience could not be placed at the disposal of the community, and the Ministry of Health realised that this was not in the public interest. It was interesting to note that teachers were not debarred from belonging to education authorities, and were indeed obliged to send representatives.—In the course of a brief discussion on this topic a representative said that he had two partners, one of whom did part-time work at a public clinic. Because of this appointment all three members of the firm were prevented from taking any part in the government of their town.

Representation of Profession in Parliament.

So much non-controversial talk proved a little enervating, and everyone brightened up noticeably when asked to destroy the Association's Parliamentary Elections Fund. The Chairman and the meeting amiably accepted an assurance from representatives of the press that they would observe their usual discretion in suppressing names and details, after which Dr. E. K. Le Fleming entered on an account of the Fund's recent history. It had proved impossible he said, to support any Labour candidate at the general election principally because the Labour Party still held by nationalisation or municipalisation of all hospitals and the ultimate establishment of a whole-time salaried State medical service. As stated in the published report of the Council, approval and support had been given to the candidature of two members of each of the other parties—namely, Dr. J. H. Morris-Jones (Lib.), Dr. A. Vernon Davies (Cons.), Dr. J. Vincent Shaw (Lib.), and Dr. L. Haden Guest (Cons.), all of whom expressed themselves as in favour of the Association's policy. The two former had been elected. The Fund, said Dr. Le Fleming, had not been too well supported, but after much thought he had come to the conclusion that it served a useful purpose. It was valuable to have in the House medical men who could accurately represent the views of the profession as set out in the policy of the B.M.A.

Dr. Fothergill, proposing for Brighton that the Fund, having failed of its purpose, should be wound up and that the money should be used for cognate purposes, said that legislation was now done in Whitehall, not at Westminster. An M.P.'s duty was first to his party, then to his constituents, and then to his profession. Some would put conscience first; in a few instances this might be so. At any rate, the Association was already in a position to approach the central authorities at Whitehall and the local authorities elsewhere, and it could best gain its ends in this way.—Mr. Bishop Harman also wanted to kill what he described as "this untimely child," and the proposal got further support from Dr. Peter Macdonald, despite (he said) the arguments advanced in its favour.

Sir Richard Luce said he had always been opposed to the Fund and had never been ready to take anything from it. After a man's duty had been done by conscience, constituents, and party—in that order, he thought—what then was left? A Member of the House who was paid to represent some outside body—that was what it came to—was liable to the taunt that he went there to represent special interests. To be in such a position was unpleasant, especially to a professional man. Anyone familiar with medical work would be listened to in Parliament with respect and attention, but he would have nothing like the same influence if it was recognised that he was there to support the interests of his profession. Sir Richard did not believe, moreover, that the Fund had ever got a man in who would not have been elected without its help.

Dr. D. F. Todd spoke of the educative effect of having medical men in the House. They went not to represent the profession directly, but to represent the community.—Dr. S. Morton Mackenzie wanted to let the Fund go on, and so did Mr. McAdam Eccles.—Dr. Brackenbury said it had failed financially, but in a more modest form was an essential part of the machinery; Dr. Temple Grey pleaded for its abolition; Dr. Le Fleming replied in its defence; and eventually Dr. Fothergill's resolution to wind it up was put to the meeting and defeated.

A Medical Ophthalmic Service.

As there is little likelihood of any draft regulations about ophthalmic benefit being issued in the near future the Council has agreed that the National Ophthalmic Treatment Board shall put into operation a scheme for an ophthalmic service approved by the Representative Body last year.

By arrangement under this scheme, it is stated, insured persons and their dependents may have their eyes examined "by an ophthalmic medical practitioner at his private consulting room," and obtain spectacles, at an inclusive fee of 18s. Arrangements have also been made whereby non-insured persons who cannot afford the ordinary fee and whose family income does not exceed £250 a year, may take advantage of these facilities. The spectacles will be supplied by members of the Association of Dispensing Opticians, who practise no sight-testing. The scheme will be administered by a National Ophthalmic Treatment Board comprising representatives of this association and of the B.M.A.; the Minister of Health, and approved societies are also being invited to send nominees. Particulars may be had from the general secretary of the Board at 1, High-street, Marylebone, London, W. 1.

Dr. R. Wallace Henry (chairman of the Ophthalmic Committee) said he believed the scheme would be found quite workable, and Mr. Bishop Harman described it as a really valid attempt to cater for one of the great needs of civilisation. He believed it would be adopted by public authorities and other organisations to the great advantage of the public.

Vaccination.

Newcastle tabled a resolution demanding that "Government lymph should be available for all practitioners and that every general practitioner should be able to vaccinate his own patients in the same way as public vaccinators, and obtain similar remuneration from the Government." Bath wanted the meeting to pass a statement that—

> The Representative Body views with concern the spread of small-pox in this country and the difficulty of ensuring adequate vaccination of the public; that one of the reasons for this inadequacy of protection is the uncertainty of certain preparations of vaccine lymph; that sometimes these fail to produce reactions and vaccinated persons acquire small-pox, at other times the reaction is so severe that the health of the patient is seriously affected; that experience shows that these objections do not apply to Government lymph, but this is not available for other than public vaccinators, and in the case of immediate contacts for medical officers of health; and that the Representative Body urges the Council to represent to the competent authorities that vaccination cannot be properly promoted unless they are prepared to provide Government lymph to private practitioners (if necessary on payment) or to give a Government guarantee of efficiency to supplies of lymph prepared by private firms.

In 1923 the Minister of Health told the Association that he understood there was no difficulty in obtaining supplies of glycerinated calf lymph from reputable firms, that the Government Lymph Establishment was established to provide lymph for the primary vaccination of infants by Government vaccinators, and that the supply of such lymph to doctors would involve a large and costly extension of the present supply for which he saw no need.

This statement, which has since been repeated several times, was criticised for Bath by Dr. R. G. GORDON. It was time, he said, that everyone woke up to the fact that the incidence of small-pox was becoming serious. The lymph obtainable from reputable firms was sometimes ineffective and sometimes drastic in its action. He would say nothing about post-vaccinal encephalitis, because our present knowledge did not justify dogmatic statements about it. It was recognised, however, that on the whole Government lymph gave relatively constant results, and at a time when small-pox and the disuse of vaccination were both increasing it was surely not too much to ask that a supply of such lymph should be available.—Dr. MIDDLETON MARTIN thought that the grave difficulties in the way of getting the public to appreciate the importance of vaccination should be combated by encouraging practitioners to use their influence in the home. He hoped that further facilities would be provided.

In the subsequent discussion a public vaccinator was quoted as saying he had never had a failure with Government lymph in 21 years—whereas lymph from a private firm might give as few as 25 per cent. of "takes"—and Dr. W. N. WEST-WATSON said he had been struck by the small proportion of successful results with the lymph he had been using recently.—Dr. B. H. PAIN said that when some years ago he proposed in the *Times* that every medical man should vaccinate his patients at the cost of the public an inspector from the Ministry informed him that this would be expensive and would involve placing practitioners under supervision. Accurate records had to be kept so that if anything went wrong the lymph could be traced to its origin.

Dr. BRACKENBURY recommended caution, if only because there were members of the Association whose livelihood depended on the private manufacture of lymph. When vaccine proved ineffective complaint should be made to the Therapeutic Substances Act Advisory Committee.—The CHAIRMAN (Dr. Hawthorne), as a member of that committee, said that there were inspectors under this Act just as under the Food and Drugs Act. Though these inspectors examined samples of lymph as part of their duties, their procedure would doubtless be hastened by specific complaints.—Dr. C. E. S. FLEMMING maintained that if this Act controlled the preparation of lymph, then its control was inadequate. A number of people in his district had been made seriously ill by vaccination, and this had naturally affected public opinion adversely.

Dr. J. B. MILLER said that the general practitioner, who had to take the responsibility of advocating vaccination, ought to be able to feel confident in the lymph used for the purpose. Dr. Miller did not regard official supervision as a hardship; but Dr. E. LEWYS-LLOYD (Chairman of the Public Health Committee) remarked that if anyone was under the impression that the record-keeping and inspection of public vaccinators were nominal, he was making a mistake. In Dr. Lewys-Lloyd's opinion the Therapeutic Substances Act did give a guarantee, and if any sample of lymph was inefficient the machinery of this Act should be set in motion.

Ultimately the proposed resolutions were referred to the Council for consideration.

A State Medical Service: Possible Unsoundness of the Young.

Bearing the arms of Kensington Mr. E. B. TURNER entered the lists with a motion condemning the project of a whole-time salaried State medical service and calling on the Association to educate and organise its members to resist any legislative attempt to set one up. The proposal would either have to be fought or allowed to go by default; and he was all for fighting. If the profession felt about it as he did, then steps should be taken to form opinion. There was a large body of younger men whose outlook was largely bounded by contract practice, and who would easily be lured into a State medical service. "Si vis pacem, para bellum," said Mr. Turner—apparently unaware that the sentiment is out of fashion.

Dr. BRACKENBURY was almost scornful. The motion had an air of panic. If one thing was certain it was that the whole medical profession was fully decided that it would not work a whole-time medical service.—And did Dr. Brackenbury remember, asked Mr. TURNER, how sound and solid the profession had been about national insurance? How 27,000 practitioners had said they would not go on the panel till the B.M.A. took away its embargo, and how they flocked to do so before that embargo was removed? Would it not have been better then not to have passed quite so many unanimous resolutions at crowded meetings, but rather to have considered and discussed the views of the silent minority?

Dr. H. S. BEADLES did not believe the profession was "solid" at all. He thought many young men would willingly join a whole-time service, though they would not be wise to do so.—The same view was taken by other representatives, one of whom spoke of an "enormous number" of men who wanted such a service.—Mr. BISHOP HARMAN said this was absurd; 99 men out of 100 had spunk enough not to prefer whole-time salaried work to the adventure of practice.—Dr. C. E. S. FLEMMING suggested that the best way to meet this talk about a State medical service was to formulate a comprehensive scheme in its place, as the Council hoped to be able to do next year.—Finally a member who rashly compared the advantages of private practice and public work was eliminated by Dr. BRACKENBURY, who said that such comparison had nothing to do with the case. What the Association had always set its face against was not the public health service, but rather the stereotyping of ordinary family practice into the form of a State medical service. In favour of this, he repeated, there was *no* considerable body of medical opinion.

Not much more was said on this subject. Rejecting Mr. TURNER's motion for mobilisation, the meeting contented itself with reaffirming its former convictions on the subject of a State medical service.

Need of Superannuation Schemes for Medical Officers.

Arising out of the case of the late tuberculosis officer for Gateshead, who is believed to have contracted encephalitis lethargica from a patient in the course of his duty and on losing office received no compensation in spite of steady pressure on the local authority concerned, Dr. R. FORBES for Gateshead proposed:—

That . . . it be an instruction to the Council: (*a*) to take such action as it deems necessary to urge local authorities to adopt superannuation schemes under which the medical officers and their staffs would benefit. (*b*) To make strong representation to all local authorities that where a medical officer is disabled permanently or with fatal results, through contact with infectious diseases, and where his disability is directly traceable to his work in this respect the dependents of the practitioner should be suitably compensated for the loss involved.

Describing the case as one of great hardship, Dr. Forbes said that a medical officer who was required to stand between the community and infectious disease ran a rather special risk, and it was not too much to ask that the community should compensate him or his dependents.—The motion was carried.

Remuneration of Poor-law Medical Officers.

Attention was drawn by the North of England Branch to the deplorable conditions of service under which poor-law medical officers are at present working in areas where unemployment is rife.—Dr. R. FORBES said that the question was national rather than local, but Dr. BRACKENBURY replied that the Council, while fully aware of the misfortunes of these officers on Tyneside must also take into account the fact that in many parts of England medical men would be sorry to have the terms of their service reviewed. The following motion by Gateshead was approved:—

> That the Representative Body, recognising that poor-law medical practitioners will shortly become the servants of a new authority, considers that the time is now opportune to explore the status and remuneration of these officers, and instructs the Council to examine the whole matter and take such steps as are necessary to secure equitable terms of service and adequate remuneration for the work involved.

Other Subjects Discussed.

The meeting agreed to the two following proposals of the Council:—

> That the Representative Body reaffirms the opinion it expressed in 1924 that the General Medical Council and the profession generally have acquiesced in the custom, now of long standing, of advertising in the lay press, nursing homes, sanatoria, and hydropathic institutions, and feels that, in any policy formulated by the Association, regard must be had to this custom; and further that the R.B. takes no exception to the association of registered medical practitioners with an institution for the treatment of patients by physiotherapeutic and electrical methods, provided the following essential conditions are strictly conformed to: (*a*) That the institution is not in any way advertised to the lay public; (*b*) that the treatment of all patients is under the direct control of a registered medical practitioner who accepts full responsibility for their treatment; (*c*) that the relation between the medical officer of the institution and private practitioners conforms to the usual ethical procedure between consultant and private practitioner.
>
> That the following Clause 1 (1) of the Preservation of Infant Life Bill (as sent from the House of Lords to the House of Commons) be approved:—1.—(1) Subject as hereinafter in this subsection provided, any person who, with intent to destroy the life of a child capable of being born alive, by any wilful act causes a child to die before it has an existence independent of its mother, shall be guilty of felony, to wit, of child destruction, and shall be liable on *conviction thereof on indictment to penal servitude for life*; provided that no person shall be guilty of an offence under this section unless it is proved that the act which caused the death of the child was not done in good faith for the purpose only of preserving the life of the mother.

Dr. ELEANOR LOWRY, for Marylebone, proposed a motion (which was carried) deploring "the insufficient provision which exists for the administration of the beneficent provisions of the Mental Deficiency Acts" and assuring the Minister of Health of the support of the B.M.A. in urging the local authorities to meet the grave need for institutional care.—Dr. H. C. BRISTOWE spoke strongly of the extent of this need, and Dr. A. HAWKYARD mentioned that unfortunately attempts to get defectives into institutions were often hampered by members of the medical profession whose only object sometimes seemed to be to get their patients off. There was very little knowledge of the Acts among practitioners.

Dr. TEMPLE GREY proposed for Marylebone that "communications between doctor and patient, unless they concern fraud or crime or otherwise the public interest, ought to be privileged from disclosure in courts of law." The extreme view of the sanctity of medical privilege was, he said, not the medical but the social view. The public would demand medical privilege as soon as they realised that it was *their* secrets which were being given away.—The motion was *referred to the Council.*

On the report of the Organisation Committee Dr. MORTON MACKENZIE said that whereas there were only 1852 women medical practitioners in this country in 1922, the number in July of this year was 4259, of whom about two-thirds were members of the Association.

The Council's negotiations towards the establishment of an international medical sea code were approved. Dr. BONE said that the Board of Trade hoped to be able to make good use of the code proposed.

The General Medical Council.

It was announced that at the forthcoming election of Direct Representatives of the profession on the General Medical Council the candidature of Dr. H. B. Brackenbury and of Mr. N. Bishop Harman would be supported by the Association.

The CHAIRMAN and others referred in very warm terms to the work of Sir Jenner Verrall, who is resigning from the G.M.C. after over 18 years' membership. A resolution of deep appreciation of his services was placed on record.

THE ANNUAL GENERAL MEETING.

On July 23rd the retiring President, Sir Ewen Maclean, invested Prof. A. H. Burgess with his badge of office, after which the Chairman of Council, Dr. Brackenbury, invested Sir Ewen with the new past-president's badge. In reporting that the Representative Body had elected Dr. W. Harvey Smith, professor of ophthalmology in the Manitoba Medical College, as President for 1930–31, Prof. Burgess said that the last meeting of the Association held abroad was at Toronto in 1907, and that the next would be at Winnipeg in 1930 under Prof. Harvey Smith's presidency. The treasurer, Mr. Bishop Harman, formally presented the new symbolic staff which he has given to the Association.

At the adjourned annual general meeting later in the same day the President delivered the address which we published last week. He presented the Sir Charles Hastings clinical prize to Dr. Arthur Crook, of Norwich, the Hempson prize to Dr. A. C. T. Perkins, of Bury St. Edmunds, and the Middlemore prize to Mr. W. S. Duke-Elder.

THE RELIGIOUS SERVICE.

The Bishop of Manchester, the Lord Mayor of Manchester, the Mayor of Salford, the Chancellor and Vice-Chancellor of the Victoria University, and officials of the Association attended the service in the Cathedral on the 23rd. The Archbishop of York was the preacher. In the course of his sermon Dr. Temple suggested that the advance of science was liable to create a sense of insignificance in mankind and thereby might operate against the sense of responsibility which was one necessary part of the religious man's existence. Yet it was part of all religions that every moral choice made by human beings mattered more than the course of the stars to God who made them all. All new knowledge of the world was and had to be new knowledge of God.

SOCIAL AND OTHER FUNCTIONS.

The annual dinner of the Association was held in the Free Trade Hall on July 25th, Prof. A. H. Burgess presiding. Covers were laid for 600 guests, and more would have attended had it been possible. After the loyal toast ("The Duke of Lancaster"), Dr. W. J. Mayo proposed "The Cities of Manchester and Salford," recalling the fact that his father was a student in Manchester under John Dalton, and that the *Guardian* was quoted all over the United States as a sound, logical, honest, and fearless paper. Alderman Davy and Councillor Collins, in reply, both claimed Dalton, and made play of the administrative problems of two communities situated at each others' doors. Dr. A. T. Bazin, President of the Canadian Medical Association, invited the company to toast the sister Association, and Dr. H. B. Brackenbury, in responding, took the chance of setting out what the B.M.A. was and what it was not. The toast of "Our Guests" was proposed with infinite humour by Sir StClair Thomson, and responded to in the same vein by Judge T. B. Leigh. Lord Moynihan, proposing "The President," spoke of him as an "artist" in his craft. Prof. Burgess thanked all who had contributed to a successful meeting (not excepting the "Clerk of the Weather"), and especially the local general secretaries, Dr. E. Bosdin Leech and Dr. R. G. McGowan.

Honorary degrees were conferred upon a number of distinguished visitors at a congregation of Manchester University, held in the Whitworth Hall on July 24th, the Earl of Crawford and Balcarres presiding. The degree of Doctor of Laws was conferred on Dr. C. H. Mayo, Dr. W. J. Mayo, and Lord Dawson of Penn; that of Doctor of Science on Dr. C. O. Hawthorne and Sir Ewen Maclean. In replying for the recipients, including those whom he described as the "Heavenly Twins in Surgery," Lord Dawson said that the Public Orator, Prof. S. Alexander, had referred to Rochester as the Mecca to which all were drawn. To Britons, it was, he thought, more than that; it had played no mean part in strengthening the sense of unity between the free peoples on the two sides of the Atlantic. Among the problems to be faced by medical faculties was, he said, one of real importance at the present time; that was to try to bring about closer contact between the universities and the health services, not least to secure for the officers and workers in those services academic guidance and recognition.

On July 25th the Bishop of Manchester dedicated in the Eccles Parish Church a stained glass window, given by the Mayo brothers in memory of their father, William Worrall Mayo, who was born at Eccles in May, 1819, and died at Rochester, Minn., in March, 1911. In the inscription he was described as a pioneer, physician, citizen, a man of hope, vision, and achievement.

THE ANNUAL EXHIBITION.

An exhibition of surgical instruments and appliances, drugs, foods, books and the like, held in the City Exhibition Hall, Deansgate, from July 22nd–26th, was well arranged and attended. Some account of it will appear later.

COMBINED SECTIONS OF SURGERY, PHYSIOLOGY, AND BIOCHEMISTRY.

ABDOMINAL PAIN.

Opening Addresses.

Prof. E. D. TELFORD (Manchester) being in the chair, Dr. C. H. MAYO (Rochester, U.S.A.) opened the discussion by remarking that to-day the prize-fighter was not alone in his appreciation of the importance of the solar plexus. Abdominal pain, it was now generally agreed, was not merely a question of referred pain or of viscero-sensory reflexes. The structures in the abdomen were themselves sensitive to such stimuli as pulling—to undue contraction or distension. Even the solid organs, such as the liver and ovary, had proved themselves sensitive in operations performed under local anæsthesia, and it was well known that the puncture of an artery could be exquisitely painful. The parietal peritoneum was, of course, very susceptible to stimuli because of its rich innervation from the intercostal nerves, but the visceral peritoneum was also sensitive because of the white medullated fibres described by Langley in the splanchnic nerves. Dr. Mayo dealt at some length with the types of pain met with in gastric crises, their varying incidence, location, and duration, agreeing with Ryle that a more careful analysis of pain was necessary. He admired the contributions of the physiologists, and found Adrian's "Basis of Sensation" wholly delightful and extremely illuminating. Nevertheless, he concluded, "I think I have said enough to convince you that when the character and site of an abdominal pain tells something to the surgeon it does so not because he knows much about the underlying anatomy and physiology, but because he has encountered that particular pain many times before, and he remembers what he found when he opened the abdomen."

Sir FARQUHAR BUZZARD (Oxford) spoke on a more general and philosophic plane. He reminded his hearers that pain was, to the moralist, a corrective, to the physiologist, a protective mechanism, to the clinician, it played its part in healing, but we were not primarily concerned here with the question of the usefulness or uselessness of human suffering. As regards the abdomen, he regarded the territory of the sympathetic nervous system as presenting problems fundamentally different from the ordinary reflex phenomena of skeletal muscle. It was Ross of Manchester who clearly separated somatic from visceral sensation. However great were our difficulties, we should not hide our ignorance behind a diagnosis such as psychalgia or functional pain, and he hoped for the abandonment of such loose terms as rheumatic, neuritic and neuralgic. Sir Farquhar also dealt with the problems of gastric crises, and thought we might come to a diagnosis in such cases "without the necessity of worrying the patellar tendons." He quoted Hilton, "Every pain has its distinct and pregnant significance, if we will but carefully search for it."

Discussion.

Mr. JOHN MORLEY (Manchester) dealt with the views of Sir James Mackenzie on referred pain. He described some of the experiments he had made with Dr. Twining in which it was clear that the position of deep and sharply localised tenderness varied quite materially with posture, and again how referred pain could be proved to be referred, not from the viscus, but from the parietal peritoneum—e.g., from the diaphragmatic surface along the phrenics and to the shoulder. Dealing with the work of Weiss and Davis, in which the effect of local anæsthesia on the areas of referred pain had been investigated, he had repeated their experiments and in the main confirmed their findings. Their support of the Mackenzie view which they thence argued was, however, wrong, for in cases in which the abdomen was opened under spinal anæsthesia, a swab inserted under the diaphragm on one side caused referred pain in the corresponding shoulder, which could be abolished with local novocaine. If the swab were now transferred to the other side of the diaphragm there was extreme pain in the other shoulder, proving, since the spinal paths were blocked, that the impulses were spreading from the diaphragmatic peritoneum via the phrenic nerves. He regarded the application of analogies from the cardiovascular and genito-urinary systems to the intraperitoneal organs as most unfortunate, and maintained that Mackenzie's viscero-sensory and viscero-motor reflexes were twin phantoms, whose abolition would make diagnosis simpler and more accurate.

Dr. E. P. POULTON (London) thought that a reasonable physiological interpretation could be formulated to cover the facts of abdominal pain as at present known. He showed how, in a hollow organ, we should regard tonus rings simply as points where the tension is lower than elsewhere. Describing his experiments on the œsophagus, in which various arrangements of bags can be swallowed and held at different levels and the pressures within them recorded, he pointed out that pain was associated not with contraction but with relaxation. When and where the peristalsis was held up there was extreme pain, and the most severe type of colic was associated with such a hold-up of the peristaltic waves. He indicated how useful information about pain in the chest might be got by noting its relation to swallowing. If felt *after* swallowing the source of the pain was œsophageal. Other types of pain might be stopped entirely by swallowing, or made infinitely worse as in certain dyspepsias.

Dr. A. F. HURST (New Lodge Clinic) thought it unwise to underestimate the importance of reflexes, and said that is was evident from what we knew of the gall-bladder and appendix that visceral pain was mainly due to distension. Localisation in space of the members of the body was mainly due to the impulses arising in muscles, bones, and joints, but there was no similar rigid fixation amongst the viscera. Where an organ was fixed, the localisation of pain was very accurate and informative, but not so in movable organs. In his experience the localisation of pain did not vary with the changes in position of the organ. Pain from the appendix was usually sharply and constantly localised. From the terminal ileum it was referred to the umbilicus, but from the pelvic colon it was merely felt vaguely above the umbilicus in the mid-line. Directly the distension passed from the pelvic colon to the rectum, the pain moved to the perineum, as in the normal call to defæcation. He was not convinced that referred pain in the Mackenzie sense did not exist, and thought that the better study of abdominal pain should do much to improve diagnosis.

Resumed Discussion.

After a brief interval the discussion was resumed under the chairmanship of Prof. H. S. RAPER (Manchester).

Dr. J. A. RYLE (London) said that he had not a great deal of confidence in the evidence got with balloons and the other devices of the experimental physiologist. The piecing together of the wealth of information afforded by clinical observations was more important, but this very wealth was bewildering, and it was seldom that Nature produced a clean experiment. Taking as a type of abdominal pain that associated with spastic constipation, he showed how it might be systematically investigated by ten questions dealing with its character and degree, its spatial relationships, its temporal relationships—duration, frequency, and special times of incidence—and the factors, if any, which were to be regarded as aggravating or relieving its severity. His thesis, from his observations on colonic pain, was that the pain of disease affecting a hollow viscus was in that viscus and was a function of its musculature, that visceral pain may be localised with considerable accuracy, but that when inflammation or severe mechanical stress were lacking referred somatic signs and symptoms were generally absent. He considered that the pain of organic visceral disease was itself evidence of a functional disturbance, and might be closely simulated by the pain of a functional disturbance, without organic disease. He did not suggest that an abnormal degree of tonic shortening or hardening was the sole or even the usual cause of pain in the hollow organs of the abdomen, for there were stresses, not considered here, whereby tension in plain muscle-fibres might be exaggerated with resultant pain.

Mr. V. ZACHARY COPE (London) said that he had cast aside his five pages of typescript, as their matter had already been covered. He had three points he would like to emphasise: (1) Pain from some areas was very accurately referred. Thus the pain referred from the diaphragm should not be loosely described as "shoulder" pain—it was subclavicular, acromial, or supra-spinous according as the focus was anterior, medial, or posterior on the diaphragm, with symptoms due to the stomach, the spleen or liver, or the duodenum or enlarged glands. (2) Localisation by means of the parietes might be impossible. Thus he had himself experienced acute hypogastric (testicular) pain from an appendicular abscess, and had met the same reference of the pain in others. Hunger-pains, associated with the pylorus, might be due to a focus, God knows where! (3) He would remind us how much parietal sensibility varies in different areas. Thus pelvic peritonitis was much less painful and slower in developing pain than the upper abdominal type—the two areas might be regarded as "silent" and "demonstrative" respectively. He agreed with Mr. Morley that the viscero-motor reflex was a myth, the symptom being due to direct irritation of the parietal peritoneum. He had a feeling built on clinical observations that the viscera had a very much larger representation in the *left* side of the brain than in the right—he even estimated the proportion as ten to one! He felt that in the discussion the speakers had not sufficiently differentiated spontaneous pain from that elicited by pressure. In appendicitis, for example, the former was a general hypersensitiveness in the right iliac fossa, whilst the latter could be sharply localised but varied with posture and the like.

Prof. A. W. SHEEN (Cardiff) thought that pain was the last guide for a surgeon to use, and regarded tenderness as a much greater help. He felt very enthusiastic about sympathectomy, as introduced by Leriche for inoperable tumours. In answer to the really important question: Is a surgeon to operate for abdominal pain? he had followed up a large number of non-operated and non-diagnosed cases, and all but one—an obscure case of gastric crisis—were well and working. He referred to severe abdominal pain in erythema multiforme, and said that one of his most popular lectures dealt with 30 causes of abdominal pain in which the surgeon should by no means interfere. It would be a good thing if one could have in hospitals a border-line ward, in which *surgeon and physician could go round together.*

Dr. A. P. CAWADIAS (London) said that in a consideration of abdominal pain there were three elements to remember—the visceral, the nervous transmission, and the cortical perception, and that often the neurological and psychological points of view were as important or more important than the purely gastro-enterological. Too little stress was laid on the neuritis of the splanchnic nerve, which might be due to an acute infection such as dysentery or to a toxic factor such as alcohol or nicotine. The central perception element could be treated by local novocaine, or by counter-irritation of any kind to inhibit the pain, or by shock therapy. He would plead for a broader conception of abdominal pain, neurological and psychological as well as surgical.

Mr. A. R. FLINT (Leeds) briefly described a case in which, after total gastrectomy, there were incessant hunger-pains. (Dr. POULTON explained that there were contractions and relaxations in the jejunum as in the stomach and œsophagus.)

Replies.

In his reply, Dr. MAYO said that he had been struck by the wonderfully gentle way in which the speakers had treated each other, even where they had serious points of disagreement. It was the general view to-day that surgery was too much the surgery of sacrifice—sacrifices which would have been saved had patients, appreciating the significance of pain, gone earlier to their physicians. Medical discussions were still too much concerned with gross disease—too often treatment was expectant until there was something to sacrifice. Clearly food was implicated as a factor in the ætiology of most of these cases, and in the Mayo Clinic much attention was now being devoted to the allergies and food peculiarities. Referring to the Leriche operation, even this might only be successful for some months, and cases should be treated before such grave indications arose. "I *do dislike* the acute abdomen—laparotomy after laparotomy" were his closing words.

Sir FARQUHAR BUZZARD thought that in the case referred to by Mr. Flint he might be dealing with a form of "phantom stomach." He had been particularly pleased with Dr. Ryle's contribution to the discussion, but was shocked by Prof. Sheen. For himself he believed that we could learn far more by listening longer to our patients, and he would emphasise the danger of stressing the indications afforded by tenderness, since this was a symptom vitiated by fear.

SECTION OF RADIOLOGY AND RADIO-THERAPEUTICS.

EARLY DIAGNOSIS OF CANCER OF THE STOMACH.

Prof. Haudek's Address.

Dr. W. J. S. BYTHELL (Manchester) being in the chair, Prof. MARTIN HAUDEK (Wilhelminenspital, Vienna) opened a discussion on the value of X rays in the diagnosis of early gastric carcinoma. During the last decades there had been in Germany, said Dr. Haudek, an increase in the average duration of life from 38 to 57 years. From middle life onwards, cancer, next to cardio-vascular diseases, was the commonest fatal disease. In 35 to 40 per cent. of deaths from cancer the stomach was the site of the growth, and early recognition of gastric carcinoma was a most promising line of attack upon cancer. Now that X rays had been available in the diagnosis of cancer for 20 years, to omit their use in diseases attended by gastric symptoms was a professional error. Many thousands of cases of gastric carcinoma had been diagnosed by the aid of X rays, and the number of laparotomies at which incurable cancer was found had decreased (73·8 per cent. during 1901–14; 62·1 per cent. during 1915–25, Eiselsberg, Vienna). Unnecessary and merely exploratory laparotomies had also decreased in number, especially the latter. To the use of X rays also belonged some of the credit for the increase in the number of resections for carcinoma—from 22–40 per cent. between 1908 and 1924. But 60 per cent. of operations were still undertaken too late. Any estimate of the possibility of further progress—concerning which he was himself hopeful—must involve a consideration of present causes of failure.

There were, he said, three main causes of delayed radiological diagnosis of gastric carcinoma. (1) *The latent period*, during which the disease presented no symptoms. (2) *Delayed X ray examination*, due to latency and to non-recognition of the gravity of the local symptoms by doctor and patient alike. (3) *Faulty X ray examination.* At one time the difficulties of radiology were underestimated. Too much importance was still attached to apparatus, and too little to the operator by laymen, and unfortunately, by many doctors. X ray examination was sometimes undertaken by men with only a little technical training. The result of an examination depended far more on the skill of the investigator than on the quality of the apparatus. The X ray specialist should have a thorough basic knowledge of pathological anatomy and internal medicine. Similarly, physicians and surgeons who carried out their own X ray examinations must be familiar with general radiology, and if not certain of their findings must consult a radiologist of experience. X ray consultations were far too seldom requested. Screen examination without radiography was another fault in technique, especially in the diagnosis of carcinoma, where a study of the "relief pattern" of the mucosa (as seen in good X ray films) was essential. For each examination about half an hour was required, and no more than six to eight consecutive examinations should be undertaken. The investigation may require to be completed the following day. Superficiality and fatigue were inevitable if even an experienced radiologist was required to undertake 20 or 30 examinations in a few hours, as in some hospitals. The results might be only 10 per cent. worse, but what patient would like to be among the 10 per cent. in whom a cancer of the stomach was recognised too late?

Technique.—There was, said Dr. Haudek, no standard technique in gastric investigation. He commenced himself by taking an accurate history of the illness, as a frame into which the X ray findings fit. Before the abdomen was examined the chest was screened. The cause of symptoms hitherto attributed to the stomach might be thus shown to be aneurysm, pulmonary tuberculosis, malignant pleurisy, pulmonary metastases, or bronchial carcinoma. With the patient standing on a low footstool, the abdomen was palpated for increased tension of the recti, localised tenderness, or resistance. Four hours earlier the patient has taken for the motility test a meal of thick gruel containing 70 g. of barium sulphate. Apart from the large residues significant of pyloric stenosis, a small remnant might be visible as a "surface film" of an ulcerated carcinoma. The second meal consisted of about 300 c.cm. of a mixture just fluid enough to swallow, containing 120 g. of barium. The patient first drank one large mouthful, 20–30 c.cm., which was followed down the œsophagus. If there was any delay or dysphagia he gave a small gelatin capsule, containing one gramme of barium. If this, followed by a drink of water, passed undelayed through the cardia, malignant stenosis could be excluded, but the arrest of the capsule was of great service in the diagnosis of cancer of the cardia, whether originating there or in the stomach. When it reached the stomach the first mouthful of 30 c.cm. of suspension was dispersed by compression with Holzknecht's "distinctor" or a pad. The folds of mucosa were thrown into relief by a thin film of barium, and thus the whole stomach wall could be examined, unless retained secretion interfered (by dilution of the paste) with this study of the "relief pattern." Central shadow defects, or furrows between the lobes of a medullary carcinoma, led to a definite diagnosis of tumour. The borders of benign growths were circular and well defined. The stomach was then filled with the remainder of the suspension, and screened at different angles, the contour, the flexibility of the walls, and the peristaltic movements being studied. If in atonic, dilated stomachs the crescentic barium shadow did not reach the lesser curvature in spite of pressure, the patient was laid upon a couch on his right side for a few minutes and re-examined. He attached great importance to examination in the prone position for the study of peristalsis along the lesser curvature. A flat infiltrating growth on the lesser curvature might cause no disturbance of peristalsis along the greater curvature which alone could be studied in the erect position. In his opinion the examination of peristalsis on the lesser curvature (with the patient prone) rendered superfluous the expensive apparatus required for Fränkel's cinematography.

In the majority of cases Dr. Haudek found a single X ray examination to be sufficient, but if the motility test had shown retention of food or secretion, a second examination was required on the following day. Having taken only liquid food on the evening of the first examination the patient returned next day in a fasting condition, and before examination lay upon his right side for at least two hours, with the pelvis raised. The pylorus thus became the lowest point, and the stagnant contents were evacuated more completely than with a stomach-tube. About 50 c.cm. of very thick barium cream were then introduced into the empty stomach, and the examination of the relief pattern made as described; finally the gastric contour was examined with the full drink. If the method described failed, there was either pyloric stenosis, due to cancer or ulcer (which could be ascertained), or there was high-grade hypersecretion due to ulcer. To distribute the contrast substance Holzknecht's distinctor, or one or both hands were employed. The speaker did not use lead rubber gloves, relying on the thickness of the patient's body as a protective medium.

The number of very small growths discovered in the earliest stage was small. A much larger number of operable tumours had been sent to operation, but most numerous had been those in which inoperability has had to be reported. He showed on the screen a dish-shaped tumour which, with the stomach completely filled, might easily be confused with an ulcer niche. In the relief pattern, however, the folds of mucosa terminated abruptly before they reached the carcinomatous crater, whereas they converged upon an ulcer niche. Another slide showed an operable growth at the pylorus. The radiologist's interpretation and the histological report were in agreement that the lesion was a carcinoma, though at the macroscopic examination it had been assumed that an ulcer was present. Circumscribed scirrhus almost always originated on the lesser curvature just proximal to the pylorus, and the greater curvature was drawn towards the lesser as a "spigot" formation. In prepyloric ulcer and benign thickenings the lesser curvature was flattened, and the convexity of the greater curvature is maintained. Medullary carcinoma, even when near the cardia, was the most favourable type of tumour, both in case of diagnosis and operability. Characteristically it showed a central filling defect like a benign tumour, but the latter might sometimes be differentiated by its well-shaped edge, or pedunculation. The radiologist should never assume the responsibility of delaying operation because he considered a tumour as probably non-malignant. Another slide showed a commencing adenocarcinoma high up in the body of the stomach, clearly visible in the partly filled stomach, but impossible to demonstrate with the stomach completely filled. In no single clinically suspicious case in which he had excluded carcinoma during the post-war period had the disease, said Dr. HAUDEK, been later shown to exist. Erroneous diagnosis of cancer was most frequent in the pars pylorica, and the differentiation of ulcer and cancer was most difficult there because ulcers of the pars rarely show niches, and were often accompanied by considerable submucous œdema, which caused irregularity, and by spasm. Thirty per cent. of prepyloric ulcers underwent malignant degeneration compared with 3 per cent. in the pars media. He referred to investigations upon the significance of gastritis in early diagnosis of cancer (Orator). If it became possible anatomically to distinguish precancerous gastritis from that associated with ulcer, resection of precancerous gastritis would represent the early operation for carcinoma (Konjetzny).

Discussion.

Dr. A. E. BARCLAY (Cambridge) acknowledged the deep indebtedness of radiologists to Prof. Haudek, whose pioneer work had guided him from the outset of his radiological career. He recalled some early failures and early successes in gastric diagnosis, and emphasised that then, as now, he had learned to take nothing for granted—not even the correctness of an adverse operation report. Definite lesions shown in the radiogram can be overlooked at operation. He agreed with the opener in stressing the importance of critical study of the mucosal folds, and of the value of the sign of disappearance of the folds in carcinoma in contrast to their convergence in ulcer. He had not used the opaque capsule for diagnosing growth at the cardia, but used a bismuth bolus. He asked Dr. Haudek whether he could give an explanation of the rapid emptying often noted in early carcinoma wherever situated in the stomach. He felt strongly that re-examination by the radiologist in suspicious cases should be conceded far more willingly by both patient and doctor than was the case at present. A single examination, however painstaking, might sometimes leave a doubt, which re-examination would definitely confirm or dispel. He deprecated overloading the radiologist, especially in hospitals and clinics. Early diagnosis depended first, foremost, and all the time on the knowledge and skill of the investigator.

Dr. J. C. BULL (London) commented on the highly significant fact that in the post-war period the Opener had not had a single negative carcinoma *diagnosis disproved by operation.* He then showed slides illustrating spasmodic contractures simulating earliest carcinomata; in these cases operation or subsequent course had established their innocent nature. He had found belladonna, so strongly advocated by Carman, disappointing in abolishing these spasms. The speaker emphasised, from his own experience as a clinician practising radiology, that no single method was so valuable as the radiological in diagnosing gastric cancer.

Dr. GILBERT SCOTT (London) said he regarded Prof. Haudek as the patron saint of the direct method in opaque meal work; his technique should be standard for all routine work, not only for carcinoma. Dr. Scott himself had always advocated systematic radioscopic palpation with the small "white-wash" meal. Immediate complete filling was a common source of error. The rugae must be examined in detail. With regard to the surface film often retained on the carcinomatous surface, research should be directed to finding the most suitable consistency of *meal to cause such a deposit*; watery solutions often failed to give it. He deprecated taking a preliminary history, which was bound to bias the report. He examined first and took the history afterwards. He referred to the difficulty in distinguishing large chronic ulcers from carcinomatous ulcers; it was not his habit to make a diagnosis of carcinoma, but to report an organic lesion. Pyloric carcinoma with dilatation of the stomach showing paradoxical feature of ready passage of pylorus by contents indicated old chronic pyloric ulceration on which malignant disease had been subsequently grafted. The ulceration resulted in obstruction with dilatation, but when carcinoma converted the pylorus into a rigid tube obstruction was relieved. He thought the chief reason for delayed diagnosis was the latent period. He discarded indirect evidence, such as local tenderness, rigidity, and rate of emptying, if this were the sole evidence obtainable, and relied entirely on direct evidence. He hoped Prof. Haudek's paper would not lead the inexperienced worker to subject patients to unnecessary laparotomy on the strength of minute, imperfectly understood, variations of the normal contours. He asked what value he attached, in differentiating simple from malignant lesions, to the occurrence of peristalsis right up to the edge of the visible lesion. As regards operability, it was Dr. Scott's habit to confine himself to a statement of the extent of the lesion, leaving the question of operability to the surgeon; the operative findings were supplied him in every case.

Dr. W. H. ROWDEN (Leeds) said he found half an hour too little for an examination. He used a technique similar to Prof. Haudek's, and also insisted on the prone examination. He had found it a help to bring the tube close up under the patient in watching peristalsis in this position, since this exaggerated the size of the peristaltic wave. In taking serial pyloric radiographs the interval should be a minute or longer. Normal radiograms at such intervals never gave two exactly similar pictures, but serials at shorter intervals might do so even in a normal case. Like the opener, he had found an increase in the number of actual resections, indicating an improvement in early diagnosis. As regards pyloric obstruction, one point was of value in differentiating simple from malignant obstruction; obvious pyloric obstruction at the cancer age with a small stomach was invariably due to malignant involvement, with a large stomach it was almost invariably non-malignant.

The PRESIDENT had felt for some time that a *definite diagnosis of malignant disease of the stomach* ought to be obtained more frequently than in any other condition examined by an opaque meal. With careful examination and improved technique it should soon be possible to put the early diagnosis of gastric carcinoma on a very sure basis. He referred to the difficulties due to extrinsic tumours, particularly of the head of the pancreas, and instanced two such cases simulating gastric carcinoma.

Reply.

In reply, Dr. HAUDEK said the double meal method which he had introduced 20 years ago, with a six-hour normal emptying limit, had been an improvement on previous methods, but he had now come to rely upon direct signs. Alterations of emptying rate were of secondary importance, often purely functional. Rapid emptying, for example, could occur in many conditions, and could not be relied on for establishing early diagnosis of carcinoma. The rapid emptying seen in carcinoma, to which Dr. Barclay had alluded, he ascribed to rigidity of an infiltrated pyloric end, in which, though the lumen was reduced in calibre, there was a failure of the pylorus to close. Six-hour residues were commoner in ulcer than in cancer, and usually larger. He warned against over-estimating the importance of rapid emptying and delay. Dilated stomach was common in ulcer, rare in cancer. Hyperperistalsis, a common functional disorder, was of little value in diagnosis, but anti-peristalsis usually signified an organic lesion. Most important was the *interpretation of normal peristalsis.* For this the prone position was essential, and he thought it a fallacy in Fränkel's cinematographic method that the standing position was used by that worker. This position failed to show the highly important lessercurvature peristalsis. He agreed with Dr. Bythell that extrinsic tumours might cause difficulties, but the examination of the mucosal relief and the pliability of the gastric walls generally excluded such conditions. Dr. Rowden was in error in thinking 20 minutes to half an hour was all he required for a gastric examination. *This was an average figure*; many carcinomas were diagnosed in the first few seconds. In a difficult case unlimited time was allowed. As regards a case history, he often had to do without it owing to language difficulties in a mixed population; its importance lay in suggesting some further examination when the stomach was negative. The X ray examination only made an anatomical diagnosis. For the full diagnosis the history was necessary, and Dr. Haudek said his colleagues often welcomed his general opinion of the case based on examination of many thousand cases.

SECTION OF OCCUPATIONAL DISEASES.

OCCUPATIONAL DUST.

Dr. W. F. DEARDEN being in the chair, the discussion was opened by Dr. J. C. BRIDGE, H.M. Senior Medical Inspector of Factories, who remarked that it was in Manchester he joined the Factory Department as a medical inspector, one of his earliest duties being to inquire into an outbreak of "weavers' cough" at a spinning mill. The works of Arlidge and Oliver, he said, were full of valuable mortality statistics for various industries, and Collis, in his Milroy lectures for 1915, dealt fully with the effect of dusty occupations and mortality-rates, emphasising the effects in particular of the dusts of free silica (SiO_2). The inquiry of Dr. Dearden, Milroy lecturer in 1927, into the health of workers in humid cotton sheds and the printing industry, had been carried further by Dr. Bradford Hill.

For himself, said Dr. Bridge, he could do little but indicate some of the more common forms of injury to health produced by occupational dust. He proposed to divide such effects into two arbitrary groups, realising fully that some might fall into both groups, and that others, in the light of better knowledge, should be included in both. These were: Dusts which exercised (*a*) a general toxic effect; (*b*) a localised effect, whether (1) internal, or (2) external.

Group A. Dusts: General Toxic Effect.

This group consisted mainly of the dust of certain metals, and chiefly their salts, which produced a definite syndrome of symptoms. Of these probably the most important, and one which was still met with most frequently, was lead and its compounds. *Lead* poisoning still figured prominently in the notifications made to the Chief Inspector of Factories. (Dr. Bridge gave comprehensive tables of case-incidence and mortality for various industries.) To one point in connexion with lead excretion he drew special attention. Kehoe and other American observers found that lead was excreted in measurable quantities in the urine of normal healthy persons who had not been exposed to any known risk of lead absorption. These findings were confirmed by Prof. Chaston Chapman, and were important because the presence of small quantities of lead in the urine had been regarded as confirming the diagnosis of lead poisoning in a lead worker.

Arsenic.—The classical symptoms due to the inhalation of dust containing arsenical compounds did not often occur in industry. In general, the effect of arsenical dust was manifested by localised affections of the skin.

Manganese.—In 1922 Dr. J. R. Charles, of Bristol, drew the attention of the Department to two cases of manganese poisoning affecting men employed in grinding manganese ore. Other cases had been reported in America in the manufacture of manganese steel. (Dr. Bridge gave the symptoms of manganese poisoning in detail, and dealt with poisoning by zinc, cadmium, and the nitro and amido derivatives of benzene.)

Organic Dusts.—Dusts might act as carriers of toxic substances or organisms, and produce symptoms of a general character. Fur dust after carotting—that is, painting with nitrate of mercury—had produced mercurial poisoning. Wool sorters' disease was due to the inhalation of dust carrying spores of the anthrax bacillus. Of special interest to Lancashire was the condition known as "weavers' cough," which might be due to the inhalation of the spores of a mildew. Closely allied was the cough affecting men working in malthouses. No doubt there were other dust-borne diseases due to the presence of a fungus.

Group B. Dusts: Localised Effects.

The most important and widespread forms of localised internal disease produced by dusts were the various forms of pneumonoconiosis, of which silicosis was the most important. The recent scheme for compensation under the Various Industries (Silicosis) Scheme gave some indication of the widespread nature of the industries in which dust containing free silica occurred. Dr. Bridge mentioned the fine type of fibrous pneumonoconiosis produced by silicates and other minerals, and the effects of the inhalation of coal dust upon trimmers. In time, he said, with a more complete survey of workers exposed to particular dusts, it might become possible to determine the particular form of dust by the character of the fibrosis to which it gave rise.

Vegetable Dusts.—Of the effects of these on the lungs little or nothing was known, but Dr. Middleton concluded that the dust in the case of wheat, barley, rye, and oats contained hairs derived from the grain which on *a priori* grounds appeared to be capable of causing irritation of, and inflammatory changes in, the respiratory passages. Dr. Bridge quoted the case of a woman employed for 25 years at a bench where she had been exposed to inhalation of pure tobacco dust, and who suffered from loss of sight. He also drew attention to Dr. J. B. Duguid's article (THE LANCET, 1927, ii., 111) on the incidence of intrathoracic tumours in Manchester.

Turning to the localised external diseases produced by occupational dust, there were, said Dr. Bridge, few if any dusts occurring in industry that would not produce in certain individuals an inflammatory condition of the skin. This not only made it difficult to decide whether or not a dermatitis was of occupational origin, but threw doubt, in many cases, on the actual causal agent. From his own experience the dusts which appear to exert the most rapid and severe conditions were the nitro compounds of benzene and its homologues—for example, dinitrochlorbenzene, picric acid, paranitraniline. Of simple compounds the sodium and potassium salts of chromium and the caustic alkalis produced not only skin lesions, but ulceration of the mucous membrane and septum of the nose leading to complete perforation. The absence of untoward symptoms following such definite destruction of the internal nares was a matter of surprise. Cancer of the skin was produced wherever pitch dust was generated, and the connexion between cancer and arsenical dust was well established. The oldest form of cancer of the skin—namely, that of the chimney sweep—still occurred. Dr. Bridge concluded by saying, "While once the masters of cure, we are now, or ought to be, the slaves of prevention. A dust-free industry may be ideal, but it should be our goal."

Asbestos Dust.

Dr. W. E. COOKE (Wigan) read a paper on asbestos dust, and the curious bodies found in pulmonary asbestosis. Asbestos, he said, was woven into cloth before the time of Herodotus 450 B.C., but pulmonary asbestosis dated only from A.D. 1900. After describing the chemistry and microscopical appearances of asbestos fibre and dust, and the presence of large particles of the dust in fibrotic and necrotic areas of the lung, he detailed further experimental work on the curious bodies found in this disease. His explanation of their formation was that fine spicules of asbestos, by mechanical action on the bronchioles and alveoli, caused either minute extravasations of whole blood or serous exudates which enveloped them. Interaction took place between the plasma proteins and the soluble fraction of asbestos with adsorption of colloidal aggregates on to the spicules. In support of this he showed specimens containing a slender filament of biotite upon which colloidal matter had been deposited. As these bodies had been found in every autopsy in this disease, and as the only mineral that could possibly produce them was asbestos, their presence in any numbers was pathognomonic of pulmonary asbestosis.

Dr. A. C. HADDOW (Leeds) described the clinical aspects of asbestosis, and quoted a case in which the curious bodies were found in a man who was not employed in the industry, but who lived next door to an asbestos factory. This result was confirmed by Prof. J. M. Stewart (Leeds).—Dr. W. BURTON WOOD (London) showed X ray photographs of cases of pulmonary asbestosis and compared the picture with that of silicosis.—Sir THOMAS OLIVER (Newcastle) also spoke on the clinical aspects of the disease.—Sir THOMAS LEGGE (formerly H.M. Medical Inspector of Factories) said there could be no doubt of the seriousness of asbestos poisoning among the workers in that material. The idea that nothing but free silica dust would set up fibrous changes in the lungs had had a very bad effect, and the foregoing papers showed how important it was not to underrate other kinds of dust such as asbestos. He hoped to see asbestosis added to the list of diseases for which compensation could be obtained.

Reviews and Notices of Books.

CARDIOLOGY.

The Heart in Modern Practice. Second edition. By WILLIAM DUNCAN REID, A.B., M.D., Assistant Professor of Cardiology, Boston University. London: J. B. Lippincott Company. 1929. Pp. 460. 25*s.*

THE second edition of this text-book differs from its predecessor principally in the addition of nine new chapters dealing with the cardiac arrhythmias. This is hardly an improvement, for, as the author admits, it completely alters the balance of the book, which was its chief merit. One of the greatest difficulties of a student is to get a good sense of proportion and to see the various facts of medicine in their true perspective. For many years heart murmurs were the centre of attraction, more recently they have been superseded by the arrhythmias; but now that these are beginning to fade into the background and find their true level, it is no longer desirable to give them such a prominent place. Among the many minor alterations are the sections dealing with circus movement and coronary infarction, which constitute valuable additions. The electrocardiograms used as illustrations are clear and well reproduced, though we prefer actual polygraphic and sphygmographic tracings to diagrammatic ones. The numerous references to recent original papers will be appreciated by those who wish to study each subject more deeply; but compared with the more modest first edition this volume is on the whole disappointing.

The Pressure Pulses in the Cardiovascular System. By CARL WIGGERS, M.D., Professor of Physiology, Western Reserve University, Cleveland, Ohio. London: Longmans, Green and Co. 1928. Pp. 200. 14*s.*

IN cardiovascular mechanics the history of the development of the instrumental method of investigation provides frequent examples of erroneous conclusions resulting from the failure of workers to recognise mechanical artefacts. As one instrument supersedes another, new features make their appearance in the records. Often these have been attributed to the fundamental processes under investigation, when in reality they have been produced by the physical properties of the apparatus. In recent years it has been the aim of experimentalists to devise instruments in which inertia is reduced to a minimum. Dr. C. Wiggers, being a pupil of Otto Frank, has naturally devoted his attention especially to optical methods of registration, and has collected in this monograph his own observations on this subject and those of other workers. The two opening chapters are devoted to a critical review of the instrumental artefacts which vitiate or modify the form of the records obtained. There follows a series of chapters dealing with the pressure changes and sequence of events within the heart, arteries, and veins, and a consideration of the various factors such as heart-rate, venous filling, and aortic resistance which may modify the normal sequence of events. The author points out that ventricular as well as auricular systole is a fractionate process, and considers the bearing of this fact on the interpretation of the intraventricular pressure curves. In the final chapter he deals with the way in which the commoner types of arrhythmia may modify the mechanics of ventricular systole. To the clinician who lacks a thorough grounding in physics it may prove stiff reading, but it should be read not only by the physiologist, but by all those who are especially interested in the study of heart disease, since so many of the problems considered have a direct bearing on the practice of medicine.

This book forms one of the Monographs on Physiology, formerly edited by the late Prof. Ernest Starling, which are intended to review the present position of our knowledge in those departments which have advanced most in recent years.

Heart Disease in Childhood. By H. B. RUSSELL, M.D., M.R.C.P., and C. K. T. HAMILTON, B.M., M.R.C.P. London: Constable and Co., Ltd. 1929. Pp. 104. 7*s.* 6*d.*

Heart Disease in Childhood is such an attractive title that it is a pity the authors have not kept more closely to their subject. Such descriptions as that of the electrocardiographic method, for example, cannot, by any stretch of the imagination, be legitimately included; the book suggests an elementary treatise on general cardiology which has been modified in order to render it applicable to the cardiac affections of childhood. Rheumatic heart disease is discussed in considerable detail, but the subject of congenital lesions is dismissed in eight pages. It is surprising that the old hypothesis of "back pressure" should still find a place in one of a series of Modern Medical Monographs. On the whole it is our impression that the authors have inserted quite a lot of irrelevant matter, while they have failed to make the most of their material.

What you should know about Heart Disease. By HAROLD E. B. PARDEE, M.D., Assistant Professor of Clinical Medicine, Cornell University. Philadelphia: Lea and Febiger. 1928. Pp. 120. $1.50.

HEART disease to the lay mind is apt to be associated with the idea of sudden death and it is often difficult for people to realise that in its milder forms it is not necessarily progressive, and may, in fact, be compatible with a fairly active life. The object of Dr. Pardee's little book is to elaborate this thesis in language intelligible to the general public, to explain the nature of heart disease and the reasons for the various therapeutic measures employed. By so doing the author hopes to achieve a more intelligent coöperation between patient and doctor and so to enable them to work together to the best advantage. There is an admirable chapter on exercise and rest and the question of diet is fully discussed. Dr. Pardee gives perhaps too optimistic an impression of prognosis, but that is excusable, for he is deliberately out to counteract undue pessimism. His book will undoubtedly be of real value to many sufferers from heart disease, for while avoiding technical terms he has succeeded in giving an accurate, up-to-date and well-balanced account of its more important aspects.

QU'EST CE QUE LA MÉDICINE?

By E. RIST. Paris: Masson et Cie. 1929. Pp. 235. Fr. 25.

THIS is a thoroughly interesting book of essays, displaying a wide range of general and special knowledge, while its pages are full of the love of history and the appreciation of art. The essay on the Hippocratic oath is one of the best sermons on the sanctity of medical confidence we have read, and the accompanying essay on the moral responsibilities of the doctor is a direct development of the old Greek's words. The essay on the diagnosis of the diseases of the chest before the methods of percussion and auscultation were applied—the dates of these two classic methods of exploration being 1761 (Auenbrugger) and 1819 (Laënnec)—is a sound study, while Les Débuts de la Percussion is a development of this essay and leads up to a general chapter on the progress of our science. Here is a serious lecturer at his best—wise, but not didactic, not flippant, but never dull.

MADNESS IN SHAKESPERIAN TRAGEDY.

By H. SOMERVILLE. With a preface by WYNDHAM LEWIS. London: The Richards Press, Ltd. 1929. Pp. 207. 6s.

Mr. Somerville, in a series of interesting essays presenting modern as well as accepted views, deals with the old subject of madness as represented in Shakesperian tragedy, stating his conclusions well and justifying them, where he can, by references to the text. The characters selected for comment are, save perhaps one, familiar to the whole world—their words and their deeds may be said to form a part of universal education. Such characters are Hamlet and Ophelia, Macbeth and Lady Macbeth, Lear and Goneril, Othello, Brutus and Constance, the last being the only one of whom many things cannot be immediately recalled save after a recent reading of "King John." She is best remembered by the terrific words in which she courts death, words which, as Mr. Somerville points out, could not have been used by a person so mentally destroyed. But even though there may be a difficulty in reconciling the coherency of language with the disorganisation of mind, the picture of a battered mentality is vividly presented; and here the author points out that quite early in his creative activity Shakespeare realised the value of insanity as a means for the exhibition of the excessive emotion necessary to the violence of his tragedy. He might have added that in Elizabethan days the insane lived largely with the sane, and were, therefore, more easy subjects for study than they became when segregation was the rule. Constance is selected for particular comment because the rising tide of insanity can be watched throughout a story, at the commencement of which she is perfectly sane; thus we have a fine exhibition of the early growth and development of acute mania. To Hamlet's madness he thinks the type manic depressive most nearly corresponds; Macbeth he labels a paranoiac; Lear, a victim of attacks of acute mania, who, if he had lived, would have been a hopeless dement; Ophelia has the temporary mental overthrow of the girl madly in love; Timon is a sound typification of megalomania; while Brutus's mental breakdown is found convincingly to have many features common with that of Macbeth. Goneril is described as a mental monstrosity, the words implying that anyone so foully wicked could be nothing but mad, while Lady Macbeth more or less escapes analysis—her response to horrible circumstances is a lapse into mad criminality.

The various views in the essays may be exactly regarded, in the author's words, as "attempts to explain some of the difficulties occurring in the speeches, as well as those arising out of the strange and puzzling behaviour of the principal characters during their attacks of insanity." The explanations are for the most part satisfying; they could not be expected to cover the field.

THE MODERN DANCE OF DEATH.

The Linacre Lecture for 1929. By PEYTON ROUS. London: Cambridge University Press. 1929. Pp. 51. 2s. 6d.

A MODEST little book which is worth careful study and a good deal of reflection. It should be widely read by the hygienist on the one hand and the experimental pathologist on the other. We flatter ourselves that medical science has enormously reduced the incidence and fatality of most diseases and we are apt to forget that the body is just where it was; it has now just the same potentialities and limitations as it had, when infectious diseases left a much smaller porportion of the population to realise that there was a natural end. We dance with death now as we did, but less reluctantly—for it is towards the end of the evening and we are getting tired. Such in brief is the tenour of Dr. Rous's sermon. As he gave it, it is a brilliant commentary on life and individuality, full of shrewd discourse about the hard facts of experimental medicine to which he has himself made such notable contributions. Those who do not care for the philosophy will find the pathology of the best.

STONES, HILLTOPS, AND THE SEA.

By RUTH ALEXANDER. London: Alston Rivers. 1929. Pp. 272. 12s. 6d.

THIS is a record of a month's travel enjoyed by the author in company with some twenty other people. The party toured the Eastern half of Yugoslavia in two motor char-à-bancs, and met with many small adventures and many large opportunities of learning what life is like in a very unfamiliar part of Europe, opportunities which have been well used in this book. The journey covered Slavonia, Croatia, Bosnia, and Herzegovina, still replete with the signs of Turkish rule, Montenegro, and Dalmatia, with its Italian enclave, and Miss Alexander has noted with discriminating enthusiasm and humour the extremes of fertility and barrenness manifested by the landscapes and the variety of religious tongues, and clothes offered by the populated centres. This is a gay account of a jaunt which, it can be gathered, was thoroughly successful in the event though often trying in its experiences. Some of the many picturesque scenes are reproduced from photographs supplied by two of the author's fellow-voyagers, Dr. G. A. Grierson and Dr. V. G. Ward.

AN OUTLINE OF ENDOCRINOLOGY.

Second edition. By W. M. CROFTON, B.A., M.D., Lecturer of Special Pathology, University College, Dublin; Pathologist, Dr. Steevens' Hospital, Dublin. Edinburgh: E. and S. Livingstone. 1929. Pp. 163. 8s. 6d.

THIS is the second edition of Dr. Crofton's handbook of endocrinology, originally published in 1924. There are several additions to the text, notably a chapter on the liver chiefly dealing with pernicious anæmia (which, in spite of Minot and Murphy's valuable work on liver treatment, should surely not call for comment in a handbook devoted to endocrinology), and a chapter on recent advances. Many of the views expressed in this chapter are drawn from the author's own experiences, which appear to be so divergent from current medical opinion that they cannot be accepted without reserve. Nevertheless, there is much which is of interest in this book, though flights of fancy such as the following (p. 149) are scarcely to be commended to a serious student of medicine: "There is apparently no gland yet developed that will enable man to grow wings. Must we wait for the millennium until such a gland of internal secretion develops?" Perusal of this book leaves the impression that this happy state can hardly be long delayed. In the meanwhile the medical student interested in endocrinology would be well advised to follow the teaching of more generally accepted text-books of medicine.

THE LANCET.

LONDON: SATURDAY, AUGUST 3, 1929.

MILDER VACCINATION.

WHETHER post-vaccinal encephalitis is directly due to vaccination or whether it can be ascribed to a concomitant infection must be considered unsettled, though it might be argued that the evidence in favour of vaccinal encephalitis is at least as strong as that which is regarded as establishing the ætiology of some other diseases. The fact remains, however, that the number of cases of encephalitis following vaccination appears to be increasing, and recent inquests on such cases have caused a good deal of concern among the public. The increase is perhaps only apparent. It may be that in the past mild cases were not recognised for what they were, and that the association of fatal cases with vaccination was disregarded; but this does not alter the situation for the layman who sees in vaccination sinister possibilities which he had never before contemplated, and who is troubled by a suspicion that the knowledge of these dangers has been withheld from him. The suspicion is void of foundation, for it is only within the last six or seven years that the nervous complications of vaccinia have been recognised in medical circles; within that time, moreover, the Ministry of Health has appointed two distinct committees to consider various aspects of vaccination, and their reports were published together a year ago. The final recommendation of the Rolleston report (which we endorsed warmly at the time [1]) was that steps should be taken to impress upon the public mind the nature and purpose of vaccination, for which the report affords a body of accurate and unbiased information. Unfortunately this recommendation of the Committee has been ignored. No real attempt has been made to instruct the public on the nature of vaccination; to explain its advantages; to acknowledge its complications; and to discuss whether, on the whole, it is to be recommended.

The layman of to-day is too much interested in medical matters and too much alive to their importance to be impressed by mere dogmatic statements. Simply to assert that universal vaccination is necessary in the interests of the public health, and that the direst results are likely to follow its discontinuance, is not to convince him. He requires a reasoned argument and will not be satisfied with anything less. The situation is not rendered any easier by the fact that alastrim has been evident in this country for the last decade and has by its mildness done much to rob the name of small-pox of its terrors. It is true that from time to time there are outbreaks of virulent small-pox with a high proportion of fatal cases, but energetic action by the health authorities has hitherto kept them in control and they have scarcely served to remind the public what a dreadful scourge the disease was in this country not so many years ago. On the other hand, some hundreds of cases of alastrim are notified as small-pox every year, most of which are no more severe than simple chicken-pox. It is perfectly reasonable that the layman should say: why, if this is all that small-pox means, should I worry about vaccination, which apparently is itself more dangerous than the disease from which it is supposed to protect me? It is no good answering that this mild type of small-pox may at any moment change to the virulent form, for this is probably not true; American observations seem to show that for 20 years alastrim has bred true and has remained relatively innocuous. The right reply is that for all practical purposes alastrim differs so much from classical small-pox as to be a distinct disease, and that its mildness does not justify us in neglecting to take proper precautions against the more malignant form of small-pox.

We are left then with the question what precautions the profession should advocate in the circumstances of to-day. There can be no doubt that in an epidemic of severe small-pox the public would accept vaccination without much opposition, but as we pointed out two and half a years ago [2] there is enough sense in the average man's objections—when supplemented by the nonsense of the antivaccinists—"to make universal and full vaccination of infants (as theoretically enforced by Parliament) impracticable in this country at the present time." The first alternative to universal protection, we said, was to let small-pox take its course, offering vaccination to those who preferred it. The second was to modify our methods of vaccination so that sensible people would have no reason to fear and dislike them. The third was to abandon universal vaccination altogether in favour of the effective treatment of contacts in face of an epidemic. Criticism might be lessened, we pointed out, "if such vaccination aimed at conferring only brief and temporary immunity, and it is theoretically possible to check the progress of an epidemic by using an antigen producing symptoms so far negligible that popular prejudice would soon fade away." In the same article we quoted a method suggested by Dr. PARLANE KINLOCH for milder vaccination in infancy, and a few months later we published an account of American views and practice [3] which included a description of means whereby the least possible "take" may be secured. Meanwhile the Rolleston Committee has made its definite recommendation that a trial should be made of vaccination (or revaccination) in one insertion with a minimum of trauma.

In the B.M.A. discussion reported on p. 223 considerable dissatisfaction was expressed with the quality of the lymph available for the use of private practitioners, and from more than one quarter the demand was expressed for the universal supply of Government lymph. It was claimed that the lymph of private firms was unequal in its action, at some times failing to produce reactions, and this is probably true. But the statement in one of the proposed resolutions that in some vaccinations the health of the patient is seriously affected is surely far more significant than the complaint that certain lymphs are ineffective. As the Vaccination Committee pointed out, unsuccessful vaccination is very often due to faulty technique; but an excessive reaction suggests that the virus is too potent or the dose administered too great. It is probable enough that the method of four insertions officially advocated in this country gives the most efficient protection against small-pox, but we have ample evidence that its use is occasionally associated with severe local and general reactions, and we have the definite opinion of the Rolleston Committee that a different procedure should be tried. American and Canadian results suggest that vaccination and revaccination in one insertion is efficient, and though the actual duration of the immunity conferred is, of course, still uncertain, the Committee had excellent grounds for believing that satisfactory results would be obtained by primary vaccination in infancy, with revaccination on entering and leaving school. The infantile vaccination is undoubtedly of paramount importance. When carried out by the modified method its immediate effects are negligible, whereas all the evidence goes to show that if vaccination is postponed till the school age or later its dangers are definitely increased. The local reaction is greater and it is noteworthy that an overwhelming proportion of recorded cases of post-vaccinal encephalitis have occurred after infancy.

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[1] THE LANCET, 1928, ii., 234.

[2] Ibid., 1927, i., 238.

[3] Ibid., 1927, i., 671.

Another important recommendation of the Rolleston Committee was that experiments should be made to determine if it is feasible to reduce the potency of the lymph without impairing its efficacy. We now realise that vaccinia is not only a local disease; the virus is disseminated throughout the body, and the question of the dose inserted obviously requires close study. It is probable that the lymph now in use is considerably stronger than necessary, and possibly the occasional serious sequelæ of vaccination would disappear altogether were a weaker lymph employed. Repeated but less energetic application of a more dilute lymph is likely to be the method of vaccination in the future. It offers adequate protection while at the same time it minimises risk. Vaccination can never be popularised while accidents are common enough to cause complaint in medical circles. Without doubt the public should be widely instructed in the necessity for adopting universal prophylaxis against small-pox, but at the same time we must ensure that vaccination itself is robbed of its terrors.

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THE REPORTS OF MEDICAL REFEREES.

It has been often remarked that a disproportionate amount of workmen's compensation law is made or declared in cases which originate in Scotland. An instance is furnished by the recent decision in the House of Lords in the case of Burrows *v.* Wilsons and Clyde Coal Company, in relation to the *reports of medical referees.* The *judgment of the* Lords firmly upholds the finality status of these reports, and at the same time the decision contains *useful hints for doctors who may be called upon to* act as referees.

In the case referred to the moving parties were the employers, and their object was to have the compensation ended by a declaration that the man had made a complete recovery. Their efforts were made on three separate occasions with substantial intervals of time, suggesting that the referee was proceeding in a strictly judicial spirit and was exercising a severely impartial judgment, as indeed might fairly have been assumed. At the first and the second attempts the employers failed, but after the third examination the medical referee reported that in his opinion the workman had completely recovered from the accident, and that his condition was such that he was fit for his ordinary work. Now the Act says that the report shall be conclusive—things must have an ending, and a county court judge is not qualified, nor probably has he the time, to sit in order to review the technical opinion of a medical expert, and to uphold or reject it on the balance, in his mind, of medical evidence from both sides. And anyhow such procedure might seem to justify appeals to higher courts on purely medical issues, which in most cases would be regrettable. But what happened was that the workman tabled in the county court at Hamilton a specific allegation of later symptoms, said not to be observable on such an examination as had been made by the medical referee, and which, it was alleged, pointed to a distinct risk of the disease recurring from the effects of the same accident. The workman did not, indeed, ask the county court judge to hear evidence on the subject, but he did present alternative suggestions. These were that either the report should be sent back to the referee for reconsideration, or that the order to be made should be one only suspending payment of compensation. The employers, on the other hand, stood upon the finality quality of the existing report, and claimed an order ending compensation. The county court judge took the employers' view and ended compensation. Then the workman appealed to the High Court in Scotland, and that court practically took the workman's view. The President of the court regretted that the man had not moved the county court judge himself to inquire into the allegations of risk of recurrence, and the court decided to send the case back to the county court judge for that purpose. No such step has ever before been taken, and in view of its general importance the employers took the case to the House of Lords. The result has been to restore the county court decision and to declare compensation ended. Lord Dunedin censured the step proposed to be taken by the High Court in Scotland as a *grave* disturbance of the administration code of workmen's compensation. Of that code two essential features are that a medical referee is final on medical facts, and the county court judge, as arbitrator, is final on all other facts.

No doubt it is a matter of temperament whether a medical man will or will not welcome the view that from his report as medical referee there can be no appeal, and that no cavilling at or contradiction of the report is even to be listened to. This latest decision in the Lords makes clear that, when the Act says that the report is conclusive, it means exactly what it says. This decision, then, conveys a lesson not to be forgotten. The quality of finality attaches only to an unambiguous report. This matter has been previously dealt with in these columns at length (*vide* The Lancet, 1929, i., 402), the occasion being the observation of Lord Sands in a judgment delivered in the Scottish Court of Appeal *in a case* similar somewhat to that under discussion. The report of the referee is no place for recording the considerations, reservations, and pros or cons on which the medical opinion has been arrived at. The problem may be difficult but an unambiguous solution must be put forward. A new feature was introduced by Lord Dunedin's *speech. Before this* case we should have said that the report must be unqualified, and as a general matter we say that still. But it is clearly contemplated that it is permissible for, and may be the duty of, a medical referee to report a complete recovery combined with—or ought we to say qualified by?—a risk of recurrence of the disease or of the effects of the injury. Is this another case where lawyers and doctors see things differently? A medical man would probably say that either there is complete recovery or there is not, and that if the ind [illegible] the accident has left effec [illegible] a recurrence of the condition, then there is not complete recovery. What appears to be really in view is whether the workman is again fit for the full exercise of his former trade functions. There will probably be agreement that that stage might be reached, and yet a medical man might see the prospect of a recurrence of the injured condition. Lord DUNEDIN clearly holds that a report of complete recovery with that qualification is a competent form of report, and that the consequence (with which, however, the medical man has no concern) is that compensation will be suspended and not ended. In this way this latest case may open a new chapter of difficulties. Obviously, a mere surmise or general suspicion that the existing state of matters may issue in recurrence will not be a proper exercise of responsibility. The attitude must be much more definite than that. Yet the medical referee is neither bound nor entitled to seek relief by stating detailed medical data, thus in effect throwing on the county court judge the responsibility of decision. Further, there might be a class of case in which, while the man is able to work as hard as ever, the fact of his doing so will bring into operation or accentuate the factors tending to recurrence. In such a case could it be reported that there was complete recovery at all? This class we have imagined, but it assuredly exists and introduces issues of real importance. If complete recovery be reported, with a rider added upon risk of recurrence, the best that the man can hope for is that compensation will be suspended; that is to say, he will in the meantime, and until recurrence, receive no more compensation. Whereas, if the true view is that in such a case it is not proper to report any form of complete recovery, then the man will continue to draw compensation, full or partial, as the case may be.

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THE CORRELATION OF CANCER STATISTICS.

THE radiological treatment of cancer has been accorded greater publicity than any other modern therapeutic method. The community has been invited to subscribe—and has subscribed—immense sums for the purchase of radium and for research into the application of radiological methods to cancer. The lay press has assured its readers that this line of work offers the most promising hope of a successful attack on the most dreaded disease. Experts have adduced satisfactory results in different clinics all over the world, and have shown that these results in certain regions of the body compare favourably with those obtained by surgeons. An effort is now being made on international lines to exploit this new weapon to the full and to prevent its abuse. The Cancer Commission of the League of Nations, realising the world-wide significance of the development in radiotherapy, appointed a subcommission to gather and collate information on methods and results. Unfortunately for this purpose the practice of radium therapy—the quantity of radium salt used, the shape of the applicators, the method of application, and the period during which the exposure is allowed—varies in different clinics, quite independently of the adjustment necessary to adapt general rules to a particular lesion in a particular patient.

The region of the human body first selected for investigation was naturally the genital tract of women, since the results after a period of years from all clinics are impressive. The subcommission entrusted to an executive committee, consisting of Dr. J. HEYMAN of Stockholm, Dr. A. LACASSAGNE of Paris, and Prof. F. VOLTZ of Munich, the task of collecting detailed case records from the three large clinics with which they are respectively connected, in the hope that these might be correlated. The report of the subcommission, which has just been published, forms a document[1] of great interest. Its most outstanding feature is, paradoxically, its failure to achieve its object. The subcommission had intended, from a study of results combined from these three centres, to draw up statistical data which would form a guide to radio-therapeutic treatment. Dr. JANET LANE-CLAYPON spent much time and labour on an attempt to produce this analysis, but was forced to the conclusion that the methods employed in the three clinics and the classifications of stage of disease differed in such essential particulars, and that the data of after-history were set out so inconsistently that any attempt to correlate the three sets of figures could only cause misunderstanding. It is not yet possible, in fact, for an unbiased statistician, from the material provided, to express in figures an opinion on the exact value of radium in treatment, or on the best technique for applying it. But it is clear that if radiological methods are to be explored and improved the experience of the big clinics must be available for smaller and younger foundations, and the subcommission have, therefore, taken steps to clarify the position. They have drawn up, with great care, a set of rules for the classification of the different varieties of utero-vaginal cancer, for the grouping of growths into different stages, and for the essential statistical data and the method of calculating results, and have elaborated a scheme for describing the details of technique. They have also designed a standard international case-record with a diagram for marking extent of growth, which has already been adopted by the three clinics at Stockholm, Paris, and Munich, and which will, it is hoped, be adopted by all other institutions using radiological methods. Five years hence, therefore, there should be a body of strictly comparable statistics from all parts of the world. From these it should be possible to decide with reasonable accuracy which methods are giving the most satisfactory results.

Though the achievement of the main object of the subcommission has had to be postponed, the illustrated accounts supplied by the three members of the executive committee, which form the bulk of the report, will certainly encourage those who look to radium and X ray treatment as the hope of the future in gynæcology. The results obtained show a steady improvement year by year. It is, however, obvious that the details of dosage and method of application must be most carefully considered and adjusted if the end-results are to be satisfactory. The increasing use of radium by practitioners who are not fully instructed in its technique offers a serious threat of abuse. The inexperienced doctor may rest content with transitory improvement in cases which he ought to cure, or may apply an inadequate or excessive dose by a method which has been discarded as unsatisfactory. No one who is unable to spare time to attend such practical courses as those offered by St. Bartholomew's or the Westminster Hospitals, or to work for a period at radium clinics, should attempt to treat patients himself. The fact that an international effort to frame, if not a code of rules, at least an indication of preferences, has failed, is not a warrant for daring experimentation by individuals even more ignorant of the physical and physiological forces thus harnessed than are the experts. The danger of the widespread advertisement of radium in the treatment of cancer is undoubtedly its casual adoption in private practice by men who would not try to perform an intricate surgical operation. With the establishment in all countries of convenient treatment centres in connexion with hospitals this danger should cease. It is probable that the study of records compiled on a comparable basis will lead to a standardised technique, but it is unlikely that this will ever be adapted for the use of those without special training.

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[1] League of Nations Publications. III: Health. 1929. III. 5. Publications Department, League of Nations, Geneva. (London: Constable and Co.)

Annotations.

"Ne quid nimis."

METROPOLITAN ASYLUMS BOARD.

THE annual report[1] of the Metropolitan Asylums Board, which has just come into our hands, reviews the work of the Board for the year which ended on May 31st last. The Board was established in 1867, to combine the unions and parishes of the metropolis, for the purpose of establishing "asylums" for the reception and relief of the sick, insane and infirm, and the present is the thirty-first report which sets out the discharge of these functions. It will be the last review of a complete twelvemonth report to be issued by the Board, for on April 1st next the whole of its functions will be transferred to the London County Council, and more in sorrow than in anger, the story of this transfer is told (pp. 27–29). The transfer is, of course, only a part of the comprehensive measure for the revision of local government, which received the Royal Assent on March 27th, and it may be surmised that, had "asylums for the sick, insane and infirm" been imbued elsewhere with the spirit and ideals of the Metropolitan Asylums Board, no occasion would have arisen for such drastic change. In a previous report the Board made clear to the Minister of Health the value which it has set upon its work, a value which there will be few to question. Since its inauguration in 1867 the Board has enlisted the services of men and women who have devoted themselves to the work of providing, maintaining, and extending where necessary the public hospitals required by London for infectious diseases and tuberculosis, mental hospitals, ambulance and transport services, a training-ship, and other lesser services. The whole of the debt of nearly £7,000,000, raised to meet capital expenditure on the erection, acquisition, and equipment of these hospitals has been paid off, with the exception of a sum of about £300,000, representing expenditure on grant-aided services of which the Government is responsible for one-half. The Board now has under its control 25,000 hospital beds, and in times of pressure employs a staff of 10,000 persons. Its duties have steadily increased, and only last year Parliament imposed fresh responsibilities in connexion with the Metropolitan Common Poor Fund. It has been especially galling to the group of 73 members—33 elected by metropolitan boards of guardians and 18 nominated by the Ministry of Health—that they are now to be superseded by virtue of a guillotine resolution which provided no opportunity in the House of Commons for the discussion of the provisions of the Bill as they related to London, the whole of these being passed en bloc in a few minutes, so that no reference was possible in the House to the work of the Board. In other years we have taken the opportunity afforded by the annual report to call attention to one or other of the far-reaching avenues of reparative and restorative work for which the Board is responsible. The present report is the largest which has yet been issued, and after the usual summaries — administrative, general, medical— nearly 200 pages are allotted to a series of papers contributed by medical officers of the infectious hospitals, mental hospitals, tuberculosis, sick children, and dental services. To some of these we shall recur. Had the Board always presented its report in a form so attractive and well illustrated as the present, its work would have been even more widely known among the rank and file of the medical profession than it is at present. With one aspect of the work we have kept our readers closely in touch for long past, by recording the weekly bulletin of cases in the infectious hospitals. Many developments may be deduced from a careful study of this list—the increasing hospital care of measles and whooping-cough, the allotment of more than a hundred beds for the study of the results of encephalitis lethargica, the provision of beds for mothers to accompany their infants with ophthalmia neonatorum, the segregation of cases of puerperal fever for concerted study—to name but a few of the directions in which the work of the Board has led the rest of the country in the effective treatment of infectious disease.

REPRESENTATIVE MEETING OF THE B.M.A.

Manchester was much impressed, if a little mystified, by the proceedings of the Representative Body of the British Medical Association which concluded four strenuous days' business there last week. The newspapers were astonished to find that delegates working daily from 9.30 A.M. till 6.30 P.M. could easily be reconciled to the prospect of a further evening session, but this, of course, will not surprise those who know their medical profession from the inside. What was far more remarkable was the spirit in which the representatives tackled the programme set before them—a programme making continuous demands on altruism as well as understanding, neither of which was lacking. Dr. E. R. Fothergill had some justification when he described the meeting as epoch-making, for it included far-reaching decisions on the working of voluntary hospitals, the future relations of public and private medical service, and the practice of midwifery. In all these matters the profession has a hard task to keep up with the march of events which are largely beyond its control, but the schemes proposed and approved at Manchester are at the very least a laudable attempt to divert progress into paths which lead in an approved direction. Some idea of their nature and their reception may be gained from the brief report of the meeting which we conclude on another page of this issue.

PELVIC IRRADIATION IN THE PREGNANT WOMAN.

THE use of radium and X rays in gynæcology is increasing every year. It is therefore becoming more and more important to know what effect, if any, irradiation exerts upon the ovary and the embryo, and whether it is likely to prejudice the health of subsequent children. The question is difficult to investigate, for it is almost impossible to assess the numerous other factors capable of causing ill-health or defect in the offspring. Very little is known of the effects of heredity and environment upon the mother and the unborn child, or the extent to which disease in the mother, either local or general, may influence the fœtus. This is particularly important since the pelvis is only irradiated for some kind of pathological condition. All the defects of structure and function that have been observed in the children of irradiated women have also been observed in the children of others, and no condition has so far been recognised as pathognomonic of irradiation. It is nevertheless possible to draw certain general conclusions from a careful study of a series of cases. Dr. Douglas P. Murphy, of the University of Pennsylvania, has recently published an analysis of 320 pregnancies from the literature,[1] and of another 283 of which data were supplied by a number of radiologists and gynæcologists in answer to a questionaire.[2] The 320 cases in the literature included 53 women who had undergone irradiation after conception; 44 of them carried their children to term; 27 of the children presented some disturbance of health or defect in development during the period over which they were observed. Out of 198 full-term pregnancies which followed preconception irradiation, only 10, or 5 per cent. of the children were not perfectly healthy when under observation. Although no account is taken of other detrimental factors, it appears, as would have been anticipated, that irradiation is much more likely to prejudice the health of the child if performed after conception than if performed before. The children of the women who were treated after conception presented, on the whole, the more serious lesions.

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[1] From the Office of the Board, Victoria Embankment, London, E.C. 5s.

[1] Surgery, Gynecology, and Obstetrics, 1928, xlvii., 201.

[2] Ibid., June, 1929, p. 766.

The material provided by the questionaire was, of course, much more fully documented. It did not appear that irradiation before pregnancy increased the probability of abortion. The abortion rate was 21 per cent. only, compared with the 33 per cent. suggested by various statistics as the rate for the population at large. In the group irradiated during pregnancy the rate was, however, 43·3 per cent. Of the 53 women who were irradiated when pregnant, 23 aborted while 12 of the remainder bore children who were classified as unhealthy according to the definition laid down for the purposes of the investigation. The children suffered from under-weight at birth, microcephaly, hydrocephaly, blindness, Mongolian idiocy and other gross defects of structure and function, mostly involving the central nervous system. Dr. Murphy considers that most of these disturbances may therefore be fairly attributed to the irradiation. His supposition is supported by animal experiments.[3] He regards the damage as due, perhaps, entirely to the direct irradiation of the embryo, and hardly at all to the effect of the rays upon the internal secretion of the ovaries. The unhealthy children born by the 230 women who had received irradiation before conception only numbered 15 per cent. of the total. Many of their disturbances were not serious, and none of the children showed microcephaly; moreover, all the lesions were of kinds which also appear among the children of mothers who have not been irradiated. The infantile mortality-rate was lower among the children in this group under investigation than among the general population. The conclusions which Dr. Murphy suggests are, first, that no pregnant woman should receive pelvic irradiation if the child is to be allowed to go to term, for according to his figures, there is risk that it will suffer from a serious defect; secondly, that, before a woman is irradiated, it should be definitely ascertained that she is not pregnant.

SYNTHETIC PERFUMES.

To throw a perfume on the violet, is, we learn on high poetic authority, to be guilty of ridiculous excess; but we have, it seems, approached that absurdity. In *Science Progress* for July, Mr. H. Stanley Redgrove discusses the present state of synthetic perfumery. The general conclusion we may draw from his article is that nature may be imitated very closely but that in most cases delicate noses will prefer her products to those produced in the laboratory, although these have their uses. Pure substances are rarely found in nature. So far as the organisms which yield perfumes are concerned, their main rôle is not to produce pure chemicals, but to carry on their own life and to continue it in their progeny. The odoriferous substances which they secrete are incidental to this and in most cases the odour which has caused them to be esteemed is due not only to a main product but to others associated with it. In the course of investigations on organic chemistry many odoriferous products have been separated, some identical with, others only smelling like the main constituents of natural perfume. The least attractive example of a substitute perfume is the use, now confined (and even then with danger) to cleansing and polishing preparations, of nitrobenzene for bitter almonds, of which the odoriferous principle is benzaldehyde. A more subtle case of partial identity quoted by Mr. Redgrove is that of jasmine. The natural perfume consists mainly of benzyl acetate, an easily synthesised substance, but not a very satisfactory substitute alone, as otto of jasmine contains also benzyl alcohol, linalol, linalyl acetate, methyl anthranilate, indole, and a ketonic body jasmone. Not all of these substances are pleasant smelling alone and in quantity. Many artificial "musks" have been used, since, in 1888, Baur accidentally discovered one. The best seems to be trinitrobutylmetacresol-methylether, and other nitro bodies are used. Musk itself appears to be a methyl cyclopenta-decanone, containing neither nitro group nor indeed nitrogen in any form. Synthetic vanillin appears satisfactorily to replace the product of the bean. Ionone is used now in most preparations of "violets." The main use of synthetic perfumes seems to be when blended with the more complex products of nature. Possibly a more determined effort in the direction of better culture of perfume yielding plants might enable the natural products to hold their own. While the industry is not exactly of fundamental importance to medicine, there are occasions on which the injunction *cura jucunde* requires perfumes.

CLINICAL TRAINING AT THE SYDNEY MEDICAL SCHOOL.

THOUGH there is a close association in this country between the medical schools and the hospitals to which they are attached the hospitals were mostly incorporated long before they were used as training places for students, and moreover in very large centres not one but many hospitals are needed to give the clinical facilities required for the education of one year's batch of university students. The election of university professors who are to undertake hospital duties is usually made by a joint committee consisting of representatives of the hospital and of the university, assisted by experts, but the ordinary staff appointments are generally made independently of the university, which is then invited to recognise the person appointed as an official teacher. This custom has not led to friction, though in the early years of a medical school the attempts to impose academic ideas on an institution already staffed have not always met with success. According to our Australian correspondent the conditions in which the students of the Sydney Medical School receive their clinical training are ideal, for not only is the Royal Prince Alfred Hospital, Sydney, one of the most progressive in Australia, but the Act of incorporation provides that the Senate of the University of Sydney controls the conditions under which the medical students receive their training. The result is that all the professors and lecturers *of the University medical school* are members of the staff of the hospital and all medical appointments to the hospital are made by a conjoint board consisting of the members of the University Senate, together with the directors of the hospital. Much of the present-day efficiency of the hospital is due to the sound foundations laid early in this century by the late Sir Thomas Anderson Stuart, the professor of physiology, and who was Dean of the Faculty of Medicine at the University for nearly 40 years. The board of directors of the hospital consists of ten representatives of the subscribers and governors of the hospital, ten representatives of the Government, and two ex-officio members of the University Senate, including the Chancellor and Dean of the Faculty of Medicine. There is no specific provision for a representative of the medical profession, other than the Dean *of the Faculty of Medicine, but the board has always* endeavoured to secure the election or appointment of men who represented the branches of the medical profession necessary to the efficient administration of the hospital. Under the by-laws of the hospital the honorary medical staff form a medical board, to which is referred any subject of medical importance for opinion and report. Arrangements are made periodically for the members of the permanent administrative staff of the hospital to visit Great Britain and the United States of America in order to maintain the hospital in accordance with modern developments. The specialties appear to be particularly well served. The professor of psychiatry (Dr. R. W. Dawson) and his assistants now carry out their work as part of the daily routine of the hospital. The attendance at the venereal diseases clinic, first established in 1917, has latterly become so great that it has been found necessary to limit the number of patients on any particular day. The department of urology was developed as a result of the generosity of Dr. Gordon Craig, who contributed £20,000 towards the establishment of an urological department at the university, while the committee controlling the £140,000 collected for a cancer research institute in connexion with the University of Sydney and the supply of radium made available by the Commonwealth Government has provided facilities for colloidal lead treatment at the hospital and has also installed a deep X ray therapy plant. Every cancer patient is reviewed by a conference of experts, and a decision is made whether operative surgery, radium, or deep X ray therapy or lead will be utilised. Since the establishment of the clinic there has been a marked influx of patients from New South Wales and the adjoining States. The students should also benefit from the establishment of a social service department, since they are apt to neglect during their hospital years those problems of environment and economic condition, the adjustment of which forms such a large part of their duties in private practice.

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[3] Reifferscheid. k. Strahlenth., 1925–26, xxi., 266.

MAN AS A CARNIVORE.

It is widely believed by medical men that the consumption of large quantities of meat causes a strain on the cardiovascular and excretory systems which may be at least partly responsible for the production of arterio-sclerosis and nephritis. Moreover, a section of the profession is at the present time engaged in preaching the doctrine that meat is a dangerous form of food for human consumption on account of the risk of auto-intoxication following the absorption of putrefactive products formed from it in the large intestine. Neither of these beliefs or theories rests on any very solid foundation of established evidence, though it is possible that they are of real practical value to the clinician as a guiding principle. Any direct evidence that promises to shed even a gleam of light on the vexed problem of the harmful or beneficial effects of meat diets on mankind will always be welcome. An experiment has been recently carried out in the United States to test, as thoroughly as modern clinical and laboratory investigations will allow it to be done, the effect on man of an exclusive meat diet lasting for one year. The subjects of the experiment were the arctic explorer Stefansson (who had previously lived in the arctic regions for seven years on a similar diet) and his colleague Andersen. The exhaustive metabolic, bacteriological, and chemical investigations carried out during the year have not yet been reported in full, but a brief summary of some of the main results has been published by Dr. C. W. Lieb,[1] who took part in the work. No decrease in physical or mental vigour was observed either subjectively or objectively in either of the men, although sedentary lives were led by both. They endured the hot weather of a New York summer just as well as in former years, and at the end of the test period had a very good colour. Andersen noted that his hair stopped falling out shortly after the meat diet was started. Stefansson maintained a blood pressure of 105 systolic and 70 diastolic throughout the whole period, in spite of the fact that he had lived on an exclusive meat diet for seven years before the present test was begun. Andersen's blood pressure was 140 systolic and 80 diastolic at the beginning of the test, and 120 systolic and 80 diastolic at the end of the year. The average protein intake was not really excessive, amounting to 100 to 140 grammes a day. The bulk of the diet in each case was composed of fat. Most of the meat eaten consisted of boiled or stewed cold storage meat. Stefansson occasionally took eggs when he could not get meat; Andersen took no food but meat the whole time. In spite of the fact that this diet contained but very small amounts of calcium, no evidence was obtained by radiography that there had been any absorption of calcium from the long bones. At no time were there any signs in either subject of disturbance of the renal functions, and chemical analyses of the blood revealed no significant alterations apart from a temporary lipæmia after very large amounts of fat had been eaten. In the case of Andersen, a sugar-tolerance test carried out at the end of the meat-eating period produced a typical diabetic curve. It was noted that the stools of both subjects remained inoffensive, very few putrefactive spore-bearing organisms ever being found. The intestinal flora were in both cases simplified as regards both types and total numbers of bacteria. For the first few days of the test period Stefansson was given nothing but lean meat, and he predicted that he would soon feel ill. After two days he developed nausea and diarrhœa with lethargy and general weakness. The addition to his diet of suitable quantities of fat was followed in two days by complete recovery, and for the remainder of the year no further trouble of the kind occurred. At the end of his test period Andersen had an attack of lobar pneumonia. He made an uninterrupted recovery, and it was noticed that he showed few of the toxic symptoms of other patients in the hospital with the same type II. pneumonia. While the results of these observations are not intended to be regarded as a piece of propaganda in favour of the consumption of large quantities of butcher's meat, they are of very great interest as a demonstration of the apparent harmlessness of a meat diet to healthy white men living in a temperate climate.

A CASE OF GENERALISED BLASTOMYCOSIS.

Generalised blastomycosis is not common, and a case from the clinic of Prof. Kerl, in Vienna, recently demonstrated by Dr. E. Urbach, presents unusual features. A patient, aged 30 years, who has been under observation at the clinic for ten months, gave the history that two years ago a swelling appeared on his gums, with ulcers, and that this was followed, after six months, by swellings on the thigh, the abdomen, the neck, and face. Surgical treatment was tried, as well as X rays applied to the gums. When the patient was seen first by Dr. Urbach, a thin, purulent secretion was oozing from the lanced tumours on the neck, thigh, and abdomen. Syphilis was excluded, and all examinations of the blood, sputum, and cerebro-spinal fluid gave negative results. A mycotic disease was suspected, and microscopic examination showed the presence of a yeast in pure culture in all secretions; the yeast was found also in sections of the swellings included in giant cells. The patient gave a distinct allergic reaction on intracutaneous injection of blastomycin, and the organism was lethal to experimental animals (mice and rats). The patient suffered from chronic bronchitis. Yeast fungi were found in the sputum and cultivated, both from the urine and from the cerebro-spinal fluid. Treatment of the generalised infection with autogenous vaccine, with X rays, with intravenous injections of iodine, in large doses, had some temporary effect, but the patient soon relapsed. Recently he has had a high temperature, with rapid extension of the disease in the mucous membranes. The meninges are now affected, and the prognosis is regarded as bad. The newly instituted laboratory for mycotic diseases, attached to the Vienna dermatological clinic, has lately been able to establish the mycotic origin of many rare affections of the skin, and of certain cases of chronic bronchitis and bronchiectasis. It is possible that the yeasts are responsible when "oidium albicans" is frequent in the mouth, the œsophagus can easily be affected. Hitherto, blastomycosis has not often been reported in Austria, but now we must be on the lookout for it.

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[1] Jour. Amer. Med. Assoc., July 6th, p. 20.

THE CLINICAL SIGNIFICANCE OF LACTIC ACID.

RECENT research into the metabolism of carbohydrates in the human body has led clinicians to study more closely the products of this metabolism in many pathological conditions. The brilliant work of A. V. Hill and others has shown that lactic acid is an important product of normal muscular activity, being formed in the process of contraction without the intervention of oxygen. It is only in the phase of recovery after contraction that a portion of this lactic acid is in fact oxidised, whereby sufficient energy is liberated to enable re-synthesis of approximately four-fifths of that originally formed into some complex precursor body. Prof. J. J. Macleod in his exhaustive account of the physiology of glycogen, lately published in our columns,[1] could not identify such an unknown precursor with either the glycogen of muscle or its free sugar. His experiments showed that it was only when oxygen supplies failed to keep pace with demands that any significant lowering of muscle glycogen occurred, and that lactic acid continued to accumulate in muscle after death, even after all the glycogen present had disappeared. It is therefore probable that some substance is formed between glycogen and lactic acid, though the nature of such an intermediary body is at present unknown. Whatever may be the exact part played by lactic acid in muscular activity, its non-removal places the body in a condition of so-called oxygen-debt, whereby it is ensured that the over-production may be gradually compensated for by an increased oxygen-intake after the acute period of excessive formation has ended. Extreme and violent periods of exercise may thus lead to an enormous accumulation of lactic acid in the muscles and blood; on the other hand even slight exertion may similarly lead to accumulation, if the processes of oxidation and removal are themselves deficient. Increase in lactic acid may thus result from over-production or from non-removal, or from a combination of both.

The normal quantity of lactic acid in the blood is reported by various workers to lie between 9 and 30 mg. per 100 c.cm. of blood, being subject to relatively wide variations and greatly increased by muscular exercise. Its subsequent fall is effected both by the prolonged increased oxygen absorption after the exertion, when the oxygen-debt is made good, and by its excretion unaltered via the kidneys and skin. Analysis of the urine and of the jerseys worn by the players after a violent game of football have shown the relatively enormous quantities of this acid that may be excreted through these channels. In some pathological conditions it is probable that a defect in one or all of these mechanisms is at fault. In hyperthyroidism, for example, a relatively small amount of physical effort is sufficient to lead to an abnormally large oxygen-debt, and Zondek has shown that the oxygen dissociation curve of the blood in this condition resembles that found during muscular work in normal individuals; it is suggested that many cases of Graves's disease are in fact the result of abnormal metabolism in the muscles, to which the thyroid hypersecretion is secondary and compensatory. In cardiac failure the highly acid urine may contain large amounts of lactic acid, and the return to alkalinity under treatment offers a valuable and important guide to prognosis; in this case the defect is both one of impaired oxidation resulting from the limited pulmonary ventilation with partial asphyxia, and one of lessened excretion by the kidneys and skin. A maximum efficiency of lungs and circulation is associated with rapid disappearance of lactic acid from the muscles, and what is known as training is probably at least in part a process of increasing this rate of removal. It is suggested that the stiffness and cramp so frequent in the unfit after bodily activity is a result of such non-removal. Bergmann and Dresel[2] have brought evidence to show that an excess of lactic acid is a cause of the muscular exhaustion occurring in myasthenia gravis, and Arai[3] in a review of intermediary metabolism quotes the increase found after injection of adrenalin or administration of thyroid extracts. Further investigation into the relationship of lactic acid to pathological states of exhaustion will no doubt continue to throw light upon these fascinating and difficult problems.

There are, however, other significant facts in connexion with this subject. Warburg has shown the importance of lactic acid in the growth of malignant tumours, and the presence of this substance in the cancerous stomach is well known. Craven Moore and Roberts[4] have gone so far as to state that its presence in a test-meal is pathognomonic of gastric carcinoma, and according to others a part at least of this acid is produced directly by the tumour; there is, it seems, an increase in blood lactic acid in patients suffering from carcinoma whenever this is associated with metastases in the liver, and it is conceivable that traces may be excreted into the stomach though there may be no growth actually in this organ itself. It is certain that disordered hepatic function may lead to high lactic acid values in the blood, and the change in the blood after a dose of this substance has been used as a test of liver efficiency. In diabetes a marked rise of blood lactic acid occurs after the ingestion of sugar, which can be immediately reduced by the injection of insulin. Tanaka[5] and others have shown a similar occurrence in experimental lack of vitamin B, and also in beri-beri in man. Arai makes the interesting suggestion that the peripheral neuritis occurring in both may be due to an intoxication by some product of pathological metabolism. It is a suggestion that deserves further consideration.

THE STORAGE OF X RAY FILMS.

THE disaster at the Cleveland (Ohio) Clinic continues to have its repercussion in all countries where celluloid film is extensively used in medical practice. Sympathy has gone out to Dr. G. W. Crile for the unkind irony of fate which singled out a man who has done so much to relieve the suffering of humanity and who has contributed so much to the safety and comfort of patients in hospitals. Particularly distressing for him has been the widespread impression that the disaster occurred in a hospital when, as a matter of fact, it happened in a building specially contructed for diagnostic and laboratory work. Such a separated clinic building was a further attempt to protect the hospital patient confined to bed. We learn from the *Bulletin* of the Cleveland Academy of Medicine, which has analysed the pathological findings, that some of the earlier deaths were due to carbon monoxide poisoning, while other more delayed reactions resulted from nitrogen dioxide. The reaction for cyanides was questionable. In a report made by the State Department of Industrial Relations to the Governor of Ohio, the immediate cause of the disaster is described as follows:—

1. X ray films in basement storage room decomposed slowly in their cabinets because of the heat from either a leaky steam pipe in the room, or from electric light bulbs hanging on ordinary cotton insulated wires.

2. Gases generated by the decomposition seeped into the room and thence into a pipe tunnel which circles the basement and thence into pipe chases which led to all parts of the building.

3. The first explosion occurred near a switch-board in the basement when the circulating gases came in contact with cold air entering the basement through an open window.

4. The second explosion probably occurred in the walls

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[1] THE LANCET, July 6th, p. 1; July 13th, p. 55; and July 20th, p. 107.

[2] Bergmann, G., and Dresel, K.: Zeit. f. Klin. Med., 1925, cviii., 120.

[3] Arai, M.: Le métabolisme intermédiaire en médecine. Verhandl. d. Jap. Gesellsch. f. inn. Med., 1925, xxv., 21.

[4] Moore, Craven, and Roberts, W. M.: Quart. Jour. Med., 1925, xxii. (Proc. Ass. Phys.).

[5] Tanaka, K.: Centralbl. f. die ges. inn. Med., 1925, liii., 215.

and pipe chases and the third explosion probably occurred between the ceiling of the fourth floor and the roof.

The investigators appointed by the U.S. Army Chemical Warfare Service have now issued their own report on the causes of the disaster. A special chamber was constructed in order that experiments might be made as nearly as possible under the same conditions as obtained in Cleveland, several tons of film being employed. It was found that ignition could be provoked without the presence of a flame by such agents as hot steam piping or an electric light bulb. Mere storage of film in an overheated room gave rise to evolution of toxic gases. While combustion in a free supply of air does not result in any large quantity of poisonous gas, in a limited supply of air, and when combustion is brought on gradually, large quantities of carbon monoxide and nitrous oxide along with higher oxides of nitrogen are produced. Chemical extinguishers were found of no avail, but large quantities of water were effective if applied in good time. The comparative safety of film made with a basis of cellulose acetate was confirmed by the American investigators. Their report concludes with the statement that a storage vault 7 by 8 by 8 ft. with a 16-in. square vent in the rear wall just below the roof, held close by a 155° F. fusible link, affords reasonably safe storage for a ton and a half of film.

Two recent brochures (Nos. 74 and 76) of "Occupation and Health," issued by the International Labour Bureau in Geneva, give in concise form some of the salient facts in the combustibility of cellulose. The decomposition of the nitro-cellulose which it contains continues, once it has been started, even in the absence of air, because its complex molecule contains sufficient oxygen to combine with the hydrogen and carbon present. In the case of detonation innocuous gases, such as nitrogen, steam, and carbon dioxide, are formed. But when the material burns in a confined space the decomposition is less complete, so that nitrous fumes, carbon monoxide, and possibly hydrocyanic acid, are given off. Once alight celluloid burns rapidly, with leaping jets of flame, attaining a temperature of 1500° to 1700° C. Unstable qualities of celluloid may decompose at about 100° C. and may even take fire with an explosion, a phenomenon which for good qualities only occurs at 150° to 170° C.; but decomposition may continue without flame, even after apparent extinction of the fire, with the generation of explosive gases which may reach distant situations and cause a fresh outbreak. Conflagrations of celluloid, or its less active decomposition without flame, cannot be damped down by ordinary methods of excluding air, by immersion in carbon dioxide or in steam, since all the elements needed for combustion are present in the material itself. One gramme of nitrocellulose film is said to set free 200 c.cm. of carbon monoxide, 150 c.cm. of oxides of nitrogen, and 5 c.cm. of hydrocyanic acid, as well as traces of acrolein and camphor. Hence a fire caused by it can only be fought by men wearing gas masks, while those who are rescued must be looked upon as possible cases of gassing, particularly by nitrous fumes, the symptoms of which, although they do not become manifest for some time, may cause death within 24 hours.

As a result of the Cleveland disaster, the Public Health Council of New York State has prohibited, after September 1st, next, the sale or distribution of cellulose-nitrate film for X ray purposes, and it is understood that New York City will take similar action. The State of Ohio has issued an elaborate set of recommendations designed to achieve the same end. Cellulose-acetate films are "strongly recommended" in place of the inflammable variety, and where the latter are in use, or in storage, it is suggested that a print should be taken for record purposes and the film destroyed. In the meantime, our own Protection Committee, as it is called, has suggested certain common-sense precautions, such as the desirability of storing X ray films in special cabinets or cupboards and so limiting the number which are lying open during reference, and especially the need for a film store, isolated and cool, in the case of institutions where large numbers of films accumulate. It was stated at the recent annual meeting of the Institution of Fire Engineers in Manchester, that certain hospitals might have on their hands as much as three or four tons of film without conforming strictly to the requirements of the celluloid regulations. It was stated at this meeting that insurance companies were conferring with hospital authorities in the matter of storage. No doubt practice varies at present, but we have been given details of one large X ray department recently built in which the films, as they are returned from the wards, are filed in steel boxes which are themselves kept in a large fire-proof crypt in the basement. Such a crypt, which is remote from steam pipes and electric wiring, may be as safe as the concrete outbuilding which would be ideal where space made it practicable. We learn from various sources that the non-flam or cellulose-acetate film has not only the drawback of expense—a serious matter when radiographic films are so large—but also that it is apt to have a yellowish tinge and to be less translucent than the nitrated film. The Protection Committee indicates the undesirability of permitting smoking or naked lights in the proximity of a film store, but it is perhaps fair to repeat that X ray film is not ignited by chance contact with a glowing cigarette end. Any general rule against smoking in an X ray department would be disregarded as an indication of childish panic rather than of considered judgment.

AUTOHÆMOTHERAPY IN SYPHILIS.

A REMARKABLE case of resistant syphilis, with an intractable Wassermann reaction, has lately been described by Beume,[1] of Hanover. The patient, who presented himself for the first time in November, 1926, with a typical chancre and a negative W.R., had two courses of treatment, each consisting of ten injections of neosalvarsan (0·45 g.), and 15 injections of bismogenol, concurrently. His third course, in May, 1928, was begun too late, and was frequently interrupted, so that his W.R., hitherto negative, became strongly positive at the end of it. His fourth course included a series of mercury inunctions and ten injections of neosalvarsan. The fifth course began in December, 1928, and entirely failed to influence the progress of a tertiary cutaneous manifestation at the scalp margin. Just after the eighth salvarsan (and twelfth bismogenol) injection, the patient had a riding accident, and was brought to hospital with a hæmatoma of the knee and ankle-joints. During his four weeks' detention there was mild fever. He said nothing to the hospital authorities about his luetic infection, but on discharge on March 12th of this year presented himself at Beume's clinic, where it was found that the cutaneous lesions had disappeared, and the W.R. had become completely negative. Beume remarks that the pyrexia, as well as the hæmorrhage, may have influenced the sequel, and raises the interesting question whether the proteins set free in the serum, or the fact of their having been previously salvarsanised, was the more important factor in bringing about a cure. He maintains that the proposal, which he has previously made, to treat Wassermann-fast cases by a combination of salvarsan, bismuth and autohæmotherapy, receives further support from this case.

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[1] Derm. Woch., June 6th, p. 812.

SALARIES OF HEALTH OFFICERS IN U.S.A.—The New York State Department of Health states that with the increased number of full-time health officers, there is awakening a more general disposition to remunerate more fairly all health officers for their services. In a comparison recently made of cities of 100,000 population or over as to the salaries paid health officers in 1923 with the salaries paid in 1927, it was found that the average salary increased from $5000 to $6200; in cities of 50,000 to 100,000 population it increased on an average from $3404 to $4570.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXVIII.

INTERPRETATION OF THE SCHICK TEST.

THE Schick test has now become a well-established clinical aid to diagnosis; it is, therefore, important to have a clear idea of what we ask it to tell us under any given circumstances and to what extent we can rely upon the answer.

The test consists in the intradermal inoculation of a minute amount of diphtheria toxin accurately measured; in susceptible persons a characteristic red circular swelling appears. In such persons the injection of antitoxin will produce immediately passive immunity which will last about three weeks, whereas by giving prophylactically toxin rendered non-poisonous by the action of chemical and physical agents—i.e., "toxoid," with or without the addition of antitoxin, in three doses a week or more apart, active immunity of indefinite duration can be produced.

Technique of Test and Reading of Results.

The technique is simple; the prescribed dose of toxin—with English products, 0·2 c.cm., with American and continental mostly 0·1 c.cm.—is injected intradermally. It is advisable to use the special sharp rustless steel needles, much smaller than the ordinary hypodermic size, sold for the purpose; the plunger of the syringe must fit so tightly that liquid cannot readily be forced past it by any finger pressure. If the needle be held nearly parallel to the skin it is easy to inject intradermally and produce the desired small circular swelling. Even if the operator feels that he has gone too deeply, the proper reaction will probably be obtained, but it is easy to repeat the injection an inch away in the forearm. It is wise always to assign the same forearm—preferably the left—as the one for the toxin injection, and the other for the control fluid. Clear descriptions of the various reactions to be looked for are usually supplied with the various products on the market.

The *negative* reaction, when there is no local red reaction on either arm, and the *negative-and-pseudo*, with equal reactions on the two arms usually fading in a few days, indicate that the patient has a high degree of immunity against diphtheria; he is considered as "immune" against the disease.

The *positive* reaction shows a red flush from half an inch to two inches wide. This usually appears within 24 hours, but may be delayed until the second day and in unusual instances to even the third or fourth day. It is wise to make a final reading on the seventh day. The redness gradually disappears, a fine scaling may occur, and the resultant brown stain fades slowly during the next few weeks. (It is well to offer women patients the option of being tested just above the knee, for a circular brown stain on the forearm, which in patients with sensitive skins may last for some weeks, may be resented.) The right arm into which the control fluid is injected may show a red reaction, while the left arm shows a much larger and probably more intense reaction. This *positive-and-pseudo*, and the simple positive reactions indicate that the patients have either minimal or no immunity against the disease; they are "susceptible."

Clinical Use of the Test.

We may use the test (*a*) in considering whether a given patient has diphtheria, (*b*) we may ask is a given subject immune when we are attempting to control an epidemic, or (*c*) when merely seeking the susceptibles in a non-epidemic period in order to immunise them.

(*a*) If we Schick-test patients with sore-throat, we must consider the result first in its relation to treatment, secondly as a help in administration. It is true that practically every patient admitted to an isolation hospital suffering from diphtheria is Schick-positive (unless, of course, antitoxin has already been given). But for the average patient treatment should not await the application of, or result of, the Schick test. All experienced authors agree that the practitioner responsible for treating a patient complaining of a sore-throat, with some membrane present, which he thinks is probably due to diphtheria, must give antitoxin at once without awaiting the results of swab or of Schick test. The records of every large isolation hospital show that deaths and instances of prolonged convalescence with paralysis or cardiac weakness occur due to failure to give antitoxin when the patient is first seen and the suspicion of diphtheria first arises in the practitioner's mind. From the *administrative* point of view, on the other hand, the test may give great help. The injection of the Schick dose of toxin will give a correct reading even if antitoxin be given four or more hours later. In some hospitals all patients with a "mild" attack are Schick-tested and either given antitoxin four or five hours later —or the physician, guided by long experience of diphtheria, may decide that the patient requires no antitoxin. But this is not a decision for which the wise general practitioner, who has not the patient under observation from hour to hour, will ever wish to take responsibility. If a patient suspected to be suffering from diphtheria gives a negative response to the Schick test, it is very unlikely that the disease is diphtheria. To most useful medical rules there are exceptions. Rare instances are recorded in which "mild diphtheria" has been seen in patients known to be negative to the Schick test—e.g., sore-throat with a slight amount of membrane, temperature probably never reaching 100° F. and a very slight disturbance of health, with absence of complications during convalescence.

To sum up, the Schick test used with discretion may aid in treatment, but it cannot always give us decisive information that will relieve us of the duty of giving antitoxin where diphtheria is suspected; it may be of great service in deciding whether the case should be treated from the public health point of view as one of diphtheria.

(*b*) When attempting to control an epidemic in a school or institution, the test will aid us much. The method has been often described. The whole population is Schick-tested and divided into positive and negative groups. In the latter no diphtheria will occur; only amongst the positive reactors will cases appear. The two groups are swabbed in the search for "virulent carriers" amongst the negative reactors, and to detect, in the stage of incubation, any diphtheria amongst the positive reactors. (If the outbreak be a violent one, it can be stopped entirely by giving antitoxin at once to the positive reactors. Some three weeks later active immunisation may be begun.) Where possible, however, it is better to employ active rather than passive immunisation.

(*c*) When we begin to immunise a group of people as a prophylactic measure, the test is the basis of the whole procedure. With the knowledge and experience gained during the past decade by testing on the large scale, we can say whether, as a compromise, it is permissible to immunise without testing. Since most children of early school age are positive to the test, the tendency of public health authorities is to immunise all children up to the age of 6 or even 10, without preliminary Schick-testing. Some public health authorities do not test as a routine after immunisation. This saves time and money, the obvious disadvantage being that cases of diphtheria may occur amongst the inevitable small residuum of children who do not become Schick-negative after one course of any of the diphtheria prophylactics available, and this may discredit the whole procedure.

Reservations.

Error may conceivably arise from faulty technique, readings, or the conclusions drawn. Reliable "buffered" diluted toxin of sufficient stability is now available and the technique of the test is simple. The reading of the reaction can be made in the great majority of instances readily and with confidence. A pale red coloration 5 mm. in diameter is clearly a negative reaction, a violent red one of 20 to 30 mm. clearly positive. A small number of reactions may make one pause; pale reactions from about 5 to 10 mm. in diameter are difficult to read as either positive or negative; the reading on the seventh day, however, will clear up most difficulties. The wise practitioner will not, in such instances waste time. He will leave the conclusion to any expert available or will make whatever decision will be least dangerous to the individual tested. If the symptoms of the patient suggest diphtheria, but the Schick test is returned as "negative," the doctor will be well advised to conclude that a mistake has been made in the test and to be guided by his clinical observation; he will, therefore, give antitoxin. If the reaction be a "doubtful" one, he will conclude that it is really positive and will give antitoxin. In testing with a view to immunisation, or retesting after immunisation, he will give prophylactic treatment to all with "doubtful" reactions.

R. A. O'Brien, C.B.E., M.D., D.P.H.,
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Beckenham, Kent.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lts. (D) to be Surg. Lt.-Comdrs. (D): R. M, Finlayson, C. G. Cruickshank, T. Hunt, L. B. Osborne, R. J. Mc. A. Andrews, A. W. Wallace, L. M. Hughes. and C. J. Finnigan.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Capts. to be Majs.: J. C. Collins (prov.), and remains secd.; W. I. FitzG. Powell, and remains secd. G. W. B. Shaw.

Lt. (on prob.) N. J. Nicholson resigns his commn.

ARMY RESERVE OF OFFICERS.

Lt.-Col. C. A. J. A. Balck Foote having attained the age limit of liability to recall ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Col. J. S. Riddell (late R.A.M.C., T.F., ret.) to be Hon. Col. R.A.M.C. units, 51st (Highland) Div., T.A.

Lt. J. Cook to be Capt.

Supernumerary for service with O.T.C.: A. J. Parer to be Lt., supern. for serv. with Med. Unit, Univ. of Lond. Contgt., Sen. Div., O.T.C.

INDIAN MEDICAL SERVICE.

Col. J. W. D. Megaw to be Maj.-Gen.

Lt.-Col. H. M. Mackenize to be Col.

Maj. G. R. Lynn to be Lt.-Col.

Capts. G. M. Moffat, L. G. Pearson, and Pirojsha Merwanji Antia to be Majs.

DEATHS IN THE SERVICES.

Surg.-Commander Devonshire Penrose Hawkes Pearson, R.N., who died on July 22nd, entered the Navy as a surgeon in 1913, and was appointed to the cruiser *Antrim*. He served in the Grand Fleet during the early part of the War. In 1916 he was nominated for special duty in the Mediterranean, and in 1918 became P.M.O. of the new cruiser *Danæ*, with the acting rank of surgeon lieut.-commander. He was confirmed in this rank in 1919, and was promoted to surg.-commander in 1925. He retired from the service last year.

Special Articles.

MODERN HOSPITALS IN SWEDEN AND DENMARK.

By H. S. SOUTTAR, F.R.C.S. Eng.,
SURGEON TO THE LONDON HOSPITAL.

It is probable that the next few years will see a general reconstruction both of our hospital system and of our hospitals themselves, more especially in the provision of a hospital service for private patients of every class. I therefore welcomed the request of my colleagues on the staff of the London Clinic and Nursing Home, a large private hospital which is at present being erected in London, to visit the clinics of Sweden and Denmark and to gather such information as might be of use to us in equipping this new hospital on the most modern lines. Our party was formed of the managing director, the architect, the domestic bursar, and myself, so that we were in a position to criticise and appreciate all we saw from every point of view.

Nothing could have exceeded the kindness with which we were everywhere received, and every possible facility was placed at our disposal. In the course of ten days we travelled nearly 3000 miles and went over 17 hospitals from the cellars to the attics. We were very greatly impressed by all that we saw and by the immense strides made in medical service throughout Scandinavia. It has become a national service in the best sense of the term, supported by the resources of the State, organised and controlled by a progressive medical profession, and quite obviously used and welcomed by the public, both as a privilege and as a right.

The position of these hospitals must be understood if their significance is to be appreciated. The organisation differs greatly from that familiar to us. Sweden is divided into a number of administrative counties and each of these is responsible for the care of its own sick. In a central town a large hospital which serves the whole county is erected and maintained by the county authorities, who have a considerable measure of autonomy. In only a few large towns, such as Stockholm itself, are these special hospitals maintained by the municipal authorities, and here also are a few independent endowed institutions, such as the Diakoniss Hospital in Stockholm.

Payment According to Accommodation.

In every one of these hospitals, even in those which correspond to our poor-law infirmaries, the patient has to pay according to accommodation. It is true that with the working class these payments are met from insurance societies, membership of which is universal, whilst the charges themselves are exceedingly moderate, varying from 3*s.* to 21*s.* a day with the accommodation. It is, however, a perfectly definite payment for services rendered, and although it is backed by the State, or in a few cases by endowment, there is quite obviously no question of charity in the transaction.

As to the accommodation provided, it is everywhere of a very high order. There is a general tendency towards the abolition of large wards and the limitation of the beds to six or eight at the most. The majority of the beds are in rooms taking one, two, or three patients, and as a result the patients have a degree of privacy impossible on the older system. This might at first appear to involve additional work for the nursing staff, but the arrangements are so convenient that this does not result. In every hospital ample provision is made for private patients, but the accommodation differs only in small refinements from that in the rest of the hospital, for, indeed, the latter can hardly be improved upon.

A Medical Director.

In all the public hospitals visited by us the professional work is under the control of a medical director, who mostly has a large degree of executive control, and a number of assistants working entirely under his authority. The system is the usual one maintaining on the Continent and differs fundamentally from that customary in this country. It cannot be denied that it leads to a degree of coördination which must be of advantage both in the progress of medical science and in the treatment of the individual. It necessarily involves, however, the concentration of all the more important work in the hands of a few individuals, and the effect of this is accentuated by the fact that practically the whole surgical work of the country, both public and private, is carried out in the hospitals. It is true that in Stockholm and Gothenburg there are large private hospitals, open to all practitioners, but, in general, surgical practice is only carried on within the walls and by the staff of the local hospital.

Spacious Buildings.

The buildings themselves give an impression of spaciousness and of coherent design which is very impressive. The Academic Hospital, at Upsala, with accommodation for 577 patients, is situated in grounds 25 acres in extent, yet the buildings are so arranged that access from one to another is easy. Even in the great County Hospital of Copenhagen, which is designed for an ultimate capacity of 1000, contact between the various departments and sections of the hospital is easily maintained by large underground tunnels. Spaciousness and accessibility have been combined with extraordinary skill.

The feeling of space is maintained by the large airy corridors upon which all the modern hospitals are based. With the use of separate rooms for the patients the pavilion system, in the ordinary form, ceased to have any advantage, so that some modification of the corridor plan is universal. The corridors have been kept clear of every encumbrance, even the doors lying flush in their walls, and to look down one of these long corridors, silent and empty, to a window in the far distance is impressive. Silence indeed is one of the most remarkable features of these hospitals, for the floors are covered with rubber or cork, the doors are hollow and packed with wool, and there are no bells. Every now and then a light appears in a little bulb over one of the doors, to indicate that a patient requires the nurse, and its silent call adds still further to the impression of quiet.

The Patients' Rooms.

The patients' rooms are of adequate size, much larger than those in many of our nursing homes, and the fittings are simple and well designed. The fact that box-spring mattresses are almost universal shows the standard of comfort supplied. Central heating is everywhere in use, and the double windows, necessitated by a Scandinavian winter, are so arranged as to allow of full ventilation without a draught. The excellence of the ventilation of all the hospitals we visited was a surprise to those of us who are familiar with Continental custom. In the private rooms hot and cold water is always laid on, and in the private Red Cross Hospital in Stockholm each room has its own lavatory attached.

The Baths.

As one would expect in Sweden and Denmark, the bath departments are constructed on a magnificent scale, and one would have to go to Bath or to Buxton to find their rival in this country. Every conceivable form of bath is supplied, and all are in constant use. It appears that rheumatism is a serious problem, and almost every hospital has a separate rheumatic section, specially supported by the State. It takes the form of a boarding-house to which patients can be sent from any part of the county served by the hospital and where they can live comfortably at very low rates, usually met by insurance, during their treatment. The whole organisation seems admirable, and it might well be adopted in this country.

X Ray Equipment: Operating Theatres.

The X ray equipment was everywhere of the highest order and few hospitals in this country could approach what appears to be an almost standard installation. The diagnostic and therapeutic departments are in every hospital entirely distinct, with entirely separate generators and equipment. The diagnostic department is generally equipped with the convenient apparatus designed by Prof. G. Forssell, and the generators have usually a capacity of 120,000 volts. In the newer hospitals Stabilivolt generators by Siemens and Halske are installed, with a capacity of 320,000 volts, for purposes of treatment. The finest of all is the equipment at the County Hospital of Copenhagen, where the new "cannon" apparatus is the last word in radiotherapy; this whole department, controlled by Dr. Leif Arnzten, stands by itself as an example of superb equipment and design.

The operating theatres are everywhere designed on a lavish scale and are arranged in self-contained suites of theatre, anaesthetic room, sterilising room, surgeons' room. One of the finest is at Västerås, where the central section of the top floor is given up entirely to theatres. A large sterilising room with completely duplicated equipment is placed between two large theatres. Behind these a very large corridor gives direct access to all three and forms an ante-room. From this opens on the other side, dressing rooms, sisters' stores, a special X ray room for pyelograms and other special work, and a writing room for the surgeons. It is true that modern theatres in this country are arranged in a similar way, but rarely with such convenience and never with so much space and light.

Unlimited Space and Light.

One accustomed to working in a hospital in London is perhaps most impressed by the unlimited space and light available. The wide airy corridors, the large balconies on to which beds can so easily be wheeled, the ample space provided for the operating suites, and the obvious consideration for the comfort and convenience of all those who have to work in the hospitals, are evidence of sound organisation and thorough efficiency.

In the hope that it may be of assistance to those who are anxious to see for themselves the hospitals of Sweden and Denmark, a list is appended of those which appeared best adapted to the requirements of this country.

—	Beds.	—
STOCKHOLM. Sophiahemmet ..	95	Private hospital with training school for nurses.
Red Cross Hospital	60	Private hospital.
UPSALA. University Hospital	577	Director: Prof. Nystrom; Asst. Director: Dr. Westerborn.
VÄSTERÅS. Central Lazarett ..	235	Director: Dr. Norrlin; Asst. Director: Dr. Berner.
NORRKÖPING. Lazarett ..	350	Director: Dr. Bager.
COPENHAGEN. Bispebjerg Municipal Hospital	800*	Surgical Director: Dr. Wessen.
Kobenhavns Amts Sygehus (county hospital)	300†	Medical Director: Dr. Jorgensen; Surgical Director: Dr. Helsted; Secretary: Inspector Knud Warming.

* To be increased to 1800. † To be increased to 1000.

It must not be imagined that these hospitals are a new departure in policy; they are rather part of a steady evolution, the evidence of a very remarkable appreciation in Sweden and Denmark of the value of modern medicine and surgery, and of a determination to give them every material assistance that is possible. They are State hospitals in the sense that they are built, equipped, and subsidised by the public authorities, but it is very evident that they are no product of a bureaucratic system but of a wholehearted coöperation between the medical profession and the State. In the very best sense of the word they are National hospitals, and we who visited them are convinced that only on the basis of National funds can such services be supplied.

The Defects of the Voluntary System.

Voluntary effort has done magnificent work for the hospitals of this country, but the problem has entirely changed and has passed beyond its powers. On the one hand, owing to the extraordinary advances in medicine and surgery during the last 20 years, it is impossible for private charity to cope with their demands. On the other hand, the sick poor for whom our hospitals were founded have disappeared, and in their place a class is demanding, and in my opinion rightly demanding, admission to our hospitals, who would resent the suggestion that they are the objects of charity. The care of the health of the nation is now recognised to be a function of the State, and it is impossible to dissociate our health from our hospitals. Unless our hospitals are maintained at the highest level of modern efficiency, we are bound as a nation to fall behind.

Far from our hospitals being as they once were the envy of other nations, the great majority are years behind the times, and lack of funds compels the hospitals of our metropolis to carry on their work in the heart of London with an equipment and in surroundings which would not be tolerated in a small provincial town in Sweden. Most of them are in financial difficulties and some are virtually bankrupt, so that it is inconceivable that they should be able to bring themselves up to date, whilst their mere maintenance makes quite unfair demands upon those who have hitherto so generously borne the responsibility upon their shoulders. They have made a gallant fight against social and economic changes which have altered entirely the clientèle which they serve and removed the old sources of their income, whilst they are faced with financial demands such as voluntary effort can never be expected to meet.

The Future.

Is it not time that we recognised these facts and faced boldly a complete reconstruction of our whole hospital system? All of us who have grown up under the old system, where the charity of our nurses, of our doctors, and of the public worked hand in hand to relieve suffering and to help the poor, will view its departure with regret. Yet I feel confident that the future will hold far greater opportunities than the past, and I have returned from my visit to Sweden and Denmark not so much depressed by the backward condition of our hospitals as stimulated by the prospect of the possibilities which lie before us. For I am convinced that we shall set our house in order and regain our lead.

In conclusion, I can only express our gratitude to our friends who placed at our disposal so generously their time and the resources of their hospitals, and most of all to Prof. Viggo Christiansen, of Copenhagen, and Dr. John Hellström, of Stockholm, who organised our visit and to whom we owe its success.

REBUILDING OF MIDDLESEX HOSPITAL.—At a meeting of the Court of Governors last week Prince Arthur of Connaught, the Chairman, gave an account of the progress and finance of the scheme of rebuilding. The work in hand and provided for includes the new west wing, a new nurses' home (an anonymous gift), a new residents' house, a block for paying patients (the gift of Lord Woolavington), an annexe ready to be converted into an out-patient department, and a great central power house, in addition to Mr. S. A. Courtauld's gift of the Institute of Biochemistry. The amount still required to complete the building is £380,000 and there is a gap of about £16,000 a year between receipts and expenditure. A sum of £15,000 is required immediately on current account.

MEDICINE AND THE LAW.

Colonel Kynaston and the General Medical Council.

THE failure of Lieut.-Colonel J. W. Kynaston's action against the General Medical Council blocks one possible avenue by which a medical practitioner, aggrieved at the removal of his name from the Register in consequence of charges of unprofessional conduct, might conceivably succeed in reopening the merits of the disciplinary issue. Nothing is more certain in the legal view of such issues than the fact that, if the General Medical Council has properly conducted its inquiry into the conduct of a practitioner charged under Section 29 of the Medical Act with "infamous conduct in any professional respect," the law courts will flatly refuse to interfere with the Council's finding or to rehear the matter by way of appeal. Colonel Kynaston, therefore, could not possibly succeed in his recent attempt to have the record of his removal deleted unless he could show that the Council had acted without jurisdiction, or with bias, or in some other fashion contrary to natural justice. His attempt was based on three grounds. One of them was a definite allegation of bias. The conduct in respect of which his name was removed from the Register some seven years ago was, he contended, in part a criticism of Sir George Newman's administration as Chief Medical Officer of the Ministry of Health: Sir George Newman was, he complained, a member of the committee which decided the disciplinary issue; *ergo*, the tribunal was biased and prejudiced. When a party enters upon litigation his legal advisers will, of course, expect him to use every possible weapon; Colonel Kynaston, in making what the Lord Chief Justice called a "faint suggestion" of bias in the circumstances stated, may have been relying rather upon a technical than a substantial foundation. The King's Bench Division made short work of his allegation. Lord Hewart remarked caustically that there were only two answers to it: firstly, that there was not a tittle of evidence of bias, and secondly, that Sir George Newman did not take part in the decision.

The other two grounds of Colonel Kynaston's application were less invidious. He maintained that the book and letters in respect of which he was accused of unprofessional conduct amounted to the adoption and advocacy of a theory of medicine and surgery, and was, therefore, privileged under Section 28 of the Act; disciplinary action taken in these circumstances was, he argued, illegal. Further, he claimed that he had applied to have his name removed at his own request before the charges formulated against him were tried; the examination of the charges thereafter was, he contended, improper. On this latter point the judges of the King's Bench Division made it clear that a practitioner, if minded to do acts which would clearly invite disciplinary proceedings, cannot claim to have his name removed from the Register, and afterwards, when those acts have been completed, claim to have his name restored again. Mr. Justice Avory pointed out that the statutory declaration required from a practitioner who seeks to have his name removed from the Register at his own request contains a statement that he is not aware of any proceedings, or of any reason for proceedings, for the removal of his name penally. Mr. Justice Branson remarked that even on such voluntary application the Council is to remove the name "if it thinks fit," so that there still remains a discretionary power in the Council. Looked at generally, as the Lord Chief Justice observed, no small part of Colonel Kynaston's case was an invitation to the King's Bench Division to review the decision reached by the Council seven years ago. "It is well settled," said Lord Hewart, "that the Court has no such power: the Council did the very thing which the law empowers them to do." The matter, he added, which was seven years old, had been stirred, not because any human being could seriously consider that there was any ground for undoing what the Council had done, but because Colonel Kynaston had been summoned for another offence under the Medical Act, and it was desired to add a make-weight to the defence in those proceedings.

The Police-court Proceedings: Colonel Kynaston's Appeal.

In those police-court proceedings[1] to which Lord Hewart was alluding, a fresh step was taken by Col. Kynaston on July 15th, when he made an application at Marlborough-street police-court with a view to appealing against Mr. Cancellor's decision dismissing summonses against him under the Probation of Offenders Act.

It may seem strange that there should be an appeal where there has been no conviction, but the Criminal Justice Act of 1925 (Section 7, as amended in 1926) allows a person in whose case any order under the Probation of Offenders Act has been made by a court of summary jurisdiction to appeal to quarter sessions as if he had been convicted, provided that he did not plead guilty or admit the truth of the information at the original trial. Mr. Cancellor, it will be remembered, dismissed outright the summons charging the defendant with having wilfully and falsely pretended to be a doctor of medicine. The second summons, charging him with wilfully and falsely using the title "M.R.C.S. Eng.," Mr. Cancellor found proved; Col. Kynaston must, he thought, have known that the use of those letters would lead readers to believe that he was still a member of that distinguished body. The magistrate, however, refused to register a conviction on this latter charge because of the following extenuating circumstances: first, Col. Kynaston had no opportunity of arguing his case before the Royal College of Surgeons; secondly, a somewhat similar summons was withdrawn a year or two ago—a fact which might have lulled him into an erroneous sense of security from further proceedings; thirdly, Col. Kynaston had done distinguished work both in his military service and in his civilian practice afterwards. As, however, the magistrate accompanied the dismissal of the summonses with a serious warning of future penalties if the defendant persisted in publishing the advertisement, it is natural that Col. Kynaston should wish to reopen the decision.

"Wilfully and Falsely."

It was made clear in the previous proceedings against Col. Kynaston that there was no suggestion of fraud. In proceedings under Section 40 of the Medical Act of 1858 it is an important element of the charge that the accused should have "wilfully and falsely" pretended to be, or should have "wilfully and falsely" taken or used a medical title or any name, title, addition or description implying that he is registered or recognised by law as a medical practitioner. The principal leading cases on the meaning of "wilfully and falsely" have been those in which American "correspondence" degrees were in question—an abuse which has now largely ceased. In Andrews *v.* Styrap (1872), Thomas Andrews had used the letters "M.D." after no more elaborate qualification than the purchase (without going to America, studying or passing any examinations for such degree) of a diploma as a doctor of medicine from the University of Philadelphia. Baron Martin, when the case came up to the Exchequer Division, remarked, "this is no diploma at all, it is a mere pretence." The magistrates, he said, were right to convict: "there was ample evidence that the appellant *wilfully* (for he did it on purpose) and *falsely* (because he pretended thereby to be on an equal footing with any regularly bred and registered physician or M.D. in England) took, assumed, and used the title of 'M.D.' under a diploma obtained by him from an American University without any course of previous study or any examination, but simply on the payment of a sum of money, and which diploma therefore he must have known to be in fact utterly worthless and valueless as an indication of the possessor's merit, learning, and skill as a physician or as giving him any of the privileges of a registered medical man." On the other hand, in Carpenter *v.* Hamilton (1877) the accused had held himself out to be "Dr. John Hamilton, Doctor of Medicine of the Metropolitan Medical College of New York," and it was never proved that he did not possess this qualification. "How is it possible," asked Baron Cleasby in the Exchequer Division, "to make out a charge of falsely pretending to be something, when the only evidence is that the man pretends to be what he really is?" Baron Martin's exposition of "wilfully and falsely" in Andrews *v.* Styrap is still relied upon. If it is applied to Col. Kynaston's case, it may be easy to say that the defendant used the letters "M.R.C.S. Eng." wilfully "because he did it on purpose"; it is not so easy to say that he did it "falsely" because his original possession of the diploma was justly founded on established grounds of "merit, learning, and skill." The cancellation of the diploma was not due to any reflection upon his "learning and skill." The law may be clearer when Col. Kynaston's litigation is complete.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Murder by Strophanthin.

A medical man, Dr. X., was recently tried for murder in Bonn, in curious circumstances. He had an entanglement with a woman, Mrs. Y., who had been a nurse, which was inconvenient in view of his desire to marry someone else. One evening when Mrs. Y. was in the doctor's house, she was heard to cry out that she had been poisoned, and that she wished to be examined at once at the university hospital. Dr. X. himself carried her to the hospital where he declared to a medical officer that she was very hysterical, but that as she complained of heavy pains in the rectum, a rectal wash-out might be indicated. The woman continued to cry that something had been introduced into her rectum, and as she was very excited, she was at once taken to the clinic for nervous diseases, where she died an hour later. At the autopsy, strophanthin was found in the rectum, whereupon Dr. X., whose behaviour had aroused suspicion, was arrested, and tried for murder. At the trial a chemist gave evidence that some days before Dr. X. had presented a prescription for strophanthin in crystalline form. On being informed that strophanthin was in stock only in solution, he had induced the chemist to procure it in crystalline form. In handing over the drug to the defendant, the chemist warned him that it was a strong poison. Defendant replied that he wished to use it for cauterising the nose of a patient. Medical witnesses gave contradictory evidence; a professor of pharmacology stated that though strophanthin might be used for that purpose it was an uncommon technique. A professor of rhinology declared that he had never heard of strophanthin being used for cauterisation. Defendant said that the woman had complained of pain in the rectum, and that he had therefore performed a rectal examination. Being very hysterical she might have taken the drug from his table and introduced it into the rectum herself for suicidal purposes. He admitted, however, that the dead woman had been his mistress. After a trial lasting four days, which caused a great sensation throughout Germany, Dr. X. was sentenced to death for murder. The case is unique, since murder by strophanthin has never before been recorded. The plea of insanity made by the defendant's counsel was not accepted by the Court.

Legal State of Pharmacies.

Dr. Lustig, a government medical officer, recently read a paper before the Berlin Society for Public Health, on the legal position of pharmacies, which is very variable. Certain pharmacies possess rights connected with certain premises, which may date back some railways and that of the old streams. In order, however, to regard the railways as a third factor producing an indirect association between rats and acute rheumatism, it is necessary to assume that dampness and acute rheumatism are related. The report mentions, however, another fact which suggests that rats and rheumatism are related, whether causally or not. Both occur most frequently in defective houses, where rats can gnaw their way into the spaces below the floor-boards in the basement and ground-floors. Rats, moreover, are attracted by untidy yards and kitchens. As we remarked in our previous comment, the work of other investigators has shown that acute rheumatism is very common in needy households, but is rare among the very poor. Social workers know well that the inhabitants of the class of premises which are infested by rats tend to be untidy and wasteful in their manner of life, while persons on the verge of destitution, to whom every scrap of food is important will presumably offer rats little or no hospitality. The Kensington report also shows a close correspondence between acute rheumatism and density of population, another factor favourable to infestation by rats.

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[1] See THE LANCET, July 13th, p. 95.

These data prove nothing conclusively, but suggest a great deal, and must provoke other workers to make investigations on the same lines. The next report from Kensington, which will show whether the correspondence is confirmed or diminished when the number of notified cases is larger will be awaited with interest.

Public Health Services.

THE HEALTH OF LONDON IN 1928.

Statistics.

Estimated population. 4,458,200. Birth-rate, 16·2. Death-rates per 1000 of the population, all causes, 12·1; pulmonary tuberculosis, 0·89; non-pulmonary tuberculosis, 0·14; cancer, 1·52; pneumonia, 0·93; bronchitis 0·59. Rates per 1000 births: Infant mortality, 67; maternal from childbirth, 3·59.

AMONG the 28 metropolitan boroughs the following are some of the highest and lowest rates. The three highest birth-rates were: Shoreditch 20·7, Finsbury 20·4, Poplar 19·9; the three lowest Westminster 10·4, Hampstead 11·6, Holborn 12·0. The three lowest death-rates were: Lewisham 10·0, Wandsworth 10·9, Woolwich 11·0; the three highest were Shoreditch 13·6, Holborn and Chelsea each 13·5. The three lowest infant mortality-rates were: Chelsea 48, Wandsworth and Woolwich each 50; the three highest were Paddington and Kensington each 85, Finsbury 84. The three lowest phthisis rates were: Hampstead 0·45, Kensington 0·60, and Wandsworth 0·71; the three highest were Finsbury 1·29, Bermondsey 1·28, Shoreditch 1·19. The three lowest rates for maternal mortality from childbirth per 1000 births were: Bethnal Green 1·40, Stepney 2·00, Holborn 2·11; the highest were Westminster 13·06, St. Marylebone 6·82, Stoke Newington 6·45.

Dr. F. N. Kay Menzies points out that, as would be expected in an ageing population, there was an increase in recorded deaths from diseases of the heart and circulatory system and from old age. Fatal street accidents caused 747 deaths, as compared with 669 in 1927, but these fatal accidents to children caused the same number of deaths in both years—viz., 149. The increase in infant mortality from 59 to 67 was largely due to diarrhœa and measles. The death-rate among children under two years from diarrhœa and enteritis was 10·32 per 1000 births, as compared with 7·59 in 1927. During 1928 London was attacked by small-pox of the mild type. The infection was brought to the south of England by a tramp who reached a Sussex casual ward in a collapsed condition in December, 1927, but the nature of his illness was not suspected until secondary cases occurred a fortnight later, the diagnosis being then confirmed by the council's small-pox consultant. By this time vagrants infected in this casual ward had spread the disease over the countryside. In all there were 285 confirmed cases, with one death in Southwark. The London experience showed that vaccination protects equally against the mild and the more virulent forms of small-pox.

The deaths from measles totalled 1358, the highest number since 1922. Measles was prevalent in London both in 1917 and 1918, and since then has been epidemic in alternate years. It is due again next winter and likely to be accompanied by a prevalence of whooping-cough above the average.

Maternal Mortality.

Dr. Menzies devotes much consideration to the statistics relating to maternal mortality and puerperal fever. In the first place he points out that the fertility of married women of the "better" class is lower than that of the poorer class owing to the higher age at marriage, but that only a relatively small proportion of the difference in the extremes of social class is attributable to difference in the actual age of the mothers. In the census for 1911 the social grouping is faulty, but appears to indicate that the fertility in the lower groups is one and a half times that of the higher groups. Dr. Menzies, on the other hand, gives figures which indicate that the fertility of the mothers of elementary school-children is 3·6 times that of other mothers in the County of London. He stresses the point that much more accurate data for social grouping should be obtained in the forthcoming census of 1931. The metropolitan boroughs which had a low maternal mortality in 1920-27 were Finsbury, Shoreditch, Greenwich, and Stepney, and in all of them the proportion of illegitimate births was low, whilst in Chelsea, St. Marylebone, Westminster, and Stoke Newington, where the highest maternal mortality occurred, the percentage of illegitimate births was generally high. During 1901 to 1910 there was a considerable decrease in maternal mortality attributable probably to the provision of better-trained midwives. Since this period the decline has been much less. In order to define and direct measures for the improvement of maternal health is is essential that greater attention should be given to records bearing upon maternal conditions, and one detail needed is a record of the age of the mother when each birth is registered. This point was especially emphasised by Dr. T. H. C. Stevenson in his evidence before the National Birth-rate Commission in December, 1914, but no action has yet been taken. Dr. Menzies gives figures to show that maternal risk in childbirth is lowest at ages under 25 years and increases rapidly with age after the thirtieth year, and that in such a comparison allowance has to be made for the double risk at a first confinement.

Another point brought out by the figures is the inverse relation of maternal mortality and fertility. A woman marrying at 18 and having three children before the age of 25 has a death risk of 2·07 per 1000 children born, whilst a woman marrying at 33 and having three children before the age of 40 has a death risk of 5·86 per 1000 births. Figures from New South Wales show that the maternal mortality-rate would be at a minimum if each married woman had four children. After the fourth child the risk increases. Other points are that a smaller family increases the maternal mortality by exaggerating the effect of first confinements and that the decrease in childbirth mortality among women under 30 is greater than the decrease in other causes of death, which recalls the fact that there has been lately noted in London an increased mortality among single women from phthisis.

Puerperal Sepsis.

Dr. Menzies questions the deductions made in the Aberdeen report on puerperal sepsis, issued by the

Scottish Board of Health in 1928, and gives his reasons for so doing. He goes on to produce evidence that the resistance to puerperal fever diminishes markedly with age, and to show fluctuations in the annual puerperal sepsis rates, which indicate a close interdependence of movements in the mortality from erysipelas, puerperal fever, and scarlet fever, an interdependence which was pointed out 50 years ago by Dr. G. B. Longstaffe in a paper read before the Epidemiological Society. There are no reliable figures available as to the percentage of sterile women, and the operations of birth control in reducing fertility is an unknown factor. Economic stress by increasing the proportion of unwilling mothers may prejudice the normal risk and excessive spacing of confinements may also increase the risk by bringing about conditions approximating to those of first confinements. The conclusion drawn from this statistical analysis is that the sustained rate of maternal mortality, in spite of improvements in the maternity service, is in general terms the result of the repression of natural fertility brought about by economic conditions, but the tentative character of the statistics is stressed and the need for more detailed records relating to the maternal state.

Disease Incidence.

The notifications of *enteric* showed an increase from 322 in 1927 to 580 in 1928, largely owing to the outbreak of paratyphoid B attributed to infected cream. There were 41 confirmed cases of *poliomyelitis*, of which 9 ended fatally. There were five more fatal unnotified cases of this disease. There were 83 confirmed cases of *encephalitis lethargica* of which 27, or 32 per cent., were fatal. There were 22 additional deaths from this disease amongst unnotified cases, in many of whom the post-encephalitic symptoms were not observed until years after the mild primary illness. The M.A.B. has now provided 50 beds for persons over the ages of 16 suffering from post-encephalitic symptoms. *Influenza* caused 590 deaths as compared with 1815 in 1927, but during the last weeks of 1928 there were signs of an epidemic in the north which later became general, and in the first quarter of 1929 there were more deaths from influenza than in any first quarter since the great epidemic of 1918. *Acute rheumatism* under 16 is now notifiable in Holborn as well as in Kensington and Paddington. A comparison of the mortality from acute rheumatism in various groups of boroughs lends no support to the effect of social conditions in the causation of this disease.

Tuberculosis.

There has been practically no decrease in the mortality from pulmonary tuberculosis in London during the past three years. The experimental scheme, begun in 1926, by which the tuberculosis dispensaries could obtain artificial light treatment at certain hospitals and centres, was very little used by the tuberculosis officers of the 10 boroughs concerned, and further experience confirms the view expressed in last year's report that the best results are obtained when light treatment is given as an addition to the fresh air, good food, and regular régime provided in a residential institution in the country. The present scheme is therefore to be dropped. The scheme for boarding out children who are contacts with advanced pulmonary tuberculosis has been continued; 140 children were accepted and 52 were being boarded out at the end of the year.

Underground Rooms.

Existing legislation for the control of underground rooms has been directed almost exclusively to the regulation of such as sleeping-places, but Dr. Menzies points out that the use of basement dwellings as living rooms is particularly injurious to the health of the women and children, who mainly occupy them during the daytime and that there is no statutory power to close only part of a house. The council is therefore considering the promotion of further legislation to deal with the whole problem of underground rooms.

Milk.

During 1928 the biological examination of 1605 samples of milk from 40 counties was completed and 148, or 8·9 per cent., were found to be tuberculous. As the result of following up by various county medical officers of health 66 tuberculous cows were found and slaughtered under the Order. The difficulty of tracing is greatly increased by the bulking of the milk at country depôts prior to despatch and this is more than ever the case since the introduction of glass-lined tanks. For example, one of these containers may hold 3000 gallons of milk, which may have come from 200 farms. On the one hand, the introduction of a single infected milk infects the whole of the tank; on the other hand, a massive dose of tubercle bacilli is diluted. The attention of the Ministry of Health has been drawn to this matter. Another point that has arisen out of milk examinations is that the guinea-pigs frequently die from an acute intercurrent infection. Such cases have been reported to the authorities responsible for supervising the farms and have been found useful as a lever for the removal of insanitary conditions on the farm. In 1888 there were 738 licensed cowhouses in the county. In December, 1928, there were only 55, chiefly in the rural districts of Woolwich and in Stepney and Bethnal Green, where the considerable Jewish population, from religious motives, are always anxious to obtain fresh raw milk. In the case of the imported milk for the year ended June 30th, 1928, 7·6 of the samples were tuberculous and 16·9 per cent. of the guinea-pigs died from intercurrent infection, whilst in the case of the milk produced in London 6·7 per cent. of the milk samples were tuberculous and 7·5 per cent. of the guinea-pigs died from intercurrent infection, so that the comparison is in favour of the London-produced milk. The description of the powers wielded under the various Milk Acts by the L.C.C. and the boroughs respectively appears to be dual responsibility at its worst.

Venereal Diseases.

The number of attendances under the V.D. scheme per new V.D. case shows another great increase, and the number of non-venereal cases attending the clinics has increased from 2300 in 1917 to 10,164 in 1927, and 9595 in 1928.

A New Hospital.

Dr. Menzies mentions that the rapid growth of the population on the Becontree Estate has created a need for hospital accommodation and that the trustees of King Edward's Hospital Fund and the Ministry of Health have each agreed to contribute £10,000 towards the capital cost if an equal amount is subscribed from other sources and the details of the scheme are satisfactory.

MENTAL HOSPITAL REPORTS.

THE 116th annual report of the *Royal Edinburgh Hospital, Morningside*, is illustrated by two line drawings of the Jordanburn Nerve Hospital and the out-patient department, and opens with a historical retrospect and survey of psychology in social life.

The Jordanburn Hospital is an entirely new venture under the new Charter, and is a voluntary institution for patients suffering from all that is comprised by the term "nerves." Its out-patient clinic is held every morning and provides facilities for every modern psychological investigation and treatment, including a child guidance clinic, social service department, mental deficiency section, and neurological department. The scheme will be completed later with the erection of laboratories in connexion with the magnificent lecture theatre. In the six nursing homes associated with Morningside and situated in the suburbs of Edinburgh, there were 93 patients at the end of 1928. These are specially equipped for nerve patients, and each has its own peculiar features, so that a change from one to another can often be made with benefit. The number of admissions, from all parts of Great Britain, is steadily increasing. At the main institution there were at the end of the year 155 voluntary and 705 certified patients. During 1928 applications for admission were received from 114 voluntary patients, and 98 certified. The medical superintendent discusses again the lamentably small number of poor voluntary patients received into the mental hospitals of the country. The usual details and tables are not supplied with this report.

The 128th report of the *Aberdeen Royal Mental Hospital* for 1928 records that there were 810 patients at the end of the year; 21·8 per cent. of the private admissions were on a voluntary basis, but only two rate-aided voluntary boarders were admitted. Seventy-six of 181 admissions were suffering from some bodily illness, and 12 from epilepsy. One general paralytic was discharged as cured without having had any special treatment, and five were able to return to work after malarial inoculation. The total recovery-rate was 25·96 per cent., and the death-rate 8·3 per cent. Six cases of paratyphoid occurred on the female side, and there were two cases of scarlet fever. T.A.B. vaccine and scarlatinal antistreptococcus serum were used respectively to immunise the contacts. The dentist examined over two hundred patients, of whom 170 required treatment. Eighty-two patients received ultra-violet radiation, most of them on account of physical conditions; anæmia was benefited and sleep, appetite, and weight improved. No lasting mental improvement was observed. Nearly a hundred cases were X rayed during the year. Rather more than a hundred patients were employed in the occupational therapy department on very varied crafts, and many discharged patients continue the work in their own homes. Research work is being carried on in the laboratory in addition to a large number of routine investigations. A cinematograph with non-inflammable films has been bought for the branch institution at Daviot, and has given much pleasure; one unfortunate patient had never seen a moving picture before, and was greatly alarmed at the first entertainment!

The *Glasgow Royal Asylum* publishes for 1928 its 115th annual report, illustrated as usual by a number of photographs. There were 536 patients resident at the end of the year, and 68 of the 135 patients admitted were voluntary boarders. Forty-five patients were discharged recovered and 34 greatly improved. The death-rate was 4·7 per cent. In redecorating the building attention has been paid to the influence of colour schemes on mental health. The kitchen has been centralised and reorganised, and much labour saved thereby. The seaside home at Skelmorlie and the nursing home at Dowanhill continue to render valuable service. The visiting dentist reports that he saw 204 patients, and practically none of them objected to treatment. The occupational therapy officer describes a very successful year in her department. Many patients on parole spend their day there, and some of them take away material to work at in their rooms. Every now and then a handicraft is dropped altogether so that it can be taken up later with a feeling of novelty. Nurses and attendants work among the patients and help the atmosphere of industry and life in the department. The amount realised from sales has more than defrayed the cost of materials. Four nurses and five attendants passed the senior examination of the General Nursing Council. The medical superintendent emphasises again the need for a psychiatric clinic, and discusses the popular attitude to mental illness.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 20TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 144 (last week 115); scarlet fever, 1864; diphtheria, 949; enteric fever, 56; pneumonia, 935; puerperal fever, 46; puerperal pyrexia, 87; cerebro-spinal fever, 12; acute poliomyelitis, 9; acute polio-encephalitis, 1; encephalitis lethargica, 28; continued fever, 2; dysentery, 11; ophthalmia neonatorum, 129. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on July 23rd–24th was as follows: Small-pox, 173 under treatment, 3 under observation (last week, 198 and 11 respectively); scarlet fever, 1405; diphtheria, 1046; enteric fever, 11; measles, 208; whooping-cough, 373; puerperal fever, 31 (plus 11 babies); encephalitis lethargica, 124; "other diseases" 24. At St. Margaret's Hospital there were 10 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 38 (8) from measles, 1 (0) from scarlet fever, 25 (8) from whooping-cough, 10 (4) from diphtheria, 65 (13) from diarrhœa and enteritis under two years, and 27 (2) from influenza. The figures in parentheses are those for London itself.

Birmingham and Liverpool each reported 6 deaths from measles, Leeds 4, and Bradford 3. Whooping-cough claimed 3 victims in Birmingham. Diarrhœal deaths were at their maximum in Liverpool 8, Birmingham 7, and Wolverhampton 3.

The number of stillbirths reported during the week was 291 (corresponding to a rate of 42 per 1000 births), including 50 in London.

Death from Small-pox.

THE fatal case reported last week from Stepney was that of a female infant, aged 3 days, whose certificate was filled up thus: 1. (*a*) Small-pox. (*b*) Unvaccinated, born with a rash, mother suffering from small-pox: 2. Prematurity. Dr. D. L. Thomas, medical officer of health, tells us that the infant's mother, having had a rash for about a week, was taken with labour pains on June 29th and removed to the Mile End Hospital where she gave birth a couple of hours afterwards. The baby, it seems, showed no rash for the first 12 hours, but when seen on July 1st had a profuse eruption. The case is an interesting one, inasmuch as the baby contracted the disease in utero.

ROUSSEAU'S RETREAT AS TUBERCULOSIS HOSPITAL. The Stoke-on-Trent City Council has obtained an option for the purchase of Wootton Hall as a tuberculosis hospital. Wootton Hall, which is romantically situated on the Staffordshire bank of the Dove, was from March, 1766, to May, 1767, the home of J. J. Rousseau, who there wrote the early part of his "Confessions." The village of Ellastone in which it stands is the Hayslope of "Adam Bede," and Wootton Hall is the Donnithorne Chase of that book.

VILLAGE SETTLEMENTS AND CENTRES.—Last week the Duke and Duchess of York paid their second visit within five years to the Papworth (Cambridgeshire) Village Settlement for Consumptives. The Settlement, which came into existence 12 years ago, with two shelters in a garden, is now a community of 700 persons who are able to support themselves by various handicrafts. The ex-patients live in cottages amid perfect sanitary conditions, and although 100 children have been born of parents one of whom is tuberculous, no trace of the disease has been found in any of them. The Papworth Industries have increased their turnover from a few hundred pounds in 1918 to £54,000 in 1928, and men and women who would normally be unemployable have received £112,000 in wages.—At the annual meeting last week of the Village Centres, Curative Treatment and Training Council, Incorporated, Field-Marshal Lord Plumer, who presided, reported that the income had fallen off. No appeals for money were made during the last two years, for fear of conflicting with those for the Haig Memorial Homes, nor had there been any appeals on Armistice Day, yet only £16,500 had been received from the British Legion. The factory is working efficiently, but it was stated that an income from donations and subscription of at least £7000 per annum is required; last year there was a loss of £400.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Adjournment for Summer Recess.

Parliament adjourned on Friday, July 26th, for the summer recess. Both Houses will reassemble on Tuesday, Oct. 29th. The Royal Assent was given by Commission to the following Acts:—Colonial Development Act and the Housing (Revision of Contributions) Act.

Poor-law Administration.

In the House of Commons on Tuesday, July 23rd, Mr. Neville Chamberlain moved that a humble address be presented to His Majesty praying that certain Orders made by the Ministry of Health, dated June 27th, 1929, in reference to the Bedwelty, Chester-le-Street, and West Ham Unions, in which appointed guardians are functioning under the Guardians (Default) Act, should be annulled. He said that the Orders purported to extend the period of office of the present appointed guardians until August 2nd, but he understood that the Minister of Health intended to dismiss them on that date and by a new Order to substitute other appointed guardians who would function until April 1st next. Since the appointed guardians had been at work all further borrowing by the unions concerned had ceased and the financial position had improved. In addition, the West Ham appointed guardians had increased the efficiency of the medical and nursing service at the hospital by appointing four consultants—a gynæcologist, an orthopædic surgeon, an ophthalmic surgeon, and a neurologist. They had appointed a dentist and an anæsthetist, they had added one medical officer to the staff, and had substituted 14 staff nurses for a corresponding number of probationers. In the children's homes they had provided a new and more varied diet at an additional cost, and had changed the clothing of the children, which was heavy and unsuitable, for lighter and healthier garments. They had encouraged games and outdoor exercises for the children, and had also encouraged them to join the local groups of boy scouts and girl guides. In place of part-time district medical officers full-time medical officers had been appointed, and the number of district nurses had been increased. The report on their work showed that not only was the administration of the old guardians extravagant but also grossly inefficient, and the hard-hearted, callous bureaucrats, as they were described by hon. Members who did not approve of anything that the late Government did, had really effected a revolution in the efficiency of the service as well as in the financial position. Now these people were to be swept away as if they had done something to be ashamed of instead of pulling West Ham out of chaos into order, and in their place were to be put people who would be nominated by the local authority. In view of statements which had been made by members of the Labour party in the West Ham area, and the fact that under the Local Government Act something like £250,000 of public money was to be handed over from the Exchequer to be distributed in that area towards the local rates, he thought there was danger in the course which the Minister of Health proposed to take. He hoped that Mr. Greenwood would indicate that he stood up for the best principles of poor-law administration, and that he was not prepared to commit himself to practices such as those which led to the passing of the Guardians (Default) Act.

Mr. Greenwood, Minister of Health, said that he wished to see boards of guardians doing their honest duty in an enlightened and humane way, without extravagance and without placing an enormous burden on the other people who were paying the rates and who in many cases he realised were very little better off. He had no reason to believe that they would not get wise and fair administration from the newly appointed boards of guardians when they took office. All or most of them were persons of considerable experience; they were being given a trial trip and they would be able ultimately to introduce the county councils and the county borough councils in those areas to the real problems which they had to face. He could think of no other way of dealing with the question than the one he had adopted. He could not have squared it with his conscience to leave the three appointed guardians there for another eight months.

After further debate,

The Constitutional Issue.

Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health, said that there was a serious constitutional issue involved. The late Minister of Health took power to himself to appoint three persons or any number that he liked as guardians. He fixed their salaries and he could appoint them for a given time. For the acts of these persons the Minister was not accountable to Parliament. It might be said that there were precedents. Mr. Chamberlain had tried to cover himself with the name of Mr. Gladstone by pointing out that the great Act of 1870 allowed of the supersession of a school board and the appointment by the Minister of substitutes. But in that case the Minister had to certify the expenses of the displaced school board, which brought them under full Parliamentary control. So in later Acts, such as the Public Health Act of 1875, the power was taken to place the Minister—that was Parliament—in the room of local authorities, but there was not a single other Act which allowed the Minister to have at his disposal persons for whom he could not answer to Parliament. It would be a real danger if such a class of persons were allowed to grow up, particularly in local government. They saw abroad the degradation of local government by these quasi-executive ambiguous officers like burgomeisters and préfets, persons clothed with the authority of the executive and charged from headquarters with keeping the local authorities in their places. Whatever might have been wrong the remedy put forward by the Guardians (Default) Act was the wrong remedy.

Mr. Chamberlain: Will the hon. lady explain how she has met that constitutional point in the change which is proposed to be made by these Orders?

Miss Lawrence: Unless some Order of this kind was made there could be no board of guardians. We could not have an election without legislation and we could not allow all poor-law relief to lapse. We therefore made what I call a gesture and handed over in effect the nomination of these persons to the elected authorities who will deal with them now.

The motion for an address was negatived by 284 votes to 154.

The Housing Subsidy.

The Housing (Revision of Contributions) Bill passed through Committee and was read the third time and passed.

The National Radium Trust.

On Wednesday, July 24th, the House went into Committee on a supplementary vote of £100,000 as a grant-in-aid of the National Radium Trust. Mr. Dunnico, Deputy Chairman of Committees, was in the Chair.

Mr. Greenwood, Minister of Health, said that he did not imagine that there would be much controversy about this vote. It was an inheritance which had come to him from the late Government, and its purpose was to provide for a grant-in-aid of the National Radium Trust, subject to a maximum of £100,000, based on £1 for every £1 of voluntary subscriptions; for augmenting the supply of radium for use in the treatment of the sick, and for the advance of knowledge of the best method of rendering radiological treatment. The money would be expended by the trust under the terms of a Royal Charter incorporating that body. The recommendations of the Radium Subcommittee of the Civil Research Committee, published in a report early this year, were accepted in principle by the late Government subject to further consideration on matters of detail. Since that time a consultation had taken place with the leaders of the various branches of the medical profession, and certain minor changes had been made in the proposals of the subcommittee. It was finally thought to be expedient to appoint the Radium Trust and the Radium Commission through the instrumentality of a Royal Charter, and a Royal Charter had now been received from the King empowering the establishment of the Trust and the Commission. The Trust would hold the money and would be responsible for the actual ownership of the radium. The Commission would be the body responsible for its custody, care, and utilisation. The Radium Trust would consist of the Lord President of the Council, who would be chairman, the Minister of Health, the Secretary of State for Scotland, the President of the Royal Society, the President of the Royal College of Physicians of London, the President of the Royal College of Surgeons of England; the chairman of the Central Liaison Committee for Voluntary Hospitals in Scotland, the President of the Royal Society of Medicine, and the President of the British Medical Association. The Trust were also required to coöpt two medical members of the Commission and might coöpt not more than three other persons. That matter was now under consideration, and it would be the function of that body to accept and to hold the funds which had been subscribed and to purchase the radium. The Radium Commission, which would be responsible for the custody, distribution, and use of the radium, would consist of a chairman to be appointed by the Trust; four members nominated by the Minister of Health, the Secretary of State for Scotland, the Medical Research Council, and the Department of Scientific and Industrial Research; and six members having special knowledge and experience of the application of radium in the treatment of the sick. These six persons were to be appointed by the trustees from a panel of 12.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

ANNUAL MEETING.

THE annual meeting of this Association took place in London on July 10th, 11th, and 12th, under the presidency of Dr. NATHAN RAW, C.M.G., who delivered a presidential address on

Fear.

He began by saying that fear was of immense importance to the community and of particular concern to a large number of individuals. A high authority had stated that fear was the driving force of life, without which there would be quiescence and no bodily reactions. Certainly if we had no fear our instinct of self-preservation would be useless. But an aspect which had an enormous bearing on life was a needless and morbid apprehension. The late Dr. Mercier entitled his book "Disorders of Conduct," averring that of mind he knew nothing. Dr. Raw quoted in full Mosso's classical description of his own feelings when called upon to make a speech, and added his own observations on men afflicted with stage fright when required to address their fellows. A former master of his own, who was a professor of rhetoric, at the beginning of a nervous affection could only speak sitting, owing to excessive trembling of the legs, and at last he had to renounce the triumphs of his great eloquence as he was afflicted with a temporary paralysis. The President thought the only way to find a solution of this distressing state was to analyse, without prejudice, all that was known about cerebral activity, and to see what physiologists had discovered in studying the emotions and the physical phenomena of thought.

He acknowledged that it was normal to fear; it was one of the emotional manifestations of a primal instinct and ordinarily expressed itself in efforts at flight or concealment. The Langue-James theory contended that an emotion was the sensation of the visceral changes accompanying it. There was no need of proof that visceral changes accompanied fear, pallor of skin, trembling of limbs, dilatation of pupils, protrusion of the eyes, which were said to be due to excitation of the adrenals. Reflex action played an important part in the exhibition of fear. The Langue-James theory was rejected by many great psychologists. The real solution was that fear was indicative of a defensive mechanism, that this was excited by the perception and realisation of danger, which set in motion a physical mechanism to defend life. Sherrington, by his brilliant work, showed that in animals the basal ganglia were the seat of the primary instincts and emotions. Hughlings Jackson taught that the emotion of fear arose in the cerebral cortex. Cowardice was uncontrolled fear; it was abnormal and antisocial to be a coward. The really brave man did not run away, but not because he had no fear; he overcame it and faced the danger. There was, however, a limit to human endurance, and the diabolical methods used in the late war had played havoc with the nervous systems of thousands of brave men, so that they would never recover.

Fear associated with disease was well known. Delirium tremens was not now nearly as frequent as it was 20 years ago. Edgar Allan Poe, who died of it at 37, had left a ruthless analysis of the experience. Many people lived in constant dread of such diseases as cancer, tuberculosis, blindness, or insanity.

National fear was of immense importance; whole communities might be seized with a subdued fear of attack from more powerful neighbours. The question was often asked: Is religion based on fear? It has been said that fear formed the stock-in-trade of many irrational forms of ecclesiastical propaganda. When religion, which should appeal to the highest instincts in man, debased itself to the point of appealing to the lowest and meanest instincts, it undermined the very foundations of character, poisoning the fountain of life at its source. Any religion which appealed primarily to fear was doomed to decay with the dawn of more universal intelligence. The fear of death had long been recognised as an instinct, and Rousseau said that he who pretended to face death without fear was a liar. This fear was a natural impulse, and was not merely an accident. Schopenhauer, however, said that from the point of view of intelligence there was no ground for fearing death; only those with blind faith could subdue this fear of death. The finest examples in history of the calm resignation to the inevitable were furnished by the aristocrats of France when perishing by the guillotine in the French Revolution.

The description of the human emotions given by Charles Darwin 57 years ago had never been excelled. Worry was a comparatively recent product, though fear dated from the dawn of human intelligence. No children should be brought up to fear their parents or anything else. And too many teachers seemed to think that their secondary, if not their chief, function was the creation in their pupils of inferiority complexes; certainly worry over examinations was a prolific cause of academic failure. We could never hope to conquer fear, but we should learn to control it.

Dr. REGINALD WORTH proposed a cordial vote of thanks to the President for his address, and Dr. BEDFORD PIERCE seconded.

On July 11th Dr. W. M. FORD-ROBERTSON (Northampton) read a paper entitled

Some Cases of Mental Disorder: A Patho-Clinical Study.

In recent years, he said, research into mental disorders had tended to become, more and more, the study of the pathology of the living, and to this the advances of biochemistry had largely contributed. He did not think the study of focal infection by bacteriological methods would lead very far. More effort should be made to correlate its local and remote effects in disordered metabolism, disturbed endocrines in relation to the patient's economy as a whole. It seemed that in mental disorders one had to deal with bacteria of a special type, which probably could only adapt themselves as chronic infective agents to a certain group of the community, i.e., those who had a neurotoxic susceptibility. This needed that one should search for new methods of bacteriological technique, study the results, and attempt to correlate cause and effect. Knowledge of the somatic disorders underlying insanity was, as yet, so limited that attempts to continue on these lines would lead only hesitatingly along the progressive path. Efforts should be concentrated more on the individual as a problem in pathology. There had been up to the present a lamentable lack of proper collaboration between biochemist and bacteriologist.

Dr. Ford-Robertson's main thesis consisted of a detailed account of the findings in 120 cases of mental disorder which had been thoroughly overhauled, and four of these were given with minuteness. They served, he said, to emphasise how complex, indeed elusive, were the problems of the physical disorders underlying insanity. His observations led him to believe that the person of psychotic tendencies failed to reveal clearly the underlying pathology of the internal environment by ordinary signs and symptoms. Surgical removal of foci of infection alone could not bring about recovery. Yet focal infection was of the greatest importance in mental disease. He had satisfied himself that the insane harboured anaerobic bacteria of the diphtheroid and lepto-streptothrix group which often infected the major part of the alimentary canal.

Dr. W. F. MENZIES (Cheddleton) discussed the contribution at some length, and expressed regret that the association had not provided in its rules for the admission of the pure biochemist, as he would be a great acquisition for this kind of research.

Dr. J. R. LORD (Epsom) also spoke, pointing out that it was not so much a matter of the presence of septic foci in these cases, but that the toxins were absorbed. In the latter event a biochemical problem arose, which, if not adjusted, led to dysfunction of some part of the nervous system. Neuro-toxins seemed to have a degree of selectivity of action, different toxins selecting different functional zones.

Other Subjects Discussed.

Dr. GORDON PETERS (Epsom) read a paper on Charcot's Joints in Tabo-paresis. He related three cases of general paralysis of the insane who were also afflicted with Charcot's disease of the spine. One remarkable case was that of a woman of 29, the subject of congenital tabes who had suffered from Charcot's spine from an early age.

The morning of July 12th was taken up with a consideration of the Report of the Mental Deficiency Committee (1929), the discussion being introduced by Dr. A. F. TREDGOLD.

In the afternoon Dr. LORD spoke on a Modern Approach to the Problem of the Admission of Mental Patients to In-patient Treatment. The points he dealt with specifically were: (1) the non-intervention at any point of a judicial authority; (2) the administrative recognition of the non-volitional case; (3) the power of local authorities to deal with (and retain as necessary) occurring mental disorder on lines as far as possible parallel with those practised in regard to infectious and other physical diseases; (4) notification of all non-volitional and involuntary cases to the local authority, and the latter also to a central authority; (5) certification to be abolished and replaced by a system of confirmation or continuation of the initial action taken by the local authority, or by a panel specially nominated by the local authority; (6) all institutions receiving voluntary cases who are retained voluntarily and non-volitional cases to be registered and subject to visitation by the local authority; (7) active prophylaxis by the psychiatrisation of public assistance work.

A discussion followed.

On Wednesday the Association dined together, with the President in the chair, and the guests included Lord Riddell, the Mayor of Westminster, Dr. Pameijer, Sir Arthur Robinson, and several foreign delegates. On Thursday afternoon a reception and garden party took place at Springfield Mental Hospital.

Obituary.

KENNETH ARTHUR LEES, O.B.E., M.B., B.CHIR. CAMB., F.R.C.S. ENG.,

ASSISTANT SURGEON FOR DISEASES OF THE THROAT, NOSE AND EAR, ST. MARY'S HOSPITAL, PADDINGTON.

Kenneth Lees, who died following an operation for cerebral tumour on July 23rd at the age of 48, was the son of the famous physician David Lees, and early decided to follow his father in the study of medicine. He passed from school to King's College, Cambridge, gaining a first-class in the Natural Science Tripos in 1903. In 1905 he elected to join St. Mary's Hospital, where his father, originally a Guy's man, was giving clinical teaching to crowds of appreciative students. Though his untiring energy and keen enthusiasm, when he was working under his father's inspiration, were apparent, Kenneth Lees showed a great inclination towards surgery. He qualified M.R.C.S., L.R.C.P. in 1907, took his Cambridge degree in 1909, and became F.R.C.S. Eng. in 1912. He held a succession of resident posts at St. Mary's Hospital, and in 1914 was promoted to be surgical registrar. During the war years this post was a strenuous one. It involved full afternoons in the theatres and emergency operations, as well as much of the teaching in wards and out-patient department normally undertaken by members of the honorary staff. All those who worked with Mr. Lees during those trying times, when the staff was seriously depleted as the result of the war, testify *to his unfailing promptness in answering every call,* night and day, and to his equanimity and urbanity. The students who passed through the hospital during this time were indebted to him for coaching at unconventional hours, and many owe their examination success to his conscientious efforts and good-humoured ragging. His services to the hospital were recognised by the award of the O.B.E.

Though Mr. Lees always retained a great liking for general surgery, circumstances led him to specialise in diseases of the nose, throat, and ear; he was appointed to the staff of St. Mary's in 1919, and later to other hospitals, including the Queen's Hospital for Children, Hackney. His interest in this branch of work increased every year, and his wide surgical experience gave him from the outset a mature outlook on all aspects of a case which many specialists only acquire late in life.

Outside his work Mr. Lees had many interests. He enjoyed golf, and his car meant more to him than just a means of easy transport. He was a keen Mason and he was Worshipful Master of his hospital Lodge at the time his fatal illness manifested itself. Kenneth Lees was retiring in disposition, but in congenial company he showed a whimsical humour and keen appreciation of wit in others. He married, a few years ago, a niece of the late Dr. William Hill.

THOMAS EAGLESON GORDON, M.B., B.CH.,

PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS IN IRELAND

PROFESSOR OF SURGERY, TRINITY COLLEGE, DUBLIN.

THE death occurred on July 27th, at his residence in Dublin, of Prof. T. E. Gordon, President of the Royal College of Surgeons in Ireland, in the sixty-third year of his age. He had been in bad health for several months past, and had recently resigned his post as Surgeon to the Adelaide Hospital, Dublin.

PROF. T. E. GORDON.

Photo by Lafayette, Dublin

Thomas Eagleson Gordon, a North Irishman by birth, was educated at Trinity College, Dublin, doing his professional courses at the Adelaide Hospital; he graduated in 1890, and in 1895 took the Fellowship of the Royal College of Surgeons in Ireland. After holding a resident appointment at the Adelaide Hospital, he was appointed Assistant Surgeon; he had already been elected Visiting Surgeon to the City of Dublin Hospital, but resigned this post to return to the Adelaide Hospital. His professional career was bound up with this institution, for he remained in active work there for 35 years, and was senior surgeon from 1915, until ill-health forced his retirement a few months ago. In 1919 he was appointed to the chair of surgery in Trinity College in succession to the late Mr. E. H. Taylor, and during the war was attached to the 83rd (Dublin) Hospital, B.E.F., with the rank of lieutenant-colonel.

Prof. Gordon was an attractive and accomplished teacher, both in hospital and in his professorial work, while he was particularly interested in his duties as curator of the pathological museum in Trinity College, and did much to make the splendid collection of Robert Smith and Edward Bennett more readily available for teaching purposes. He was a man of wide culture, well read in history and archæology. He was elected President of the Royal College of Surgeons in Ireland last year, and in June of this year was elected for a second year. His death is greatly regretted by his professional brethren.

JOHN BROWN, M.D. MANCH., D.P.H.

FOR many years medical officer of health for Bacup, Dr. John Brown died on July 29th at Blackpool, where he had been living in retirement. He was born at Callington, in Cornwall, in 1849, and attended school there before going up to University College, London. He started the study of medicine at Charing Cross Hospital, and gained a number of scholarships and prizes in that school. On qualifying as L.R.C.P. and L.S.A. Lond. in 1877 he was appointed house surgeon to the Western Ophthalmic Hospital, and later in the same year medical officer of health for Bacup. As a post-graduate student of Owen's College he became M.B. in the Victoria University of Manchester in 1888, when he also took the diploma in sanitary science. Dr. Brown was a prolific writer, and belonged to numerous medical societies in Manchester and elsewhere. His experience in the public health service was considerable, for he undertook many branches of the work of his district. During the 15 years of retirement, which he spent in Blackpool, he devoted a good deal of attention to the subject of cancer. He leaves a widow and five sons, two of whom, Dr. J. P. Brown of Bacup, and Dr. G. B. Brown of Manchester, are members of the medical profession.

Correspondence.

"Audi alteram partem."

AURAL DISEASE AND BATHING.

To the Editor of THE LANCET.

SIR,—Though it has long been known that frequenters of swimming baths, especially deep divers, run some risk of infection of their noses, throats, and ears, the marine bathing pool, to my knowledge, has not yet been impugned. Last summer on my holiday I had the opportunity of daily observation of one such pool, which enabled me to draw certain deductions. This swimming pool had been made by enclosing a portion of the foreshore with a sea wall, the summit of which was completely submerged at every high tide. This arrangement ensured a certain amount of change in the supernatant layer or layers of water, but the bed of the pool necessarily remained undisturbed, and consequently pollutions must have slowly deposited by sedimentation, and would consist of the usual dead organic material found in swimming baths, such as human hair, material from the noses, throats, mouths, intestines, and skins of former bathers, also the remains of dead fish, crustacea, &c. To cleanse such a pool seemed to me to be an impossibility, as the bottom of the deeper portion of the pool was covered with rocks and boulders which had been enclosed when the encompassing sea wall was erected. There was one sea gate or sluice which could be opened, but this only extended to half the depth of the wall, and was consequently useless from the point of view of draining the floor of the pool.

Bathers would be wise to content themselves with the open seashore, and avoid such types of pools, though the keen swimmer would miss thereby the many gadgets, such as diving boards and slides, which render the pools so seductive.

Two cases of infected noses and accessory sinuses came under my notice from this pool, and prompted me to write this letter, as I feel that the hygienic side of such pools has often been, and may again, be overlooked in their construction.

I am, Sir, yours faithfully,

BEAUMONT H. COMERFORD, M.D., D.P.H.

Chester-square, S.W., July 30th, 1929.

To the Editor of THE LANCET.

SIR,—Your annotation on this subject last week (p. 182) has interested me, although its meritorious aloofness rather irritates me at the moment when one of my own children, as a sequel to bathing in a public swimming bath, is recovering from a mastoid operation, in spite of a prompt paracentesis of the intervening acute ear. Nor is my irritation lessened by the fact that my kind specialist colleagues seem to have no doubt of the frequency of these disasters, even in children who have perfectly healthy throats.

If your suggestion is true that in the purification of bathing places "more attention has been paid, as evidence of contamination, to the intestinal flora of the *Bacillus coli* group, than to the pyogenic organisms which more frequently attack the ears," it would seem that the supervision of these places is conducted on lines ten years out of date, and that it is necessary to impress the public health authorities with the great importance of the post-war streptococcus. Further, it would be interesting to know if any special measures are undertaken to prevent excessive contamination of swimming baths in times of great heat and shortage of water.

I am, Sir, yours faithfully,

August 28th, 1929. F.R.C.P.

AN INHERITED TENDENCY TO SUPERNUMERARY DIGITS.

To the Editor of THE LANCET.

SIR,—The following example of heredity in the appearance of supernumerary digits seems to be of interest.

My wife, who has perfectly normal hands and feet (as also have I), gave birth three months ago to a female child which had an extra thumb on each hand and an extra great toe, webbed with the normal on the left foot. My wife's sister was born with an extra thumb on her right hand. One other brother and a sister had normal hands. My father-in-law, his brother and his sister all had a normal number of digits, but the thumbs in all cases were long and tapering, look more like index-fingers and have not the full range of movement of the normal thumb. His mother and her brothers and sisters all, so my information goes, had precisely the same abnormally-shaped thumbs, but had no "extras." Going back one further generation, my wife's great-grandmother had extra thumbs on both hands. I do not know if she had any abnormality of the feet.

Apparently, therefore, the inherited tendency passed over two generations, only showing itself as a slight deviation in all cases from the normal in the shape of the thumbs; affected the next in one individual only; and was passed down to yet another in an indirect fashion.

I should be glad to have the comments of an expert in Mendelism on this sequence and for a forecast as to the prospects of future individuals exhibiting the characteristic.

For obvious reasons I prefer to sign myself

Yours faithfully,

July 29th, 1929. PHALANX.

VICTORIA INFIRMARY, NEWCASTLE-ON-TYNE.—The report for 1928 shows that 14,409 in-patients, whose average stay was 15·1 days, were treated. The accident cases totalled 20,657, of which 1301 were motor casualties; 436 of them were admitted to the wards. The number of beds available, including 30 at the Innes Hopkin's Memorial Home at Ryton, is 572, but every day in the year the normal number of beds has been exceeded by 28, and on some occasions 80 more beds have been occupied than the number for which the wards were planned. The nurses' home is to be extended by 150 bedrooms, 100 nurses being at present housed elsewhere. The medical staff are pressing for the establishment of a number of paying beds in the infirmary extension vacated by the Ministry of Pensions.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At an ordinary meeting of the College, held on July 25th, with Sir John Rose Bradford, the President, in the chair, the following officers of the College and members of committees were elected for the ensuing year :—

Censors : Dr. Robert Hutchison, Dr. James Collier, Dr. R. A. Young, and Dr. Cecil Bosanquet. *Treasurer :* Dr. S. P. Phillips. *Registrar :* Dr. Raymond Crawfurd. *Harveian Librarian :* Dr. Arnold Chaplin. *Assistant Registrar :* Dr. R. O. Moon. *Library Committee :* Dr. H. R. Spencer, Dr. R. T. Williamson, Dr. Hector Cameron, and Dr. C. J. Singer. *Curators of the Museum :* Dr. H. R. Spencer, Dr. C. E. Lakin, Dr. Hugh Thursfield, and Dr. C. F. T. East. *Finance Committee :* Dr. H. Morley Fletcher, Sir John Broadbent, and Dr. L. S. T. Burrell.

The following were appointed examiners :—

Chemistry : Mr. H. W. Cremer and Mr. W. B. Tuck, D.Sc. *Physics :* Mr. J. H. Brinkworth and Mr. D. Orson Wood. *Practical Pharmacy :* Dr. W. J. Adie, Prof. W. E. Dixon, Dr. Philip Hamill, Dr. Newman Neild, and Dr. V. J. Woolley. *Physiology :* Prof. B. J. Collingwood and Prof. Swale Vincent. *Pathology :* Sir Frederick Andrewes and Dr. Charles Bolton. *Anatomy :* Prof. Duncan Blair. *Medical Anatomy and Principles and Practice of Medicine :* Sir Percival Hartley, Dr. W. J. Fenton, Dr. A. E. Russell, Dr. Cecil Wall, Prof. Frederick Langmead, Dr. E. A. Cockayne, Dr. E. P. Poulton, Dr. D. H. de Souza, Dr. Albert Ramsbottom, Dr. A. C. D. Firth, Dr. F. M. R. Walshe, and Dr. E. Bellingham Smith. *Midwifery and Diseases peculiar to Women :* Dr. Eardley Holland, Dr. J. B. Banister, Dr. Carlton Oldfield, Dr. Malcolm Donaldson, and Mr. A. C. Palmer. *Public Health :* (Part I.) Dr. Roche Lynch and (Part II.) Dr. Charles Porter. *Tropical Medicine :* Prof. J. C. G. Ledingham and Dr. Harold Scott. *Ophthalmic Medicine and Surgery :* Dr. Grainger Stewart. *Psychological Medicine :* (Part I.) Dr. Edward Mapother. (Part II.) Dr. Porter Phillips and Dr. Gordon Holmes. *Laryngology and Otology :* Dr. Donald Rose Paterson. *Murchison Scholarship (1930) :* Dr. Gordon Holmes and Dr. Letheby Tidy.

Dr. Letheby Tidy was elected representative of the College on the General Medical Council in succession to Sir Farquhar Buzzard, and Sir Ewen Maclean a representative on the Advisory Medical Board of the University of Wales.

The Baly medal for distinction in the science of physiology was awarded to Dr. E. D. Adrian, F.R.S., and the Bisset-Hawkins medal for advancing sanitary science and public health to Prof. Edward Mellanby, F.R.S. The Murchison Scholarship was awarded to Ian G. W. Hill, M.B., of Edinburgh University. Prof. J. B. Leathes, F.R.S., was appointed to deliver the Harveian oration, and Prof. W. E. Hume the Bradshaw lecture in 1930. Sir Maurice Craig was appointed a delegate to the Conference of the National Council of Mental Hygiene to be held in October, and Dr. Maurice Davidson a delegate to the Fifteenth Annual Conference of the National Association for the Prevention of Tuberculosis at Newcastle-upon-Tyne in October.

The following further appointments were announced : Dr. Andrew Balfour as FitzPatrick lecturer for 1930 ; Dr. Carey Coombs as Lumleian lecturer for 1930 ; Dr. Donald Hunter as Goulstonian lecturer for 1930 ; Prof. J. J. R. Macleod, F.R.S., as Oliver-Sharpey lecturer for 1930 ; Dr. L. S. T. Burrell as Mitchell lecturer for 1930 ; and Prof. Matthew J. Stewart as Croonian lecturer for 1931.

The thanks of the College were voted to Sir Wilmot Herringham and Dr. John Fawcett for their valuable and lengthy services as representatives of the College on the Senate of the University of London.

The President nominated a committee for the preparation of a new edition of the official "Nomenclature of Diseases."

Having satisfied the Censor's Board the following were admitted Members :—

William W. Barraclough, Richard A. Brews, James K. Cameron, Geoffrey P. Chandler, Albert Coleman, Frederick M. M. Eyton-Jones, Kenneth A. Gilchrist, Frederick C. Golding, John S. Harris, Jack Hartsilver, Aubrey J. Lewis, George E. Lewis, Charles W. Mackenzie, William F. T. McMath, Natwar Jalsing Modi, Francis J. Niall, Douglas A. Robertson, Raghunath Saran, Cedric W. Shaw, Gordon M. Tallent, and Geoffrey T. Todd.

At the same meeting of the Comitia licences to practise were granted to 140 candidates (133 men and 16 women) who have passed the final examination of the Conjoint Board in Medicine, Surgery, and Midwifery, and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates :—

C. Abraham, Univ. Coll. ; S. Annaswami, Madras ; M. A. E. Anous, Cairo and King's Coll. ; S. W. K. Arundell, Middlesex ; Nancy M. Badeley, Royal Free ; C. P. Bailey, Cambridge and St. George's ; E. F. Barnardo, Cardiff and London ; D. W. Bawtree, Cambridge and St. Thomas's ; D. R. Belletty, Calcutta and Middlesex ; M. J. Bennett-Jones, Liverpool ; H. J. W. Bergh, St. George's ; W. R. Bett, St. Bart.'s ; P. M. F. Bishop, Oxford and Guy's ; R. M. Bolam, Cambridge and Durham ; J. J. Boulle, London ; J. H. Boultbee, Liverpool ; K. J. Box, St. Thomas's ; Bertha A. Briant, Royal Free ; C. E. Brierley, Cardiff and Bristol ; H. P. Brody, Sheffield ; E. A. Butterworth, St. Mary's ; V. I. C. Cadogan, Univ. Coll. ; E. H. Capel, Middlesex ; F. S. Cliff, Univ. Coll. ; F. T. Clive, St. Thomas's ; C. L. Collins, Cambridge and St. George's ; P. A. Cooper, Univ. Coll. ; W. J. Cotton, Oxford and Guy's ; J. P. Crabtree, Manchester ; S. T. Crowther, Cardiff ; P. Dalzell, St. Bart.'s ; A. C. Dawes, King's Coll. ; Catherine Day, Royal Free ; Jessie E. Dodds, Sheffield ; C. E. Dolman, St. Mary's ; W. J. L. Downing, Middlesex ; G. Duckworth, St. George's ; T. F. H. Duffell, Birmingham ; D. H. A. Edmondson, Liverpool ; L. M. Edwards, Cardiff and St. Bart.'s ; J. L. Egan, King's Coll. ; Cordelia H. England, Cambridge and King's Coll. ; I. Q. Evans, Cardiff and St. Bart.'s ; M. D. A. Evans, Cardiff and Univ. Coll. ; R. G. P. Evans, Middlesex ; D. Ezekiel, Charing Cross ; R. B. H. Falchney, Liverpool ; M. Farid, Birmingham ; W. J. Ferguson, Guy's ; J. A. Fernandez, Univ. Coll. ; K. S. Fitch, Guy's ; S. K. Foster, Leeds ; W. W. Fox, Manchester ; A. W. Franklin, St. Bart.'s ; A. Freitag, Cracow and Charing Cross ; R. L. Frost, Guy's ; Ruth C. Galletly, Royal Free ; S. Garson, St. Bart.'s ; N. D. Gerrish and J. J. J. Giraldi, Bristol ; Elizabeth L. Haden, Univ. Coll. ; Hafizuddin, Agra and Charing Cross ; Nellie M. E. Hallinan, Charing Cross ; Margaret L. Homburger, Royal Free ; A. G. J. Harris, Cambridge and St. Bart.'s ; R. L. H. Harris, St. Bart.'s ; F. Hawking, Oxford and St. Bart.'s ; Dora M. Hill, Charing Cross ; R. E. Holmes, London ; I. P. G. Howells, Cardiff and St. Mary's ; W. V. Howells, Cambridge and London ; J. M. Hulett, Guy's ; Laura F. Hutton, Charing Cross ; D. E. Hyman, Manchester and Charing Cross ; K. G. W. James, King's Coll. ; S. K. Jatar, Bombay and London ; A. N. Jones, Guy's ; D. S. Jones, St. Bart.'s ; H. H. Kenshole, Cardiff and Guy's ; T. H. Khan, Calcutta and King's Coll. ; C. W. Kidson, Birmingham ; S. Knight, Univ. Coll. ; M. Kokia, Westminster ; M. Kremer, Middlesex ; J. Libman, Liverpool ; F. J. G. Lishman, Univ. Coll. ; M. Luckeenarain, Univ. Coll. ; S. D. McClean, Guy's ; W. H. McMenemey, Oxford and St. Bart.'s ; A. H. M. McMullan, Birmingham ; R. G. Mayer, Bristol ; R. B. Mayfield, Cambridge and St. Thomas's ; D. A. Metcalf, Cambridge and London ; V. L. Misso, King's Coll. ; S. N. Mistri, Bombay and London ; W. J. Moffat, Cambridge and St. Thomas's ; A. B. Moffatt, Manchester ; G. B. Mobile, Bombay and Guy's ; R. D. Morgan, Cardiff and Middlesex ; Q. St. L. Myles, Oxford and St. Thomas's ; T. Nallainathan, Ceylon and Univ. Coll. ; R. A. Nash, Guy's ; E. J. Neill, St. Bart.'s ; P. L. Nirula, Punjab ; F. E. Norris, London ; S. W. K. Norris, Birmingham ; L. J. O'Loughlin, Manchester ; H. J. Partington, Liverpool ; Penelope A. Peach, Royal Free ; W. Pearce, Leeds ; A. L. Pereira, St. George's ; R. B. Pringle, Cambridge and St. Thomas's ; G. E. A. Prins, Calcutta and St. Mary's ; C. B. Prowse and W. Radcliffe, Cambridge and St. Bart.'s ; B. Rait-Smith, St. Bart.'s ; Florence Ram, Sheffield and Cambridge ; B. V. P. Reddy, Bombay and London ; W. H. Reynolds, Cardiff ; P. J. Richards, Cambridge and St. Bart.'s ; K. M. Robertson, St. Thomas's ; J. A. Robson, St. Bart.'s ; Irene H. Rogers, King's Coll. ; H. L. Rogerson, St. Bart.'s ; I. A. Sabri, Cairo and St. Bart.'s ; R. M. Sargent, Univ. Coll. ; C. K. Soonce, Liverpool ; J. M. Scott, St. Bart.'s ; R. P. W. Shackleton, Cambridge and St. George's ; Everell M. Shipham, Royal Free ; S. Simon, Leeds ; A. R. Smith, St. Thomas's ; W. H. B. Spoor, Cambridge and Bristol ; L. Stirling, London ; A. G. C. Taylor, St. Thomas's ; E. W. Thompson, Manchester ; D. J. Turnbull, London ; J. O. B. van Langenberg, Ceylon and Middlesex ; M. H. Wace, St. George's ; J. V. Walker, Birmingham ; R. Warnecke, Adelaide and London ; J. A. White, St. Mary's ; J. O. Williams, St. Bart.'s ; J. K. Willson-Pepper, Cambridge and St. Thomas's ; Camilla Wiseham, Royal Free ; M. G. Woolf, Cape and St. Thomas's ; L. C. Wright, Manchester ; P. Yarmarko, Manitoba and Middlesex ; and D. J. Young, Middlesex.

The undermentioned diplomas were conferred (jointly with the Royal College of Surgeons) upon the following candidates :—

Diploma in Public Health.—K. P. Ankle-aria, D. D. Bhargava, D. L. Brown, H. A. Bulman, Helen Banistead, K. Cathiravelu, K. B. Chakravarti, A. N. Chatterji, M. Das, A. W. H. Donaldson, D. C. Farquharson, Loveday S. Farquharson, J. W. Fisher, L. Fourie, Hilda M. Garlick, D. Hughes, A. T. Jones, Margaret M. McDowall, Aileen I. McMahon, A. Macmillan, H. H. Mahmood, A. J. Mhatre, S. Mozumder, Joan Nixon, J. D. Robertson, A. S. Simpson, G. Singh, W. S. Slater, J. H. Stritch, R. Watson, Edith S. Williamson, and Frances M. Yule.

Diploma in Ophthalmic Medicine and Surgery.—Agnes L. Adam, B. Alexander, P. K. Banerjea, W. A. Briggs, R. D. W. Butler, S. N. Cooper, V. A. P. Costobadie, T. Edmunds, Julia M. Fleming, A. A. Gibbons, S. L. Goorin, I. C. Fraser, J. R. McClean, N. Manson, R. S. Marya, M. D. Nunan, P. Pattabhiramaiya, A. M. Ponnambalam, C. S. V. Ramanan, K. Sen, L. B. Somerville-Large, B. R. Tandan, M. Tree, T. K. Uttam Singh, D. G. Vyas, and G. B. White.

Diploma in Psychological Medicine.—Leonard Porter, Flora H. McCalder, Viola [illegible] Cameron, Ruby T. Carr, S. W.

Davies, J. H. Ewen, E. A. Haslam-Fox, J. E. S. Lloyd, Seringapatam V. S. Rao, and Kathleen M. Todd.

Diploma in Laryngology and Otology.—Bodh Raj. Chaudhri, Patrick Hickey, G. J. Hutchison, Rajnarain Kacker, W. A. Kerr, K. S. May, R. F. Paterson, C. L. Rosenfield, and Gobind Vaishnavi.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on July 23rd, with Mr. Alexander Miles, the President, in the chair, the following 27 successful candidates (out of 81 entered) who passed the requisite examinations between March 21st and 28th were admitted Fellows:—

George Brown, Eva Taylor Cairns, John Campbell, Kewal Ram Chaudhri, Douglas Bannerman Craig, Ross Alfred Grant, Guthrie Yoehlee Graves, Thomas Paterson Gill, David Hardie, Arthur Taylor Henry, Reginald Stuart Jones, Ganesh Das Kapur, John Kerr Ritchie Landells, Donald Percy McDonald, George Henry Mohony, Ma Yin May, Andrew Patrick, William Valentine Semple, William Stewart Shearer, Balwant Singh, Narain Singh, William Collis Spackman, Robert Scott Stevenson, George Munro Sturrock, Alan Boardman Taylor, Maxwell Kidger Tucker, and George Sydney Thompson

Dr. Hari Prakash Lal obtained the diploma of Licentiate of the College.

The Ivison Macadam Memorial Prize has been awarded after a competitive examination in Organic Chemistry to Mr. C. D. Campbell.

UNIVERSITY OF GLASGOW.—It is announced that Sir Donald MacAlister will retire in October from the offices of Principal and Vice-Chancellor of the University.

UNIVERSITY OF LEEDS.—On July 23rd the honorary degree of D.Sc. was conferred on Dr. C. H. Mayo of Rochester, Minnesota.

ST. MARY'S HOSPITAL.—Lord Iveagh has promised to give £20,000 towards the extension of the St. Mary's Hospital Therapeutic Inoculation Department which is under the direction of Sir Almroth Wright, F.R.S. This sum will be paid in seven annual instalments and the hospital will thus be able to claim income tax and surtax so that over £30,000 will be available for the building of a pathological institute beside the hospital.

WALLINGFORD DISTRICT HOSPITAL.—The Morrell Memorial Hospital, so named after Miss Mary Morrell, the founder in 1879 of Wallingford Cottage Hospital, a nurse who died from septic poisoning contracted in her work, was last week superseded by a new District Hospital. The building contains 18 beds in three wards, and two private wards, and is equipped with modern appliances.

Dr. Arthur Edward Giles, consulting surgeon to the Chelsea Hospital for Women and gynæcologist to the Prince of Wales General Hospital, Tottenham, has been elected Master of the Drapers Company. He is the first member of the medical profession to fill the office of Master of this Company, whose records go back to the fourteenth century.

DONATIONS AND BEQUESTS.—The late Mr. Frederick Dempster-Smith, of London and Bournemouth left £25,000 to the Governors of St. Bartholomew's Hospital for the endowment of a ward in memory of his late friend William James Marriage ("Sol"), a corporal-major in the Household Battalion, who was killed in France, to be called the Sol Memorial Ward.—Mr. George Turner of Edgbaston, Birmingham, left £1,250 to the Birmingham General Hospital, and £1,000 each to the West Bromwich District Hospital, Royal Midland Counties Hospital for Incurables, Leamington, and the Quest Hospital, Dudley.—Mr. Elias Sumner Berry of Southport left £1000 to the Preston and County of Lancaster Queen Victoria Royal Infirmary to name an "Oswald William Berry Bed" in memory of his son who was killed in action in France.—Mr. Alfred Thomas Johnson Ward [illegible] [illegible]ton, Bristol, left £500 each to Bristol Royal I[illegible] General Hospital, Bristol Eye Hospital, an[illegible] of Industry for the Blind, Westbu[illegible] (Elizabeth Ann Phippen) Esme Gordon [illegible] London, left £400 to St. George's Hospit[illegible] Infirmary, £250 each to the London [illegible] Hospital, Roehampton, S.W., St. Dunstan['s] [illegible] Sailors and Soldiers, National Society [illegible] of Cruelty to Children, [illegible] Dumb [illegible] After legacies to servant[s] [illegible] residue of her property [illegible] Hospital, St. Tho[illegible] Cancer Hospital, Fu[illegible] Children, Gt. Ormond [illegible] Blind, and the Dist[illegible] Mr. Alfred Norman D[illegible] building extension f[illegible]

CHARING CROSS HOSPITAL NURSES' HOSTEL.—St. Mary's Convent, Haverstock Hill, has been purchased by Charing Cross Hospital as the site of a new nurses' hostel. The spot is easy of access from the hospital by the Hampstead Tube.

LONDON HOSPITAL SUNDAY FUND.—The Council of this Fund reports that the amount received in the past year was £78,130, being £3300 less than in the previous year. Of this sum £77,940 is to be distributed among 165 hospitals, 82 dispensaries, and 35 nursing associations.

EAST HAM WAR MEMORIAL HOSPITAL.—On Wednesday in last week the Queen opened this general hospital, which is a memorial to 2000 local men who fell in the war. Its genesis was the East Ham Cottage Hospital, founded in 1902 with 25 beds, which has now been converted into children's wards. The new building contains 100 beds and has cost £75,000.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH.—This hospital in Grove End-road, St. John's Wood, which was founded in 1856 by four of the Sisters of Mercy who had been working with Miss Florence Nightingale, last year treated 1542 in-patients—an increase of 177 over the preceding year—of whom 321 were private patients. There were 1131 operations, the X ray department has been enlarged, and the rebuilding of the first portion of the nurses' home is approaching completion. The second portion is urgently needed, the old building being in bad structural condition. The hospital contains six wards and there are 18 rooms for private patients, including two for persons of small means, for which the charge is £2 10s. per week. Eight rooms, moreover, are reserved for priests and nuns of the Roman Catholic diocese of Westminster, but the hospital is entirely undenominational. The total weekly cost per patient is £4 0s. and of the £25,520 spent during the year only £2835 was derived from investments. There are 134 beds and the hospital is a training school for radiographers and for Roman Catholic nurses.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—At the annual meeting last week the Council reported that the special appeal for £100,000 had produced £110,941. From this money grants have been made to the Burrow Hill Sanatorium Colony, at Frimley, and towards the establishment of workshops for tuberculous patients. The Burrow Hill Colony is an experimental scheme for providing treatment and technical education for tuberculous boys from 14 to 19 years old under medical and scholastic supervision (see THE LANCET, 1929, i., 673). It contains 80 beds, 60 of which are provided for arrested cases; the other 20 are in a separate block for patients in the earlier stages of the disease. The institution is primarily intended for youths suffering from pulmonary tuberculosis in whom permanent arrest of the disease is ultimately likely to be secured, and who are in need of, and temperamentally fitted for, technical education, which consists of gardening and clerical work. For the rest, four medical men have been engaged as Medical and Assistant Medical Commissioners who, in addition to general propaganda work, act as lecturers. Three motor vans, with interesting exhibits, including films, have been equipped, and illustrated lectures have been given in many parts of England and Scotland. The educational work is organised by Dr. William Brand, the Medical Commissioner.

CHADWICK TRUST SCHOLARSHIPS.—In view of the quality and number of the applications received for the two Chadwick travelling scholarships in sanitary science and municipal engineering, the trustees have decided to make three instead of two appointments.

The scholarships are of £400, tenable for one year, [illegible] the successful candidates are: Francis Bach, M.D. Ox[illegible] Out-Patient Medical Officer of the National Heart Hosp[illegible], to whom a scholarship is granted "for the purpose of inv[e]sti[gating] [illegible] the environmental and other causes of rheumatic [illegible] and their influence in producing diseases of the [illegible] Edmund A. Elsby, B.Sc., of Liverpool University, [illegible] [st]udy and collect data respecting the removal of [illegible] from the atmosphere in factories; and John B. [illegible], Glasgow University, who will study sewage [illegible] with special regard to trade waste.

[illegible] Gift Scholarship of £100, to enable the [illegible] study and present a scheme [illegible] and efficient system of heating [illegible] to a hall seating about 1000 [illegible] [illegible]ed and a set of residential [illegible], is offered for competition. [illegible] [Briti]sh subjects, should apply in [illegible] [illegible]th and Sept. 30th to the [illegible] at 204, Abbey House, West-

ENLARGEMENT OF BOSCOMBE HOSPITAL.—Four new wards for men, containing a total of 12 beds, were opened last week at the Boscombe branch of the Royal Victoria and West Hants Hospital. The largest ward, of six beds, is named after the late Mr. Augustus Gould, one of the benefactors of the Hospital.

A NURSERY SCHOOL IN LIVERPOOL.—The Liverpool Education Committee have approved a resolution by the Elementary Schools sub-committee recommending the City Council to authorise the establishment of an experimental nursery school to accommodate about 200 children between the ages of 2 and 5 years. The aims of the school are stated to be: (a) To foster all-round healthy physical development by providing a favourable environment, by training in hygienic habits, and by encouraging free activity; (b) to lay the foundations of intellectual development by providing a great variety of interesting experiences, by special training, and by such simple instruction as is suitable; and (c) to lay the foundations of character by the inculcation of self-respect and consideration for others. Formal lessons will have no place in the curriculum. The children will be taken daily to and from their homes. The cost to the ratepayers will be about £17 per head per annum, which is less than half the expense of children at Corporation day nurseries.

SUN-BATHING IN PUBLIC PARKS.—On July 29th Mr. George Lansbury, the First Commissioner of Works, received a deputation including Dr. C. W. Saleeby, Sir Arbuthnot Lane and Sir Alfred Fripp, which put forward, pleas for extended facilities for sun-bathing in public parks. Sir Richard Paget outlined a scheme for a permanent sun-bathing colonnade on the west bank of the Serpentine in Hyde Park, and appealed to the Department to encourage the granting of permission all over the country for the wearing of bathing shorts. In his reply, Mr. Lansbury referred to the fundamental need for providing more sunlight in the homes of the people, and spoke of the care which was taken to see that those in mental homes and prisons should get plenty of light and air. Similar regulations were made for children in class rooms. The only time when the law did not insist on the proper cubic space was when the children were asleep, which seemed to him one of the maddest things in the world. He hoped that legislation to be introduced in the autumn would deal with the slum problem so drastically that no child could in future be born in an underground basement.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Special Course in Urology. Afternoons and evenings until the end of August. Further information from the Secretary, Fellowship of Medicine.

Appointments.

GREGORY, J. C., L.R.C.P. Lond., M.R.C.S., has been appointed Obstetric House Surgeon at University College Hospital.

Certifying Surgeons under the Factory and Workshop Acts: HENDRON, M. F., M.B., Ch.B. Belf. (Croston, Lancs.); and MOWAT, J., M.B., Ch.B. Glasg. (Chapel-en-le-Frith, Derby).

Vacancies.

For further information refer to the advertisement columns.

Aylesford, British Legion Village, Preston Hall Sanatorium.—Second Asst. M.O. £200.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £150.

Basingstoke, Park Prewett Mental Hospital.—Jun. Asst. M.O. £350.

Birkenhead General Hospital.—Cas. S. £100.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, Royal Sussex County Hospital.—H.S. £150.

Burton-on-Trent, General Infirmary.—2nd Res. H.S. £150.

Bury Infirmary.—Sen. H.S. 2nd H.S. Also 3rd H.S. At rate of £200, £175, and £150 respectively.

Cardiff Royal Infirmary.—Aural H.S. At rate of £75.

Carlisle, Cumberland Infirmary.—H.P. Also H.S. to special Departments. Each at rate of £165.

Cheshire Joint Sanatorium, Market Drayton, Salop.—H.P. £250.

Colonial Medical Services.—Vacancies.

Dudley, Guest Hospital and Eye Infirmary.—H.S. £150–£175.

East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £150.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Glasgow, Govan District Asylum.—Jun. Asst. M.O. £325.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Ilford Emergency Hospital.—Sen. and Jun. H.S.'s.

Infants Hospital, Vincent-square, Westminster.—Anæsthetist.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. At rate of £120.

Kidderminster and District General Hospital.—H.S. At rate of £150.

Liverpool, Ministry of Pensions Hospital for Epileptics, Maghull.—Jun. M.O. £300.

Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. At rate of £200.

Liverpool, Royal Liverpool Children's Hospital.—Res. M.O. for Heswall Branch. At rate of £120. Also 2 Res. H.P.'s and 2 Res. H.S.'s for City Branch, Myrtle-street. Each at rate of £60.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London Homœopathic Hospital, Great Ormond-street, W.C.—Asst. Surgeon for Diseases of the Eye.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Manchester, Ancoats Hospital.—Orthopædic H.S. Also H.P. Each at rate of £100.

Manchester Royal Infirmary.—Jun. H.S. £100.

Middlesex Hospital Medical School, W.—Second Demonstrator in Physiology. £250.

Miller General Hospital, Greenwich-road, S.E.—Hon. P. to Skin Dept. Also Cas. O. At rate of £150.

Northwood Mount Vernon Hospital.—H.S. At rate of £40.

Nottingham General Hospital.—Asst. Res. Cas. O. At rate of £150.

Nottingham Children's Hospital.—Res. H.S. At rate of £150.

Oldham County Borough Education Committee.—Asst. Schools M.O. £600.

Richmond Royal Hospital.—Jun. H.S. £100.

Rotherham, County Borough of.—Deputy M.O.H., &c. £650.

Rotherham Hospital.—H.P. £180.

Royal Air Force Medical Service.—M.O.'s.

Salisbury General Infirmary.—Res. H.P. £150.

Scarborough Hospital and Dispensary.—Two H.S.'s Each at rate of £125.

Shipley, Urban District of.—M.O.H. £800.

Swansea Hospital.—H.S. £150.

Weston-super-Mare, Queen Alexandra Memorial Hospital.—Res. M.O. £150.

West Riding of Yorkshire.—County M.O.H. £1,600.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Jun. H.S. At rate of £125.

Worcester General Hospital.—Sen. and Jun. Res. M.O.'s. £180 and £120, respectively.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Bristol (Glos.), and Brentford and Ealing. (Middlesex).

Births, Marriages, and Deaths

BIRTHS.

BATTEN.—On July 27th, at a nursing home, Hampstead, the wife of Lindsey W. Batten, M.B., M.R.C.P., of a son.

HEGGART.—On July 18th, at Victoria Cottage, Rowhedge, Colchester, the wife of Dr. John E. Heggart, of a son.

DEATHS.

BOTT.—On July 21st, at The Bungalow, Percy road, Broadstairs, Stanley Bott, M.D., L.R.C.P., M.R.C.S., aged 60, late of Tower House, Caistor, Lincs.

GRAVELY.—On July 24th, at Cowfold, William Homewood Gravely, M.R.C.S., L.R.C.P.

LEES.—On July 23rd, Kenneth Arthur Lees, F.R.C.S., formerly of Weymouth-street, W.

LUCAS.—On July 23rd, Thomas John Rashleigh Lucas, C.B., colonel (retired), A.M.S., late of Bury-street, St. James's, S.W., son of the late George Lucas, of Ballinadee, Co. Cork, Ireland, aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which was completed with the issue of June 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

FOUR MILLENNIUMS OF CHINESE MEDICINE.

By K. C. WONG.

(Concluded from p. 208.)

IV. THE MODERN OR TRANSITIONAL PERIOD.

Transitional is a fitting term for the Tsing Dynasty, for during this period Chinese medicine showed a gradual and perceptible decline until 1805, when it received a fresh shock by the introduction of Western Medicine. Struggling under the yoke of an alien race naturally, the scientific advancements made could not be compared with those made in other Dynasties. Emperor Kien Lung, however, was a great patron of literature, and as an outcome of his encouragement the "Golden Mirror of Medicine" was produced. This is a sort of encyclopædia of medicine and surgery compiled by a committee of doctors at the order of the Emperor. It summarises the corrections and revisions of many ancient works and epitomises all the recent methods and discoveries. The "Golden Mirror" is recognised as a standard work.

An interesting figure of this time was Wang Hsun-shan, who is sometimes styled the reformer of Chinese medicine. He was the author of "Correction of Medical Errors," a remarkable little work which contains many ingenious opinions concerning anatomy and pathology, based on 42 years medical experience, and the observations of 30 decapitated human bodies. Unfortunately the corrections are erroneous. The book, though of not much scientific value, is full of original ideas, the opinions on the causation of hemiplegia, and on the brain as the organ of thought, being especially interesting.

Vaccination.—The Western method of vaccination was introduced into China in May, 1806. It was brought over from the Philippines to Macao, whence it spread to Canton and other places. It is remarkable that a century before Jenner's epoch-making discovery the Chinese seem to have had an idea of vaccination, for in the "Synopsis of Ancient Herbals" the use of fleas from the cow for the prevention of small-pox is mentioned—is it wholly impossible that the fleas of a cow affected with variola, when taken by the mouth, might have an effect analogous to that of vaccination? That this treatment was once popular suggests that there may be some efficacy in it; if so, and if there had been a Chinese Jenner to follow up the clues millions of lives might have been saved.

WESTERN MEDICINE.

In 1805 Dr. Hobson, an Englishman, came to Canton to be followed later by Drs. Parker, Kerr, and others. Silently and steadily these pioneers of Western medicine worked their way, and in spite of the proverbial conservatism of the people it has now gained a firm foothold. Only a few historical landmarks will be given.

The first Chinese who studied foreign medicine abroad was Wong Cheuk Hing. A native of Canton he was born in 1882, and obtained his English education in Macao and Hong-Kong. In 1840 he followed a Mr. Brown to America for further studies where he stayed for four years. After his graduation in literature he went over to Edinburgh to study medicine, receiving his degree in 1855. Two years later he returned to China and worked in the various hospitals in Hong-Kong and Canton until his death in 1878. With the return of a number of graduates from Japan in 1899 a new situation was created. Hitherto all Western medical work was entirely in the hands of European and American doctors. Through the writings and influence of this new body of men, Japanese medicine, and especially Japanese medical terms, became popular. They founded schools and hospitals and gradually developed into a new force in Chinese medical matters. Many of them are now holding important positions in the Government.

The new era in modern preventive medicine may be said to have dated from 1911. The great pneumonic plague in Manchuria demonstrated to the people the superiority of Western science as compared with the old native methods for the suppression of plague. Since that time many laws governing the notification of infectious diseases, the standardisation of medical education, the dissection of dead bodies, the registration of medical practitioners, the sale of narcotic drugs, &c., have been passed. In 1914 the National Medical Association of China, which has for its members the most prominent graduates from European, American, Japanese, and Chinese Colleges, was founded. Prior to this teachers and authors had great difficulty in their work because of the lack of uniform scientific terms. In 1915 a Terminology Committee was appointed, consisting of representatives of the Ministry of Education, National Medical Association, Medical and Pharmaceutical Society, Medical Missionary Association, and Kiangsu Educational Association, to determine the terms to be used throughout China. In order to promote public health and sanitation among the masses a joint Council of Public Health Education was formed in 1916 consisting of representatives from the National Medical Association, Medical Missionary Association, Y.M.C.A., Y.W.C.A., and China Christian Educational Association. All these organisations are doing splendid work towards the medical progress of China.

The formal opening of the Union Medical College and Hospital at Pekin on Sept. 15th, 1921, adds another chapter to the annals of medicine in this country. The whole plant covers an area of about 10 English acres and costs approximately five million dollars gold. It is the first medical school in the Orient, not only in the magnificance of its architecture, but also in the completeness of its outfit. Great things are expected of this institution.

The Missionary Doctors.

In conclusion, the highest tribute must be paid to the missionary doctors who were the earliest to found hospitals organise schools, and promote public health and hygiene, &c. They have brought a new light and a new hope to the teeming millions of suffering humanity. Though handicapped by insufficient funds, lack of proper equipment, and other adverse conditions, these men laboured with incessant zeal, gradually gaining ground until Western medicine attained its present position. The institutions they founded are scattered throughout the country. They are not only centres of healing but are also factories of learning, whence, every year, a small army of trained men are sent out to join those in the field to fight the demons of ignorance and disease. Inspired by the noble efforts of these pioneers, the Government and other public bodies have started to establish hospitals and schools of their own. Some of these are well organised and fully equipped. In the years to come the work of the missionary doctors may be eclipsed and eliminated. But their great contribution to medical advancement and to human progress in China will for ever remain.

CONCLUSION.

Such is a brief epitome of medicine as it has existed and been practised in China. While the Chinese anticipated many discoveries, collected a great variety of facts, invented some valuable methods and brought a few to a high degree of excellence, yet they have never pursued a single subject in a way calculated to lead them to final success. The circulation of blood, anæsthetics, X rays, vaccine therapy massage, catheters, hypnotism, hydrotherapy, hygiene, organotherapy, &c., had all been hinted at, but remained barren of results until centuries later Western science stepped in and secured the prize. The field of Chinese medicine is still a veritable virgin soil. There are golden opportunities for research workers to break open the hidden wealth of treasures. The day will come when Chinese medicine will pass through this stage of transition to emerge once more, purified and strengthened, and lead again the medical thoughts of the world.

RATING OF BRIGHTON HOSPITALS,

As the result of action through the Social Service Centre at Brighton, an agreement has just been reached in regard to the assessment of charitable institutions in the town. Strong representations had been made of the great hardships which would be inflicted upon the hospitals if the figures arrived at by the Corporation valuer, when the town was re-assessed under the Rating and Valuation Act, 1925, were allowed to stand. As the result of the representations, the Corporation valuer (Mr. H. P. Nye), in conjunction with Mr. Gerald Eve, have thoroughly reviewed the position. They took into consideration the assured income of the hospitals as against voluntary contributions, and those institutions which depended mostly on voluntary contributions were valued at a proportionately lower figure than those which derived an assured income from grants from State or municipal funds, or from payments by beneficiaries. The result has been as follows, the figures in parenthesis denoting the original assessment, while the other figures show the new assessment as proposed under the Rating and Valuation Act, and those which now stand as the final settlement. :—

	New. £	Final. £
Royal Sussex County Hospital (£175) ..	4,103 ..	2,040
Royal Alexandra Hospital for Sick Children (£48)	1,290 ..	685
New Sussex Hospital (£80)	600 ..	304
Sussex Eye Hospital (£24)	300 ..	162
Sussex Maternity Hospital (£124)	636 ..	364
Sussex Throat and Ear Hospital (£28) ..	450 ..	260
Brighton, Hove and Preston Dispensary (£47)	260 ..	122
Dental Hospital (£24)	90 ..	68

Popular Lecture:

EXPERIMENTS ON FROGS AND MEN.

Delivered before the British Medical Association at Manchester on July 26th, 1929,

BY A. V. HILL, F.R.S.,

FOULERTON RESEARCH PROFESSOR OF THE ROYAL SOCIETY.

MAN is an inveterate experimenter. Those of us who have been happy enough to see small boys at work, who have been small boys ourselves, or indeed are still small boys, will know what joy is found in taking an old alarm clock to bits or a bicycle to pieces, in seeing how fast we can run a hundred yards, in breeding rabbits, pigeons, or canaries, in fixing wireless apparatus together, or, when we are older, in trying a new kind of oil or petrol or even a new kind of medicine. Boys and men, however—by which I mean also girls and women—are not the only experimenters to be found in nature, as any who have watched a kitten or a parrot will know; and experiments made by monkeys have been scientifically studied. Man, however, is the chief experimental animal, both as experimenter and "experimentee." Indeed, in many of man's most joyful adventures he acts in both capacities; he makes experiments upon himself, often to his own great danger or discomfort.

MAN THE EXPERIMENTER.

To run in a Marathon race or to try to swim the Channel, to see how far one can ride a bicycle in 24 hours, to climb to 20,000 feet, to set out to walk (or to fly) to the South Pole, to make a height record in an aeroplane, to dive under the sea, all these involve trials and experiments upon oneself; which is one reason why so many apparently useless feats are performed. Every new adventure on which man has embarked throughout the ages, every change in his social and economic and political condition, has meant experiments upon his bodily frame and organisation, experiments sometimes successful but often followed by disaster.

In learning the use, treatment, and preservation of food he must, unwittingly often, have made millions of experiments upon himself, thousands of them extremely unpleasant, many of them fatal. Without these experiments, however, the present order of civilisation, depending as it does upon a regular supply of food, would have been impossible. When he set out to journey on the sea he experimented on sea-sickness, and later on, as his journeys lengthened, on scurvy and the need of vitamins. When he deserted a natural diet and gathered together in cities he experimented on nutrition and the physiological effects of radiation (or its absence), with rickets as a curious result. When he began to dig deep tunnels, or to work in diving bells or diving suits, he discovered that considerations of the physical solubility of gases in his blood and tissues may affect his well-being, and he invented caisson disease. When he climbed high mountains, or went up in balloons, he discovered mountain sickness, and acclimatisation to it. When he took to rapid manœuvres in aeroplanes he found out that the human factor is a limiting one, that violent acceleration—"centrifugal force"—may play havoc with his circulation and render him suddenly unconscious. Labouring in hot mines, in extremes of climate, with excess or deficiency of sunlight; living on sterilised, preserved, or purified food; breathing quartz dust or carbon monoxide; working with materials which exert a chronic irritation on the skin, or with ultra-violet light, or with X rays and radium; in all such experiments he found limitations to his independence of his external environment; he made experiments upon himself and others, experiments involving ill-health, disaster, and death to many. Even apart from disease, from the experiments which Nature wantonly insists upon making on us, we cannot avoid making experiments on ourselves if we are to do anything new; and, even if we do nothing new, we shall probably find we must make experiments still to discover how to remain just as we are.

NATURE THE EXPERIMENTER.

I am speaking this evening to those, and the friends and relations of those, who spend their lives in mitigating the results of the experiments which Nature makes upon suffering mankind. Some of these experiments involve bacterial infection and, therefore, are, or will be, to some degree avoidable. Others have no known cause, though some day their character too will be revealed. Others are due to functional disturbances in the mechanism—i.e., in the biochemistry and biophysics of the living cells of the body. Some are due to gross lesions which can be seen. Every imaginable ill, great or small, every conceivable torture, physical or mental, you are called upon to witness, and to attempt to alleviate. Some of this suffering is unquestionably due to human folly; some to man's insistence—no doubt for perfectly good reasons—upon living in a civilised industrial state; some to what we call accident—which usually means insufficient skill, or a disregard for human safety. Much sickness is avoidable, and *would* be avoided if only questions of public health and infant welfare were taken seriously enough. Many diseases, however, and their consequences, cannot be prevented altogether, until at any rate we know much more than we do to-day. You can predict the course of the disorder when once it is apparent; you can mitigate its evil consequences; sometimes even you can cure it; but at present you cannot tell us how to avoid it altogether.

Now each of your patients represents an experiment performed by Nature, often apparently a cruel and ruthless experiment, and you—her laboratory assistants—are given a variety of them to witness and to try to learn something from. Nature, however, is an extremely bad experimenter; she is, in fact, the imaginary vivisector of antivivisectionist literature, whose experiments are made without mercy and without apparent cause. So badly and so casually performed are they, so ill-controlled, that it is often impossible for you to reason accurately from them at all. Small wonder that for thousands of years medical knowledge advanced so relatively slowly, when it had to be based only on experiments such as those which Nature provides. For, as all who have tried to reason from experiments have found, these may be good or they may be bad; so well made on the one hand, so carefully thought out and prepared before the event, that one may draw sure and decisive conclusions from them; or, on the other hand, so ill-conditioned, so casually performed, that no certain deduction is possible. In most of Nature's experiments the variables involved are all confused with one another; the factors at work cannot be disentangled; half a dozen functions have been interfered with at one and the same time; the results are not clear cut, and an extraordinary degree of judgment and experience is required before you can reason from them at all.

This cannot indeed be otherwise. To your individual patients you have a duty to perform which is greater than your duty to the rest of mankind. The only way in which the confusion may be avoided is by comparing the results of Nature's casual, random, and complex experiments on human beings with those of simple, properly controlled experiments on living animals. Such a comparison is the means by which in the last few hundred years, and especially in the last seventy-five, medical science has made such startling progress. You can observe, within certain narrow limits prescribed by ethical considerations you can experiment on, man; the idea of the use of criminals for dangerous experiments, common in the past, is repulsive to-day. In any case, fortunately, the supply of criminals would be inadequate! To acquire a real knowledge of the factors at work, these observations, these limited experiments possible on your patients or yourselves, *must* be compared with the results of simpler experiments on animals, in which it is a matter of little moral importance if the patient dies.

THE EXAMPLE OF CLAUDE BERNARD.

Many of you will have read with pleasure and instruction "An Introduction to the Study of Experimental Medicine," by Claude Bernard. As Lawrence Henderson says in the introduction to the English translation: "The discoverer of natural knowledge stands apart in the modern world an obscure and slightly mysterious figure." To some he is a magician; to others he is a sort of stage professor, with blue spectacles and a long beard, forgetful and untidy; to a number (including Mr. Bernard Shaw) he is a criminal or a fool; to the majority he is almost entirely negligible, until the newspapers make some preposterous stunt about him, when he receives unwanted attention for a few weeks. "Whoever fails to understand the great investigator can never know what science really is. . . . Not the least merit of Bernard's book is that we have here an honest and successful analysis of himself at work by one of the most intelligent of modern scientists."

I cannot do better than quote what Bernard says about the experimental method: "Man is metaphysical and proud. He has gone so far as to think that the idealistic creations of his mind, which correspond to his feelings, also represent reality. Hence it follows that the experimental method" (by which of course Bernard means not merely the *making* of experiments, which is easy, but the art and science of experimentation, which is difficult) "is by no means natural to man, and that only after lengthy wanderings in theology and scholasticism has he recognised at last the sterility of such efforts. . . . The human mind has at different periods of its evolution passed successively through *feeling*, *reason*, and *experiment*. First, feeling alone, imposing itself on reason, created the truths of faith or theology. Reason or philosophy, the mind's next mistress, brought to birth scholasticism. At last, experiment, or the study of natural phenomena, taught man that the truths of the outer world are to be found ready formulated, neither in feeling nor in reason. These are indispensable merely as guides: but to attain external truths we must of necessity go down into the objective reality. . . . In the search for truth by the experimental method, feeling always takes the lead: it begets the *a priori* idea or intuition: reason or reasoning develops the idea and deduces its logical consequences. But if feeling must be clarified by the light of reason, reason in turn must be guided by experiment."

In these words lies the philosophy of the great experimental physiologist, whose work and outlook are bearing at last such rich fruit in experimental medicine. It may seem curious that the bearing of that fruit has been so long delayed. Henderson is probably right in seeing in the growth of bacteriology, following on the discoveries of Pasteur, the cause which drew men's attention away for a time from the more fundamental study. The magnificent edifice of bacteriology is not yet complete, but one's mind's eye can grasp already what its dimensions, its plan, its proportions, its significance are to be. Thought is returning to Bernard's conception of medicine as an experimental biological science, of which, as he rightly said, zoological vivisection is, and is likely to remain, an integral part.

Let me take an example from Bernard's own work to illustrate how a few controlled experiments on living animals may shed light on the countless uncontrolled experiments of Nature on living man. The existence of vasomotor nerves, the control of blood-vessels by the innervation of the muscle-fibres that lie around them, are matters of ultimate importance, not only in our understanding of bodily functions, but in dealing with the phenomena of disease. In 1851 Bernard made his first communication on the effect of dividing the cervical sympathetic nerve in the neck of a living animal. The ensuing rise of temperature on the affected side, a surprising and quite unexpected phenomenon, led by a long series of researches directly to our knowledge of the vasomotor system. It is almost impossible, as Michael Foster says, to exaggerate the importance of the result, the influence which it "has exerted, is exerting and in widening measure will continue to exert, on all our physiological and pathological conceptions, on medical practice, and on the conduct of human life. Whatever part of physiology we touch, be it the work done by muscle, be it the various kinds of secretion, be it the insurance of the brain's well-being in the midst of the hydrostatic vicissitudes to which the changes of daily life subject it, be it that maintenance of bodily temperature which is a condition of the body's activity: in all these, as in many other things, we find vasomotor factors intervening." In inflammation and in fever, in shock, in any of the disordered physiological functions which constitute disease, whatever be the tissue, vasomotor influences have to be taken into account.

All this dominant knowledge has come from Bernard's initial experiment in cutting the cervical sympathetic nerve. A simple experiment on a living animal suddenly brought a great light into a field where men had been groping in vain with the help only of clinical observation. The result of the experiment was the first clear light which broke upon the subject: and it was the following up of the teaching of the experiment which supplied the interpretation of the hitherto obscure clinical facts.

As Foster rightly claims, we must insist that the experiment in question was what is called, as though it were a term of abuse, a vivisectional experiment: an experiment which many would prevent us from performing to-day, willing though they be, when they go to the doctor, to profit by similar experiments in the past. Such experiments are sometimes declared to be needless, since the knowledge gained by them *might* be arrived at in other ways. It is true that in the course of time, experiments made by Nature, or by accident, on human beings, *might* have suggested to some quick mind that nerve-fibres do act on blood-vessels, and how they act. The unbiased inquirer will admit this, but he will also acknowledge that up to the day of Bernard's experiments all the experiments which a seemingly cruel Nature had carried out year after year, and day after day, on millions of suffering men and suffering animals, passed before the eyes of eager observers without suggesting anything more than the dimmest idea of such an action of nerve-fibre on blood-vessel. And he will also admit that a single stroke of Bernard's knife—a stroke bringing pain which shrinks into insignificance compared with the pain which it has been the means to spare—laid bare a truth which all Nature's cruel experiments on myriads of men and animals for half a million years had not, in fact, succeeded in bringing to light.

All this our unbiased inquirer will admit. Whatever antivivisectionists may say about the might-have-beens, about the way in which some superhuman intelligence *should* have been able to see the truth without the aid of experiment, there remains the plain, simple historical fact that this discovery, with all its bearing on health and disease, had its origin in Bernard's initial experiment on a living animal. I have recalled, almost without paraphrase, what Foster wrote in 1899. It is no less true in 1929. Would anyone dare to-day, had he the power, to *give* the pain which Bernard's discovery abolished, in order to *save* the pain by which the discovery was made? If so, he may call himself a friend of animals, but he is an enemy of mankind.

THE VALUE OF ANIMAL EXPERIMENTATION: HARVEY AND BERNARD.

We hear so much [illegible]on raised to-day to the use of living animal[illegible] [illegible]ts designed to solve the problems w[illegible] and physiology supply, that one must continue to insist that nearly all fundamental knowledge in the medical sciences has, in fact, arisen from such experiments. In the dedicatory epistle of "De Motu Cordis," addressed to that "most excellent and most ornate man," the President of the College of Physicians in London, William Harvey, speaking of the experiments on living animals by which he had for many years demonstrated the fact of the circulation of the blood, remarked: "Neither do Philosophers suffer themselves to be addicted to the slavery of any man's precepts, but that they give credit to their own eyes; nor do they swear allegiance to Mistress Antiquity, as openly to leave their friend Truth. For as they think them credulous and idle people, who at first sight do receive and believe all things, so do they take them for stupid and senseless that will not see things manifest to the sense, nor acknowledge the light at midday. . . . Likewise all studious, good and honest men do never suffer their minds so to be o'rwhelmed with the passions of indignation and envy, but that they will patiently hear what shall be spoken in behalf of the truth, or understand anything which is truly demonstrated to them; nor do they think it base to change their opinion, if truth and open demonstration so persuade them." If only the precept of these words could be heeded by those who object to the experiments of Harvey and his successors!

When Harvey, as he said, "first applied his mind to observation from the many dissections of living creatures as they came to hand" to find out the nature of the motion of the heart, he "straightways found it a hard thing to be attained, so that he could almost believe that the motion of the heart is known to God alone." At last, however, "using daily more search and diligence, by often looking into many and several sorts of creatures, I did believe I had hit the nail on the head and thought I had gained both the motion and use of the heart, which I did so much desire."

And so, by the vivisection as he says of "toads, serpents, frogs, house-snails, shrimps, crevisses, and all manner of little fishes," together with eels, dogs, swine, doves, chicken embryos, crabs, wasps, hornets, gnats, bees, geese, rats, sheep, adders, lice, swallows, partridges, hens and swans, modern physiology and modern experimental medicine were born. For those who, in Harvey's words, are not "stupid and senseless," who are ready to "acknowledge the light at midday," we have here one of the greatest discoveries of all time; a discovery greater even than that of the circulation of the blood; the discovery that by comparative experiments on "many and several sorts" of living creatures we may reveal the nature and working of man's body, we may increase his power and happiness and wisdom, and cure and protect him from suffering and disease.

This lecture has been entitled "Experiments on Frogs and Men." The physiologist's little friend the frog has been chosen as the general type of the experimental animal, and I have just read you a list of all its colleagues which William Harvey employed in his discovery of the circulation of the blood. In using these various animals he assumed, unconsciously, what we now know to be a fact, the fact (I do not call it the theory) of evolution. He realised, being a sensible person, that the hearts of snakes or crabs, of snails or fishes, do not differ so much from those of the higher animals and man, that an investigation of the former would throw no light upon the latter. There *are* differences of course; no reasonable man supposes that by studying the circulation, or, indeed, any function, in the frog or even in the dog alone, we shall learn enough to make us competent physicians. The differences, however, are often more apparent than real; the fundamental properties of the ultimate living units—that is, of the single cells which build up the various organs—are surprisingly alike. By the methods of comparative physiology, or of experimental biology, by the choice of a suitable organ, tissue or process, in some animal far removed in evolution, we may often throw considerable light upon some function or process in the higher animals, or in man.

THE FURTHER RANGE OF DISCOVERY: DEFICIENCY DISEASES.

I have spoken of two discoveries of the more distant past, those of Harvey and Bernard, which were made by the aid of experiments on animals, discoveries on which the practice of medicine to-day is based. Where would you be if you did not know or would not acknowledge the circulation of the blood? How would your patients fare had you never heard of the control of blood-vessels by nerves? To refer to other discoveries, how safe would surgery be to-day had the researches of Pasteur on animals and their applications by Lister on men never been made? When you take a blood pressure, do you or your patients give full credit to the Rev. Stephen Hales, who laid the basis of that particular science, by experiments on living animals performed in the parsonage at Teddington? Do those whom, by a miracle of skilful surgery, you save from the misery of hyperthyroidism and restore to normal health realise that our knowledge of the thyroid gland and the possibility of this particular operation are due alike to the so-called vivisection of animals and men? Brain surgery, renal surgery, the surgery of the nerves, the spleen, the pancreas, the stomach, the ligature and suture of arteries, the use of artificial respiration, the treatment of anthrax, rabies, diphtheria, tetanus, and syphilis (to name only a few); the researches which led to all these were intimately bound up, from first to last, with experiments on, with the vivisection of animals, as well as men. This is a matter—as Foster said about Bernard—of plain historical fact, which those who wish may verify. No manner of abuse or misinterpretation will get over a plain historical fact. Is there a fool so great, or a criminal so wicked, that he would be willing now to *cause* the suffering to men and women which these advances in medical and surgical knowledge have already saved—and will save in the next 50 million years—in order to *prevent* the suffering to animals, such as it was, by which, once and for all, they were achieved?

In 1889 Mering and Minkowski found that complete removal of the pancreas in animals is followed by severe and fatal diabetes, and a long series of experiments led to the conviction that some chemical substance, prepared by certain patches of cells, the so-called islets of Langerhans, existing in that organ are essential to the normal utilisation of sugar by the body. So certain did this seem that—although all attempts to isolate it had failed—the name "insulin" was given to this hypothetical substance by de Meyer, in 1909, and independently by Schafer, in 1916. I need not tell you how the Toronto workers in 1922—only seven years ago—succeeded in isolating this substance, and how effective it has proved in the treatment of human diabetes. Those of us with friends and relations who are maintained in practically normal health by the daily administration of insulin, and who—in all human certainty—would die in a few months were the supply of insulin prevented, can appreciate what experiments on animals have done. Not only did the discovery of insulin rest absolutely upon experiments on dogs, rabbits, and other animals, but even its supply cannot be maintained at present, until scientific knowledge of its nature is advanced much further, without continual experiments on mice and rabbits, for its standardisation. This again is plain historical fact. There are people who assert, and affect to believe, that insulin has no effect on diabetes, or that, in fact, it does harm; they base their assertion on the crude handling of statistics. There are still people who believe that the earth is flat, and that spirits can make images on photographic plates. Have those who protest against insulin ever seen a patient, sick unto death in diabetic coma, pulled as by a miracle out of his sickness and restored to health? Would they dare to condemn to death a healthy happy man, in active work, a man such as many of us know, but a complete diabetic, by refusing him his daily dose of insulin because it has to be tested and standardised on rabbits or mice? The question really needs no answer; ultimately these are humane people, though they have bees in their bonnets.

It is only three years since the experiments of Whipple on the regeneration of blood corpuscles by dogs, bled and then fed on liver, led to the discovery that pernicious anæmia can be averted, if not cured, by feeding human patients with the same substance, or by treating them with liver extract. It is healthy, I know, to have a certain mistrust of "experts," but it is healthier still to have a mistrust of fools. Those who are qualified to judge, and have seen the evidence, are convinced of the efficacy of this treatment; they have no shadow of doubt about it, and it is plain historical fact again that it was led to by experiments on animals. Unfortunate, maybe, but true! Yet a medical man I once met, a valued member of an antivivisectionist society, asserted in my hearing that the liver treatment of pernicious anæmia is a delusion, since in fact there is no such disease at all; according to him it is really cancer of the bone-marrow—whatever that means (and he himself has a cure for cancer). Whose opinion should the public accept in this matter, which after all is not altogether unimportant since it involves quite a number of human lives?

We hear a great deal in these days about vitamins: the public enjoys the word, especially in America. I once had the privilege of sitting at dinner between two distinguished members of the advertising profession. One, I believe, was an arch bill-poster, the other I found later was concerned with the advertisement of patent foods. Neither knew who I was. The first began: "When I sit down next to a stranger I generally open the conversation by asking him, 'Do you know my distinguished cousin?'"—naming one of the greatest of living investigators. I did, and conversation progressed favourably, finally leading to vitamins. When I turned to my second neighbour I told him how conversation had opened on my other side, and how, of course, it had turned to vitamins. He replied that vitamins were the curse of his existence, that he wished they had never been discovered, that their discoverer was a criminal and ought to be locked up, and so on. He seemed in other respects a reasonable and healthy man, so I made further inquiries. It appeared that in every patent food vitamins have to be present—at any rate in the advertisement—and it gives him sleepless nights wondering how the word (not necessarily the substance) can be introduced. It is true, alas, that any new knowledge can be abased and exploited for commercial purposes, yet it remains a fact that many children and many adults in Great Britain *are* suffering from vitamin lack. Walk through the poor streets of many a great city—I will not say Manchester—at an hour when the children are not in school, and see how many you can spot who are suffering from obvious rickets. Now rickets can be cured—cod-liver oil or radiated ergosterol will cure it—at infinitesimal expense compared with the end to be gained. There is no excuse for rickets any more in a civilised community.

Other deficiency diseases are known—beri-beri, scurvy, &c.—but apart from definite disease, it is probable that many defects or weaknesses, not amounting to definite disease, are due to vitamin lack. We still do not know what most of these substances are, but a means of testing and controlling their activity is available in the feeding of animals. The discovery of vitamins was made by experiments on animals—though I admit that scurvy was discovered inadvertently, and a cure for it invented, by experiments on sailors. My friend, Prof. Elliott, once said to me that to Hopkins, for his work on nutrition and accessory food factors, medicine would owe more than to anyone since Pasteur. I at any rate can testify that Gowland Hopkins's researches involved experiments on animals—did I not work for several years in a coal-cellar at Cambridge, in the company of several hundred of his rats? I never saw him maltreat them—in fact, I have good reason to believe him to be the most kind-hearted of men—but this is "vivisection," to give it its legal title, and Hopkins's discoveries were made by "vivisection" in a coal-cellar. I am happy to have lived among the rats of such a "vivisector," and to have seen such a discovery emerge.

These matters are not unimportant. Human lives and human happiness are involved. Look up the history, recent or remote, of medical knowledge and treatment, explore the story of any medical discovery, and you will find experiments on men and experiments on animals inseparately mingled. It cannot, and it should not, be otherwise. *Anti-vivisection, in fact, is anti-scientific medicine;* and those who work in laboratories need a fearless recognition of the fact by those who work on patients. Your rewards, social and financial, are not usually less than theirs; it is you who have the ears of our rulers, whether in cottage or in mansion; they remain, to the public, obscure and somewhat mysterious people; it is you, in fact, and not they, who can stop, if anyone can, the crime of hindering or preventing medical progress by means of scientific experiment. The object of our opponents is frankly to put an end to medical research, in so far as animals are used, instead of men, for experiment. They say so openly. You reply that this is inconceivable. It is not inconceivable; it might very well happen. There are States in America where even the teaching of evolution is forbidden. Do not let England become the laughing stock of the world, like Tennessee!

THE PHYSIOLOGY OF SENSATION.

But enough of these unpleasant and futile controversial matters; let us turn for a moment to something of more interest. You have probably all wondered how it is that some things provoke you more than others, how you recognise things as hotter, colder, heavier, lighter, darker, more or less painful. The fact that you can distinguish pain from cold, or light from sound, is simple to explain—each has a specific kind of receptor, each sends in its messages to the nervous system along a different line. All the evidence, however, as garnered from innumerable experiments upon the nerves of frogs, tends to show that a nerve-fibre transmits its messages in an *all or none* way. Nervous activity consists of discontinuous waves, just as the pressure of a gas is due ultimately to bombardment by its separate particles. Now these waves cannot be varied in degree by varying the stimulus—a stronger stimulus does not produce a greater wave in the nerve, provided it produces one at all. How do we recognise a stronger stimulus, as we certainly do? We have indeed the finest appreciation of changes in our environment and in ourselves. The physiology of sensation, and of reflex and voluntary muscular response, together with our theories of the pathology of the nervous system, depend vitally upon an answer to the question—how are we aware of variations of intensity in a stimulus applied to a sensory end-organ?—and until a very few years ago no response was forthcoming. All our philosophy of the sensory relations of the human body to its environment depends upon the answer.

The physiology of the frog's nerve, most carefully and fully studied, seemed inadequate to explain this most obvious characteristic of the human nervous system. What an opportunity for scorn for those who expect research to be instantly followed by practical application! And yet, lying in this mass of exact data obtained on the isolated nerve of the frog, and on the generalisation built upon it, lay the means, as soon as the modern amplifying valve was applied to the action current, to open up a new field of physiology of great practical importance and of intense theoretical interest.

The nerve impulse had long been known to be accompanied by an electric change in the fibre in which it travels; this impulse lasts for approximately a thousandth of a second at any spot; it is of the order of size of a few milli-volts, but in a fibre embedded in a nerve trunk it is largely short-circuited, and the external effect to be recorded is very small indeed. Without amplification it is difficult enough to record a single wave in a whole nerve trunk with any accuracy, to record it in a single fibre is utterly beyond the reach of any available instrument. With the aid, however, of the tools which wireless engineers have provided, single nerve waves in single nerve-fibres can be amplified and recorded, and a whole new world of hurrying, scurrying activity is opened up to analysis.

The opening up of this new world is chiefly the work of Prof. Adrian and his pupils, and the answer to our question is at once apparent. The sensory end-organ records a *greater strength of stimulus by a greater frequency* of response. A heavier pressure on the skin sets up a greater number of nerve messages per second in the fibres running into the nervous system; a brighter light, a greater tension in a muscle, a hotter body, a stronger pinch or prick, are registered by a greater frequency of the impulses evoked by it. The experiments, conducted with splendid simplicity and skill, have left no doubt of the quantitative nature of sensory response. Not only can the separate waves in an afferent nerve-fibre be registered photographically, but they can even be transformed into sound and heard in a loud speaker. The physiology of sensation has taken a new jump forward, and nobody with a particle of scientific imagination can doubt that this new knowledge will have important bearings upon the pathology of nerve affections.

This work, however, has developed not only on the afferent or sensory, but also on the efferent or motor side of the nervous system. For a quarter of a century it has been believed that the only way in which the strength of a muscular response can be graduated is by a graduation of the *number* of muscle-fibres involved in it. All skilled movements, all fine work, the economy and precision which are rightly so much esteemed in the trained performer, which are lost in various disorders of the nervous system, all depend upon this precise grading of muscular effort. It seems now from Adrian's work that variation of the number of fibres involved in a muscular response is only the *coarse* adjustment; the fine adjustment is due to a graduation of the frequency with which the muscle-fibres are excited by their nerves. Here, again, in its bearings upon our theory of the working of the nervous system, we have a very fundamental fact. Such facts have been established by experiments on frogs, eels, rabbits, and cats—by "vivisection," that is to say, to give it its official title—though I am sure that no pain, worthy of the name, has been caused by them. They have been confirmed by experiments on men. At a meeting of the Physiological Society, Prof. Bronk, a collaborator of Prof. Adrian, had a fine electrode thrust into an arm muscle, and the resulting action currents were led off to an amplifying system and thence to a loud speaker. As he varied the force exerted by his muscle, the pitch of the sound emitted by the loud speaker waxed and waned; at first a rattle like a machine gun, and finally a musical note; one *heard* a single human muscle-fibre varying the strength of its contraction. No doubt the result *might* have been attained by a superhuman intelligence, without preliminary experiments on animals; it is a matter, however, of simple historical fact that it was not so attained, but that experiments on frogs and tortoises and eels, on dogs and cats and rabbits, were the *actual* path by which the result was reached. If anyone dares to assert that it is unimportant, the history of all scientific thought is against him. Indeed, if the understanding of anything at all in man's universe is important—which, of course, some people deny—it is of his own central nervous system.

THE CENTRAL NERVOUS SYSTEM.

Let me illustrate the matter further by a recent experience of my own. It is known that the extremely complex functions of the central nervous system depend upon an adequate supply of oxygen, that without oxygen they rapidly fail. It is known that central nervous activity is readily modified by fatigue. Now in trying to discover the fundamental nature of the activity of the nervous system we need something simple to work with; the central organ itself is so utterly out of reach of direct experiment, so hopelessly changed by isolation or interference, that we can do little but fire messages in, in various ways, and observe what comes out again. The study of the spinal cord and brain has become, in fact, the study of reflexes, whether automatic or conditioned, a study which in the skilful hands of Sherrington, Magnus, Pavlov, and many others, has opened new vistas of research and knowledge and promised—or indeed begun to provide—a rich harvest to the neurologist. The magnitude of their achievement I should be the last to under-estimate, but they would be the first themselves to recognise that their methods alone cannot solve the whole problem. What are the individual cells and fibres doing during activity? What are the physico-chemical changes involved in excitation, inhibition, and facilitation in the central organ? What *is* the central excitatory state revealed by Sherrington's experiments? Can we give some picture of the central nervous system based upon the elementary properties of the isolated nerve? A very difficult problem, which many people have tried and are trying to solve.

Let us consider an analogy. For centuries the movements and properties of the heavenly bodies have been studied. Astronomical discovery is perhaps the noblest monument to the human intellect. To-day, however, the flood of light which is being poured afresh upon the dimensions and time-relations, the history and evolution of the universe has resulted, not chiefly from astronomical observation as such, but from the labours of physicists in their studies of radio-activity, of spectra, and of the conduction of electricity through gases, and of mathematicians in their theories of the interchanges of radiation and matter. In 1929 the picture which science gives us of the universe is based upon the properties of atoms, electrons, energy, and radiation. So it must be with the central nervous system. In the solution a necessary step is to learn in greater detail the properties of the central nervous cells and of the fibres which project from them; we need to know them not only by their works at a distance, but by near and personal acquaintance. Keith Lucas made a first attempt to explain the fundamental characteristics of the central nervous system on the basis of those of the medullated nerve-fibre of the frog, an experimental object whose clear-cut functions we can investigate methodically in the laboratory by rigorous physical methods. Lucas's attempt has not been wholly successful; although patches of light have been thrown upon central nervous function by work upon the isolated medullated nerve of the frog, there is still much that remains obscure.

It may be that a further little step, in this type of analysis, is possible. It happened by good fortune some three years ago, at the Marine Biological Laboratory at Plymouth, that I examined the limb nerves of Maia, the spider crab. Other people, of course, have done this before, but they did not chance to have a galvanometer at hand. The activity of this tissue can readily be measured by recording its electric response to stimulation. To our astonishment the nerve was found to be obviously and highly fatiguable. It is almost impossible, as you know, to fatigue a medullated nerve. Students make experiments to show that it cannot be done. The researches of my colleagues, Levin and Furusawa, have shown this non-medullated nerve of Maia to possess some most interesting properties—properties which one would like to see examined as the possible material for an analysis of the central nervous system. The nerve can be fatigued, almost to complete exhaustion, by stimulation for a few minutes. Fatigue at the point of stimulation is greater than at a distance from it. In the presence of oxygen it recovers; in the absence of oxygen it does not. At 10° C., 25 minutes are required for complete recovery, from six seconds only of stimulation. Only 2 per cent. of the energy involved in activity is liberated during the passage of the impulses produced by excitation, nearly 98 per cent. in the succeeding 25 minutes of recovery. The normal resting state of the nerve is accompanied by an electrical potential difference across its surface. The potential difference is diminished or abolished by stimulation or by oxygen-want; here is an obvious and lasting effect of activity, which was not known at all in medullated nerve. In the presence of oxygen the potential difference is slowly restored, just as though it were due to a little accumulator which has to be recharged by a dynamo when it is run down. The energy used is many times as great as in the case of the medullated nerves previously examined. Hence perhaps the rapid onset of fatigue. There is evidence that the maximum frequency at which the nerve transmits its impulses rapidly decreases as activity continues.

Now the central nervous system consists largely of grey matter—that is, of nerve cells and of non-medullated nerve processes; only to a minor degree can its properties depend upon its medullated fibres. In the fatiguability, in the large amount of energy used, in the dependence on oxygen, in the varying degree of electric polarisation of its surface, may we not see in the crab's non-medullated nerve, more faithfully reproduced, the properties of the central nervous cells, than in the simple medullated nerve of the frog?

I realise that I am only guessing. Investigation as yet has not had time to enable us to do more. I am showing you, so to speak, Bernard's process of *feeling* at work. Nothing may come of it after all; feeling is often wrong. Only future research will show whether the comparison will prove fruitful, and I do not claim that any particular problem has been solved. I give you the comparison merely to illustrate a very early stage in scientific procedure. If, however, the guess proves to be right, we have here an example taken straight, so to speak, from the factory, of the principle which Harvey's work so fully emphasised of the advantage of trying your experiments "on many and several sorts of creatures," on any living animal on which you can lay your hands. The most unexpected creature in the world—even the spider crab crawling about at 20 fathoms—may help you to solve a riddle which would prove quite insoluble so long as your only experimental animal is man.

EXPERIMENT THE ONLY WAY.

Is it indeed conceivable that we can find out about life without examining life? The whole history of human knowledge and progress tells us the danger and folly of scholasticism and unverified hypothesis, the advantage of unbiased experiment and observation. If you wish to find out about the stars you must observe the stars, you must experiment with the materials which you suspect the stars to contain, you must try to reproduce, and to experiment under, the conditions which obtain in the stars; you must study spectra, electrons, radiation, gravitation; you will not be content merely with pictures of the sky at night. If you want to solve the problems of flight you must experiment on flight; you will never solve them merely by examining dead birds or fossil birds, or even living birds in cages. If you want to understand the properties of matter you must make experiments with matter, and apply mathematical calculations to your results as necessary; it is not sufficient to read what the Greek philosophers said about matter. If you want to know how living things evolved you must examine the strata of the earth, in which you can find them in their various stages of evolution ready to look at. You must not be content with the first chapter of Genesis. If you want even to play tennis you must experiment in playing tennis—all the books in the world will teach you nothing without the practical experience. So, if you want to understand life and the problems involved in life, if you want to acquire the power which an understanding of living processes will bring you, you must observe living things, you must take them to pieces to see how they work, you must become familiar by long experience with the way they behave.

Living processes, as Bernard upheld, are subject to the same determinism as the phenomena of the inorganic world. Cause and effect are related in the same way. There are no spooks, no spirits, no magic, no supernatural agency, no lack of causal relationship to hinder us from applying the same kind of exact quantitative experimental analysis as men are accustomed to apply to the facts of physics, chemistry, engineering, or astronomy. The only difference is that the problems of physiology, taken in its widest sense, are far more difficult and complex that those of the so-called exact sciences. The problems of biology require greater and not less experimental skill, more patience and not less, more time to unravel, more judgment and more understanding for their solution. Biology is *not* a soft job, for people with second-best brains; though physicists and chemists sometimes affect to think so. There is no evidence, however, that its problems are not ultimately soluble. We may not solve, as the newspapers would say, the "mystery of the origin of Life"; any more than astronomers can tell us how the universe of matter, energy, and radiation came into being in the beginning. Probably there *was* no origin and there *was* no beginning; at least there is no evidence at all on the subject. The real difficulties in biology are great, but they are experimental difficulties, not philosophical ones. If we wish to understand life we must experiment with it, not talk about it. Our experimentation, of course, must be led to by hypothesis, for random experimenting is as useless, as dangerous, as unverifiable hypothesis; but when once we have appealed to Nature to judge between our theories, we must accept her decision, without bias of hypothesis, or philosophy, or religion. We must trust absolutely to experience, guided by reason. *We must admit no challenge to the arbitration of experiment, except better and better and still better experiment.* The field of biology is vast, much of it is still quite unexplored, but we have a few landmarks to guide us. The fact of evolution is certain, the fact of determinism, the fact that the laws of the inorganic world apply in biology with the same precision as elsewhere. The field is not ripe yet for much more theory—exact quantitative experiment on living creatures and tissues is the present need, and will remain so for many years to come.

How, then, shall we proceed? By experiments on man? Surely, for man is the only experimental animal who will coöperate fully with the experimenter, and most important results have been obtained in recent years by controlled experiments on man. Besides, the habit of experimenting on man, on themselves and their friends, is a valuable lesson to learn for all those whose lives are to be devoted later to medicine; and no less important should it prove in connexion with the scientific study of industrial and social welfare. Let us, however, insist and continue to insist that human physiology and medicine are branches of biology as a whole. Man has a kinship, through evolution, with all the plants of the earth, the beasts of the field, the birds of the air, the creatures of the sea. Fifty years ago this conclusion was opposed by all the resources of sentiment and of organised religion. Even to-day there is widespread objection among the uneducated to the teaching of evolution, but none on the part of those who have studied the evidence. We *are* akin to the other creatures, and a frank acknowledgment of the fact need not, in fact does not, diminish our appreciation of the nobility of human nature or of the sanctity of human life. One objection to the use of animals in experimental medicine is undoubtedly the same old anti-evolutionary prejudice. To-day, however, the conclusion cannot seriously be contested, Bernard is admitted to be right, medicine and human physiology *are* branches of experimental biology. We must make them so in fact as well as in theory, in hospital and laboratory as well as in lecture room.

Let us advance, therefore, by experiment, hopefully and without fear. Harvey, by his experiments "using daily more search and diligence, by often looking into many and several sorts of creatures," did finally "hit the nail on the head" and so laid the basis of modern scientific medicine. To-day there are unlimited opportunities for experimental biologists, adequately schooled and disciplined in hard reasoning and exact methods, in its border sciences. From frogs to elephants upwards, from frogs to filtrable viruses downwards we may take our choice, according to the demands of the experiment; and the end of it is man. Puny, fearful, unreasonable, selfish he may sometimes be; yet possessing always elements of nobility, courage, kindness, and devotion such as no other animals possess, which make him, as was said 1900 years ago, "of more value than many sparrows." On his behalf, for his health, his happiness and his wisdom, for his freedom from suffering, superstition, and ignorance, experimental biology and experimental medicine should be ready to sacrifice, if needs be, many sparrows and many frogs.

TREATMENT OF CHOREA BY NIRVANOL.

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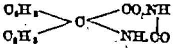
A NEW method of treating chorea with a preparation called nirvanol has recently had a fairly wide trial in Germany. In most clinics where the method has been used it has met with such constant success that it continues to be employed in severe and obstinate cases. Up to the present, knowledge of this form of therapy has failed to reach the shores of England or America, and we have been unable to find any reference to nirvanol in the literature of either of these countries.

During the last few months we have used the method in six cases of chorea, and have been sufficiently impressed with its favourable results to think it worth while to bring this new form of treatment to the notice of the English medical profession, so that it may receive more general trial in this country.

Nirvanol is composed of γγ-phenylethylhydantoin, and has the following formula:—



It is formed by the combination of urea and glycol, and was originally used as a hypnotic for sleeplessness and as a sedative in epilepsy and various types of psychosis. In chorea, relatively smaller doses are used, and successful results are not due to any hypnotic effect, but to a specific reaction which occurs after several days' oral administration. This reaction, on which the whole treatment depends, is akin to serum disease, or a mild anaphylactic shock, and is so distinct that it has been named nirvanol disease.

Method of Treatment.

The drug is administered by the mouth in daily doses of 0·3 g. for a child of 9 to 14 years of age. In most cases 8 to 14 days after beginning the treatment a well marked morbilliform rash appears usually accompanied by pyrexia. The drug is stopped directly this reaction occurs. The rash is at first composed of tiny red macules which, in the course of a day or so, enlarge and become slightly raised. The distribution varies, but usually the eruption is first noticed on the chest, abdomen, and elbows. From here it spreads to other parts of the limbs, the extremities being particularly affected, and spots are nearly always visible on the dorsum and soles of the feet, and sometimes on the palms of the hands. The back may be involved, but the face generally escapes. After about four or five days the rash gradually disappears, hardly having reached a definitely papular stage, and rarely becoming confluent except on the elbows. In our cases the rash always had this morbilliform character, but other observers have noted urticarial and scarlatiniform eruptions. There are few subjective symptoms, but conjunctivitis, pharyngitis, cervical adenitis, and slight œdema of the eyelids and face are apt to occur. Vomiting is uncommon, but there may be slight headache and drowsiness. The nirvanol rash does not usually irritate and, accompanied by these other slight manifestations, is strikingly like rubella. Its tinge, however, is not the typical pink of this infection, and more closely resembles a mild attack of measles, although the absence of true Koplik's spots is a valuable differentiating sign. In fact, this peculiar rash is best described as falling between these two exanthemata, not quite resembling either in some of the most important details.

The continental writers state that the temperature may be considerable for several days, rising as high as 104° F. in some cases, but in our patients this high pyrexia did not occur, and two remained afebrile throughout, although the rash was well marked. In any case the reaction is over by the third to fifth day, and it has been noticed that the earlier it is evoked in the course of treatment, the more severe is the rash, and the longer the duration of the temperature (Leichtentritt, Lengsfeld, and Silberberg).[1] Just before the onset of the fever the choreic manifestations seem to be aggravated, but with the disappearance of the rash they improve with dramatic suddenness, and are generally completely arrested within a week or ten days. In certain cases the reaction is delayed until the 24th day, and in others a curious secondary reaction may arise, similar to the primary one, 17 to 39 days after starting treatment (Leichtentritt et al)[1]. This occurs as long as 12 days after the drug has been stopped, and may occasionally be very severe (Keller).[2] Heart lesions, present at the time, are apparently unaffected and certainly not made worse, but in the German reports, details of the cardiac condition in the cases treated are meagre. In one of our cases the chorea was complicated by early carditis with dilatation. We had the impression that this was favourably influenced, and the heart had certainly resumed its normal size with the arrest of the chorea, although an apical systolic murmur persisted. The treatment has not been long enough in practice for us to form any opinion as to the ultimate prognosis. One or two cases have been described in which a relapse occurred many months after the first successful nirvanol treatment. In these children, nirvanol arrested the chorea again without producing the typical reaction on the second occasion (Keller,[2] Huber).[3] A few successful cures have also been reported in cases treated for the first time, which have shown little or no reaction (Schmal).[4] But in both instances the effect of the drug on the blood-picture is generally well marked despite the absence of rash or fever.

The most constant change in the blood is a true eosinophilia, which reaches its maximum just before the appearance of the rash. In addition, during the administration of the drug there is generally a leucopenia with a decrease of the polymorphonuclear cells and, at the same time, a relative lymphocytosis and monocytosis. With the subsidence of the general reaction the blood-picture gradually resumes the normal. These changes were mostly present in five out of our six cases, and have been tabulated on the accompanying charts. Eosinophilia appears to be one of the prominent features of nirvanol disease and, as already indicated, may occasionally be the only evidence of a reaction.

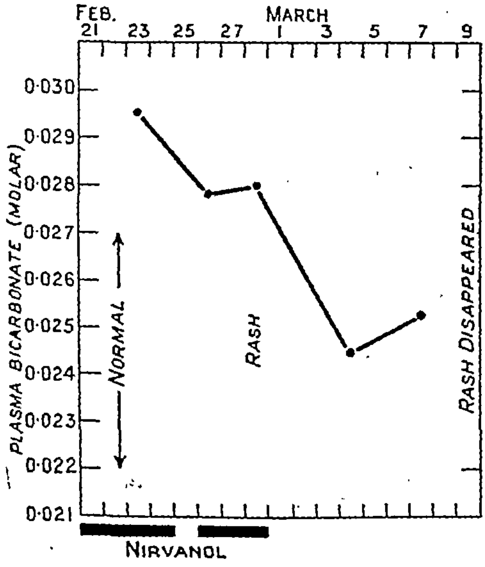
For the treatment to be successful one must aim at producing nirvanol disease, and with this in view a sufficiently large dose of the drug must be given, but there is as yet no means of regulating the severity of the reaction. It is wise never to exceed a daily dose of 0·3 g. of nirvanol. The drug must be stopped immediately the typical reaction (rash, fever, and so forth) appears, and if this has not occurred by the fourteenth day it is useless and even dangerous to proceed with the treatment (Huber).[4]

Pathology.

de Rudder[5] likens the reaction of nirvanol to that of serum disease, in which an alteration of the acid-base equilibrium of the blood has been found. He states that there is at first an alkalosis approaching a pro-anaphylactic tetany. The peripheral nerves share in the general stimulation, and this no doubt accounts for the temporary aggravation of the choreic movements. At the moment of the eruption the alkalosis is changed into an acidosis, and it is this sudden alteration presumably, which he claims, has such a marked effect on the central nervous system. Dr. W.W. Payne has investigated this point on two of our cases (Cases 3 and 4), and by measuring the blood plasma bicarbonate has been able definitely to confirm a tendency towards alkalosis during the administration of the drug, but was unable to establish any sudden swing over to acidosis. His estimations are tabulated in the Figs. 1 and 2. It will be noticed that, taking Blackfan and Bengt Hamilton's[6] figures, 0·022 to 0·027 molar as the normal, the plasma bicarbonate in Cases 3 and 4 was increased after a few days administration of the drug, but it never dropped below normal during the course of treatment. Thus there appears to be a tendency towards alkalosis, but not to an acidosis.

The usual effect of nirvanol appears to be absent in certain patients, and it is interesting to note that they are also resistant to the various sera, which in normal people would produce anaphylactic phenomena. This may possibly be taken as substantiating evidence that nirvanol disease and serum sickness are analogous. The exact manner in which the drug produces such a remarkable effect on chorea is not really known. It is certainly not due to a mere production of fever as, for instance, occurs in the malaria treatment of dementia paralytica, for the drug is just as efficacious when there has been no rise in temperature (see Cases 5 and 6). The eosinophilia can only be an integral part of the reaction, and seems hardly likely by itself to be the effective agent. If it were, other substances provoking eosinophilia might presumably have a beneficial action on chorea similar to nirvanol. We can hardly believe the explanation is that of protein shock.

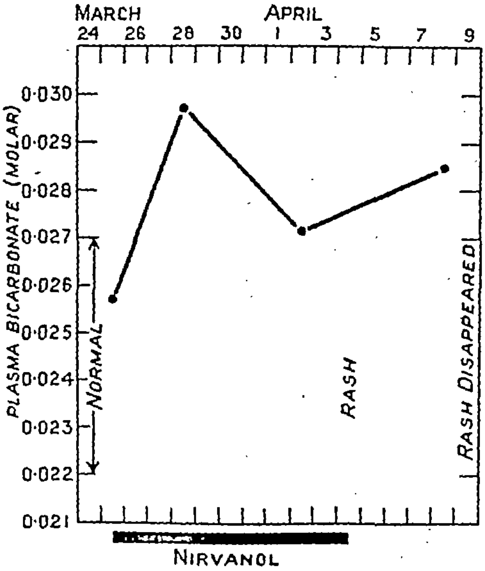
FIG. 1.



The blood-plasma bicarbonate estimation in Case 3.

Extensive animal experiments have been performed by Leichtentritt, Lengsfeld and Silberberg.[1] They produced shock in rabbits by injecting them intravenously with serum of patients previously treated with nirvanol, but there was no eosinophilia. Oral administration of the drug to these animals caused a marked leucopenia with relative lymphocytosis. When this was continued long enough the bone-marrow became seriously affected and an aleukæmia was produced, closely resembling that occurring in benzol or salvarsan poisoning, and after an excessive use of X rays and radium.

FIG. 2.



The blood-plasma bicarbonate estimation in Case 4.

Dangers.

Although the six cases we have treated ran a mild and favourable course, these experimental results serve as a warning that nirvanol is not a harmless drug, and that its exhibition, if not closely watched, is liable to be dangerous. It should never be given unless the doctor in charge is conversant with its action, and the patient must be under constant medical supervision. The possibility of a deleterious effect on the bone marrow must be kept in mind in the present stage of our knowledge of this treatment, and a watch kept on the leucocyte fall. Even with the most careful administration, alarming results have been reported on rare occasions. For example, Keller describes the following case. After a typical reaction occurring on the sixth day of nirvanol treatment, followed by a striking arrest of the choreic movements, the drug was stopped immediately and the patient appeared to be cured. Eleven days later, however, a severe secondary reaction set in with high fever, headache, and a second scarlatiniform rash, tonsillitis, gingivitis, stomatitis, nephritis, enlargement of the liver and spleen with jaundice, blood-stained diarrhœa, swelling of the face and œdematous ulceration of the upper lip. A protracted recovery eventually ensued, and was complicated by troublesome furunculosis. There was some reason to believe that the formidable secondary reaction in this case was brought on by accidental exposure to sunlight. This may have been a coincidence, but since another severe secondary reaction has been reported after giving artificial sunlight to a patient who had just finished his course of nirvanol, it appears wise to guard against such rays for two or three weeks after this form of therapy.

The rash may very occasionally extend to the bronchial mucous membrane as in measles, and give rise to broncho-pneumonia (Pilz).[7]

Results.

Good reports of nirvanol have come from various German clinics. Roeder[8] in Gottingen, Rietschel,[9] and Hester[10] in Wurzburg, Husler[11] in Munich, Matzdorff[12] in Breslau, Huber[2] and Schmal[4] in Berlin, Keller[3] in Karlsruhe, all subscribe to the effectiveness of the drug. Two other independent observers, however, Bendix[13] and Buttner, are not so enthusiastic, and find no advantage in nirvanol over any other form of treatment of chorea.

Judging from the following cases treated by this method, we have been impressed by the beneficial effect of the drug on chorea, and the disappearance of the movements has certainly seemed to us to be more rapid and complete with this form of treatment than with any we have employed hitherto.

CASE 1.—A girl, aged 11, had been suffering for three weeks from severe acute chorea, which had probably been precipitated by overworking for a musical scholarship. She had suffered from pains in the limbs six months previously.

March 28th, 1929: On admission, movements were incessant, and the child was very restless with speech affected; heart normal. April 3rd: Nirvanol started, 0·3 g. daily. 5th: Sore throat; restlessness increased. 6th: Slight headache; temperature 101·4°; tachycardia, 140. 7th: Temperature subsided; pulse-rate 100. 8th: Mild conjunctivitis; no change in chorea. 13th: Rash appeared first on both elbows; scattered papules on hands, wrists and soles of feet; nirvanol stopped. 15th: Rash more extensive and irritating. 16th: Rash still developing and confluent in certain areas. 17th: Rash fading; chorea improving. 20th: No chorea.

Blood Counts (Case 1).

Date in 1929		Leuc. per c.mm.		Pn. cells. per cent.		Lym. per cent.		L.Mn.cells. per cent.		Eos. per cent.
2/4	..	10,000	..	55	..	38	..	6	..	1
5/4	..	18,000	..	42·5	..	49	..	4·5	..	4
9/4	..	14,000	..	47·5	..	48	..	4	..	0·5
12/4	..	16,000	..	45	..	50	..	4	..	0·5
16/4	..	20,000	..	58	..	38	..	3	..	1
23/4	..	13,000	..	56	..	37	..	4·5	..	2·5

Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. L.Mn.=large mononuclear. Eos.=eosinophiles.

CASE 2.—A boy, aged 10 years, had been suffering from mild but persistent chorea for three months, which had not improved under treatment at home. There was no previous history of rheumatism.

Feb. 10th, 1929: On admission, mild chorea present; heart showed some enlargement to the left with systolic murmur at the apex; normal temperature. 10th to 28th: Rest in bed without drugs produced no improvement. March 1st: Nirvanol started, 0·3 g. daily. 6th: Slight puffiness of the eyelids; heart resumed a normal size, but systolic murmur persisted. 9th: Temperature 99·6°; no alteration in pulse-rate. 10th: Rash appeared, morbilliform in character; face flushed, macular rash all over the body, conjunctivitis, infected fauces and a few small white spots on the buccal mucosa; axillary glands palpable; sore throat, but no other symptoms; temperature 99·4°; nirvanol stopped. 11th: Temperature subsided. 12th: Rash faded; movements less. 21st: No chorea.

Blood Counts (Case 2).

Date in 1929.		Leuc. per c.mm.		Pn. cells per cent.		Lym. per cent.		L.Mn. cells per cent.		Eos. per cent.
28/2	..	12,000	..	38	..	52	..	3·5	..	0·5
5/3	..	9,000	..	37	..	40	..	5	..	0
6/3	..	8,000	..	50	..	37	..	4	..	9
10/3	..	9,000	..	23	..	62	..	3	..	12
5/4	..	10,000	..	40	..	49	..	2·5	..	8·5

Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. L.Mn.=large mononuclear. Eos.=eosinophiles.

CASE 3.—A girl, aged 8½, had been suffering from chorea for three weeks. She had had repeated severe attacks of chorea during the last two years, associated with headaches and bouts of vomiting. No history of any other rheumatic manifestations.

Blood Counts (Case 3).

Date in 1929.		Leuc. per c.mm.		Pn. cells. per cent.		Lym. per cent.		L.Mn. cells per cent.		Eos. per cent.
22/2	..	9,200	..	64	..	32	..	4	..	0
25/2	..	8,200	..	48	..	48	..	8	..	6
28/2	..	5,200	..	59	..	27	..	3	..	12

Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. L.Mn.=large mononuclear. Eos.=eosinophiles.

Feb. 15th, 1929: On admission there was moderate chorea with considerable hypotonia which showed no improvement with rest in bed; heart normal. 21st: Nirvanol started; 0·25 g. daily. 25th: Temperature 100°; nirvanol omitted for 24 hours. 26th: Nirvanol recommenced, 0·25 g. daily; temperature normal. 28th: Morbilliform rash; nirvanol stopped. March 13th: No chorea.

CASE 4.—A boy, aged 10, had had three mastoid operations, and following the last one, chorea had developed two weeks before readmission to hospital. At the same time there was a history of pains in the limbs.

Jan. 14th, 1929: On admission chorea was of moderate severity and movements were even present during sleep. No definite evidence of cardiac involvement. Treated with bromides and arsenic, but without improvement. 24th: Chorea still well marked. Feb. 12th: Movements not so evident. 25th: Relapse of chorea. March 4th: Bromides and arsenic stopped; tolysin treatment started. 11th: Chorea still present. 25th: Nirvanol started, 0·35 g. daily. April 1st: Temperature 99·8° for one day. 4th: Rash appeared first on the wrists, morbilliform in character; nirvanol stopped. 5th: Rash spreading. 9th: Rash disappeared; chorea absent. May 23rd: Report from convalescent home stating that there has been no return of symptoms.

Blood Counts (Case 4).

Date in 1929.		Leuc. per c.mm.		Pn. cells. per cent.		Lym. per cent.		Eos. per cent.
23/3	..	11,000	..	49	..	44	..	1
27/3	..	10,000	..	55	..	42	..	1
30/3	..	5,000	..	20	..	70	..	5
2/4	..	11,000	..	64	..	31	..	5
5/4	..	10,000	..	60	..	35	..	5
9/4	..	18,000	..	70	..	25	..	2

Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. Eos.=eosinophiles.

CASE 5.—A girl, aged 13, had been suffering from chorea for two months. Five years previously she had had a similar attack lasting three months, which was treated in turn with chloretone, bromide and arsenic. The present attack dated from an influenzal infection, and was at first treated by rest in bed at home together with salicylates, but without improvement. Heart normal.

April 25th, 1929: On admission to hospital the chorea was moderate, and affected the tongue and the right side of the body more than the left. May 4th: No improvement from rest in bed and aspirin; nirvanol 0·3 g. daily started. 5th: Slight drowsiness. 6th: Slight increase in chorea; drowsy. 7th to 11th: No change. 13th: Rash appeared, starting on the elbows and spreading thence to the chest, abdomen, soles of the feet and palms of the hands; a few spots on the mucous membrane of the lower lip; nirvanol stopped. 14th: Rash more clearly defined; a few papular spots and erythematous patches most marked on the elbows, fading easily on pressure; slight enlargement of the occipital glands. 16th: Rash fading; movements less. 21st: Rash has disappeared. 22nd: No chorea; there was no appreciable alteration in temperature throughout the treatment.

Blood Counts (Case 5).

Date in 1929.		Ery. per c.mm.		Leuc. per c.mm.		Pn. cells. per cent.		Lym. per cent.		L.Mn.cells. per cent.		Eos. per cent.
2/5	..	4,960,000	..	4,000	..	40	..	46	..	3	..	2
7/5	..	5,300,000	..	4,500	..	41	..	52	..	3	..	3·5
13/5	..	5,000,000	..	6,000	..	46	..	38·5	..	0·5	..	7·5
15/5	..	5,400,000	..	9,000	..	35·5	..	51	..	5	..	8·5
21/5	..	5,600,000	..	4,400	..	48	..	43·5	..	1·5	..	2·5

Ery.=erythrocytes. Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. L.Mn.=large mononuclear. Eos.=eosinophiles.

CASE 6.—A girl, aged 12½, had been suffering from chorea for five weeks with involvement of the speech. The onset of chorea was accompanied by joint pains which lasted for a few days. No previous history of chorea or other rheumatic manifestations.

Blood Counts (Case 6).

Date in 1929.		Ery. per c.mm.		Leuc. per c.mm.		Pn. cells. per cent.		Lym. per cent.		L.Mn.cells. per cent.		Eos. per cent.
4/5	..	4,520,000	..	4,000	..	48	..	40·3	..	10	..	1·6
8/5	..	—	..	5,000	..	48·8	..	42·4	..	7·2	..	1·6
12/5	..	6,000,000	..	4,800	..	50	..	43	..	6	..	1
15/5	..	5,500,000	..	6,500	..	45	..	45·5	..	6	..	3
17/5	..	5,300,000	..	4,800	..	48·5	..	45	..	4	..	0·5
21/5	..	5,300,000	..	7,300	..	60	..	36	..	3·5	..	1

Ery.=erythrocytes. Leuc.=leucocytes. Pn.=polymorphonuclear. Lym.=lymphocytes. L.Mn.=large mononuclear. Eos.=eosinophiles.

May 2nd, 1929: On admission there were well-marked movements affecting the face, body and limbs, the left arm being very hypotonic; speech was bad; heart normal. 4th: Nirvanol, 0·15 g. 5th: Nirvanol, 0·45 g.; slight headache. 6th: Nirvanol, 0·3 g., which was then repeated daily; drowsy at times; no change in chorea. 7th to 12th: No change. 13th: Rash appeared; macules on elbows, chest, abdomen, forearms and palms of the hands; one red spot on mucous membrane of the lower lip; nirvanol stopped; no change in movements. 14th: Rash more marked, morbilliform in character over neck, face, and trunk; a few papules on dorsum of the feet. 16th: Rash fading; chorea improving. 18th: Rash has disappeared; great improvement of chorea during last three days; there was no appreciable alteration in temperature throughout the treatment.

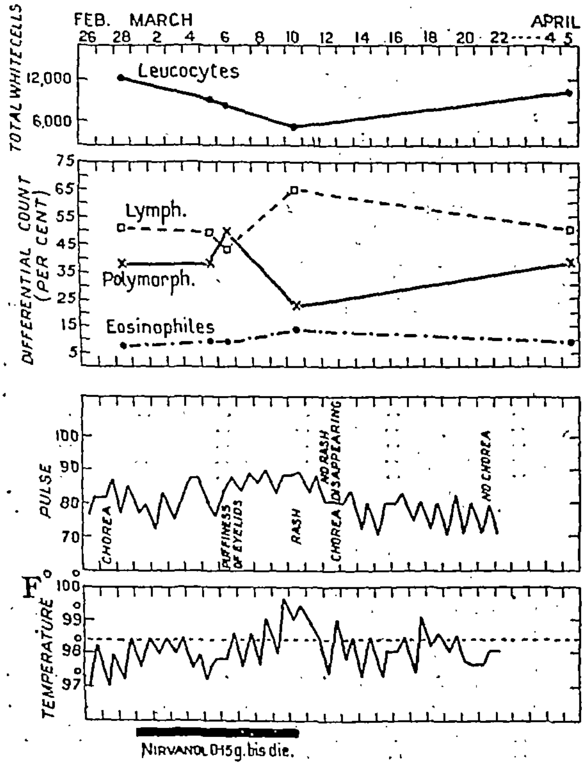
The effect of nirvanol on the blood was fairly constant in the first five cases, and followed pretty closely the changes referred to in the text. Cases 2 and 4 are such typical examples that they have been graphically represented (Figs. 3 and 4). There was no appreciable alteration in the blood count of the sixth case, and it is interesting to note that, unlike the others, this boy, although greatly improved, could not be counted completely cured.

Conclusion.

Other attempts have been made to treat chorea along similar lines. The method of Duzar in which adrenalin is injected intravenously, while at the same time alkalosis is produced by large doses of sodium bicarbonate by the mouth, has perhaps received the greatest attention, but it appears to be cumbersome and unreliable.

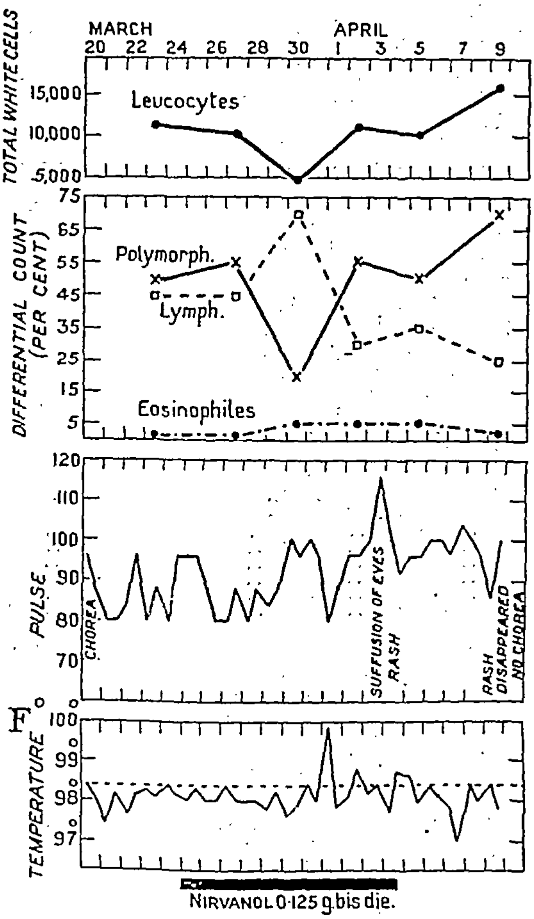
Judging from the many accounts from various independent sources, since Roeder's original communication in 1919, nirvanol certainly does seem to be a potent drug, which is effective in the treatment of chorea, and has the advantage of oral administration. Against this is the fact that there is a small element of risk in the treatment, and for this reason it may be considered unjustifiable to take such heroic measures to combat a self-curable disease. On the other hand it seems unwise to dismiss nirvanol summarily on this plea alone. We have all seen the severest cases of chorea recover with only the most trifling symptomatic treatment, but we have also seen these cases develop permanent heart disease before they are finally cured. It may be that the arrest of chorea before it has run its course may also prevent the rheumatic infection from reaching the heart. It is also possible that by treating a child with nirvanol during its first attack, relapses may be largely avoided. More prolonged investigations are necessary before these points can be decided. Should the ultimate prognosis of chorea after nirvanol prove more favourable than it is with our present modes of treatment, then the drug indeed would have been a valuable discovery. Finally, we might add that in two further cases, under our care, rheumatic nodules of long standing disappeared rapidly after a course of nirvanol.

FIG. 3.



Blood counts, temperature, and pulse-charts of Case 2.

FIG. 4.



Blood counts, temperature, and pulse-charts of Case 4.

We are greatly indebted to Dr. P. O. Ellison, Dr. Alan Moncrieff, and Dr. G. W. Goodhart for the blood counts of our cases, and for the interest they have taken in this new form of treatment.

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ASTHMA AND HAY-FEVER.

By J. E. R. McDONAGH, F.R.C.S. Eng.

Asthma and hay-fever are mild forms of shock affecting the respiratory system, and their nature does not differ from that of shock occurring elsewhere in the body. Shock depends generally upon two factors: (1) a precipitation of colloid protein particles in the vessels of the organ involved, and (2) a loss to the organ of oxygenated blood. In the respiratory tract shock is caused by a precipitation of colloid protein particles in the lymphatic spaces and capillaries, and to a lesser extent in the narrowed arterioles and arteries. The particles become precipitated when they increase in size, absorb water, and undergo agglutination. This change is termed hydration, and is brought about by any agent which will lower their surface tension to a minimum, such as histamine, nicotine, urecoline, coniine, insulin, unprotected colloid, and aluminium or ferric hydroxide. The removal from the tissues of the corpuscular components of the blood causes an immediate reduction in the activity of the tissues. This results in a relaxation of the peribronchial muscular tissue, so that the bronchioles are not constricted. In opposition to current views, I maintain that constriction of the bronchioles does not occur in the most severe form of pulmonary shock, the important feature of the condition being the relaxation of the muscles. The vagus plays little or no part in the actual causation of asthma and hay-fever. Less severe hydration causes the corpuscular elements to collect in the branches of the pulmonary artery, where the cells and tissues are stimulated and deprived of oxygenated blood. The venous congestion attracts polymorphonuclear leucocytes, which break up the hydrated particles into smaller particles. This inflammation, though it relieves the condition of asthma, may lead to broncho-pneumonia or any kind of infection of the respiratory system. Palliative drugs disperse the symptoms by breaking up the protein particles into particles bearing an adequate negative charge. If an excessive number of the particles resulting from dispersion bear a diminished negative charge, thrombosis occurs, but usually most of the particles leave the colloid state to go into true solution. This change is termed dehydration, and the increased flow of blood in the vessels changes the dyspnœa to the inspiratory type.

The action of adrenalin on asthma is not to stimulate the sympathetic nervous system, but to disperse the hydrated particles, through its negatively charged aliphatic methyl group and its negatively charged phenolic hydroxyl group. It is harmful if used over a long period because of the interstitial changes which it brings about in the mesenchymatous tissue, which in the end cause hydration of the protein particles in the plasma as a cyclical change. Much better results, without these harmful effects, are obtained from strontium aspartate, calcium oleate, camphor, acetyl-choline, and choline, which are conductors; and oxygen, which is a dehydrator. Atropine, because of the large size of its nucleus, exerts an initial hydrator effect on the protein particles, and dehydration only occurs later by reason of its negatively charged active groups. It therefore aggravates certain cases of asthma. This property has escaped general recognition, doubtless because atropine is wrongly thought to have a direct action upon the vagus.

The Cause of the Attack.

Any hydrator may precipitate an attack of asthma and hay-fever, especially in persons whose protein particles have already been partly hydrated. The precipitating factor, the foreign protein, may increase the hypersensitiveness, but to remove it does not get rid of the primary cause of the hydration. This explains why cutaneous tests are valueless, and the removal of feathers and other sources of foreign protein from the surroundings only a palliative. An important hydrating factor is a combination of the sun's rays and muscular exercise; this is why hay-fever is most common in summer, and why asthma is so apt to occur in September. The prime cause of hydration is, however, inherited chronic intestinal intoxication, to which focal sepsis of all kinds is *secondary*. *The initial hydration or state of hypersensitiveness is caused by the entrance into the blood stream of poisonous products of digestion.* These are manufactured by mutation forms of the normal *Bacillus coli communis*, and consist of foodstuffs altered physically rather than chemically. The hydrated protein particles collect in the walls of the large intestine, to aggravate the condition first by stimulating and then by paralysing the nerve-endings of the vagus in Auerbach's plexus. This produces a hyper-activity, and later a hypo-activity, of the centre of the vagus in the brain, and finally of the cerebral cortex. Incoördination is produced, and intestinal stasis is aggravated, so that the result is a vicious circle. Hydration can be transmitted by both parents, and asthma and hay-fever are therefore symptoms of hereditary disease.

Treatment.

Asthma and hay-fever cannot be cured until inherited disease is eliminated. The treatment resolves itself into removing, as far as possible, the chronic intestinal intoxication, in coördinating the individual, and in correcting the abnormal chemico-physical state of the protein particles.

Removal of the chronic intestinal intoxication is best achieved by washing out the colon as far back as the ileocæcal valve by the syphon method, by having the bowels opened two or three times a day ever afterwards, by avoiding animal food as far as possible, and in particular butcher's meat, eggs, and milk in large quantities, and by immunising the patient against the pathogenic micro-organisms found in the excreta. *While the ascending colon and cæcum are being washed out, drugs may be incorporated in the fluid, as absorption readily takes place through this part of the large intestine.* The best aperients to use are taxol, and some preparation of liquid paraffin. The manner in which the food is cooked forms 50 per cent. of the problem of diet.

The actual treatment of an attack of asthma depends in the main upon whether the attacks recur at long or short intervals and upon whether they are taken at their inception or later. Patients who have continuous asthma and signs of interstitial pneumonia do best with iodine, thyroid, and ichthyol or thiol-amino-methyl-glyoxaline, prescribed internally, and with small and repeated doses of the carbon di-sulphide product of di-ethyl-amine (contramine) injected intramuscularly. Patients who get an attack now and again should *receive two intramuscular injections* either of sup. 36 (0·01 g.) or of B.N. 368 (benzoyl-para-amino-benzoyl-3-6-8-hydroxy-naphthylamine: 0·005–0·01 g.), on two successive days. This is the best treatment in cases of hay-fever, because both asthma and hay-fever are most frequently occasioned by the hydration undergone by certain protein particles in the plasma through the dehydration of other protein particles. Both the compounds function as conductors; they correct the dehydration and cause dispersion of the recently hydrated protein particles. Provided an attack of asthma is treated at its inception and a case of hay-fever at the beginning of the season, the attack may be cut short and the next warded off for months, in some cases for years, while hay fever can be checked for the season and one or more ensuing seasons. I have had several cases each *of asthma and hay-fever* where the timely use of sup. 36 or B.N. 368 checked the attack instantaneously and prevented its recurrence, while the treatment of the primary cause was being carried out. When the hydration is well advanced pure conductors are useless for causing dispersion, and only simple dehydrators and conductors with a dehydrator action can be employed. Dehydrators need to be used with caution, because the ultimate result of using too large or too many injections is itself hydration, the state responsible for the attack. Therefore I use dehydrators having the minimum hydrator effect and those which possess a conductor action as well. Choline and acetyl-choline are useful at first, but they usually fail when re-employed. Strontium aspartate in 0·01 g. doses, injected intramuscularly every day or every other day, is a most useful drug in the less severe attacks, and is to be preferred to adrenalin. In some of the more severe cases, even when combined with oxygen subcutaneously, the drug may fail to cause dispersion of the hydrated particles. In some cases no known drug is able to correct the abnormal chemico-physical changes, and the attack has to run its course until the hydrated protein particles undergo the cyclical change of dispersion. Peptone, advocated by Auld,[3] [4] acts by causing dispersion of the hydrated protein particles and, being a derivative of protein, its action is essentially homœopathic. It must be used with caution, because a reaction (hydration) causes a serious aggravation of the trouble. Peptone does not cure asthma and hay-fever and, although its initial use may check an attack, it often fails to act a second time. Heroin is the most efficacious hypnotic in asthma, because the two acetyl groups cause dispersion of the hydrated protein particles. The greatest caution is necessary, because of all the condensed nuclei of benzene its vehicle phenanthrene is the one which causes the maximum degree of protein hydration. These methods have proved successful in a large number of cases, the end-result varying chiefly with the stage to which the chronic hydration had progressed and with the condition of the patient.

Illustrative Cases.

CASE 1.—A boy, aged 7, had had asthma every night for six months. The attacks were aggravated by active exercise. The mother and father had been operated upon for appendicitis and the mother's brother is Case 4. The patient had cyclical vomiting *as an infant*, hay-fever every year, and nocturnal enuresis occasionally. The teeth were bad and the hands were covered with warts. The urine gave an intense reaction with the hydrochloride of di-methyl-para-amino-benzaldehyde. Blood examination was as follows:—

Suspension stability of the red blood corpuscles	0·1 c.cm.
Refractive index of the serum	1·3473
Percentage of blood-sugar	0·137 g.
Percentage of blood-urea	16 mg.

Ultra-microscopic picture: Many particles moving with many large and refractile giant particles, ringed particles, and giant particled clumps precipitated.

Bacteriological examination of the excreta: 10 per cent. atypical *Bacillus proteus hydrophilus.*

Treatment.—Patient was dieted, made to have the bowels open two to three times a day, was given a course of treacle enemas till colon was clear, and had injections of the fæcal vaccine in doses of 125,000. The patient recovered completely; two injections of sup. 36 (0·005 g.) stopped the asthma at once.

CASE 2.—A girl, aged 9, had suffered from asthma since birth. Maternal grandfather and grandmother died of cancer; father suffered from hay-fever and his mother and brother were chronic asthmatics. Patient had one brother and two sisters; the brother suffered from asthma and the sisters from urticaria and epilepsy respectively. Blood examination was as follows:—

Suspension stability of the red blood corpuscles	0·7 c.cm.
Refractive index of the serum	1·3489
Percentage of blood-sugar	0·112 g.
Percentage of blood-urea	41 mg.

Ultra-microscopic picture: Many particles moving with a fair number of giant particles, all of which had a halo around and were very refractile. The other particles moved very actively around the giant particles. There were some clumps and agglutinations precipitated.

Bacteriological examination of the excreta: 20 per cent. *Bacillus fæcalis alkaligenes.*

Treatment.—Patient was dieted, made to have the bowels open two to three times a day, was given a course of treacle enemas till colon was clean, and had injections of the fæcal vaccine in doses of 250,000. The patient recovered completely.

CASE 3.—A woman, aged 28, who used to suffer from asthma and chronic bronchitis as a child, sought advice for constant abdominal pain. The patient had had attacks of rheumatic fever and was supposed to have had typhoid fever and paratyphoid. She had suffered from seborrhœa and acne vulgaris, and had once been jaundiced. The patient was always depressed; she suffered severely from dysmenorrhœa, and was in every way a typical example of familial chronic intestinal intoxication. Blood examination was as follows:—

Suspension stability of the red blood corpuscles	0·3 c.cm.
Refractive index of the serum	1·3502
Percentage of blood-sugar	0·118 g.
Percentage of blood-urea	18 mg.

Ultra-microscopic picture: Fair number of particles moving, with some very refractile giant particles and ringed particles. There were many giant particles, clumps, and agglutinations precipitated, with some precipitated en masse.

Bacteriological examination of the excreta: 60 per cent. Morgan bacillus.

Treatment.—Patient was treated in the routine way and recovered completely. This case shows that in spite of the asthma and bronchitis disappearing other signs and symptoms, the result of protein hydration, presented themselves.

CASE 4.—A man, aged 33, had had asthma for 14 years; eating eggs and having anything to do with rabbits brought on an attack immediately and the smell of petrol frequently precipitated an attack. The patient was the uncle of Case 1. The patient suffered from chronic bronchitis as a child, had had two attacks of rheumatic fever, and had been afflicted with acne vulgaris for many years. The optic discs were mal-developed, the ears were prominent, the elbows were wide-angled and hyperextended, and the patient could not stand with his feet and knees together. All the molars had been stopped or removed; the tongue was furred and the patient had acro-asphyxia. The pulse was 80 and the blood pressures registered 105 and 70 mm. Hg respectively. An examination of the abdomen revealed tenderness in both hypochondria and both iliac fossæ. The urine gave an intense reaction with the hydrochloride of di-methyl-para-amino-benzaldehyde. Blood examination was as follows:—

Suspension stability of the red blood corpuscles	1·2 c.cm.
Refractive index of the serum	1·3487
Percentage of blood-sugar	0·082 g.
Percentage of blood-urea	39 mg.

Ultra-microscopic picture: Few particles moving with some giant particles and ringed particles. There were more particles precipitated as giant particles, ringed particles, and clumps. The precipitation amounted almost to precipitation en masse.

Bacteriological examination of the excreta: 20 per cent. *Bacillus proteus valerici.*

Treatment.—Butcher's meat, eggs, and milk were excluded from the diet; the colon was washed out; the attack which the patient had at the time of examination was checked with two injections of B.N. 308 (0·005 g.), and later four injections of the fæcal vaccine were prescribed in two courses of two in a half and one million respectively. The patient had had a course of peptone injections without benefit. He recovered completely and was able to resume his occupation as a motor mechanic.

Summary.

Asthma and hay-fever are symptoms of inherited disease caused by the precipitation of hydrated protein particles and by the lack of oxygenated blood in the respiratory tract. The chief signs and symptoms of inherited disease are mal-coördination and a chronic intestinal intoxication. Asthma and hay-fever can usually be prevented by correcting the mal-coördination and removing the chronic intestinal intoxication.

Asthma and hay-fever are not diseases. Asthma is not caused by a stimulation of the vagus occasioning a constriction of the bronchioles. When adrenalin palliates an attack it does so by causing the hydrated protein particles to disperse, not by stimulating the sympathetic nervous system.

Asthma and hay-fever can usually be overcome with drugs able to cause dispersion of the hydrated protein particles. These measures are really no more than palliative, and a "cure" can result only in the prevention of inherited disease.

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ANTIDYSENTERY BACTERIOPHAGE IN THE TREATMENT OF BACILLARY DYSENTERY.

A RECORD OF SIXTY-SIX CASES TREATED, WITH INFERENCES.

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DYSENTERY is one of the three most fatal infectious diseases of the urban population of Egypt. The official figures for Alexandria for 1927 and 1928 show on a mean population of 579,485 a death-rate from tuberculosis of 1, from diphtheria of 0·3, and from dysentery of 0·2 per thousand; but for the five years 1924–28, in an average population of 560,218, the total deaths registered from these three diseases were: tuberculosis 8532, dysentery 844, and diphtheria 572. This gives over the longer period a mean yearly dysentery death-rate of 0·3 per thousand. Of these deaths the majority must be put down to bacillary dysentery; first, because, judging by the laboratory diagnosis of specimens, this is far the more prevalent form of the disease,* and secondly because more specific and satisfactory therapeutic measures (emetine, yatren) have hitherto been available for the treatment of amœbic cases.

When I took up my duties in Alexandria in 1926 I found that the serum treatment of bacillary dysentery had largely fallen into disuse as inefficacious and that many cases of bacillary dysentery were, in my opinion, being erroneously diagnosed and treated as amœbic. This meant that before 1927 many, perhaps most, bacillary dysentery cases in the district, received no specific treatment whatever. Can the impressive fall in death-rate for the years 1927 and 1928 be accounted for by the institution of a relative amount of specific treatment, or must it be passed over as something incalculable, although it represents an economy of close upon 100 lives per year? I believe that it is related to the use during those two years of antidysentery bacteriophage for the treatment of a certain proportion of the bacillary dysentery cases in the district. Towards the middle of 1927 I began preparing and distributing gratuitously antidysentery bacteriophage for therapeutic use to doctors in the city who were willing to coöperate in an endeavour to obtain information on the value of this treatment. The distribution was limited to cases which had been diagnosed cytologically in these laboratories as bacillary dysentery. Opinion then was, and to a large extent still is, divided as to the therapeutic merits of bacteriophage.

d'Herelle (1926[1]), guided by the bacteriolytic property of bacteriophage which he had established in vitro, inaugurated this treatment in 1921 on five cases of Shiga dysentery. The results were excellent: the bloody stools ceased within 24 hours in each case and the patients entered upon immediate convalescence. Enthusiasm, however, shortly afterwards waned. Otto and Munter (1921) in Germany, Davidson (1923) in America, and Fletcher and Kanagarayer (1923) in the Malay States recorded essentially negative results. Against this Da Costa Cruz (1924) in Rio de Janeiro, after an initial series of poor results, finally established uniform success, and thereby confirmed d'Herelle's original observations. This was the situation when the present investigation was begun and throughout its progress.

Phage Employed: Its Preparation and Distribution.

The therapeutic phage distributed was of multiple origin and polyvalent quality. It consisted initially of four phage-strains: one passed to me by d'Herelle and three others isolated by me in Egypt. The mixture was put up against 16-hour broth-cultures of some 12 *local* strains of dysentery bacilli: two Shiga, three Flexner, six Hiss (including one Sonne), and one Gay. Hiss type constitute the predominating organism in the Alexandria region. Complete lysis of the cultures occurred after a few hours in the incubator at 37° C. After 24 hours' incubation the lysates were mixed and filtered through a filter impregnated with infusorial earth, and later through a L3 Chamberland filter. The filtrate constituted the therapeutic phage. It was transferred to sterile ampoules in quantities of approximately 2 c.cm. Three ampoules were, as a rule, distributed to each patient undergoing treatment, with a circular instructing the patient on the use of the phage and a questionaire to the doctor, to be filled up and returned to the laboratory later. Nearly 200 cases received treatment, about 50 in 1927 and 150 in 1928, and circulars were returned from 92 cases. Of these, only 66 were full enough to use.

The remaining cases from whom no returns were received have, I consider, to be reckoned for the most part as "cures," since had they been "failures" they would have reported again at the consulting-rooms of their medical attendants. As they were mostly poor and left no addresses, they could not be satisfactorily followed up. But providing them with phage probably meant to a certain extent the dissemination of antidysentery phage in their surroundings, a factor to which d'Herelle has attached some importance, since he holds that "immunity by phage, like the disease itself, is infectious."

Clinical Results.

For simplicity of interpretation and ease of reference, the results arrived at are classified in a general way, as follows:—

+ + + —Very good—Stools reduced to 2–3 per day by the 2nd day (counting the initial day as 0), in conjunction with improvement in the general condition of the patient.
+ + —Good—{Stools reduced to 3–4 per day by the 3rd day, or Stools reduced to 3 per day by the 4th day} with improved general condition.
+ —Moderately good—Stools reduced to 4–5 per day by 5th day.
(+)—Partial failure—Little or no change in the number of stools or in the general condition within 4 days, but ultimate recovery.
——Failure—Death, or no change within 1 week of commencing treatment.

When anti-serum treatment was first being tried two factors were mainly relied upon as criteria of cure: (1) lowering of mortality, and (2) diminution in the duration of the disease, compared with the recognised slowness of cure when drug treatment only was available. Thus, Kolle and Hetsch (1918) record that the nervous symptoms diminished, the patient's strength returned, the colic and tenesmus ceased, while blood and mucus gradually disappeared from the stools, which in 2–5 days regained their normal composition. In many cases, however, progress was not so rapid. Dopter and Saquepée (1921) observe that the number of stools became lowered to 8–10 in 24 hours, to remain stationary at this level for many days. All authors have noted that when serum-therapy was instituted late it seemed to have no effect. This applies to a certain extent also to phage-therapy, as a badly eroded intestine naturally cannot return all of a sudden to its status quo ante.

The result of phage was "very good" in 35 of our 66 cases, "good" in 10, "moderately good" in 6, a "partial failure" in 5, and a "failure" in 10. Two cases, however, had been ill a fortnight and were practically dying at the moment of the phage intervention. This was presumably true also in a third fatal case in which the date of onset was unknown. One patient was ill about two months before the phage was given, and naturally an immediate cure was out of the question, in view of the intestinal lesions present. Eliminating these four cases, the failures are reduced to six. On the severest possible analysis, grouping these 6 "failures," the 5 "partial failures," and the 6 "moderately good" results together as failures, we have in all 17 failures and 45 successes on a total of 62 cases. This represents a minimum percentage success for the treatment of 72·6. Of the failures, three had been ill for a week—maybe more—before the phage treatment was begun; two of them were children less than one year old. Both early intervention and the age of the patient play an important rôle in the success of the treatment.

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* Our statistics indicate that 80–90 per cent. of all dysenteries in Alexandria are bacillary. The records of the Public Health Laboratories, Cairo, indicate a similar state of affairs. (See Perry and Bensted, 1925.)

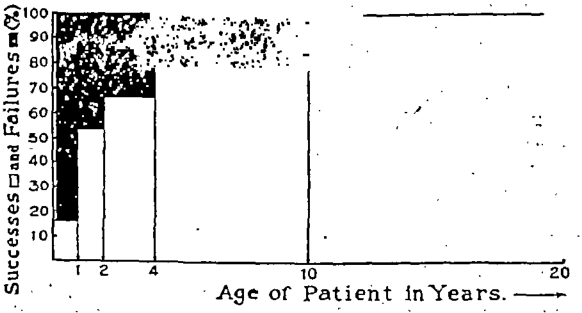
In five cases anti-serum treatment was employed in addition—an unintentional experiment, since it was no part of my idea that serum should be used—it was administered independently by the treating physician. Three of these figure as failures and two as successes. Of the three failures, one had the serum before and two after the phage, while the two successes had the anti-serum before the phage. If any conclusion is justified by these cases it is, I think, that there is no contra-indication to phage when the patient has already had serum. The two successes are interpreted rightly or wrongly, as solely due to the phage. This interpretation is, I think, justified by the clinical notes. Moreover, all authorities are agreed that for antidysentery serum to be of any use it must be given in large doses, and not in the 10 c.cm. doses generally used here.

It is well known that certain cases of bacillary dysentery *do* well on saline treatment alone, or even on emetine, but this does not invalidate the successes attributed to phage, because it is a well-established fact that many patients develop phage spontaneously. One case is particularly interesting.

> A specimen of fæces, collected on the fourth day of illness, just before the administration of the first dose of therapeutic phage, was found to be rich in a phage with the following activities: Shiga +++, Flexner ++, Hiss +++, Paracolon No. 2+++. Yet clinical improvement only dated from the administration of the therapeutic phage. The particular therapeutic phage used in this case possessed activities which were slightly different—i.e., Shiga+++, Flexner+++, Hiss++, Paracolon No. 2—.

This is obviously a patient who would eventually have recovered of his own accord. The therapeutic phage by mouth merely accelerated the cure and constituted the "reinforcements" necessary to ensure a rapid phage "victory" in the phage-bacterial engagement already going on in the patient's intestines. From this and other considerations I have not the slightest doubt that the spontaneous development of phage will explain most of the bacillary dysentery "cures" due to emetine and simple saline treatment.

FIG. 1.



Showing the percentage of successes and failures, under the influence of phage treatment in 62 cases of various age-periods.

Causes of Failure of Phage Therapy.

Three factors exert an influence on the success or failure of the treatment: the age of the patient, the number of days' illness before the phage intervention, and the bacterial flora. The 62 cases arrange themselves in terms of success and failure as set out in Table I.

These numbers are represented diagrammatically in Fig. 1.

TABLE I.

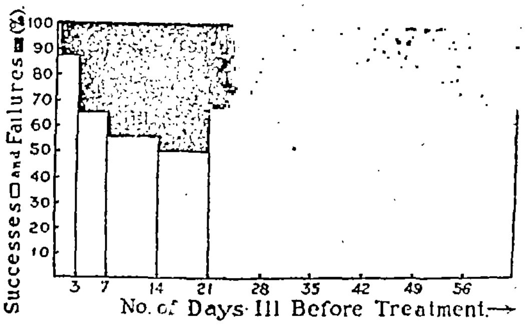
Age.	Number of cases.	Percentage.	
		Successes.	Failures.
Under 1 year	6	16·7	83·3
Between 1 and 2 years ..	15	53·3	46·7
" 2 and 4 " ..	9	66·7	33·3
" 4 and 10 " ..	9	77·8	22·2
From 10 years upwards ..	23	100·0	0

The phage treatment was least successful with children under 1 year old. It was three times as successful with children between 1 and 2, four times better with children between 2 and 4, and still more successful with children between 4 and 10, to reach complete success with adults.

Table II. sets out the arrangement in time-periods of the 62 cases in which definite information was obtained of the number of days of illness before phage treatment.

These numbers, represented diagrammatically, give Fig. 2.

FIG. 2.



Showing the percentage of successes and failures of phage-therapy in dysentery, in terms of the number of days patient was ill before the intervention with phage.

TABLE II.

Days ill.	Cases.	Percentage.	
		Successes.	Failures.
1–3 ..	15·5	87·1	12·9
3–7 ..	27	64·8	35·2
7–14 ..	13·5	55·5	44·4
14–21 ..	3	50	50
21–60 ..	3	66·7	33·3

The success of treatment varies inversely as the number of days the patient was ill before it was commenced. Thus, if the patient had been ill for three days or less about 90 per cent. success was obtained, while when treatment was delayed until the fourth to seventh day the success was about 65 per cent. When treatment was commenced one to two weeks after onset, a success of 55 per cent. only was reached; when it was delayed for three weeks, a fifty-fifty result was obtained. Beyond three weeks, and up to two months, the diagram records a certain improvement in the percentage of successes. The need for early intervention therefore is established. It might be better not to wait for a preliminary purging but to administer the phage at once and to give salines afterwards. There is one instructive case in the series which was treated very successfully in this way.

If the microbes causing the intestinal lesions are not attacked by the phage, obviously no good can be expected from its administration. Cultural studies were made of the majority of the cases, but only in six was the flora completely determined before and after phage administration. Two were successful phage-therapy cases, two were immediate failures, and two were complete failures. They are summarised in Table III.

TABLE III.—*Bacterial Flora Before and After Phage in Six Cases.*

Case.	Age in years.	Days ill before phage administered.	Bacterial flora (as isolated on Endo's medium).		Result of treatment.
			Before treatment.	After treatment.	
2	8/12	7	Coliform only.	Two atypical *B. dys.* (Gay) types.	—
25	2½	4	*B. proteus* No. 2.	*B. proteus* No. 2, *B. proteus* No. 3, *B. paracolon* No. 1, and a *B. meta-dys.* (unknown).	—
27	3	3 (1)*	*B. proteus* No. 2.	*B.C.L.A.* No. 2 or 5, *B. lactis aerogenes.*	+
33	4	1	*B. dys.* (Sonne) *B. paracolon* No. 1.	*B. lactis aerogenes*, and an unknown bacillus of the dysentery group (*a*).	+ + +
36	5	3 (1)*	*B. proteus* No. 2.	*B. morgan* No. 1, *B. lactis aerogenes*, an atypical *B. dys.* (Gay), and a *B. meta-dys.* (unknown).	+
40	6	2	*B. dys.* (Hiss).	Coliform only.	+ + +

* Third day ill, but first day of "blood and mucus" in stools. The cases were sister and brother respectively.

(*a*) Fermenting glucose, maltose, and saccharose, but not mannite or dulcite.

The two cases (Nos. 33 and 40) which did well on phage-therapy had classical *B. dysenteriæ* (Sonne and Hiss respectively) present in the stools before the administration of phage, while, after phage administration, these organisms could not be recovered on culture from the stools: in the one case 30 hours after commencing the treatment, and in the other on the fourth day. *B. proteus* No. 2 is practically constant in the failure cases. This is very striking. Its absence, before and after, in the successful cases is equally noteworthy. It suggests, I think, the need for the revision of our ideas concerning the rôle of *proteus* organisms in the summer diarrhœas of children and the bacillary dysenteries of adults. Most authors consider them rather as concomitants. I suggest that the presence of *proteus* organisms, more especially *B. proteus* No. 2, constitutes an ætiological factor of considerable importance in bacillary dysentery, particularly in children. This organism only differs from *B. morgani* No. 1, so frequently found in summer diarrhœa, by liquefaction of gelatin and by failure to produce indol. It is, I think, chiefly because of its presence that the results of phage-therapy were so disappointing in the cases under two years old. To combat *proteus* organisms by phage-therapy is fraught with difficulty, because the *proteus* group of bacteria is not homogeneous, as is the dysentery group, in its susceptibility to phage action; and because *proteus* organisms are rich in specific endotoxins, allied to botulinus toxin though less powerful. There is, therefore, no guarantee that a phage active against a *B. proteus* causing trouble in one intestinal tract will be active against the *B. proteus* of another case. Moreover, lysis in vitro of the bacterial bodies of *proteus* organisms, by liberating their contained toxins which pass into the filtrate, may render such a liquid too toxic for immediate therapeutic use.

d'Herelle (1926[3]) records having isolated two races of bacteriophage which, at the moment of their isolation from the stools of two infants who had died of infantile cholera, were very virulent for *B. proteus vulgaris*, yet of 12 strains of *B. proteus* only three were found susceptible, and they were the same for each of the two races. Again, he found the [illegible] a bacteriophaged suspension of *B. prot*[illegible] extremely toxic for rabbits immediately [illegible] solution of the bacilli (0·5 c.cm. [illegible] causing death within a few hours). W[illegible] ever, for 10 days the toxicity had [illegible] rabbit then surviving the intravenous [illegible].

Summary.

The general result of phage treatment for bacillary dysentery appears very much in its favour: 70 per cent. of the cases showed a well-defined response and rapid improvement. The good effect was the more marked the earlier the treatment was begun; it was relatively less favourable the younger the patient. It was particularly successful in patients aged 10 years and upwards. Cases with *proteus group organisms*—especially *B. proteus* No. 2—in the intestinal flora did not do so well.

Incidentally, during the progress of the treatment and side by side with it, a noteworthy lowering in death-rates from dysentery was recorded. Whether this is a simple coincidence, or affords evidence of a cause-and-effect relationship, it is not at present possible to affirm. During the investigation there undoubtedly occurred a certain dissemination of the living ultra-virus *Protobios bacteriophagus dysenteriæ* in the surroundings of the patients, with a probable dissemination of natural protection. Distribution of phage to patients in a region means an increased proportion of phage "carriers" among the population, with, in all probability, a correspondingly increased distribution of phage to food and drink. Here doubtless the fly—the great distributor of dysentery bacteria in nature—may reasonably be assumed to play a rôle.

My best thanks are due to the many colleagues—representatives of the Air Forces, the Army, and the civil practitioners in Alexandria, too numerous for individual mention—who kindly collaborated with me in this investigation.

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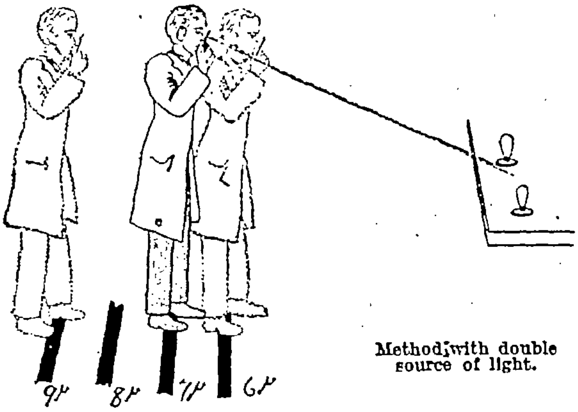
"halos" can be made to meet, overlap, or separate. The distance at which contact is made between a selected pair of corresponding rings is directly proportional to the diameter of the red blood corpuscles. The coloured ring which is easiest to use is the red fringe of the innermost complete spectrum (Spectrum of first order).

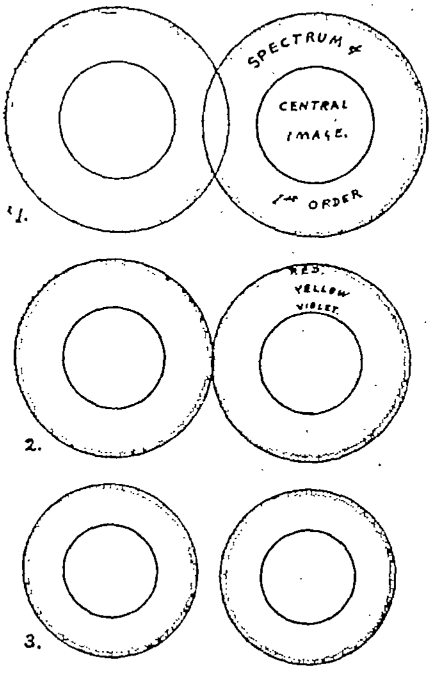
FIG. 1.



Method with double source of light.

The patient's blood-film is examined at the position of contact for the normal. Any difference in the size of the "halos" is shown by overlapping or separation of the selected diffraction rings (see Fig. 2). For example, in pernicious anæmia the "halos" are obviously smaller, and it is necessary to step back a distance which is proportional to the increase in the size of the red corpuscles. If the method is adopted as a routine the floor may be calibrated with chalk lines, so that one foot corresponds to 1 μ. This is done by adjusting the distance between the lamps so that, with normal blood-films, apparent contact is made at a distance of 7 feet. They will then be about 2 feet 4 inches apart.

FIG. 2.



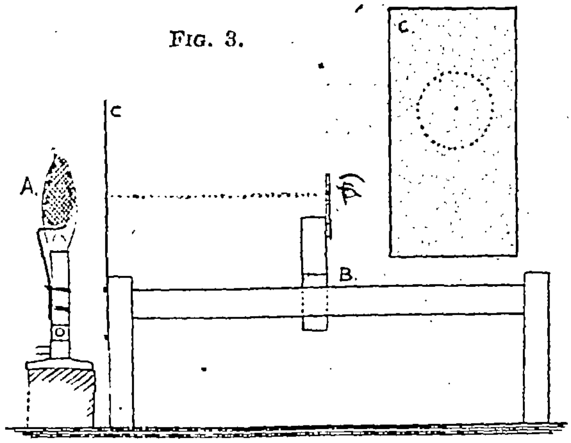
Twin spectra of (1) acholuric jaundice, (2) normal, and (3) pernicious anæmia blood-films at position of contact for the normal.

This method requires no special apparatus, is quite sufficient for diagnostic purposes, and could easily be used by the general practitioner in his ordinary consulting room.

Second Method.

This method, devised by Thomas Young (1773–1829) and described in text-books of physics under the heading of Young's eriometer,[4] is admirably suited to the present purpose. The apparatus required, which is easily constructed, consists of: (A) A source of light (sodium flame or electric lamp). (B) Optical bench with rider for carrying blood-film. (C) Metal plate with a central aperture 1–2 mm. in diameter, surrounded by a ring of 2 cm. radius, of pin-point holes. (The measurements are, of course, arbitrary.)

FIG. 3.



Young's eriometer.

A dark room is necessary when using sodium light, but is not essential for white light. On looking through the blood-film, diffraction rings are seen around the central aperture in C, whilst the ring of holes appears as a circle of luminous points. The film is moved about until apparent coincidence is obtained between the circle of luminous points and a selected diffraction ring (say the yellow of the spectrum of the first order). The distance of the film from the metal plate at which this takes place varies directly as the diameter of the red corpuscles. Since the diameter of the normal corpuscles is known, that of the patient's corpuscles can be calculated by simple proportion. With sodium light, concentric yellow rings are seen instead of spectra. Readings are taken for both borders of a selected ring (say the first). The difference and the mean correspond with the anisocytosis and average size respectively.

My thanks are due to Dr. Wilfrid Newcomb and Mr. Leslie Paton for their kind and valuable advice.

References.—(1) Pijper, Adrianus: THE LANCET, 1924, ii., 367. (2) Pijper, Adrianus: Brit. Med. Jour., 1929, i., 635. (3) THE LANCET, 1920, i., 1261. (4) Preston, T.: Theory of Light, 4th ed., p. 234.

A CASE OF
LOBAR PNEUMONIA IN A CHILD.

BY KENNETH McFADYEAN, M.R.C.S. ENG.

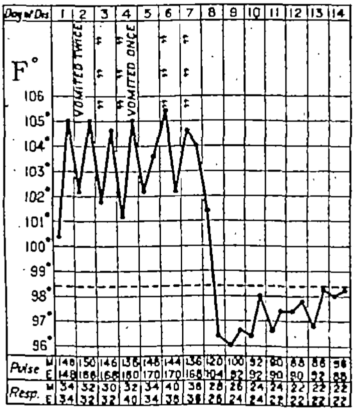
THE following case seems to be worth recording because it illustrates some of the difficulties of diagnosing pneumonia in children:—

A girl, aged 5¼ years, complained of earache on Dec. 5th. On the 6th, in the early afternoon, she said she felt cold, and was put to bed with a temperature of 100° F. She was first seen by me at 8 P.M. on that day, when a diagnosis of lobar pneumonia was made. There were definite alterations in the breath sounds and some crepitations over the lower left lobe, and a few fine crepitations scattered over a small area inside the right scapula. The right tympanum was inflamed, but this was not considered serious. During the night of the 6th–7th there was a small quantity of blood and straw-coloured discharge from the right ear.

On Dec. 7th a consulting physician saw the child at 9 A.M., and was satisfied that there was nothing abnormal in the chest, but was of the opinion that there was mastoid inflammation. At noon an aural surgeon saw the case. In his opinion the mastoiditis was acute, and was the cause of the child's general condition. He advised surgical interference unless the general condition improved in 24 hours. At 9 P.M. a second consulting physician saw the child and was satisfied that his examination of the chest was negative. He advised surgical treatment of the aural condition. At 10 P.M. a second aural surgeon expressed the opinion that the mastoiditis was slight, and that the case should be watched.

On Dec. 8th the inflammation in the right ear was definitely subsiding. There was very little swelling in the meatal floor, the tympanum was pink, there was no aural discharge, and no perforation was seen. There was no longer tenderness over the mastoid. In the evening the patient complained of occasional severe stabbing pains in the chest over the lower left ribs in the axillary line.

On Dec. 9th a consulting pathologist found a leucocytosis of 22,400 per c.mm., with 77 per cent. polymorphonuclear leucocytes, and expressed the opinion that this "indicates the presence of pus under tension." All signs of inflammation in the ear had subsided. In the afternoon the patient's condition seemed serious. The signs in the left lower lobe were now well marked. The first consultant, on *re-examining* the patient's chest, expressed the opinion that possibly the patient had a miliary tuberculosis. Albumin was present in the urine. Subsequent examination showed that the degree of albuminuria varied considerably, and was very severe when the temperature was between 105° and 106°, and at a time when the child was drinking considerable quantities of albumin water.



The treatment of the case as one of pneumonia was instituted at the outset and continued. On Dec. 13th the crisis set in, with definite signs over the left lower lobe. In 24 hours the temperature dropped from 104° to 96°, pulse from 170 to 108, respiration from 36 to 26. The patient made an uneventful recovery.

The case presents some striking features, of which one or more is frequently to be found in cases of infantile lobar pneumonia. These are, firstly, the liability of an error in diagnosis when an acute otitis media is present in the early stages; secondly, the difficulty of making a correct diagnosis when relying solely upon one examination of the chest, made at a particular moment during the illness; thirdly, the possibility of attaching undue weight to the presence of albuminuria in this condition; and lastly, the fallacy of regarding a high leucocytosis as necessarily indicative of pus. One other unusual feature, rarely seen, was the persistent vomiting.

All these features of the case are adequately dealt with by Dr. G. F. Still in his "Common Disorders and Diseases of Childhood."

London, S.E.

A CASE OF
HYPERTHYROIDISM WITH MANIA.
RELIEVED BY OPERATION.

BY J. MURRAY BLACK, M.B., F.R.C.S. EDIN.,
HON. SURGEON TO THE DUNFERMLINE AND WEST FIFE HOSPITAL.

IN his selection of cases for operation Mr. W. H. O. Romanis[1] holds that "in serious mental changes of the melancholic or maniacal type" operation is absolutely contra-indicated. The following case, however, suggests that maniacal symptoms can sometimes be relieved by operation.

Mrs. A. B., aged 42, whose husband was abroad, was brought to consult me in February, 1929.

In 1919 her relations noticed that her eyes were protruding and she was taken to Edinburgh Royal Infirmary where she was advised to have an operation on her thyroid, but refused. Since then she has had gradually increasing ill-health, palpitation, headaches, insomnia, tremor, and marked loss of flesh. In 1921 she was taken to consult a doctor and because of her maniacal symptoms she was certified insane and spent six months in an asylum. Since then, though her general health had improved, she continued to show symptoms of cerebral derangement, writing letters of abuse to her relations, locking herself in her house, and on one occasion trying to set fire to herself. Her family history is negative as regards insanity.

In February, 1929, against her will but with the permission of her relatives, she was admitted to the Dunfermline and West Fife Hospital under my charge. On admission she was quite irrational and her behaviour was that of a maniac. She was under the delusion that her relatives had employed me to get rid of her. There was marked exophthalmos and tremor. The pulse-rate was 120 per minute. The thyroid was *symmetrically enlarged* with distended and pulsating veins over the front of the gland. Her teeth were in very bad condition but she refused to have them touched. She refused enemata and hypodermic injections, but was persuaded to take Lugol's solution minims x. t.i.d. and luminal at night.

After 15 days in hospital her mental condition was not improved though her pulse-rate had fallen to 84. On the sixteenth day she was taken to the theatre and under open ether a subtotal thyroidectomy was performed. Forty-eight hours after operation she was quite rational. Twenty-two days after operation she was discharged, her condition mentally having undergone a complete alteration. Her pulse-rate was 60 per minute and her tremor had disappeared.

In July, 1929, she reported having had her teeth extracted. She is living now in peace with her relations who state that her mental condition is normal. Her exophthalmos and other physical signs are now gone and she appears to be a sane woman again.

According to Dr. John Eason, these symptoms of mania may be due to: 1. The action of the toxæmia of hyperthyroidism on the cerebral cells (this is not proved). 2. The effect of various cardiovascular disorders characteristic of exophthalmic goitre upon the cerebral circulation. 3. Coincident focal infections causing toxæmia.

If the mental symptoms are due to either (1) or (2) then, as in the present case, operation for the removal of the toxic thyroid gland appears to me to be the proper line of treatment.

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[1] THE LANCET, July 20th, p. 113.

WEST KENT JOINT ISOLATION HOSPITAL.—Lord Cornwallis, Chairman of the Kent County Council, last week opened a new administrative building and nurses' hostel at the West Kent Joint Isolation Hospital at Bromley Common, an institution which serves the borough and rural district of Bromley, and the urban districts of Beckenham, Chislehurst, and Sidcup, with an estimated population of 130,000. Each of the 40 nurses has a separate room, and the administrative offices are extensive enough to provide for the needs of the hospital for many years to come.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 231.)

SECTION OF MEDICINE.

TREATMENT OF PLEURITIC EFFUSIONS.

Opening Addresses.

Prof. G. R. MURRAY (Manchester) took the chair at a discussion on this subject opened by Sir THOMAS HORDER. The factors to be considered, he said, were the cause of the infection, the nature and size of the effusion, the stage of the disease, the associated condition of the lung, the degree of illness of the patient, and the contribution made by the effusion, as such, to the illness at the time. The traditional division of effusion into serous and purulent was, he thought, justified. Serous or sero-fibrinous effusions might be tuberculous (primary), rheumatic, influenzal, lymphadenomatous, or neoplastic. They might also perhaps be caused by some other infections besides those mentioned. Purulent effusions (i.e., empyema) might be pneumococcal, streptococcal, staphylococcal, and influenzal (mixed infections), and occasionally gonococcal, coliform, or a result of streptothrix infection. The stage of disease was very important. To remove all effusions on sight was bad practice, whether they were serous or purulent. The associated condition of the lung must be assessed as carefully as possible. Cæteris paribus, active and acute disease of the lung contra-indicated removal of the fluid, since the fluid kept the lung at rest. It was important to decide how far the patient was handicapped by the fluid—whether in toxic or mechanical fashion—and how far he was ill by virtue of his general infection. The more the illness was the result of the general disease, the more carefully and slowly should the effusion be removed.

Most serous effusions, continued Sir Thomas, were tuberculous. If very large, they should be tapped as soon as diagnosed; they should also be tapped if associated with cardiac or respiratory distress. The remainder were tapped if they showed no further signs of absorption after fourteen days from their discovery. Too early interference was meddlesome; too late interference might lead to permanent collapse of lung with chest deformity. The possibility of latent tubercle in the lung must always be borne in mind, and until the case had been properly studied its existence must be assumed. If disease of the lung was established, a conservative policy as regards the effusion was imperative; otherwise there was fear of renewed activity or even pyopneumothorax. Oxygen replacement might be undertaken. Throughout, and afterwards, the patient with no manifest signs of pulmonary disease was treated as though this was present in its early stages. General treatment was instituted; iodine and calcium might be given internally; the arm should be immobilised and the chest strapped on the affected side. In removing serous effusion slow aspiration was probably preferable to syphonage. Injecting drugs into the pleural cavity was of doubtful value, and autoserotherapy had at present too little to its credit to justify more extensive trial. Recurrent effusion might call for the trial of adrenalin or paraffin. Exhaustion by Potain's aspirator must be done carefully and slowly, the last few ounces need not be considered, for they would be rapidly absorbed. A cigarette for the doctor, said Sir Thomas, would give improved results. Local anæsthesia should be effective, and a nick with a sharp scalpel was of considerable value. The ritual of major operations was uncalled for. The volume of fluid removed might require judgment. After-care should be controlled by the tuberculous nature of the disease, and the patient should not return to active life within three months.

Rheumatic effusions were part of an acute and general rheumatic inflammation, carditis being present. Tapping the effusion was rarely necessary. In influenza the effusion was either present with pneumonia—when it should be dealt with palliatively—or followed the acute stage of the disease, when it should give rise to suspicion of tuberculosis.

In empyema, Sir Thomas Horder continued, the surgical maxim, "Evacuate pus as soon as diagnosed," should not be departed from. The time factor was of great importance. The more ill the patient and the more active and extensive the disease in the lung, the more was aspiration indicated and the less was an open method of drainage indicated. One or two aspirations might be all that was necessary, not only in pneumococcal, but also streptococcal disease. When the patient remained very ill, and/or the lung actively diseased, and freer drainage than that given by repeated aspiration nevertheless seemed desirable, trial might be made of incision without resection. As soon as might be, however, the ideal method should be employed—viz., incision with resection of portion of a rib or ribs. Treatment by incision (with or without resection), irrigation, and closure of wound, was successful in some pneumococcal cases, but too often entailed recourse to the open method later to be recommended. It should never be relied upon in streptococcal or staphylococcal cases. Digital exploration at resection operations was of great importance; it broke down adhesions and gave useful information. The question of irrigation of the empyema cavity frequently recurred. Pleural shock might, in the main, be disregarded, but experience scarcely warranted even this risk or the added pain suffered by the patient. Before employing the method coexistent pulmonary abscess should be excluded. The fact that the number of substances used for this purpose was very large suggested that the method lacked adequate justification by results. Of greater importance was the mode of drainage. Perhaps the best—though difficult in children—was to use a closely fitting tube, of considerable length, ending in an air-tight bottle. Such a device allowed of slow drainage and avoided a pneumothorax.

It must never be forgotten, Sir Thomas concluded, that the patient was suffering from a septic disease and also from a respiratory disease. Hence the general measures appropriate to both of these should never be omitted—e.g., ærotherapy, heliotherapy, actinotherapy, and immunotherapy. Residual sinuses should be treated by X rays and sunlight. Failure of the lung to expand would necessitate decortication or Estlander's operation.

Dr. L. S. T. BURRELL (London) directed attention at the outset to two factors—the nature of fluid and the cause of its effusion. Fluid due to heart failure should be removed at once. Of the clear fluids he recognised only tubercle as a cause; the reported rheumatic and other effusions were probably at origin also tuberculous. For treatment the primary question was always whether to aspirate or leave alone. He thought that in all cases the first thing to do was to remove 5 c.cm. for examination. Clear fluid was to be left severely alone, except (*a*) to relieve pressure by removal in part, (*b*) to convert effusion into pneumothorax, (*c*) to allow a lung to expand when its opposite fellow was extensively diseased, or (*d*) to treat a chronic or recurrent effusion. Removal of large volumes of fluid was not without danger; it might cause dyspnœa, or more commonly it might start an acute flare-up of a tuberculous process. Dr. Burrell stated the rule that fluid volumes over 50 ounces should be replaced by gas, selecting air for prolonged action, and oxygen for temporary effect. Fever, he said, was responsible for the degree of illness and the effusion of the fluid, and both would settle down if left alone. Early intervention caused exacerbation in most cases.

In the very chronic cases, among which neoplasm was so common, the treatment he recommended was removal of the fluid, lavage with Carrel-Dakin solution, and filling of the cavity with oxygen to a pressure of minus 6.

After-treatment was of the greatest importance, for over 45 per cent. of cases ultimately developed active pulmonary involvement, and prolonged sanatorium treatment, with its graduated exercises and education in personal hygiene, was essential.

In purulent exudates a clear difference between pyothorax and no pleural adhesion on the one hand, and empyema with its localisation by adhesions, was the key to treatment. In pneumococcal empyema the lesion appeared when the primary illness was over, and the pus was localised as an empyema. Operation was then successful and no pneumothorax was created. In acute influenzal pneumonia a pyothorax arose in the course of the illness; the fluid was thin and milky. Operation then caused complete pneumothorax, the flexible mediastinum allowing the pressure in the opposite lung to fall also, and death resulted. The presence or absence of pleural adhesion was the key to the treatment; the healing of cavities closed by adhesions could be hastened by Dakin irrigation, which promoted both sterilisation and healing. Thoracoplasty was still sometimes necessary, but should be regarded by the physician as a sign of the failure of his treatment; much might often be done by pleural lavage to avoid it.

Prof. A. RAMSBOTTOM (Manchester) referred to the frequency with which pyrexia in these cases lasted for three weeks, during which time of active disease the fluid could best be left, no damage to the lung resulting. Its removal during the pyrexial stage often led to its reaccumulation, and, provided it was not purulent nor the signs of positive pressure very marked, the fluid was best left alone. The problem of removal of small effusions during the active period of influenzal pneumonia was a difficult one. His practice was to wait until the end of the fourth week, for many effusions resolved within that time; but if the chest wall was tender to pressure over the fluid, then removal at once was indicated. The damage done by removal of pleural fluid was said to be exaggerated, and pleural shock was never seen if it was removed at the rate of ten minutes to the pint.

Discussion.

Dr. WILLARD STONE (California) recounted his experience of empyema in a base hospital, during an epidemic of hæmolytic streptococcal infection, in which 25 per cent. of the residents were found to be carriers. An outbreak of measles was followed by a large number of empyemas, most of them bilateral. Early diagnosis was followed by early operation, the formation of an open pneumothorax and a mortality of 64 per cent. Treatment by repeated aspiration with Potain's aspirator was started to replace operation until after the fourteenth day. This measure reduced the mortality to 8 per cent. Dr. Stone referred to the use of novocaine as a local anæsthetic, and to the use of Brewer's tube, when drainage was required, to form a closed thorax and permit irrigation with Dakin's fluid. The four complications found in the empyema cases were purulent pericarditis (25 per cent.), purulent peritonitis, septic nephritis, and meningitis. The best time to operate on these pyothorax cases seemed to be the 12th–14th day, and the use of antistreptococcal serum appeared to give no help.

The CHAIRMAN thought that when fluid exudates reached the level of the fourth rib, they should be removed at the rate of ten minutes to the pint. The operation should be rendered painless, and he suggested local freezing and the use of a trocar. The Potain aspirator should not be violently exhausted from time to time, but partly exhausted, the negative pressure being maintained by gentle strokes of the pump as required. Full pulmonary expansion after larger effusions was best obtained at high alpine altitudes.

Dr. RUSSELL objected strongly to the great interference with working life, and the mental agony inflicted by a tuberculous outlook in these cases. Treatment by ordinary means was quite satisfactory. A large proportion of autopsies showed tuberculous lesions; therefore prolonged and expensive arrangements, as required by the sanatorium, were unnecessary.—Dr. ASTON KEY spoke of the frequency with which empyema was overlooked in small children, and Dr. ASTLEY CLARKE referred to the use of the boracic immersion bath, and the frequency of sudden death in babies suffering from empyema.—Dr. J. SPEARES mentioned the difficulty of treating chronic sinuses after empyema operation. Breathing exercises as practised in Vienna were valuable.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

BACTERIAL FOOD POISONING.

Prof. J. SHAW (Manchester) DUNN presided over this Section.

Prof. J. CRUICKSHANK (Aberdeen) opened a discussion on the Distribution and Characteristics of Bacterial Food Poisoning. The sporadic nature of outbreaks, the dramatic onset of symptoms and frequent difficulty in tracing the cause, he said, excite interest in all the medical men, but the unexpectedness of the outbreaks both in time and locality hinder systematic investigation. The characteristic symptoms are sudden onset of nausea vomiting, severe diarrhœa, abdominal pain, and pyrexia. The interval between the taking of infected food and the onset of symptoms is short, varying from 2–30 hours. In the majority of cases severe symptoms persist only for a short time, and within 24 hours the patient suffers only from exhaustion. Pyrexia is of short duration, and may be absent. Blood and mucus are rarely found in the stools—a distinguishing feature from dysentery. The extremely short incubation period in some cases has suggested that symptoms result from preformed toxins, and in certain outbreaks there is clear evidence that the suspected food has been subjected to such exposure of heat as would ensure death of all vegetative forms of bacteria.

Since the discovery of Gaertner's bacillus in 1888 a large number of organisms closely allied in morphological and biochemical reactions have been described as the cause of food poisoning in man, or severe enteritis in animals. These organisms are closely allied to *B. paratyphoid* B. The organism most frequently found is *B. aertrycke*. This and closely allied organisms have been demonstrated in the intestines of animals. With extension of bacteriological methods the list of food poisoning organisms is constantly being lengthened, and in many ways has made the problem more difficult, especially for the routine bacteriologist.

An important feature in most outbreaks is that the food is not obviously unsound; this affects investigation, since if all the food has been eaten the cause may remain obscure, unless an organism of the salmonella group can be isolated from the patient's vomit or stools. However, there may be indirect evidence, such as blood agglutination. A puzzling feature in some outbreaks is the small number of individuals affected, although the infected material has been widely distributed. Individual susceptibility, or partial infection of the material, may be the explanation. According to W. G. Savage, human carriers are not to be regarded as playing an important part in infection, but the possibility cannot be excluded.

Among the foodstuffs which have been found to be associated with food poisoning tinned meats are especially important. The possibility of infection from eggs has been raised in a recent case, and it has been shown that severe diarrhœa in chickens and ducks may result from infection with *B. aertrycke*. Milk offers suitable conditions for growth of the organisms, and where this food is the vehicle outbreaks are widespread and severe. When fresh meat is incriminated, the animal from which the joint is cut may have been the subject of salmonella infection. The way in which tinned foods become infected is not clear. It is necessary to suppose that individual tins are infected from an unknown source, and that considerable growth of the organism has occurred with the development of "toxins" which are heat resisting. Prof. Cruickshank observed that he had great difficulty in accepting the explanation attributing outbreaks to toxins. It would be necessary to postulate a time interval for the development of toxins, and in many outbreaks there is no evidence that these conditions were present. It was inconceivable to him that a few dead organisms could be held responsible for the pronounced symptoms of food poisoning.

With regard to infection from meat of animals, he continued, it is believed that the source of infection arises from the soiling of meat with intestinal contents. If the view of Savage be accepted, that heat stable poisons are the cause of these outbreaks, we must suppose that the organisms have developed in large numbers between the death of the animal and cooking. The infrequency of *B. Gärtner* and *B. suipestifer* in these outbreaks is important, since these types appear to be the most frequent exciting agents of disease in cows and pigs. The occurence of *B. aertrycke* in the diseases of food animals is extremely uncommon, yet *B. aertrycke* is the most common finding in human outbreaks. The view strongly advocated by Savage that salmonella infections account for all food poisonings except those definitely chemical has led to the concentration of investigation upon the discovery of this group of organism with the result that other possible bacterial causes may be missed. A great extension of the bacteriological methods used in attempts to solve the problem of food poisoning is desirable. Evidence of invasion of the blood stream by organisms is rarely obtained, but the development of agglutinins to salmonella organisms occurs frequently. The difficulty of producing agglutinins in experimental animals by administration of the organisms through the alimentary tract makes their occurrence in food poisoning cases all the more remarkable, since their production in the blood is a common phenomenon after parenteral injection of living or dead bacteria. The presence of antibodies in the blood suggest that a living organism is responsible rather than preformed toxins. Savage and Bruce White record the development of agglutinins in rabbits as a result of feeding boiled cultures of *B. aertrycke*, and Geiger and Meyer after feeding to mice and a monkey. The development of agglutinins in rabbits after repeated injections of extracts of suspected meats shown by Savage and White is of little value since the titres obtained are very low.

Much interest lies in the question of the production of heat resistant poisons by salmonella organisms. Savage and White have supported the view that such toxins give rise to food poisoning, but the enormous number of organisms used by them produced only slight lesions; it is impossible to believe that any portion of meat producing poisoning in man could contain such numbers. Unless man is extremely susceptible, these experiments fail to convince. Several workers have obtained negative results by administration of toxin and killed organisms by mouth. On the other hand, Geiger and Meyer claim to have produced definite lesions with a heat resistant toxin derived from *B. aertrycke.* The animals used were mice. Rabbits, guinea-pigs, and cats usually presented very transitory symptoms, and it is remarkable that such difficulty should be encountered in producing toxic manifestations in animals which are frequently the subjects of natural infection. Further experiments on monkeys may prove of value. As a result of a survey of epidemics of paratyphoid fever, Savage and White have come to the conclusion that symptoms of food poisoning are absent in these outbreaks. In some cases, however, the symptoms of food poisoning definitely occur; it is doubtful whether a rigid separation of food poisoning from paratyphoid fever is justifiable on clinical grounds. On the other hand, organisms of the *B. suipestifer* group may produce symptoms resembling typhoid fever. The outbreak of food poisoning due to *B. aertrycke* in our troops in France, recorded by Perry and Tidy, suggests that a chronic carrier was the cause of initiation of the outbreak. In civil life the outbreaks are rarely examined so minutely. The work of Bruce White on the salmonella group is of great importance, especially in showing that the organism isolated in the majority of cases of food poisoning is *B. aertrycke.* The problem of the source of infection still remains obscure.

Discussion.

Dr. W. G. SAVAGE (Weston-super-Mare) said that he did not consider that all cases of food poisoning were due to salmonella organisms, nor that human carriers could be completely excluded as possible source of infection. Dr. Savage dealt at some length with the possibilities of the occurrence of preformed toxins. He considered that the evidence justified the claim that such toxins can be formed by salmonella organisms; from his investigation of the canning process in America, he found that a time interval was often present between obtaining the meat and canning it. The food was undoubtedly sterile when eaten, and the time incidence of occurrence of symptoms greatly supported his view. The apparent lack of support obtained in animal experiments he considered to be due to the comparative greater susceptibility of man to these toxins.

Mr. P. BRUCE WHITE (London) dealt with the classification of organisms of the food poisoning group. Several genera were believed to be implicated, and dysentery and salmonella groups were definitely associated with the disease. A very large number of species had been described; many of which were not separate types, but the introduction of agglutination tests had led to systematic classification. The speaker described the specific and non-specific antigen character of members of the group.

Dr. W. SCOTT (London) described interesting and important evidence to show that eggs may be responsible for certain cases of food poisoning. He described several outbreaks of food poisoning in which all possible infection, other than eggs, had been excluded, and although there was no absolute proof, circumstantial evidence tended to show that eggs were responsible. Duck's eggs appeared to be far more dangerous in this respect than hen's eggs. An epizoötic among ducklings was described, in which *B. aertrycke* had been isolated. There was some doubt as to the way that eggs become infected. It had been suggested that introduction of foreign material into the oviducts during copulation might infect the white of the egg. Eggs placed in a fluid culture of *B. aertrycke* might become infected, but negative results had been obtained with dry cultures. Ducks fed with *B. aertrycke* passed large numbers of these organisms in their excreta. The dry surroundings that hens chose for egg-laying might account for the smaller liability to infection of their eggs. The great importance of recognising that eggs might be a source of infection lay in the fact that many of the single sporadic cases of food poisoning which occurred might be explained in this way, since eggs were probably the most common unshared dish consumed in this country.

Dr. D. NABARRO (London) discussed the relation of food poisoning to dysentery. He pointed out that dysentery is not uncommon in children in this country, and that the possibility of this infection should be always kept in mind in suspected cases of food poisoning.

Bacillus Abortus Infection in Man.

Dr. W. D. CHAMPNEYS (London) read a paper on *Bacillus abortus* Infection in Man. He showed that the number of cases of this disease recorded in European countries was steadily increasing now that it is recognised that an undulant fever can be produced by an organism which belongs to the same (brucella) group as *Micrococcus melitensis* and occurs in cow's milk. In addition to those who might acquire infection from drinking milk, persons handling living and dead cattle might be subjects of infection. The organism responsible, *B. abortus*, was killed by pasteurisation. This organism had been injected into human beings by some workers without the production of harmful effects. The symptoms of the infection were almost identical with those of Mediterranean fever, and accurate diagnosis could only be made by hæmoculture and agglutinin tests. Injection of suspected blood in guinea-pigs was an excellent method of investigation. The speaker believed that if systematic examination for brucella infection was made in cases of pyrexia of obscure origin, the number of cases of this infection would probably be found to be much greater than was suggested by the present statistics.

Prof. MEYER (California) communicated a paper which was read in his absence. He had investigated various strains of the brucella group, and described variation in virulence of various strains in monkeys. He pointed out that many individual animals possess a natural immunity for such infections. Cultures kept for long periods tended to lose their virulence.

Dr. G. ROSS (Rhodesia) described the occurrence in Africa of cases of undulant fever due to *B. abortus*. He had made systematic examination of cases of pyrexia, which had been diagnosed as such conditions as phthisis and influenza, and found them to be brucella infections. If attempt at hæmoculture was made, patience was necessary, since the organism rarely appeared in the first six days, and might require 10–14 days. The treatment he considered very unsatisfactory; vaccines were not recommended in the pyrexial stage.

Dr. W. PARRY MORGAN (Cardiff) described four cases of brucella infection which he had investigated, the first occurring in 1912, and two within the last year. He had examined 40 samples of blood submitted for Widal reaction, and found that two of them gave positive agglutination with *B. abortus*. A number of samples of milk had also been examined by injection into guinea-pigs, and 25 per cent. of these developed agglutinins. The *B. abortus* was isolated from some of these cases, but only when it was cultivated in an atmosphere of CO_2. He emphasised the importance of recognising the marked inhibition zone in the serum agglutination.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

CHRONIC CERVICITIS (LEUKORRHŒA).

Prof. FLETCHER SHAW (Manchester), the President, was in the chair when

Mr. J. BARRIS (London) read a paper on the Ætiology and Symptoms of Chronic Cervicitis. He defined this as an inflammatory affection, involving the mucous membrane of the cervical canal and os uteri externum, characterised by leukorrhœa, erosion, and microscopic signs of inflammation. After describing the anatomy and development of the generative tract with especial reference to the changes in the epithelial lining, the speaker said that bacteria were not normally found above the external os. In chronic cervicitis, however, bacteriological investigation revealed the presence of pathogenic organisms. The invasion might be the result of direct infection, or of indirect infection following injuries to the cervix. Mr. Barris showed figures to illustrate that the condition was most common in the child-bearing period. A consideration of the complications of chronic cervicitis made evident its importance. Mr. Barris described the cervix as the tonsil of the pelvis, and stressed the fact that it may act as a focus of infection. In conclusion, he referred to K.V. Bailey's work on the basic cause of cervical cancer and its relationship to chronic cervicitis.

Mr. G. I. STRACHAN (Cardiff) spoke on the pathology of chronic cervicitis, explaining that the anatomical relations of the cervix were important in this connexion. The essential lesion in cervicitis, he said, is irritation produced by pyogenic infection, most usually brought about by the lacerations consequent on childbirth. There is œdema of the sub-epithelial stroma with outpouring of lymphocytes and plasma cells, especially round the blood-vessels and glands, and under the surface epithelium. The blood-vessels dilate, the surface columnar and glandular epithelium become irritated, so that glandular hypertrophy with distension occurs, and the cervical secretion becomes increased in amount and of a muco-purulent appearance. Some of the squamous epithelium surrounding the external os becomes separated and cast off in the discharge, and the columnar epithelium is stimulated and grows down to cover the raw area, carrying with it in its outgrowth cervical racemose glands giving rise to the appearance described by Eden and Lockyer as pseudoadenoma. In discussing the late results of cervicitis, Mr. Strachan said that the parametrium was frequently affected by lymphatic extension from the cervix, so that in the early stages infiltration and later fibrosis was produced. The parametrial extensions were the most common causes of backache or chronic pelvic pain in women. Absorption of toxins from the chronically inflamed cervical surface led, in some cases, to general ill-health, shown clinically by muscular rheumatism and osteoarthritis. Mr. Strachan pointed out that while severe puerperal sepsis accompanied by pyrexia occurred in about four cases per 1000, puerperal sepsis in a minor degree occurred in a large proportion of all parturient women. Often no symptoms were manifest at the time, but the results of the infection lasted for many years, and carried with them a risk of carcinoma formation.

Dr. R. S. STATHAM (Bristol) spoke on treatment, expressing his personal views. He thought that chronic endocervicitis was one of the commonest causes of sterility and perhaps even more often of the one-child marriage. Mild thickening and inflammation of the pelvic cellular tissues gave rise to pressure on the ureter, with chronic backache and renal pain. This process had been described by Guy Hunner, and had stimulated Dr. Statham to pass ureteric bougies in certain cases of backache associated with cervical erosion, much benefit having ensued. There were two factors to be treated: (1) the leukorrhœa, and (2) the deep infection. Cervical lacerations should be repaired at the time of confinement. In venereal clinics Dr. Statham had observed typical erosions developing in cases of gonorrhœa, as well as in patients complaining of leukorrhœa and cervicitis in whom gonococci were found on further investigation. When gonococci were found Dr. Statham thought that the best treatment was daily douching with boric acid lotion, and when the discharge had been wiped away, thorough swabbing of the cervix and vagina with 1 per cent. mercurochrome. In the cases where there was laceration of the cervix with thickening and tenderness of the bases of the broad ligaments—a mild grade cellulitis—the best results were obtained by prolonged hot douching by a skilled person; in private practice treatment could be carried out while the patient lay in a hot bath. Excellent results were obtained with the diathermy current in certain cases. When no response to treatment was observed, either repair operations or amputations or panhysterectomy should be undertaken according to the indications for the particular case. The speaker did not advise amputation of the cervix in young patients since it predisposed to abortion, and in one of his cases had led to cicatrisation, causing much trouble in labour. In elderly patients, especially in the presence of the so-called "fibrosis uteri," the operation of election was panhysterectomy combined with perineal repair when necessary. If true ulceration was found upon the cervix it was essential to remove a portion for histological examination. Finally, Dr. Statham advocated inspecting the cervix after delivery, and suturing any lacerations immediately.

General Discussion.

Dr. J. YOUNG (Edinburgh) emphasised the importance of erosion as a cause of chronic ill-health such as *arthritis, rheumatism, and chronic heart disease.* He thought that a good deal of abdominal pain could follow cervicitis. Dr. Young considered the best treatment to be a free opening up of the cervix by means of the surgical cautery. He had not encountered ureteral stricture in cases of cervicitis.

Prof. T. CULLEN (Baltimore) said that the cylindrical epithelium of the cervical canal sometimes extended over the vaginal portion of the cervix, whilst he had seen the squamous epithelium reaching almost up to the internal os. He thought that irrigation was going to prove the most efficacious treatment. Referring to operative treatment, he thought that it was sufficient to repair one side only. Prof. Cullen never removed the uterus for prolapse in old women, since it was the keystone of the pelvis. He praised Hunner's work on ureteral stricture.

Mr. L. C. Rivett (London) said that he had closely questioned many patients suffering from cervical cancer, and could not illicit any history of leukorrhœa to suggest preceding erosion ; he had not encountered any patients with leukorrhœa who had developed carcinoma.

Dr. B. Solomons (Dublin) advised a modified Schröder operation under general or local anæsthesia for erosion, and did not think that either mercurochrome or any of the other local applications produced permanent benefit. Many women could be cured by means of constitutional treatment. Hysterectomy should be left to the very last, and only be undertaken after very careful consideration. Dr. Solomons considered it very dangerous to teach students to examine and repair all cervices immediately after labour ; in his view the right procedure was to examine the patients six weeks after the birth of the child, and then carry out any plastic operation necessary.

Dr. C. Forbes (Aberdeen) thought that the products of split protein might be the cause of erosion and leukorrhœa.

Prof. O. G. Lowry (Belfast) referred to the importance of the cervix as a focus of infection, and mentioned an investigation which they had been carrying out on cases of rheumatism, with a view to finding out whether the cervix was the source of infection. He pointed out the difficulty of finding gonococci and in deciding how many cases were attributable to this organism. He did not agree with those who said leukorrhœa caused sterility in all cases.

Dr. K. V. Bailey (Manchester) was chiefly interested in the pathology, and pointed out that the connexion of chronic cervicitis and cancer can be traced histologically. Cancer was the result of a constant contact with chronic irritative exudates of specific types.

Dr. J. Riddell (Plymouth) thought that the term erosion should be dropped entirely for cervicitis. He considered that there ought to be a time-limit for medicinal treatment, and suggested that surgical procedures should be resorted to at the end of six months. He deprecated the adoption of vaginal hysterectomy, and said that the abdominal operation should be chosen in order that a more adequate investigation might be made.

Dr. F. Murray (Newcastle) said that a thorough investigation should be carried out before any treatment was undertaken. He had found that there was often an infected urine which should be treated at the same time. In cases where there had been extensive lacerations of the cervix, reparative operations might be dangerous owing to the close proximity of the large venous plexus and the ureters. He had had excellent results from instilling into the vagina, whilst the patient lay on her back, about two ounces of a mixture of one part of tincture of iodine and two parts of glycerine.

Dr. K. Foster (Worcester) held that the cause of erosion was injury at birth ; proper antenatal care would prevent the need for deliveries by forceps, and would therefore diminish the incidence of erosions.

Prof. I. P. Maxwell (Pekin) said that he had been in the habit of taking a section for microscopical examination from the cervix of every patient whose symptoms did not clear up rapidly under skilled douching (which he had been employing for some considerable time), with the result that he had succeeded in discovering a number of early carcinomata.

Prof. D. Dougal (Manchester) thought that curettage and amputation of the cervix would cure a certain number of cases.—The President did not think enough had been said about cauterisation as a method of treatment. He considered that douching tended to keep up a chronic discharge. Leukorrhœa began to worry the patient as her general health deteriorated, and with improvement of the constitutional condition the discharge produced no discomfort.

Dr. Statham, Mr. Strachan, and Mr. Barris replied.

SECTION OF OCCUPATIONAL DISEASES.

The Present Position of Silicosis in Britain.

The discussion was opened by Dr. E. L. Middleton, H.M. Medical Inspector of Factories, who dealt with (1) the occurrence of the disease in the various industries throughout this country ; (2) the manifestations of the disease as it presented itself to medical practitioners ; and (3) the legislation which had been brought into being within recent years. In a brief review of the ætiology, symptomatology, and pathology of the disease Dr. Middleton remarked that silicosis was produced by the inhalation of particles of silica, and in silicosis, properly so-called, the silica was in the form of free dioxide of silicon (SiO_2)—e.g., quartz or flint. The particles, to produce the disease, must be inhaled into the ultimate pulmonary tissue, and must therefore be of a degree of minuteness which would permit of their free passage in the mid-current of the air through the upper respiratory passages and the finest bronchial tubes. The particles were phagocyted and the lymphatic channels, perivascular and peribronchial, contained deposits of these cells which produced a reaction in the surrounding tissue. Fibroblasts were produced, changing ultimately into fibrous tissue which underwent condensation and contraction resulting in distortion with loss of function of the remaining lung tissue. Foci of tuberculosis were commonly found embedded in the dense fibrous tissue. In some cases no massive fibrotic areas were found, but in both lungs nodules varying in size from 0·1 to 1·0 cm. in diameter were present in large numbers. Sections of the lung showed the nodules to be formed in a characteristically whorled arrangement of fibrous tissue, and often particles which (if 5μ in diameter) could be demonstrated by polarised light.

The inhalation of silica dust was not usually accompanied by evidences of irritation. When free from other dusts of an irritating kind silica might be inhaled by workers without any suspicion that they were exposed to dangerous dust. Herein lay the perils of indifference on the part of the worker and absence of suspicion on the part of the employer. Dyspnœa was usually the first symptom, and in its production two characters of silicosis were important. The first was the cumulative action of silica and the second the latent period for anatomical changes to take place in the lung. Symptoms might follow exposure to silica dust at any time from 2 to 40 years. One of the problems to be solved was : Is the disease recognisable at a stage when removal from exposure to silica dust will not be followed by disablement ? In diagnosis, said Dr. Middleton, the employment history should be exhaustively studied, while a careful clinical examination, and a radiological examination by an expert were essential. Prognosis depended on (1) the amount of dust inhaled ; (2) the period of time over which this acted ; (3) the occurrence of infective processes, tuberculous or non-tuberculous. If the diagnosis could be made at such an early stage in the disease that sufficient silica had not been inhaled to produce irreparable damage, and so much damage has not been done as to produce disability, then it seemed that the disease could be arrested.

Dr. Middleton went on to discuss the industries in which silicosis occurred. The *Refractories Industry* employed 2000 to 3000 persons and was concerned with the manufacture of ganister and silica bricks. These bricks contained considerably over 90 per cent. of silica. A specialist medical board carried out *periodical medical examination of all the persons* employed. The *Sandstone Industry* represented the most widespread of all silicosis-producing industries, but the incidence of the disease was diminishing owing to the application of water and mechanical methods of dust suppression. The granite industry was allied to sandstone quarrying and dressing, but the subject was complicated because of the varying proportions of quartz, felspar, and mica present in the rock. As the result of an inquiry into the *Slate Industry* there appeared to be some evidence of the production of fibrosis of the lungs, but the occurrence of actual disability within the ordinary working lifetime of workers was not clearly shown. In the *Grinding of Metals* silicosis, and especially the combined disease of silicosis with tuberculosis, were at one time extremely prevalent. The sandstone wheel was being largely replaced by wheels of abrasives such as carborundum. Allied to the grinding of metals was the process of *Sand-blasting* of metals and the etching of glass. This consisted in playing a jet of sand under high pressure against a metal or glass surface to produce certain effects. The process was becoming more extensively used, and it was a matter for serious consideration whether a substitute such as iron or steel grit could not be used to replace the siliceous grit as the abrading material. In *Pottery Manufacture*, both in the manufacture of earthenware and of china, Dr. Middleton suggested that "potter's asthma" was due to dust containing ground flint. Ground silica was used in many industries; in the crushing and grinding of silica and in the industries in which ground silica was used silicosis sometimes of an acute type occurred. The evolution of dust in these industries was controlled by the use of mechanical methods of handling, enclosure of machinery, and the use of localised exhaust draught. *Tin Mining* in Cornwall had a high mortality-rate from tuberculosis, and it was shown that this was associated with silicosis. Drilling of the highly siliceous rock in which the tin ore occurred was now done through hollow steel with a water feed. Silicosis also occurred in *Coal-miners* employed on hard headings. It would appear that once enough silica had been inhaled to produce the nucleus of fibrosis, the resulting inhalation of coal dust into a lung in which the lymphatic drainage had been disorganised increased the fibrosis and produced disability.

Dr. Middleton concluded by describing the methods for determining the concentration of dust in the atmosphere by the gravimetric method and the numerical or counting method, but pointed out that there was no criterion of air dustiness which could safely be regarded as indicating freedom from risk of producing the disease.

Dr. P. HEFFERNAN (Tuberculosis Officer, Derbyshire) read a paper on the biophysics of silica and the ætiology of silicosis. Silicosis, he concluded, was the result of the local action of hydrated silica upon the pulmonary tissue. This action was of a physicochemical nature, and the speed of its development depended upon the rapidity with which fresh silica hydrosol was brought into contact with pulmonary tissues. Substances such as alkalis which favoured the formation of silica hydrosol from silica when added to silica dust accelerated the development of silicosis. Substances such as carbon, coal dust, or clays which retarded or prevented the formation of hydrosol from silica, or which coagulated the hydrosol when formed, retarded or prevented silicosis. Silica was a normal constituent of plant and animal cells and had a place in therapeutics comparable to that of lime.

Dr. WATKINS PITCHFORD (South Africa) spoke on siliceous dust in gold mining and uttered a warning about wet operations; siliceous mud, he said, was potentially siliceous dust. The noxiousness of siliceous dust was due to blocking of the lymph channels of the lung which allowed tuberculosis to develop.

Dr. R. E. LANE (Manchester) read a paper on the lead dust hazard. He showed that in industrial practice by far the most important portal of entry for lead was the respiratory tract. He spoke of the storage battery industry and of the types of lead dust met with in that industry. He emphasised the fact that normal healthy people both excreted lead in the urine in measurable quantities and showed minor degrees of punctate basophilia. In a research carried out on groups of lead workers in various departments he had found a definite relationship between the Pb. in the atmosphere, the Pb. excreted in the urine, and the punctate basophilia count; the basophilia could be used in estimating the danger arising from a lead process. He supported the findings of Sellars that all lead workers have a normal punctate basophilia, and that its mere presence cannot be taken as a proof of lead poisoning. It was, however, a delicate index of the degree of absorption, and as such of great value in anticipating trouble.

INDUSTRIAL TUMOURS OF THE BLADDER.

Dr. T. H. WIGNALL (Manchester) opened a discussion on the incidence of disease of the bladder in workers in certain chemicals. Certain chemical agents, he said, were known to cause forms of acute dermatitis and conjunctivitis, or bronchial and nasal troubles; others (for example, aniline) by absorption, ingestion, or inhalation, produced pigmentation, visible on face, hands, and ears, as well as general bodily weakness, dyspnœa, and possibly blood in the urine, owing to the production of methæmoglobin in the blood. Such cases, seen early and treated, recovered health, and he had not heard of any subsequent growths from acute illnesses of this type. Men working on α-naphthylamine for some years reported a frequent desire to micturate with strangury and blood in the urine. Cystoscopic examination revealed a neoplasm at the ureteric orifice in the bladder.

Mr. J. B. MACALPINE (Manchester) showed lantern slides and pathological specimens of carcinoma and papilloma of the bladder in aniline workers, many of whom were sent to him by Dr. Wignall. The growth in these workers would appear to be more malignant than similar growth in the general population.

Dr. ARCHIBALD LEITCH (London) spoke on experimental work with aniline dye-products. He had had no neoplastic response to any particular substance in mice, and suggested that the final carcinogenic agent was an end-product actually produced in the bladder itself.

Prof. J. M. STEWART (Leeds) suggested that inhalation of aniline dust rather than ingestion was the cause of the urinary troubles.

Dr. VERNON DAVIES, M.P., asked if anyone could give a definite opinion as to whether synthetic dyes did cause carcinoma of the urinary tract.

The PRESIDENT said that without doubt these tumours were far more prevalent among synthetic dye workers than in the general population, but no particular substance at the present moment could be blamed.

Dr. DONALD CAMPBELL (St. Helens) read a paper on the silicotic lung, in which he discussed the early diagnosis and differential diagnosis of the various fibroses of the lung, the importance of finding silica in the sputum, and of radiograms taken by an expert.

Dr. L. CAROZZI (Geneva) spoke on the human aspect of industrial diseases and accidents, and the need of utilising to the full the result of scientific investigation in other fields: physiology, pathology, and biochemistry. He dealt with idiosyncrasies in absorption and elimination in certain industrial skin diseases and industrial cancer, and stressed the necessity of constant medical examination of all workers, not only the sick but those in good health.

Mr. L. WARD (Engineering Inspector of Factories) gave a lantern demonstration of methods of prevention of industrial dusts.

The PRESIDENT illustrated the various processes of the cotton industry by lantern slides, and pointed out the dangers to health during each process.

Dr. E. S. BURT HAMILTON (Manchester) read a paper dealing with skin and mucous membrane lesions in chrome and arsenic workers.

In the pathological museum there was a large display of specimens, photographs, and charts contributed by Sir Thomas Legge, Prof. Stewart, Dr. Heffernan, Dr. Lane, Dr. S. A. Henry, Dr. C. C. Twort, Dr. Middleton, Dr. Cooke, and Dr. R. Prosser White.

SECTION OF ORTHOPÆDICS.

SCOLIOSIS.

Opening Address.

Sir ROBERT JONES presiding, a discussion on scoliosis was opened by Mr. D. MCCRAE AITKEN (London), who introduced a cinematograph film illustrating his methods and results. He pointed out that scoliosis was one of the earliest, as it was still one of the most difficult, problems of orthopædic surgery, and said that the observations of the early writers were as accurate and practically as valuable as those of to-day. It was the principles, not the details of treatment that mattered. He traced briefly the evolution of his own methods of treatment, wherein he had tried to apply to the spinal joints the principles laid down by Sir Robert Jones for other joints—i.e., continuous retention of the correct position while recovery of muscular function was taking place. His conception of these principles had been somewhat modified by the experiments of Sherrington and Magnus, which showed the importance of the inhibitory reflex, and that contractures, such as those of scoliosis, were often due as much to active shortening of muscle as to fibrosis. The postural reflex was largely a new name for the phenomenon long known to psychologists as the "automatic reflex," which played a large part in the training of athletes. Haglund, in using his short plaster jacket to tilt the lumbar region, had been one of the first to harness the postural reflexes to correction of the deformity. Mr. Aitken had found a modification of the Abbott type of jacket the most effective, because of its flexion of the spine to correct what he called the "squint lordosis," its pressure on the prominent ribs altering their habitual excursion into a more favourable one, and its power to deviate the patient's weight on to the leg opposite to the one he habitually used. This last point was important, and the speaker demonstrated that the side of the chest on the same side as the leg taking most weight was the one which expanded most, both with quiet and forced respiration—a phenomenon used by rowers for turning a boat, to do which they merely pressed harder on one foot.

An admirable film, produced by the Stoll Co., illustrated the points referred to by Mr. Aitken, especially the unequal breathing on the two sides of the chest. It also demonstrated each stage in his application of the modified Abbott jacket, and showed the patients standing and walking after the treatment. Without the previous photographs it would have been hard to believe how severe the initial deformity had been. With good team work, Mr. Aitken stated he could apply one of these jackets in half an hour. Correction was best maintained, he said, if the patients were taught only simple exercises for use in their own homes, not being allowed to depend on the atmosphere of the gymnasium. Besides the important exercise of sitting with pressure on the foot of the suitable side and standing on that leg, he strongly recommended the recumbent breathing and posture exercises of Goldthwait, of Boston, of which Miss Forrester-Brown had been the chief exponent in this country.

Discussion.

Mr. A. BLUNDELL BANKART (London), while congratulating Mr. Aitken on his results, expressed the conviction that even better ones would ultimately be attained if research continued. He thought scoliosis was essentially a contracture of a compound joint and that correction of the mechanical defect should precede education of the muscles. For this purpose he still advocated traction, for he did not believe effective pressure could be brought to bear on the spine through the ribs. Abbott's method only achieved a high degree of compensation, not actual correction of the defect, and this was disappointing. Scoliosis was a growth defect, comparable to club-foot and equally difficult to correct permanently. He suggested that there might be possibilities in skeletal traction.

Miss M. FORRESTER-BROWN (Bath) analysed the treatment of 65 cases, most of which were old neglected ones coming too late for correction but still amenable to great improvement in the general body balance and health. Only five had had correction in plaster jackets, and this had been applied by a modification of Galeazzi's method with the patient standing with the spine flexed. The shoulders and pelvis were included in independent parts and then joined together, while an attempt was made to correct the rotation deformity. A number of cases had got considerable gradual correction by sleeping for years on a plaster bed of Jansen's type. More than half the cases had required braces to support the spine, and in the manufacture of these the speaker emphasised the necessity of having the plaster mould made by an expert, while the positive model on which the jacket was to be built must be modified by, or under the eyes of, the surgeon. To hand the patient over to an instrument-maker without further surgical guidance was very unsatisfactory. In regard to the upper thoracic and cervical curves, which Mr. Aitken regarded as desperate, Miss Forrester-Brown had found that improvement of balance resulted from Elmslie's method of keeping the head a little suspended when the patient was seated during lessons. This helped the postural re-education. Although one might hope to prevent the majority of these severe cases by early diagnosis and treatment, some of the rickety and paralytic ones developed very insidiously, and parents were extraordinarily unobservant. Congenital cases were tedious to treat and the condition was apt to occur in poor homes, where they would be neglected.

Mr. P. B. ROTH (London) disagreed with Mr. Aitken's assumptions, saying that scoliosis was primarily a bone disease with no muscle defect, and that wedge-shaped vertebræ could not be straightened again with intermittent pressure from bent ribs. He thought that the best results were got from muscle-training in a gymnasium.

Mr. AITKEN, in his reply, said that nobody claimed to undo the wedging of the vertebræ, but only to mask it by improved body balance. He added that his plaster jackets did not interfere with school life, and the children played hockey in them.

Torticollis.

Mr. WHITCHURCH HOWELL (London) then read a paper on the treatment of torticollis. He advised subcutaneous tenotomy, done with very special precautions and followed by immediate fixation in the over-corrected position in plaster-of-Paris, which must include the whole chest and bear well on the mastoids and lower jaw. He quoted 20 successful cases out of 21 and showed slides of two excellent results.

A discussion followed in which the speakers were: Mr. R. OLLERENSHAW (Manchester), Mr. ROTH, Dr. WHITE (Norwich), Mr. AITKEN, and Miss G. HERZFELD (Edinburgh). Most of these, except Mr. Roth, deprecated the subcutaneous method as dangerous, except in the hands of someone of special experience such as the reader of the paper. They also considered it likely to be ineffective, because the fibrosis was seldom restricted to the sterno-mastoid muscle, usually involving not only its sheath but all the layers of deep fascia, often the arterial sheath itself, so that radical cure demanded a wide and careful dissection. They did not regard plaster fixation as necessary after the thorough operation, nor did they find a carefully placed skin scar to be conspicuous or troublesome.

CHELTENHAM GENERAL HOSPITAL.—This institution has been enlarged by the addition of 28 beds, a new out-patients' department, and an extension of the nurses' home. The work has cost £32,000.

ENLARGEMENT OF WAKEFIELD CLAYTON HOSPITAL. Mr. S. Canning Childs, of Camden, New Jersey, U.S.A., who last year gave a new out-patients' department to this hospital, is now presenting it with a new women's ward, which will have 48 beds, and will cost £30,000.

Reviews and Notices of Books.

STONE AND CALCULOUS DISEASE OF THE URINARY ORGANS.

By T. SWIFT JOLY, F.R.C.S., Surgeon to St. Peter's Hospital. London: William Heinemann, Ltd. 1929. Pp. 508. 45*s.*

THE author has presented us with a work that will surely be found on bookshelves abroad as well as at home, for great changes have taken place in this special branch of surgery during 20 years. Genito-urinary surgery, and particularly that branch which concerns the treatment of stone, has been revolutionised by the introduction of radiography and cystoscopy. The era of the exploratory operation for calculus has passed, the surgeon of to-day possessing a fairly exact knowledge of what he will find before he makes his preliminary incision. But, as Mr. Swift Joly points out in his preface, there exists yet another reason for bringing our knowledge of lithiasis up to date. Methods of diagnosis and treatment have changed, but so also has the disease itself. In certain areas of Great Britain, such as Norfolk and the Fen district, vesical calculus was formerly common; now it is comparatively rare. This is true to a less degree of other localities, for throughout the country vesical calculi are becoming less common, whilst the frequency of renal lithiasis remains about the same. The age and class incidence of the disease have also altered, so that it is no longer a disease of childhood found amongst the poorer classes, but of middle and of old age, occurring without discrimination of class. The reasons for these changes are discussed by the author at length in his second chapter. Stone formation, he points out, is due to a failure of the urinary colloids to hold the more insoluble urinary salts in solution. The change in its incidence witnessed in the last 50 years may perhaps be correlated with a general improvement in our dietary. There are reasons for believing that the excretion of an excessive quantity of uric acid is part of a deficiency disease, whilst oxaluria is often associated with intestinal fermentation. The more rational and varied dietary of modern times has the effect of diminishing both of these predisposing causes of stone formation.

Chapter III. deals with the diagnosis and treatment of renal calculus. In discussing its surgery the author shows a marked preference for the L-shaped incision recommended by Mayo, which commences over the last rib at the outer border of the erector spinæ and then passes outwards parallel to and about 1 inch above the iliac crest. If additional room is required, he advocates dislocating the last rib upwards over the eleventh rather than excising it. Pyelotomy, in his opinion, should always be followed by suturing the pelvis. Leakage of urine favours infection of the kidney, and this in clean cases is a disastrous sequel. When subcapsular nephrectomy is undertaken, Mr. Joly urges that every effort should be made to remove the whole of the renal pelvis. This is best achieved by Albarran's method of exposing the renal pedicle through a vertical incision in the lower portion of the stripped back capsuli. If this is not done a very thick pedicle is tied off containing the whole of the renal pelvis. As these cases are invariably infected a persistent sinus almost inevitably follows.

Mr. Joly holds the view that, generally speaking, surgeons err on the side of being too conservative in their surgical attack on stone. In many cases in which a pyelotomy or nephrolithotomy has been performed much future trouble would have been avoided if nephrectomy had been substituted. The aim should be to deal in the most efficient way with sepsis, and a prompt nephrectomy or nephro-ureterectomy, by totally eradicating the diseased area, may save the opposite side from subsequent trouble. In dealing with impacted ureteric calculi non-operative measures should only be attempted when the stone is lodged in the lower portion of the ureter. Even then the surgeon should be prepared to do an open operation after one failure to obtain expulsion by other means. The work concludes with adequate chapters on calculous anuria, vesical, prostatic, and urethral calculi. At the end of each chapter a table of references gives an indication of the author's extensive acquaintance with the literature of calculus, and at the beginning of the book is an entertaining historical sketch which takes the reader from 7000 B.C. up to A.D. 1924. Although illustrated with less profusion than most of the works that come from the other side of the Atlantic, the plates and diagrams are adequate and of good quality. The text throughout is clear, and the treatment of the subject practicable. Mr. Joly may enjoy the satisfaction that comes from knowing that he has written a standard work on the subject he has made his own, and we predict that Joly on Stone will be as well known to urologists of the present generation as was Jacobson on Surgery to surgeons of the last.

PHARMACY.

Pharmaceutical Formulas. Vol. I. Tenth edition, entirely revised and rewritten by S. W. WOOLLEY and G. P. FORRESTER. London: The *Chemist and Druggist.* 1929. Pp. 1146. 15*s.*

THIS is the tenth edition of a valuable book of reference which has appeared at steady intervals for the last 30 years. The original design of the book remains—that is to say, that we have here a collection of formulas for old as well as new preparations, which not only pharmacists and others in the drug and allied trades require, but which a great many medical practitioners will find of practical value. The present edition has been entirely revised and rewritten by Mr. S. W. Woolley, a former editor of the *Chemist and Druggist*, and Mr. G. P. Forrester, who now occupies that post; and their emendations have been directed towards the satisfaction of fresh demands, and recording progress in the art of compounding. As the authors point out in their preface, great advances have been made throughout the domains of pharmacy within recent years, coincident in many directions with advances in medicine, consequently many therapeutic agents have been added to materia medica, and improvements as well as innovations introduced in the manufacture of pharmaceutical preparations.

The volume is made up of selected formulas from the British, United States, and other pharmacopœias, together with non-official formulas from various sources, including numerous descriptions of practical methods employed in the manufacture of pharmaceutical preparations and other information of use to pharmacists and drug-producing firms, and of increasing interest to doctors. The pages comprise also a selection of formulas for "known admitted and approved remedies" from former editions and from the *Chemist and Druggist* diaries. The practical nature of the book is reflected in the fact that its contents in many instances represent inquiries received by the editor of the *Chemist and Druggist* from chemists and manufacturers at home and abroad, and seeking particulars regarding recent medicaments, and preparations included in hospital or foreign pharmacopœias. Many of these questions have had reference to formulas designated by the name of their authors or originators, and, as we can quite understand, the editor of our contemporary has had great difficulty in some instances in rendering correct replies. The employment of such titles for a prescription as "Stokes' Expectorant," "Franklin's Formula," "Griffith's Green Mixture," "Heberden's Ink," and so forth, is of historic interest, but from a scientific point of view the sooner these nicknames disappear the better.

A second volume, now in course of preparation, will contain formulas which cannot properly be classed as pharmaceutical, such as recipes and processes for the preparation of a wide range of articles which contribute to the interests of modern life. This promises to be very interesting, and, judging from the analogy of

"Cooley," of high practical value. For it is a little astonishing to find how many articles of daily use are mysteries, as far as their composition is concerned, to those who are familiar with their frequent application.

Physics for Students of Pharmacy. By C. J. SMITH, Ph.D. London: Edward Arnold and Co. 1929. Pp. 287. 9*s.*

THERE are to-day so many books, small, middle-sized, and large, compiled to meet the needs of the commencing science student, that a first impression on seeing yet another elementary text-book of physics necessarily is that there can hardly be room for it. Dr. Smith, however, has arguments to the contrary. He has thought that the syllabus of the Pharmaceutical Society of Great Britain invited a manual to meet the needs of those who would comply with the professional tests, and he has accordingly furnished some excellently clear instruction, in which the brevity of the first sections is accounted for by the fact that he has expected his readers to have done a course of matriculation physics at some previous period. Epitomising has been the author's aim, but always with the endeavour to make definitions clear, and his objects are accomplished. The section on light is done in more detail than is usually the case in books of this range, and in the section on magnetism and electricity there are many paragraphs which clear up difficulties in a manner which should appeal to the often puzzled student. For example, the chapter on magnetic measurements and that on electrical resistance will be really useful to many reading physics with whatever aim, for undoubtedly the phenomena described are, even when laboratory work goes hand in hand with reading, obscure to the early worker. This is a good little text-book.

SPECIAL CYTOLOGY.
Edited by EDMUND V. COWDRY, Ph.D., the Rockefeller Institute for Medical Research. New York: Paul B. Hoeber; London: Humphrey Milford, Oxford University Press. 1928. 2 vols. Pp. 1348. 693 illustrations. 94*s.* 6*d.*
Handbook of Microscopical Technique. Edited by C. E. McCLUNG, Ph.D., Professor of Zoology and Director of Zoological Laboratory, University of Pennsylvania. Same publishers. 1929. Pp. 495. 36*s.*

THE work on Special Cytology is supplementary to the earlier volume on General Cytology published under the same editorship by the University of Chicago Press in 1924, and the series is completed by the volume on technique under the general editorship of Prof. C. E. McClung. The custom of coöperative publications is more and more coming into fashion, and it is one for which we have nothing but praise. It is still possible for a single individual to write a biological or medical text book of a general or elementary nature, but a more ambitious work on any particular subject demands a breadth of knowledge and a grip of detail such as few men possess. A book written by many authors may lack cohesion and unity, and that imprint of personality which made many of the older text books really great. But it has the overwhelming advantage that each section is written by a specialist who has a first-hand knowledge of his subject, and is content to deal with that subject only.

No less than thirty-five authors contribute to the two volumes on Special Cytology, and differentiation is carried to such length that, for example, in the chapters dealing with the nervous system one contributor is responsible for the internal architecture of the nerve cell, another for the general relation of histological character to function in mammalian neurons, another for the sympathetic nerve cell, another for the neuroglia and microglia, and another for the cytology of the cerebro spinal pathway. Under these circumstances a single reviewer may be excused if he refrains from any attempt at detailed criticism and restricts himself to a general survey.

These volumes should be invaluable, not only to cytologists, but to workers on biology and medicine. It is all the more to be regretted, therefore, that it is necessary to publish them at a price which must be prohibitive to many laboratory workers. There are, it is true, a large number of illustrations, but many of them are copied from other works, and there are only two coloured plates. And while most of the illustrations are good, some are quite unworthy. For example, the 41 figures of the myeloblast, following p. 396, are of little or no value, though no doubt the authors' original coloured drawings, of which they are photographs, adequately fulfilled their purpose. Figs. 92 and 93 stand out as glaringly bad and old-fashioned, and some of the figures illustrating the chapter on the thyroid are unpardonable in a work of this class.

Perhaps the most striking impression the book makes is that cytology is a really vital and progressive science; it rests, of course, on an anatomical basis, but its trend is essentially physiological. Then, again, the breadth and ramifications of cytology are revealed in such a manner as to make it abundantly clear that it is very far from being, as many believe, a narrow and academic subject; and this, in spite of the restrictions which considerations of space made necessary. Attention is directed chiefly to those cells which make up the human body; animal forms below the mammalia are not specifically dealt with. Again, the work contains but little embryology, but on the other hand pathology is freely drawn upon when it throws light, as it so often does, on the normal. And each chapter contains an abundant bibliography, the better for being selected.

While not designed primarily for the medical worker, Prof. McClung's contribution to the series should prove valuable to those engaged in histological research. It differs from most handbooks of its kind in that attention is given to the principles underlying the making of microscopical preparations. The sections devoted to the examination of fresh material and to microdissection and injection are admirable, and the selection of typical staining methods judicious. Dr. Robert Chambers here deals with a subject which he has made peculiarly his own, and supplies excellent figures to illustrate the technique employed. In certain respects the work is not so profound and detailed as might have been expected. The section on fixation and fixatives is elementary and not particularly helpful; and in the troublesome subject of decalcification, the pathological histologist will find little assistance. A relatively large amount of space is devoted to the histological study of the blood, and in this section are included procedures, such as methods of determining hæmoglobin percentage, which scarcely come into the scope of a manual of microscopic technique. On the whole, however, this is one of the most valuable books of its kind to be published for many years; it should run into many editions. As a worker in histology grows more experienced, he will find that by following the principles set out in this handbook he will obtain such a grasp of microscopical technique that he can adapt it to his special needs, instead of planning his work on conventional lines.

NERVOUS AND MENTAL DISEASES FOR NURSES.
By IRVING J. SANDS, M.D., Associate in Neurology, Columbia University, New York. London and Philadelphia: W. B. Saunders Company, Ltd. Pp. 239. Illustrated. 8*s.*

THIS small book is well-planned and readable, and though intended for nurses will be found useful by students and those starting on mental hospital work as junior medical officers. The chapter on medical psychology is particularly good, though one may question whether manipulative and play instincts should be considered as instincts or more correctly as elaborations of instincts. The description of conditioned reflexes and conditioned emotional reactions and their relative importance in training and in the prevention of illness is informative. The account of the neurotic personality is hardly adequate, the hysteric type alone being described. The description of encephalitis lethargica and its after-effect is good, but it is not made clear that the anti-social reactions occur most commonly when the acute disease attacks children and adolescents. The author is unduly optimistic as to the prevention of general paralysis of the insane by early treatment of syphilis.

Dementia præcox is here classed among psychogenic disorders, the alleged endocrine and neurological changes being ignored. Among the excellent suggestions for treatment is one of "beauty parlours" to train patients in care of their personal appearance, though we hardly expect to see these instituted in our own hospitals. More space might usefully be given to general paralysis, while the sections on other organic psychoses could be curtailed, and also the elaboration of differently caused toxic psychoses. Drug addiction may be regarded as an expression of compulsion neurosis in many cases, but this is not suggested in the otherwise adequate account given of this. If the book is to be widely used in England a section as to our recognised means of mechanical restraint, which differ from those described, and the legal precautions in using them and seclusion, should be added; and modes of certification and limitations in treatment of patients as voluntary boarders also deserve some space, though, perhaps, not much.

For nurses, the chapter on special nursing procedures at the end should be supplemented by another on general nursing for mental and nervous patients, giving information about emergencies such as suicidal attempts, poisoning, and special precautions as to windows and fires. At present these instructions and also directions about feeding, prevention of bedsores, and care of the bladder are scattered amidst the descriptions of special types of illness and unnecessarily repeated. More emphasis should be laid on care as to feeding in general paralysis, and the importance in epilepsy of observing carefully not only the actual fits but prodromal signs and epileptic equivalents.

The book, however, gives a sound survey of the essential features of mental disorders and of the efforts being made to relieve and restore the afflicted to health.

SOME PRINCIPLES OF MINOR SURGERY.

By ZACHARY COPE, M.S., M.D. Lond., F.R.C.S. Eng., Surgeon to St. Mary's Hospital and to the Bolingbroke Hospital. London: Humphrey Milford, Oxford University Press. 1929. Pp. 159. 10*s*. 6*d*.

THE author does not attempt to cover the wide field of minor surgery as a whole, but limits himself to certain fundamental principles, which while elementary are yet of everyday importance. In the first chapter on the use and abuse of antiseptics, the lessons of the war are well summarised. In the consideration given to Dakin's solution, however, we could find no mention of its all-important property of dissolving dead protein material, although the value of clearing a wound of all dead material as a means of sterilising it is fully recognised. Maggots, those admirable scavengers to whom many wounded soldiers owe their lives, have a similar action. In the chapter on the treatment of acute inflammation, admirable on the whole, the author shows undue optimism about the benefit to be expected from vaccines. We find no mention of mercurochrome in this section. The superposed pictures in the chapter on infections in the hand make the text easy to follow. Much industrial disability follows such infections, and is far too often increased by ill-conceived treatment; this chapter is thus of great value to the practitioner. In the section on common sprains more stress might be put on the place of manipulation in treatment. The teaching of minor surgery to medical students is too often left in very junior hands, and the practitioner may never have had the opportunity of studying the principles on which routine procedures are based. These Mr. Cope has presented in a concise and practical form.

LE SYNDROME ÉPILEPSIE.

By O. CROUZON, Médecin de la Salpêtrière. Paris: Gaston Doin et Cie. 1929. Pp. 264. Fr.55.

DR. Crouzon's volume on epilepsy is erudite and comprehensive, yet its perusal leaves a slight sense of disappointment. Filled with an amazing number of facts of observation culled from all kinds of sources, ancient and modern, it seems to fail in the personal element; the reader is neither provided with critical summaries by the author nor apparently with any expression of his own views, based on what must be a wide clinical experience. The ground covered includes everything from the epileptic aura to the social reactions of the patient; the arrangement of material and lucidity of description leave nothing to be desired. But through this literary labyrinth we need guidance; we want the salient features emphasised and the non-essentials put on one side, and we are left to do this for ourselves. A minor note of remonstrance is called for; while numerous references are given a locus in journal or society proceedings, very many more are restricted to the writer's name, and some of these are clearly of importance.

L'ENCÉPHALITE ÉPIDÉMIQUE: SES ORIGINES:

Les 64 premières observations connues. By Dr. RÉNÉ CRUCHET, Professor in the Faculty of Medicine of Bordeaux. Paris: Gaston Doin et Cie. 1929. Pp. 133. Fr.15.

IN the spring of 1917 Dr. Réné Cruchet communicated to the Medical Society of the Paris Hospitals a paper describing some 40 cases of subacute encephalomyelitis which had been under his observation from towards the end of 1915 to the earlier months of 1916, almost entirely among military subjects, and again later in 1916–17 in another region. This little volume contains a detailed account of the cases and a reasoned claim that they belong to the class now commonly termed epidemic or lethargic encephalitis; the argument is perhaps supported by the fact that one of them, seen in December, 1916, later developed the bradykinetic syndrome and is declared to be one of parkinsonism. The remarkable clinical variety and heterogeneousness of the pictures presented by these cases are well illustrated; the author saw the condition evolve in mental, meningeal, convulsive, choreic, hemiplegia, cerebellar, pontine, spinal, and polyneuritic form. Handicapped as he was by the circumstances of the time, it is remarkable that he was able to make as careful an investigation as he did, even if details of a confirmatory kind are sometimes lacking.

Whether this encephalomyelitis of 1915-16-17 was and is a "new" disease is another question.

SINUS THROMBOPHLEBITIS.

By ALFRED BRAUN, M.D., Attending Otolaryngologist, Hospital for Joint Diseases, New York. With 111 illustrations. London: Humphrey Milford, Oxford University Press. 1929. Pp. 269. £2 12*s*. 6*d*.

A beautifully illustrated monograph on the inflammatory affections of the venous sinuses in the dura has for its central thesis the tracing of general sepsis of otitic origin. Sometimes glaringly obvious, at others slight, hidden and elusive, otitis is, mainly for anatomical reasons, a sinister cranial mischief-maker out of proportion to its degree or extent. Accordingly, the reader is introduced, in a section occupying rather less than one half of the book, to a complete anatomical description of vascular mechanisms in connexion with the ear and their immediate and distant relationships. The book is essentially an atlas, for the drawings and diagrams are on a generous scale and the text does little more than comment on their significant features. The physiology of the dural venous sinuses, and the way in which the venous blood-flow is protected from the aspiratory effects of inspiration is elucidated. Next in order are treated the etiology and pathology of sinus phlebitis, and its semiology and diagnosis; an excellent résumé of the most modern therapeutic technique is furnished in a final chapter of some 60 pages. Among useful practical matter is the description of the Queckenstedt phenomenon as adopted for diagnosis of unilateral sinus thrombosis; the account of the neural complications of the condition is in some respects inadequate (for instance, that of the syndrome of the superior longitudinal sinus), and the data (clinical and spinal fluid) for differentiation from meningitis. The bibliographical references are largely confined to German and American sources.

TRIAL OF JEAN PIERRE VAQUIER.

Edited by R. H. BLUNDELL and R. E. SEATON, Barristers-at-law. Notable British Trials. Edinburgh and London: Wm. Hodge and Co. 1929. Pp. 208. 10*s.* 6*d.*

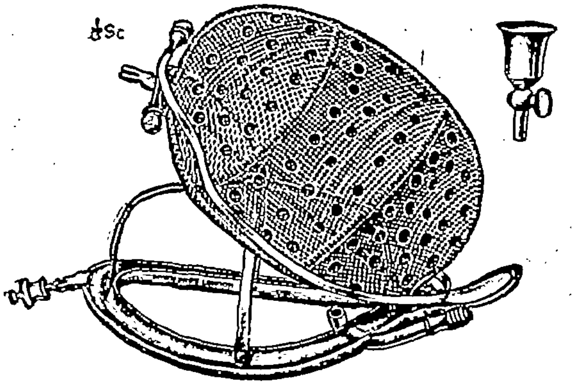
THE evidence upon a charge of poisoning, "of all forms of death the most detestable," is usually circumstantial, not direct. In Vaquier's case it was overwhelming. He became intimate with an Englishwoman, Mrs. Jones, who came to Biarritz for a holiday early in 1924. He followed her home to the Blue Anchor Hotel, Byfleet, which she managed with her husband. Mr. Jones used to take bromo salts (kept in a bottle on the bar-parlour mantelpiece) on the morning after his carouses. One Saturday morning he took his usual dose, complained of its bitter taste, went into convulsions, and died. His medical attendant, Dr. F. C. Carle, diagnosed recent strychnine poisoning, and with great promptness took possession of the bottle of salts, glass and spoon used by the dead man; he also discovered some spilt crystals on the bar-parlour floor. All these articles were eventually found to contain traces of strychnine, and the evidence of Sir Bernard Spilsbury and Mr. John Webster left no doubt of the cause of death. Vaquier, who had been early in the bar-parlour that day, had bought strychnine in London "for wireless experiments"; while in prison he revealed the hiding-place of a further supply of the poison in a toolshed in the hotel garden. He tried to implicate a mysterious third party, and the main feature of his defence was a vigorous attack on the credibility of Mrs. Jones; but there was no doubt of the verdict, and he was hanged in August, only a few months after he first met her.

The editors' introduction is workmanlike and wholly satisfactory; there is no straining after dramatic effect. The main medico-legal interest lies in the comparison of the knowledge, confidence, and precision of modern experts with that of the scientific witnesses in a case of strychnine poisoning such as the Rugeley trial some 70 years earlier. Fitzjames Stephen, who was present during most of the latter trial, gave a contemporary exposition of the effect of the expert evidence against Palmer in his "General View of the Criminal Law of England," a book still well worth studying.

New Inventions.

ETHER INHALER.

THE ether inhaler here illustrated has for its basis the principle of a vapour space which is obtained by superimposing an outer wire gauze cage on a Schimmelbusch face-piece. The gauze is perforated at short intervals, and when in use is covered with one or two layers of lint held in position by a spring. The outer cage when clipped down holds the face-piece lint in position, and ether is introduced by a small funnel through the perforations in the gauze. A feed pipe is fixed near one end of the face-piece through which oxygen or oxygen and ether vapour can be introduced under the mask. The cage is so constructed that it can be completely removed, and the mask used as an ordinary Schimmelbusch by fixing a wire retaining-ring in its place. When in use anæsthesia can be maintained either by blowing a slow stream of oxygen through ether into the mask through the feed pipe, the proportions of ether and oxygen being ideally maintained by such an apparatus as Mennell's bottle and by-pass, or by gently dripping ether through the gauze by the funnel. In all cases it is advantageous to use oxygen while maintaining anæsthesia. By adding an extra layer of lint to the cage or by covering with a layer of gamgee the anæsthesia can be deepened at will.



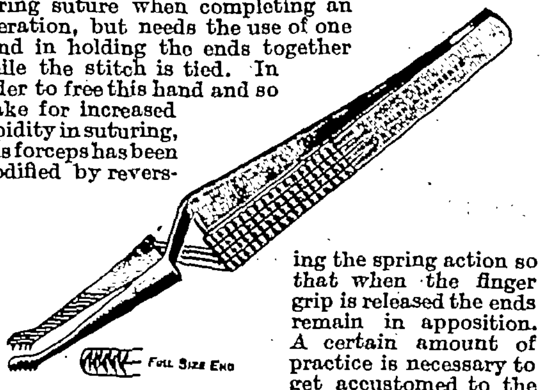
Among the advantages of this inhaler are ease and uniformity of anæsthesia, clear view of the face during anæsthesia, and economy in use.

I would like to thank Dr. Z. Mennell, senior visiting anæsthetist, and Dr. G. Edwards, senior resident anæsthetist, of St. Thomas's Hospital, for testing the inhaler and for their very helpful suggestions. The mask is made by Messrs. Down Bros., Ltd., St. Thomas's-street, London, S.E.

Bedford. G. A. METCALFE, M.B., B.Ch.

SKIN FORCEPS.

THE approximating forceps for the skin designed by the late Mr. C. P Childe, of Portsmouth, is of great assistance in avoiding the in-turning of skin edges during suture when completing an operation, but needs the use of one hand in holding the ends together while the stitch is tied. In order to free this hand and so make for increased rapidity in suturing, this forceps has been modified by reversing the spring action so that when the finger grip is released the ends remain in apposition. A certain amount of practice is necessary to get accustomed to the reversed action of the spring, but it will be found that the modified instrument does help in producing a neat and therefore quick-healing scar.



The instrument has been made for me by Messrs. Allen and Hanburys, of Wigmore-street, London.

A. W. HOLTHUSEN, M.B., B.S. Lond.

THE LANCET.

LONDON: SATURDAY, AUGUST 10, 1929.

THE BACTERIOPHAGE AND THE CURE OF DYSENTERY.

Ever since the dawn of the bacteriological era it has been the therapeutic ideal of all who have accepted the germ theory of disease to acquire some means whereby the specific micro-organisms might be destroyed or disarmed and the healthy tissues left unaffected. Innumerable agents have been on their trial, from the crude antiseptics of early days, through the biological antibodies of a later period, to the modern chemotherapeutic stage. All along this steady course of trial and progress may be seen landmarks which indicate certain notable measures of success; some clear and towering, rising erect against the winds of controversy and the corroding influence of time—such as diphtheria antitoxin, the vaccine virus, and salvarsan; others more inchoate, denoting an area whose limits are not yet demarcated—such as the benzidine group of dyes to which the modern trypanosomicidal drugs belong. One agent stands unique amongst these varied bactericidal substances—the bacteriophage described by Twort and d'Herelle. It is unique because so little is known of its nature, whilst its effect in the body as a therapeutic agent is still disputed.

The view of this substance, which at our present stage of knowledge seems most rational, is to regard it as akin to the filterable viruses, and as such its study may well lead to important advances in our knowledge of the latter, since it is an agent easily detected and handled and readily submitted to all forms of experimentation. The actively destructive effect of the bacteriophage upon sensitive bacteria is indubitable, and can be readily observed both with the naked eye in mass cultures and under the microscope upon the individual organism. It would therefore seem, upon a priori grounds, that it should constitute an ideal agent for an attack upon micro-organisms in the body, and especially upon those which act upon the surface of the intestine and pullulate in the intestinal canal. In one respect only are inherent difficulties apparent. These lie in the circumstance that when complete destruction of the organisms is not effected, resistant strains of bacteria may develop, which present an interesting analogy to the drug-fast strains of protozoa which have been such a constant source of difficulty in the chemotherapeusis of protozoal infections. What is the exact factor determining the resistance which bacteria may develop against a given phage is at present unknown. It has been widely assumed, and with a good deal of supporting evidence, that it represents a variation in the antigenic constitution of the organisms, in the technical language of the bacteriologist a variation in the "rough" direction. This variation can be brought about by other environmental conditions and may in this instance be produced by the bacteriophage. This is the view adopted in general by Hadley.[1] However, L. M. Burnett[2] in a recent paper, has adduced evidence that in the acquisition of resistance no observable serological changes in constitution may take place, the only notable effect being the loss of the resistant bacteria of the ability to adsorb the specific phage in question.

With regard to the clinical problems, which are of more general interest, we publish on p. 273 a contribution by Dr. A. Compton to the study of the therapeutic value of the bacteriophage in bacillary dysentery. About this value conflicting reports have been issued, many of which have been noticed in our columns from time to time. Of all diseases those of the intestinal group should be most amenable to treatment by this means, and it may be recalled that it was in connexion with dysentery that d'Herelle made his initial claims for the practical therapeutic use of the bacteriophage. In general, these claims have been not confirmed, although in a recent communication[3] d'Herelle announces that "the method has been applied in tens of thousands of cases of bacillary dysentery and recovery always took place in 24 hours." We are not aware that the collected details of such cases have ever been published. Dr. Compton bases his report upon 66 cases of Egyptian dysentery which had been diagnosed "cytologically" as of bacillary origin. The type of infection is stated to have been predominantly of the Hiss variety, and the bacteriophage in use a polyvalent strain including one variety of d'Herelle's own isolation and apparently of high potency. The cases were not observed directly, but were under the control of outside doctors. If we examine the reported results initially, we find a maximum beneficial effect to have been obtained in 35 out of 66—i.e., just over 50 per cent. The criterion adopted is the diminution in the number of stools, which fell to 2 to 3 per day on the second day of treatment, and (presumably) uninterrupted recovery thereafter. The ordinary saline treatment was carried on coincidently with the specific measures. Such a result, taken at its face value, appears to be excellent, but it is a constantly recurring lesson in medicine that face value results are not always safe guides to the value of medicaments. Only rigidly controlled parallel series of treated and non-treated cases will give information of real and lasting value. Dysentery is by no means always a serious and progressive malady. Anyone who has had experience of a considerable epidemic of it knows that in many cases the infection may be self-limiting and recovery may occur without any specific treatment. It is not suggested that a large proportion of Dr. Compton's treated cases are likely to have been in this category, but the possibility represents an interfering factor, whose extent it is not easy to estimate. The treatment did not appear to affect the well-known influence of age as a prognostic factor in this disease. Phage or no phage, the younger the patient the greater the mortality. There is still lacking a sufficient and clearly cut investigation of this important question which will enable us to judge of the value of the bacteriophage in dysentery. The usual criticism of negative results, that the strain of phage was not of maximum virulence, is a weighty one which cannot be disregarded. Since the evidence of the value of this treatment is anyhow not so convincing as to make it inhuman to withhold it from any sufferer, it would be a real service to therapeutics if those who, like Dr. Compton, have access to an unlimited number of cases of bacillary dysentery would treat alternate cases with the bacteriophage and the others by any one of the approval methods, giving in each case a detailed bacteriological examination before and during treatment and chronicalling the clinical course. Only by such an investigation can the question be solved which ten years of scattered observations and uncontrolled reports, suggestive though they may be, have still left unanswered.

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[1] Hadley: Jour. Infect. Dis., 1928, xlii., 263.

[2] Burnett: Jour. Path. and Bact., 1929, xxxii., 349.

[3] d'Herelle: New Eng. Jour. of Med., Feb. 21st, 1929.

THE EPIDEMIOLOGY OF MEASLES.

SINCE cholera, small-pox, and virulent scarlet fever became negligible factors of exanthematic child mortality, measles has been a prime object of concern to the health departments, sharing precedence with whooping-cough and diphtheria. The epidemiologist has been preoccupied by its curious manifestations for even longer. When a locality is hit by one of the periodical waves of measles the child population is always extensively involved, and the evolution of each outbreak is not influenced by any counter measures which have hitherto been tried. The illuminating studies of mass infection and immunity which have resulted from bacteriological and immunological discoveries in diphtheria and scarlet fever have left the epidemiology of measles no further advanced. Almost the only method of investigation open to us in measles is the statistical one which, though it can achieve little unaided, can be invoked to confirm or refute laws framed on other evidence. We welcome, therefore, an attempt to explain the well-known phenomena of the epidemicity of measles by the theories of "latent epidemisation" and "latent immunisation"[1] made in a recent study by Dr. PERCY STOCKS and Miss MARY KARN.[2] To this end a most elaborate procedure has been adopted. The detailed records of all cases of measles notified in the metropolitan borough of St. Pancras during three years from March, 1924, to March, 1927, have been studied, as well as the statistics of deaths and notifications since 1916. The living population at each age under 12 in St. Pancras at the beginning of the three years' period was estimated by applying the ascertained births and deaths to the census data, and the number of children at each age under 10 who could be regarded as definitely immune from recognised measles was ascertained from the statistics of notifications from 1916 to 1924. By laborious adjustment it was possible to estimate at any one time during the three years' period the separate numbers in two groups—viz., those who had already been familially exposed to measles during the period (the selected population), and those who had not (the residual population)—and to divide the former into those who manifested immunity after the lapse of varying periods of time and those who did not. Investigation of the true infectivity of the virus, as distinct from its apparent infecting power, and also the relation of this quality to different meteorological conditions, were attempted.

The conclusions arrived at are as follows: (1) The epidemic phenomena of measles are inexplicable if experience of an attack of recognisable measles is the only way of acquiring immunity; (2) a study of the incidence of measles at different times in the selected population, as compared with the residual population, shows that individuals in the former group acquire, without manifest sickness, a degree of immunity in excess of that exhibited in the latter and tending to diminish with the lapse of time—probably vanishing in most cases within two years; (3) this accounts for the observed fact that many children assumed to have no acquired immunity go through an epidemic without sickening, and it may explain the biennial periodicity of the disease; (4) the retardation of spread from the later foci of an outbreak, as compared with those at the onset, may also be explained by latent immunisation; (5) the *apparent* infectiousness of measles varies from a maximum at the onset of an epidemic, falling throughout its evolution to a minimum at the end, gradually increasing again in the course of the non-epidemic interval; (6) "all the changes noted in apparent infectiousness are explicable by immunity changes alone, excepting the *sudden* fluctuations, which must be attributed to changes in facility of transmission," such sudden fluctuations occurring mostly at the commencement of large epidemics; (7) the curve of the epidemic can be almost completely explained "by the concept of an active plus latent immunisation of the child *population on the one hand, and changes in facility* of transmission of the virus by droplet infection from cases or carriers to other persons coming in contact with them on the other;" the latter phenomenon being possibly related to certain atmospheric states.

It will be seen that Dr. STOCKS and his collaborator have succeeded in applying to the behaviour of measles the laws for which bacteriological and immunological support can be adduced in other communicable diseases. Confirmation of the investigation is not likely to be forthcoming at any near date because of the labour involved, the statistical skill required, and the paucity of data available. Incidentally it may be noted that an inquiry of this kind might have been even more fruitful in a more sparsely populated area, such as Renfrewshire, where measles was notifiable and carefully carded for more than 20 years, and where extra-domiciliary infection was proved to be much rarer in villages than in towns. A test that may be applied immediately, however, is the experience of practical workers in the field of the communicable diseases. Is there even circumstantial evidence of the carrier state or of anomalous forms of measles, comparable with that which can be adduced to support the theory of latent epidemisation and immunisation in other zymotics, whether of known or unknown origin? It must be confessed that there is very little. When inquiries are pressed they rarely fail to trace measles to another recognisable, if unrecognised, case. Only very occasionally does one see the crossing of a ward, for instance, by a child with coryza, Koplik's spots, and no more than a slight blotchiness behind the ears or down the side of the neck, in contrast with the experience in relation to diphtheria and scarlet fever. It is, of course, possible to argue that the signs of anomalous measles resemble so closely those of catarrh of any other origin that the infection is likely to escape diagnosis until a specific test is devised, but if this were so measles should be much less easily traceable than it is. If, then, latent infection occurs, it is without demonstrable association with modified forms of the disease. On the other hand, the general behaviour of epidemics of measles, noted by the late Dr. JOHN BROWNLEE fits well with the new hypothesis, as does the phenomenon of apparent non-infectiousness in hospital wards during inter-epidemic periods mentioned by the same observer. Dr. STOCKS and Miss KARN have produced what is in many respects the most valuable contribution to the study of measles which has appeared since BROWNLEE'S ingenious, if rather fanciful, work on the periodogram.

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[1] See THE LANCET, 1928, ii., 233.

[2] A Study of the Epidemiology of Measles. Annals of Eugenics, vol. iii., Parts iii. and iv., October, 1928.

THE CORONER'S DISCRETION.

WHEN Parliament three years ago enacted that every coroner should be paid by salary instead of by fees, it was hinted that the fee system had been a possible inducement to coroners to multiply inquests. In introducing the Bill which effected the change, Lord CAVE expressed the opinion that the suggestion was unfounded. In any case the change in the law was welcome. The Chalmers Committee's report, issued in 1910, observed that a coroner had often more trouble over holding a preliminary inquiry than over the actual inquest; *if he satisfied himself that there* was no public ground for holding an inquest and thereby saved unnecessary pain and distress to relations of the deceased and expense to the community, it was rather unfair that he should, so to speak, be fined for his good conduct; "it is not right," added the report, "to put a coroner (and still less his officer) in the position of having a pecuniary motive for holding unnecessary inquests." The desired reform—in the Coroners (Amendment) Act of 1926—gave the coroner a statutory encouragement and authority to dispense with inquests. Already the critics are asking whether inquests are not now too few.

Statistics are here more than usually inconclusive. The latest available from the Home Office deal with the year 1927 and so cover only a few months of the operation of the Act of 1926. In 1927 there were 60,511 deaths reported to the coroner; 13,108 of these were deaths of lunatics and mental defectives in institutions. In only 345 of these institution cases was an inquest held, but, in view of the medical information no doubt available as to the condition of the patients, the small proportion of inquests is easily understood. Against the total of 60,511 deaths reported to the coroner in 1927 we have the figure of 32,430 inquests held. For what the comparison may be worth, we can look back at the figures a few years ago. For 1924, for example, the corresponding totals of deaths reported and inquests held were 58,062 and 31,705. In the past few years, it seems, the number of inquests has remained fairly stationary while the number of deaths reported has considerably increased. It would be most unsafe to dogmatise upon such material; local variations are *due to accident and to the varying exercise of the* individual coroner's discretion. The 1927 tables show that in one jurisdiction a coroner happened to hold an inquest in every case of death reported to him, while, in the same period, a coroner in another jurisdiction was content to hold only one inquest for every five such deaths. These differences are inevitable. They were noted by the Chalmers Committee in 1910 when it was found that in one part of London the percentage of inquests to deaths reported was 59 while in another it was 81. It has probably been the experience of many general practitioners that on occasions when they regarded an inquest as unnecessary an inquest was nevertheless held; conversely, when, so far as is within their power, they have indicated the desirability of clearing up some puzzling or suspicious symptom, the coroner has dispensed with a formal inquisition. The coroner's decision not to hold an inquest is an act of executive rather than judicial discretion; the exercise of such discretion, conducted in private rather than in public, may find critics; it can at least be hoped that there will be the maximum of agreement between the coroner and the medical practitioner. The 1926 Act and the 1927 Regulations, which the late Sir George Greenwood and his supporters thought so inadequate a protection against either foul play or premature burial, vastly improved the old method of reporting suspicious cases to the coroner. The new system, involving perfect confidence between coroner and practitioner, is on its trial. The public, puzzled by recent exhumations of bodies and reopenings of inquests for which neither coroner nor practitioner is in any way to blame, may feel vague misgivings as to the modern working of an ancient tribunal. If at any time it were disclosed in some sensational case that the coroner had neglected or undervalued the practitioner's warning, Parliament might be pressed to limit the discretion which it conceded in 1926.

Annotations.

"Ne quid nimis."

THE EXPERIMENTAL METHOD IN PSYCHOLOGY.

IT is the fate of any science which has one hand on the human heart and the other on the laboratory instrument to promise more than it can give in respect to the problem of mind. The extraordinary achievements of the scientific method in the field of physics and chemistry promised equally glittering prizes to those who entered the lists of psychology with stout hearts and sharp instruments. With the aid of physiology, psychology has now definitely emancipated itself from metaphysics, and has sought to adopt methods comparable to those used in the study of physiology of the special senses, where a local problem can be, to some extent, isolated. Where the reactions of the whole organism are involved, however, dealing with a problem in a circumscribed or local way becomes impossible. It is to this difficulty in experimental psychology that Mr. F. C. Bartlett *devoted his Presidential address, delivered in* Cape Town on July 26th to the Psychological Section of the British Association. He has endeavoured in a historical survey to show that such idols in the temple of psychology as G. T. Fechner and H. Ebbinghaus have in reality not served their science too well in stressing the great importance of the stimulus in the reactivity of the organism. In the study of pure sensory experience, if such experience can be divorced from all others, the relationship of stimulus, however simple to response, can be studied with the hope of realising simple dogmatic laws. But no sooner do the processes studied leave the field of simple sensibility and begin to involve more complex functions and the attitudes of the organism as a whole, than the qualifications limiting results grow alarmingly and the method exhibits its shortcomings. *In such complex "sets" the stimulus does not entirely* govern the response, but merely acts as a trigger mechanism setting free propensities and activating large psychological systems or attitudes. The fault lies in the attempt on the part of the experimental method to study the organism too much away from the context of ordinary biological situations. The nonsense syllable method for the study of memory and retentiveness is a convenient example. In most, if not in all living situations, the stimulus *is* but a fraction of a total system of vectors. Mr. Bartlett notes that the physiologist "rightly lays the chief emphasis upon the local response mechanism, and for obvious reasons shrinks from speculations about the central processes until he knows as much as can be learnt about the peripheral functions and their mode of operation." But since it is these central processes that are the primary concern of the psychologist, the latter can learn little by the study of the peripheral events and can safely leave them to the neurologist.

Strangely enough, as Mr. Bartlett acutely observes, the very protagonists of the experimental method are the persons most prone to commit the error of what may be called unbridled "a priorism" in claiming more for the method than it can with its limitations produce. The theory of Gestalten, the Spearman theory of two factors, Jaensch's deductions on character from his experiments on "Eidetic Images," and lastly the easy acceptance of the conditioned reflex as the new panacea, are examples of the dangers of attempting to stretch the experimental method to cover the whole field of the mental life. Behaviourism, and the conditioned reflex which has become the irreducible unit of this valuable experi*mental approach to behaviour, are illustrations of the* dangerous consequence of the absence of logical scrutiny at all stages in the development of a new approach. So far has the enthusiasm for the conditioned reflex gone that Pavlov himself speaks of "search reflexes." Could the mixture of logical categories go further?

Psychology must concern itself with the highest reactions of the organism as a whole, and must in consequence take account not merely of the stimulus and the final response, but the whole of an organism historically determined, and at all times and at all points saturated with affect and governed by those complex methods of adjustment and growth which we term the instincts. In short, if psychology is to retain the respect of the humanist, it must pursue to some extent the clinical method. Much therefore can be added to academic psychology if it allies itself to psychopathology. It is in this field that the processes of fragmentation are best studied, since they come into being in response to some strange biological necessity. The molecular method can be pursued by those who prefer the artificial atmosphere of the laboratory, but for psychological workers. Nature provides suitable material nearer at hand.

THE PATHOLOGY OF GASTRITIS.

CONCEPTIONS of gastritis have altered a great deal in the last few years. The older pathologists recognised the gross lesions caused by corrosives like carbolic acid and irritant poisons like alcohol, but the finer forms were lost in the changes produced by post-mortem degeneration and self-digestion of the stomach. In their study of pathology in the living, surgeons found ulcers and growths affecting the stomach, but gastritis as such was unsought for, and thus passed out of practical consideration. Further examination of the material obtained by resection of the stomach has, however, revealed changes in areas other than those invaded by growth or eroded by ulcer. The newer methods of investigation, especially histological observations on portions of the stomach fixed at body temperature, immediately after removal at operation, have thrown a new light on conditions of chronic gastritis. Konjetzny[1] found in such material that gastritis was present in every case of gastric ulcer examined, whilst in every case of duodenal ulcer there was gastritis as well as duodenitis. In 90 per cent. of stomachs resected for gross carcinoma he found evidences of gastritis in other parts of the stomach. Although Konjetzny believes that the gastritis is the cause of ulcer and of carcinoma, most workers see in these results at most the frequent association of gastritis with ulcer and cancer, and leave open the question whether the gastritis is primary or secondary. The great difficulty is that both gastritis and early carcinoma may be latent, and give no clinical evidence of their presence, so that microscopy is required to settle the question definitely. X rays may sometimes indicate gastritis by showing alterations in the contour of the mucous folds outlined by barium, but a negative result does not disprove its presence. It has long been recognised that inflammation of the lining of the stomach and duodenum may occur after severe burns on the skin, and lately F. Kauffmann[2] has investigated more exactly the importance of products of degenerated tissues in causing endogenous gastritis. In experiments on dogs he produced a dermatitis by sunlight treatment, and in other instances a sterile abscess by subcutaneous injection of turpentine. The sterile abscess or inflammation of the skin served as a source of the toxins derived from breaking down of proteins. The results observed were, besides degeneration in other organs (liver, kidney, and heart muscle), fatty degeneration of the gastric mucous membrane, especially in the pyloric region. A secondary inflammation in the submucosa was often found as well. All forms of degeneration were observed, from a simple fatty change or mucous catarrh to a severe erosive gastritis, implicating also the muscularis mucosæ and connective tissues of the submucosa. These inflammatory changes are brought about by the toxic products derived from protein degeneration in other parts of the body. Toxic or endogenous gastritis, he holds, may thus arise during infectious disease, or from the presence of inflammation in organs far removed from the stomach. A degenerating carcinoma in one part of the stomach may give rise to gastritis elsewhere in the organ. Bacterial toxins, which have hitherto been regarded as the essential causes of these lesions, may be found to play a less, though by no means negligible, part.

THE AFTER-HISTORY OF ATHLETES

"It is not perhaps too confident a statement that a properly trained person, man or boy, need never fear cardiac strain." (Allbutt.)

THIS sentence expressed concisely the attitude of a large section of the medical profession in 1909 to the question of possible injury to health resulting from severe physical exercise. Since that time no facts have come to light which would render the statement invalid; on the contrary, such evidence as there is—part of it was discussed in our columns last month—all tends to confirm the belief expressed twenty years ago by Sir Clifford Allbutt. In view of the increasing number of persons of all ages who regularly take part in athletics, the subject will continue to arouse interest. Investigations are still being put in hand all over the world, and carried out mostly upon groups of men who have specially prepared themselves for some special (and short) period of exertion—for example, a University Boat Race or Olympic Games—and have been limited to an examination of the subjects shortly after the end of the contest. In the *American Journal of Medical Sciences* (July, 1929) an account is given by Dr. Burgess Gordon and the late Dr. J. C. Baker of some observations on a trans-continental foot-race. Such a race provides unusual opportunities for studying the reactions of the body to severe effort continued for a long time. It also provided in this case an opportunity for the study of the effects of daily severe effort upon the comparatively untrained as well as upon the trained subject. The entries numbered 199, the eldest being 64, the youngest 17. Examination before the race showed that about 50 per cent. were physically under-developed, 3 per cent. suffered from respiratory infections, 4½ per cent. showed gastro-intestinal symptoms, 8 per cent. showed albuminuria. During the race only 7 competitors dropped out on account of exhaustion; these were unfit at the start and were untrained. Only 57 finished the full distance. Those who retired did so for a variety of reasons. "Shin splints"—a form of myositis with periostitis in the anterior tibial region—together with financial difficulties accounted for most of the withdrawals. The total mileage was 3484, and the daily average 44·2 miles. At the finish only 14 showed signs of fatigue; all the others were in excellent health. A careful physical examination carried out three days after the race showed no cardiovascular abnormalities. A striking fact is that 65 per cent. of those examined suffered from tonsillitis. Twelve months after the finish of the race inquiries were made as to the condition of the competitors; all the replies indicated that so far from being injured, they felt themselves to have benefited from the race. It is, of course, too early to judge of the effects of such a sustained severe effort on the health of the competitors, and it is to be hoped that careful records will be kept of the later history of those who took part in the race to add to those now available. We have already referred to the study by Morgan of the lives of University oarsmen (1829–69), and to his conclusion that the deaths definitely due to cardiovascular causes were in exactly the same proportion as in the general population. Meylan, who investigated the history of Harvard oarsmen, came to similar conclusions. R. W. Michell, of Cambridge, who examined 1200 rowing men and 410 players of Rugby football, found cardiac dilatation which persisted after exercise only in men with a history of either diphtheria or rheumatic fever, who had taken strenuous exercise while untrained. It is clear that on physical grounds no objection can be made to a habit of life which involves strenuous exercise, provided the individual is physically sound and properly trained. The available evidence is almost entirely confined to men, but there is no reason to doubt that it would be confirmed by investigations of the after life of women athletes. The various federated associations concerned with promoting sporting events for women in France have instituted a medical service and propose to insist on a certificate of fitness before candidates are allowed to enter for any event; this precaution, if followed up, might well form the basis of valuable statistical information. The efforts made to collect evidence to prove that exercise does no physically observable harm is a sign of the conviction, difficult to prove, but widely held, that a condition of trained physical efficiency not only leads to happiness and well-being, but goes hand in hand with general and especially mental efficiency.

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[1] Konjetzny, G. E.: Handbuch d. spez. pathol. Anatomie u. Histologie, Berlin, 1928, iv., ii., 892.

[2] Klin. Woch., 1929, viii., 1380.

OPTOCHIN IN OPHTHALMOLOGY.

CUPREINE is an alkaloid which occurs with quinine in cuprea bark, and the important property of ethylhydrocupreine is that it destroys pneumococci. It has been used medicinally in pneumonia, but it is mainly employed as the hydrochloride salt (optochin) in a one or two per cent. solution in eye affections, especially in pneumococcal ulcer of the cornea. Unfortunately its employment in this disease is attended by much pain. Dr. S. H. Browning, at the recent Oxford Ophthalmological Congress, suggested that it should not be applied direct to the cornea after it has become infected with the pneumococcus, but that the parasite should be attacked while it is still in the lacrymal sac, before the cornea has become infected. The popularity of optochin among ophthalmologists has suffered from its chemical name, for it is generally supposed that it is a derivative of copper and is therefore a dangerous substance to use on the eye. In fact copper does not enter into its composition at all, and the patient may be assured that the pain caused by its application does not indicate damage to delicate tissues.

RENAL EXTRACTS IN THE TREATMENT OF NEPHRITIS.

THE outlook in chronic nephritis is, as a rule, so bad that anything which offers hope demands every consideration. The possibility of a new therapeutic approach was mentioned in an annotation in our columns not long ago,[1] when it was suggested that injections of phosphate may perhaps be found useful. We observe that another line of possible treatment is being explored by Prof. Stejskal of Vienna, who has published[2] a small series of cases of advanced renal disease in which injections of fresh extract of kidney were given. Organotherapy has been abused so often that attempts of this kind are naturally received with reserve; but Stejskal's idea is neither altogether new nor devoid of foundation. A similar experiment was made as long ago as 1892, by Dieulafoy, and the theory of an internal secretion of the kidneys dates back to Brown-Séquard. It has often been suggested that in contracted kidney broken-down renal parenchyma is absorbed into the blood, and that such products are responsible for the high blood pressure and other changes found in this condition; and investigation has in some respects confirmed this hypothesis. Goldzieher[3] and others, injecting emulsions of kidney substance subcutaneously into rabbits, produced albuminuria and casts in the urine, and sometimes death. At the same time the adrenal bodies were found to be markedly enlarged with an excessive hyperplasia of the medulla. These and other experiments led him to the view that resorption of diseased kidney tissue caused an over activity of the adrenal medulla which was an important factor in the rise of blood pressure in cases of contracted kidney. Much may be said for this opinion; thus we know that if serum from a nephritic patient is added to a solution of adrenalin the pressor effect of the latter is considerably increased. Again, it is possible to have a very high blood pressure without obvious nitrogen-retention, which is evidence against the alternative hypothesis that such retention is alone responsible for the hypertension. Possibly both factors are concerned in producing so-called interstitial nephritis; thus primary impairment of the function of the kidney may lead to resorption of diseased renal tissue, which increases the liberation of adrenalin, whilst the subsequent accumulation of nitrogenous waste products in the blood may cause stimulation of the sympathetic, which acts again upon the adrenal medulla. At all events, whatever may be the connexion between renal damage and hyperplasia, Stejskal is able to record a remarkable reduction in blood pressure following injection of extracts of kidney. He used a sterile watery extract, containing as far as possible the unchanged renal lipoid bodies, but almost practically free from protein. This was injected in quantities of 2 to 5 c.cm. intradermally (so that absorption should be gradual) once or more into ten patients suffering from advanced contracted kidney, some in the late stages of uræmia itself. Injection was always followed by a fall in blood pressure, which was gradual and progressive, and in some cases this was persistent. This fall was not seen after injection of other tissue extracts and only occurred in cases of renal hypertension—that is to say, the renal extract appeared to be truly "organ-specific." The falls observed in the cases recorded were of 80, 40, 70, 120, 120, 90, 180, 90, 80, and 120 mm. of mercury—an average of approximately 100 mm. All were cases with very high values before the injection and obvious signs of terminal nephritis. Symptoms other than hypertension were not consistently affected, nor did the outcome of the disease seem to be much influenced, but the figures are certainly noteworthy. The theory is advanced that the fall may be due to some effect on the blood-vessels, perhaps of some hormone in the extract, which relaxes their powerful tonic contraction.

THE INDUSTRIAL HEALTH RESEARCH BOARD

THE change of title announced in its ninth annual report[4] by the Industrial Fatigue Research Board indicates that in future its object will be to study not merely the negative or pathological aspect of industrial activity, but also its positive side of promoting and maintaining good health. This step is in accord with the trend of modern medicine, for the doctor attempts to teach the patient how to be well and keep well, rather than to seek for cure of ills earned by wrong living. The body to be known as the Industrial Health Research Board came into existence to follow up war-time research into the evil effects of long hours and heavy work, but has now as its primary aim the acquisition of knowledge about conditions and methods of work most favourable to the workers. A glance at the variety of inquiries recently completed or in progress displays the wide scope of the Board's activities. Hours of work, the heating and ventilation of factories, vision and lighting in relation to output, the effects of noise and vibration, accident causation, labour turnover, repetitive work, vocational guidance and selection, sickness prevalence among printers, cardroom operatives and miners, humidity in mines, weight carrying, the physiology of exercise, the transfer of acquired skill, and the relation of age to the acquisition of dexterity, are all included among the subjects receiving consideration. Some activities concern problems of wide industrial importance; for others the material has been submitted by Government departments and industrial associations, while yet others are experimental researches carried out in laboratories. Knowledge is being gained; it remains to bring it to the attention of industry for practical application, for it should bring with it not only increase in health for the great working population, but increase in productive activity and wealth for the nation.

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[1] THE LANCET, July 27th, p. 183.

[2] Stejskal, K.: Med. Klin., 1929, xxvii., 1015.

[3] Goldzieher, M.: The Adrenals, London, 1929, p. 223 et seq.

[4] Ninth Annual Report of the Industrial Health Research Board to Dec. 31st, 1928. H.M. Stationery Office. 1929.

A notable example of the type of information made available by the publications of the Board is the report just published, dealing with monotony in work.[5] The investigation was made on workers employed on such repetitive processes as filament winding, soap wrapping, chocolate packing, and tobacco weighing. Boredom was found to be a fairly general experience; only about one quarter of the workers escaping it. Boredom was held to be responsible for reducing the rate of work by from 5 to 10 per cent., and was more prevalent when operatives were paid on a time-basis than on piece-rates. It caused irregularity in rate of work, and affected particularly workers of superior intelligence whose productive efficiency was above the average. Workers doing entirely automatic work did not suffer much from boredom, for their thoughts could safely be detached from work and directed to more interesting subjects; it will be remembered that Auguste Comte claimed that chances for philosophic thought lay in such occupations, and looked to find pupils among such operatives. Boredom occurred most in semi-automatic processes which require enough attention to prevent mind-wandering, but not enough for the complete absorption of mental activity. Continued exposure to monotonous work causes adaptation, so that what is initially tedious and unpleasant may finally be tolerated or even mildly enjoyed. The suggestion made in this report that, by completing the mechanisation of the task, boredom is avoided and thought stimulated is decidedly unexpected. On this assumption mass production by repetitive work, when carried to a fine art, would cure the very trouble it has always been accused of causing. Here is a problem, elusive and difficult of approach, wherein progress must necessarily be slow; but the theories now put forward are ready for practical trial.

THE EVOLUTION AND PURPOSE OF THE LARYNX.

SOME years ago Mr. V. E. Negus set himself the task of tracing the reasons for the existence of the larynx and the steps of its evolution in response to the many demands made upon it. He started upon his researches without preconceived ideas, and allowed them to follow the directions which seemed to be indicated by his attempts to correlate structure and function of this organ throughout the range of animal life. He has examined the anatomy and physiology of the larynx, with its associated organs, from its earliest inception in the lung-fishes, and on this study has founded theories which he expounds with good argument in a recent publication.[6] The superficial idea that the larynx is "the organ of the voice" is obviously untenable from the evolutionary point of view. The primitive larynx is a valve placed on the floor of the pharynx at the top of the pulmonary outgrowth to prevent water and food from entering the lung sac; in the most primitive forms it is surrounded by a muscular sphincter only, but in some lung-fishes dilator fibres are also present, and in the axolotl lateral cartilages have appeared with the function of keeping the valve open when air is entering the sac. From this point Mr. Negus traces the evolution of the larynx with a wealth of detail which is of absorbing interest. The nose is primarily intended for olfaction; in fish, with few exceptions, it does not communicate with the mouth, but in air-breathing animals it is necessary for olfaction that air should pass through the nose. In order to retain this passage of air while the mouth is open during eating the epiglottis has been developed, and all keen-scented animals have a big epiglottis lying normally in contact with a long soft palate. As a secondary function in many rapidly running animals the long epiglottis reaching into the nasopharynx is valuable for maintaining a straight and open air-way to the lungs. In many lowly animals the larynx is of a domed shape, a configuration which prevents the entrance of air except when muscular action provides an opening. Some of the higher animals possess secondary valvular folds formed by specialisation of the thyro-arytenoid muscle; these prevent the entrance of air with the minimum expenditure of muscular energy, and the best instances are to be found in arboreal animals, particularly actively climbing monkeys, and in the higher apes and man. Mr. Negus believes that the primary function of these valves is to hold the thorax rigid, and so to give a fixed point of origin to the pectoral muscles. These valvular folds, which are the vocal cords of man, we owe to our arboreal ancestry; they have been further developed by the specialised use of our fore-limbs, and their employment for speech is a secondary function. These theories and other matters relating to the forms and functions of the larynx throughout the animal kingdom are supported by careful observations minutely recorded. The book gives evidence of much specialised knowledge as well as of original thought, and will be of interest to biologists as well as medical men.

RETINAL ADAPTATION AND FLICKER.

THE fact that the sensation produced by a visual stimulus persists after the stimulus itself has come to an end has long been recognised. In 1765 D'Arcy made the first recorded attempt to measure the persistence of an image by the rate at which a burning stick had to be whirled before it would give an impression of a continuous circle of light. The modern method is to fix a rotating disk, with one or more sectors cut out, in front of a source of light and increase the speed of its revolution until the flickering impression gives way to a sensation of continuous light. A recent report to the Medical Research Council shows that appreciation of rapid stimuli varies in different regions of the retina and is dependent on the condition of adaptation of the eye. To produce the sensation of flicker the subject being experimented on is seated in a cubical box with a minute window through which he can view a test patch, either directly (foveal vision) or at an angle (peripheral vision); the sectored disk is then made to rotate in front of a gas-filled lamp. The number of interruptions per second necessary to do away with flicker is known as its "critical frequency," and this varies according to the state of adaptation of the eye, according to the region of the retina on which the light falls, and according to the illumination of the test patch and its surroundings. During dark adaptation with high illumination of the test patch the critical frequency falls With low illumination of the test patch for the peripheral retina the critical frequency during dark adaptation rises. In the first case the cones are functioning, in the second case the rods. The brightness of the area surrounding the test patch is the most important factor in determining whether the critical frequency is of the rod or cone type. The outcome of investigations pursued by this method is to confirm what is already known in connexion with the phenomena of flicker. The "duplicity theory" of a double mechanism depending on the rods and cones respectively is assumed, and receives support from the results obtained. A novel suggestion based on the critical frequency of the retinal periphery in bright light is that the peripheral cones are functionally not identical with the foveal cones. If this is confirmed it will be in accordance with the known anatomical differences of the cones in the two regions.

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[5] The Effects of Monotony in Work. By S. Wyatt and J. A. Fraser. Report No. 56. Industrial Fatigue Research Board H.M. Stationery Office. 1929.

[6] The Mechanism of the Larynx. By V. E. Negus, M.S. Lond., F.R.C.S. Eng., Junior Surgeon for Diseases of the Throat and Nose, King's College Hospital, London. With an Introduction by Sir Arthur Keith, F.R.S. London: Wm. Heinemann, Ltd. 1929. Pp. 528. 45s.

[1] Privy Council: Medical Research Council, Special Report Series No. 134. Reports of the Committee on the Physiology of Vision. V. The Adaptation of the Eye: its Relation to the Critical Frequency of Flicker. By R. J. Lythgoe and K. Tansley.

AVERTIN FOR TETANUS.

The first instance, so far as we are aware, of the employment of avertin to control the spasms of tetanus, is related by Prof. Fritz Momburg and Dr. E. Rotthaus.[1] The drug appears to have been of the greatest possible service. The history of the case is briefly as follows: On July 21st, 1928, a girl of 7 fell down and got a small wound in the left patella. On July 28th, after an incubation period of only seven days, convulsions and stiffness of the limbs began. On the 29th severe trismus, opisthotonos, and rigidity of limbs supervened. Under avertin narcosis (0·17 g. per kilo) the wound was excised. Tetanus antitoxin was given intramuscularly, intravenously, and intrathecally to the extent of 20,000 units. During the next six days another 30,000 units were injected. During the 12 days following the operation the child was put under the influence of avertin 20 times. On two of the days she was made narcotic with avertin no less than three times. The dosage ranged between 0·1 g. and 0·18 g. per kilo of body-weight, and altogether she received 68·8 g. The worst days were the sixth to eighth, and the most distressing symptom was the terrible diaphragmatic cramp. For control of this, chloroform and oxygen were employed, and several times respiration ceased entirely. From the fourteenth day onward there were no convulsions, and the trismus diminished. On the forty-ninth day the child was discharged well. The authors are of opinion that the relief afforded by avertin during the acute stages of the illness was greater than any they had ever witnessed from other sedatives in similar conditions.

ANTENATAL CLINICS.

An official memorandum[2] outlining the organisation of a modern antenatal clinic, and the minimum scope of its activities, is likely to be scrutinised with jealous care, for this welfare scheme has not been accepted so cordially by doctors, midwives or, indeed, by patients, as have the infant clinics. In fact, the exhaustive scheme accepted by the Representative Meeting of the British Medical Association last month mentioned the existence of antenatal centres only to express firmly the opinion that the usual routine work done there could be done quite as well at the consulting room of the doctor or at the home of the patient. Since, however, a national scheme which might render antenatal centres superfluous is as yet only in the stage of a resolution of the Representative Body, the views of the Ministry of Health on the organisation and duties of these centres are welcome.

No encroachment on professional interests is threatened by the memorandum; on the contrary, emphasis is laid on the advisory nature of the clinics, and on the desirability of restricting their work rigidly to the supervision of normal pregnancies. It is reasonable to demand that supervision must be adequate, since a false sense of security may do even more harm than neglect. A distinction made by the Ministry of Health between consulting clinics, staffed by expert obstetricians, for which no rules are laid down, and examination clinics, such as those subsidised by voluntary organisations or municipalities. The medical officer of one of these examination clinics, whether giving whole or part time service, should be trained and experienced both in obstetrics and antenatal work, and should have held a resident appointment in a maternity hospital or at least three months' post-graduate instruction at a recognised school. His first duty is to advise patients coming independently or sent by health visitors to book their confinements with doctor or midwife forthwith. When midwives send cases they are to be encouraged themselves to attend, and to make the necessary examinations under supervision, so as to avoid duplication, but every patient should be examined by a doctor at least twice during pregnancy. The suggestion is made that on booking a case the midwife should ascertain the name of the doctor the patient would wish to employ in case of need during labour, and should inform him of this possibility, and of the antenatal condition. Doctors may not altogether welcome a form of contingent booking which morally binds them to be available if difficulties occur, but on the other hand an unexpected summons to an unknown case may be even more unsatisfactory. Whatever the outcome of the labour, the midwife is to be asked to report to the clinic on its course, the local authority being advised to offer a small fee for a courtesy which is indispensable to the collection of reliable statistics. When a doctor has been booked for the confinement, and his patient attends the clinic, no examination should be made without his consent; he also is to be asked to report to the medical officer on the labour, no fee being mentioned in this connexion. Since, however, it is laid down that a doctor wishing to transfer the whole or part of the antenatal care of a patient to a clinic should be able to do so, he stands to gain so much from the facilities to be offered, which include reports on abnormal cases, that he is not likely to grudge information in return.

The reservation of beds in hospitals for abnormal maternity cases referred by clinics as well as by doctors is recommended in the memorandum; reciprocal advantage is an arrangement for patients living far from the hospitals where they intend to be confined to attend the nearest clinic during the whole or part of their pregnancy. One brief sentence implies the desirability of the extension of the maternity service throughout the country on lines already followed by the Hampstead local authority—the provision of obstetric consultants. The minimum number of routine examinations, according to the schedule, works out to nine or ten in normal cases, between the first examination at the sixteenth week and the confinement. This number may seem excessive, but most of the examinations need involve no more than measurement of uterine height and girth, auscultation of fœtal heart, tests of urine, and inquiries as to general health, and can be conducted by the midwife. At the thirty-second and thirty-sixth week the medical officer should endeavour to ascertain the presentation of the fœtus and the relation of head to pelvis.

The disadvantages of any system under which the doctor who examines a woman during pregnancy does not conduct her labour are obvious. But antenatal centres staffed by medical officers, to which practising midwives are welcomed with their patients, are a compromise which succeeds in providing for medical supervision in cases deemed to be normal, and for the diagnosis of abnormal ones, who are referred to the doctor concerned. In the present transitional stage of our maternity services it is not easy to suggest a better antenatal scheme than the one which would be available if all the welfare centres were raised to the standard indicated in this memorandum.

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[1] Deutsch. Med. Woch., July 21st, 1929, p. 1164.

[2] Maternal Mortality in Childbirth. Antenatal Clinics: their Conduct and Scope. Mem. 145/M.C.W. 1929. H.M. Stationery Office.

ANIMAL EXPERIMENTS.

BY a coincidence, the annual return[1] from the Home Office relating to experiments on living animals is issued this week, when the general arguments justifying vivisection are set out so eloquently in our columns by Prof. A. V. Hill. We need do no more than summarise the details of the return.

The names of 1310 persons who held licences for experiments on living animals during any part of the year 1928, and of the 256 registered places where such experiments can legally be performed, are set out. The number of experiments performed was 315,891, and these are classified according to their nature. Some 15,000 were performed under anæsthesia; this group includes all operations more severe than subcutaneous venesection. The rest, amounting to over 300,000, were mainly inoculations, but feeding experiments, the administration of substances by the mouth, by inhalation, or by external application, and the abstraction of blood by puncture or simple venesection, also come into this category.

It is often wrongly assumed that most of the operations are done in the hope of directly acquiring new knowledge; the truth is that the large majority are not experiments in this sense, but are biological tests necessary for the production or standardisation of drugs, serums or vaccines, or inoculations to confirm diagnosis. One licensee did over 60,000 experiments jointly with others, for the purpose of standardising drugs, and nearly all those who record large numbers of experiments performed under certificate A alone (that is, without anæsthetics, on animals other than dogs or cats, horses, asses or mules) were working for public health authorities, or in connexion with standardisation. The only reason for emphasising this distinction in purpose is to show how rigid is the supervision over even the most trivial routine animal inoculations, and how strict are the rules governing the issue of licenses. Registered places are constantly being visited by inspectors, mostly without previous notice, and the animals have been found suitably lodged and well cared for. The three irregularities reported during the year were obviously inadvertent and unimportant.

THE National Radium Trust have appointed Mr. P. Barter, of the Ministry of Health, Whitehall, to be Secretary of the Trust, and Mr. Niven F. McNicoll, of the Department of Health for Scotland, to be Assistant Secretary.

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[1] H.M. Stationery Office, 1929, pp. 68, 1s. 3d.

PURE RIVERS SOCIETY.—At a recent meeting of this society, whose address is 1, Lincoln's Inn-fields, London, W.C.2, resolutions were forwarded to the heads of Government Departments concerned with rivers pollution. The Minister of Transport is urged to make it a condition of grants to local authorities for road-making that they shall not use on roads any poisonous substance which may affect rivers. The Minister of Agriculture and Fisheries is invited to arrange that subsidies to beet-sugar or other industries should only be granted on condition that adequate provision is made against pollution. The Minister of Health is asked to obtain power to set up River Boards on his own initiative without, as at present, having to wait for applications by the local authorities. It is also urged that a central authority on the lines of the Railway Commissioners should be set up to deal with river pollution, and a resolution asking for an amendment of the law relating to prosecutions for pollution has been sent to the Prime Minister.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXXIX.

THE DICK AND SCHULTZ-CHARLTON TESTS.

THE Dick test closely resembles the Schick[1] test. People who are susceptible to scarlet fever and have no scarlet fever antitoxin in the blood, show a red flush on the forearm when 0·2 c.cm. of an appropriate dilution (about 1 in 1000 to 2000) of scarlet fever toxin is injected intracutaneously. This toxin is the filtrate of a broth culture of the streptococcus associated with scarlet fever. By the injection of about 5 c.cm. of a good concentrated scarlet fever serum, immediate protection, lasting from two to three weeks, can be conferred on such people or they may be given prolonged immunity by active immunisation with three or four graded doses of the toxin. The same general conclusions apply, *mutatis mutandis*, as in the Schick test, though the concordance between a negative reaction and degree of immunity is less close. Thus, whereas practically all patients suffering from diphtheria are Schick-positive, from 5 per cent. to 20 per cent. of those with scarlet fever when first seen may be negative to the Dick test. It is possible that the average Dick-negative patient does not possess quite as high an immunity to scarlet fever as the Schick-negative reactor does to diphtheria.

Reading of Results.

The reading is usually made overnight, though a positive reaction in some patients may be easily read as early as four to eight hours after the injection. The red flush usually fades 48 to 72 hours later. When the control toxin has been sufficiently heated, "pseudo" reactions are so rare that "control" injections, after a little experience of their use in a given group of people, may often be dispensed with.

Treatment and the Test.

The Dick test may help in deciding on the treatment and disposal of a patient with a rash possibly due to scarlet fever. A positive Dick reaction will be consistent with the diagnosis of scarlet fever; unfortunately, a negative response will not exclude scarlet fever, for in a given series of patients with scarlet fever perhaps 1 in 10 might be Dick-negative. It is curious that the swab and direct smear from patients with rash is not more widely employed in diagnosis. The smear from the typical scarlet fever patient shows numerous diplococci or short chains of cocci. Swabs in almost every instance yield large numbers of colonies of hæmolytic streptococci on a blood plate after overnight growth in the incubator; the zone of hæmolysis is easily seen with the naked eye. From patients with rashes due to measles, rubella, drugs, or enemata, this blood plate with almost pure culture of hæmolytic streptococci is rarely obtained, though a close examination may yield a few colonies in perhaps 5 to 20 per cent. of the patients tested, as in any sample of the general population. The examination of swabs from convalescent patients has already been discussed in this series by Dr. J. G. MacCartney (THE LANCET, 1928, ii., 565). Several writers have recently brought forward some evidence suggesting that the convalescent whose swab still yielded hæmolytic streptococci on discharge was more apt to cause "return cases" of scarlet fever than the convalescent with a negative swab, and in Germany the necessity of a negative swab before discharge has been officially discussed. Since at present probably from one-third to one-half of the convalescents discharged after scarlet fever still have hæmolytic streptococci in throat or nose, a new addition to the perplexities of the medical officer of health appears to be threatened.

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[1] The Schick test was discussed in this series last week.

Contacts.

The tests aids us in dealing with those who have been or are exposed to the risk of infection. Though some authors have reported instances of scarlet fever in people who have given a negative Dick reaction, these are rare. Fifty patients under Dr. Sage Sutherland's care in Manchester became exposed to infection; of 37 negative reactors, none suffered from scarlet fever, while of 13 positive reactors, six became infected. Of 168 Dick-positive reactors under Dr. W. T. Benson's observation in Edinburgh, 36 contracted scarlet fever, while of 97 negative reactors none was atacked. Nursing staffs naturally Dick-negative, or made negative by immunisation, in Edinburgh, Birmingham, Aberdeen, Cardiff, and other large isolation hospitals, remain free from the disease. It is thus reasonable to act on the assumption that a contact who is negative to the test, either naturally, after active immunisation, or after receiving a prophylactic dose of antitoxin, will not develop the disease (though in the last instance the protection is but temporary). A dose of 5 c.cm. is successful when used as a routine in hospitals to control ward outbreaks; in this way the necessity for closure of wards is reduced or wholly avoided.

The Schultz-Charlton Test.

If the serum of a patient convalescent after scarlet fever (which contains the specific antitoxin), or the serum of an immunised horse, be injected intradermally into an area of skin showing an early scarlet fever rash, a blanching of the rash an inch or more wide will be found next day, perhaps persisting until the rash fades. This result is apparently completely specific; a rash which shows the blanching must be due to a scarlet fever streptococcus. Unfortunately, it is in testing characteristic vivid rashes (where no confirmatory test is called for) that the blanching is most definite, while in some atypical rashes in scarlet fever the blanching may not occur, nor does it appear if the scarlet fever rash be more than three days old.

Active Immunisation.

When active immunisation is contemplated the Dick test may be used to find those susceptible to scarlet fever, though children are to-day injected by some authorities without preliminary testing. There is no reason why the Schick and Dick test—and the later immunisation where needed—should not be done simultaneously; the Dick control injection may be omitted without much risk of error.

Reservations.

The test has been used on a large scale in clinical work and its utility clearly demonstrated, but there are a number of points and exceptions to the usual rules not at present understood. Thus, a few patients on admission with undoubted scarlet fever are negative to the ordinary Dick test; a number of patients on recovery, even though untreated with serum, remain positive to the test; the young baby, even though born of a Dick-positive mother, is often negative to the test and may be left to suckle from a mother suffering from scarlet fever without risk that it will develop the disease; adult rabbits will die from intravenous injection of scarlet fever culture or toxin while young rabbits may escape. These discrepancies are not met with in connexion with the Schick test. One suggested explanation, put forward mostly by American and German workers, is that the Dick-positive response represents an "allergy," a sensitiveness to the protein or other constituent of the scarlet fever streptococcus. For a full discussion of these conceptions (which at present concern the research worker more than the practising physician) the original papers must be consulted. It is possible that the truth lies halfway and that as in the tuberculin reaction, both a specific toxin and a specific sensitising body, protein or carbohydrate, play a part.

Summary.

The typical patient suffering from scarlet fever is positive to the Dick and Schultz-Charlton tests, and a blood-agar plate shows almost pure culture of hæmolytic streptococci. These three tests, used with a recognition of their limitations, are of aid in the diagnosis and prevention of scarlet fever.

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Special Articles.

THE CHROMOSOME IMBALANCE THEORY OF CARCINOGENESIS.

BY J. A. MURRAY, M.D., B.Sc. EDIN., F.R.S.,
DIRECTOR OF THE IMPERIAL CANCER RESEARCH FUND.

Boveri's essay, "Zur Frage der Entstehung maligner Tumoren," was published in 1914. The stern preoccupation of the war and Boveri's death prevented any widespread discussion of his views. Recently both in Germany and in America renewed interest has been evinced in the theory he propounded and an admirable and faithful translation into English has been made by Mrs. Boveri.[1] Prof. M. N. Metcalf, who provides a sympathetic introduction to the translation, has, in another place, deplored that as the only pupil of Boveri engaged in cancer research, I have not explored the possibilities opened up by Boveri's theory. This fact, and the intrinsic interest of the theory, lead me to take this opportunity to give a summary of it and the reasons for my own attitude.

The Theory Summarised.

The theory may be summarised as follows. The cancer problem is a cell problem. The cancer cell is essentially a defective cell, and the defect is in the nature of an inherent permanent change imposed on it and all its progeny, at the time it arises from a previously non-cancerous ordinary cell of the body. One of the most clearly demonstrated ways in which a permanent transmissible defect can be produced in a cell is by the elimination of a chromosome or chromosomes from the nucleus, as occurs in multipolar mitotic division. As chromosomes each divide into two in mitosis, it is clear that the presence of more than two centrosomes in the mitotic figure must lead to an unequal distribution of the daughter chromosomes to the resulting daughter cells. Boveri's analysis of the consequences of a primary multipolar division of the disperm fertilised sea-urchin egg showed that the larvæ which develop are pathological when all the chromosomes take part in a single distorted equatorial plate surrounded by four attraction systems (tetraster). The four quadrants of the resulting blastula are pathological to different degrees and in different ways. Two of these pathological pictures are extraordinarily suggestive and impressive. In one, the cells leave the blastula wall and migrate into the blastula cavity, forming an irregular heap of rounded or polygonal cells. In the other the cells separate from each other and from the remainder of the blastula, and float away as free elements in the surrounding sea water. One seems to have in diagrammatic simplified form loss of differentiation, the breaking up of physiological union, and metastasis formation. This observation undoubtedly was the germ of the theory in Boveri's mind. In the first instance, and in its simplest form, the cancer cell arises singly as one of the products of multipolar mitosis, in which the fortuitous distribution of the half-chromosomes has resulted in a nucleus, capable of continued existence, but defective in chromosome-individuals necessary for the ordered growth and metabolism of the normal cells.

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[1] The Origin of Malignant Tumours. By Theodor Boveri. Translated by Marcella Boveri. London: Baillière, Tindall and Cox. 1929. Pp. 119. 11s. 6d.

Certain Objections.

When Boveri came to write up this idea in the form of a connected theory many further observations and analogies were drawn upon, and the discussion of objections, to which a separate chapter is devoted, is a fascinating example of subtlety, erudition, and scientific humility. He at once realised that the uniformity of the tumours which arise when the stroma of a transplantable mouse carcinoma undergoes sarcomatous transformation and, still more, the uniformity of the filterable tumours of the fowl, were fatal to the hypothesis which, in its original simple form, depended on the fortuitous result of multipolar mitosis. To meet this difficulty it was assumed that cell-poisons acting specifically on single chromosomes, inhibiting or enhancing their action, might intervene in the process. The analogy of certain hybridisation experiments with sea-urchin eggs was cited in support of this assumption. Baltzer, in fact, had shown that in some crosses only a few of the male chromosomes entered the fertilisation spindle and took part in the formation of the embryonic nuclei. The others remained inert and were handed on passively to one or other daughter cell till they degenerated. The theory of chromosome imbalance thus acquired a considerable increase of strength having, like the incalculable Kai Lung, a tale to fit any possible concatenation of circumstances.

Conclusion.

It is idle to speculate how the intensely practical experimental mind of Boveri would have reacted to the great acquisition of knowledge of carcinogenesis in the last ten or twelve years. A theory or hypothesis which could not lead to the planning of decisive experiments had little permanent appeal for him, and he candidly reports the complete unsuccess of the large number of experiments he himself carried out to test his views. On sending me a copy of the original paper in 1914 he wrote: "I expect you will smile at it, but one must do what one can." In spite of the most serious consideration of the theory, and an affectionate admiration for the author, I have never been able to acquiesce in the fundamental conceptions of cancer which underlie it. Loss of differentiation, loss of physiological control, are the negative side of the cancer cell. Its independence and greater adaptability to external conditions seem to me rather to indicate an acquisition of new properties, not defects. The recent attempt of Bauer still further to fortify the hypothesis by substituting destruction or inhibition (or conversely over-activation) of single genes only has the effect of withdrawing still further the theory from experimental proof or disproof and thereby lessening its utility. It is now many years since I relinquished the attempt, after laborious trials, to find constant significant alterations in chromosome numbers, nuclear size, or nucleus-protoplasm ratio in cancer cells. The facts, so far as they went, did not harmonise with Boveri's theory. The subsequent modifications, while they may diminish the weight of this negative evidence, do not furnish compensating advantages in devising more conclusive tests of it's validity.

A REDCAR HOSPITAL.—The Yorkshire borough of Redcar, which has a population estimated at 22,000, and receives many thousands of visitors every year, has hitherto been without a hospital. The need has now been supplied by the presentation to the town by Mr. Arnold Stead of his residence, Everdon, as a memorial to his father. The building, which has been adapted to hospital purposes, contains seven beds, and has been fitted with apparatus for sunlight treatment, was last week opened by the Dowager Marchioness of Zetland.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Edinburgh University: Address to Graduates in Medicine.

THE Professor of Bacteriology, Dr. T. J. Mackie, was charged with the duty of addressing new graduates in medicine of Edinburgh University last month. He reviewed the present system of medical education, which needed drastic revision. The outstanding faults of the educational system now in force were the products of its growth and evolution. Medicine was once entirely art; it was now mainly science, and was one of the great divisions of biology. The medical worker might well be the supreme biologist, and it was all-important that at the very threshold of university study there should be a rational introduction to general biology—not botany, zoology, or anatomy as such, but the science of life in its broadest aspects—leading up to the more specialised study of the biology of the human species, with whose vital problems the doctor had to grapple throughout his career. The physical sciences lay at the very foundation of biology and medicine. Some medical schools had attempted to relieve the pressure of their curricula by separating off such basic studies in the first of a six years' course, leaving five years for purely medical subjects. The addition of a year to the curriculum seemed at first sight the obvious solution of a difficult educational problem, but it might still be possible to maintain the original quinquennium by a closer coördination of these preliminary studies, one with another, and with that of anatomy and physiology during the first and second years. The latter subjects constituted an integral part of the fundamental biological training and with biology, physics, and chemistry, made up the complete basic structure of their educational edifice. From the study of normal biological phenomena, the student turned to the abnormalities, accidents, and infirmities from which humanity sought protection and relief. From biology as a pure science he passed to the applied biology of practical medicine. The question arose whether the existing system of examinations in subjects might be replaced by yearly examinations, corresponding to annual units of instruction. As to the clinical part of the curriculum, it was sometimes claimed that the scientific attitude was incompatible with practical work as a doctor, and that the so-called medical art should be inculcated by bedside training according to thoroughly practical tenets, leaving scientific medicine as a thing apart in the research laboratories. If medical training were stripped of its scientific instruction, however, it would hardly justify a University degree, and would be degraded back to a mere apprenticeship. The practice of medicine was becoming more and more of an applied science, and necessitated a training in fundamental principles. The practitioner was constantly confronted with problems that were only to be elucidated by scientific method. It must also be remembered that scientific applications and laboratory methods had in modern times proved their value in medicine to such an extent that the hospital ward was no longer the centre of gravity of medical enterprise. The laboratories were serving humanity in the cure and especially in the prevention of physical suffering, as much as were the clinics. Lastly, a medical education would serve our civilisation poorly if it did not kindle fires of research among those pupils of originality and initiative who were responsive to the inspiration of scientific teaching. Our present system of training did not provide sufficient opportunities for those who might wish a more complete science training. On the analogy of the honours degrees in other faculties there might be instituted an Honours Degree in Medicine, connoting special and advanced study of one or more branches of medical science in addition to the general curriculum.

Bi-Centenary of the Edinburgh Royal Infirmary.

Arrangements for the celebration of the bi-centenary of Edinburgh Royal Infirmary have now provisionally taken shape. The anniversary of the opening of the institution fell on August 6th, and as that is the time of the year when holidays take a great many away from the city, it has been decided to defer the public part of the celebration till early in October. August 6th, however, did not go unmarked; on that day, an illustrated commemorative card was distributed to every patient and every member of the staff in the infirmary. The proposal for October is that the bi-centenary should be the subject of a thanksgiving service in St. Giles Cathedral, and, later in the same day, of a public meeting, when an appeal will be launched for the extension scheme on the site of George Watson's College. The intention is to provide a maternity and gynæcological hospital for the accommodation of 240 patients at a cost of £300,000; certain notable donations have been already made to this end.

The late Mr. A. G. Miller.

The death occurred in Edinburgh on Monday, July 29th, of Mr. Alexander Gordon Miller, consulting surgeon to the Royal Infirmary, Edinburgh, in the eighty-seventh year of his age.

Mr. A. G. Miller was the son of Prof. James Miller, formerly professor of surgery in the University of Edinburgh, and was educated at Edinburgh Academy and the University, graduating in medicine in 1864. He held house appointments in the Infirmary, took the Fellowship of the Edinburgh College of Surgeons, and in 1877 became assistant surgeon to the institution. Five years later he was appointed full surgeon in the new Royal Infirmary which had just been built. It will be seen by the dates that when he received his staff appointment the question of antiseptic surgery and the value of the Listerian system was still acute, when he, with most of his younger contemporaries, recognised the value of the new work, while the seniors on the staff were unable to reconcile themselves to the revolutionary theories. But it must be remembered that many of those seniors were not, strictly speaking, consulting surgeons, but rather could be described as successful general practitioners, who carried on surgical work if and when required. Miller displayed in his surgical work considerable originality, being the deviser of a method for excising the knee, a method for reducing dislocation of the shoulder, and a new technique for disarticulation at the knee-joint. The general level of his teaching in the wards secured his appointment as lecturer on surgery and as an examiner in that subject at the University, and also at the Scottish Royal Colleges. Although he had outlived most of his colleagues, there are still students who remember the interest which he took in their careers, his enthusiasm as a volunteer, and his strong advocacy of the temperance cause. He was, and for good cause, very highly respected.

Dr. Thomas W. M. Cameron, M.R.C.V.S., of the London School of Hygiene and Tropical Medicine, has been appointed lecturer in Helminthology in the Department of Zoology of the University of Edinburgh, and the Royal (Dick) Veterinary College.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Rural Medical Service.

THE results of a study of 800 replies to a questionnaire on the availability, quality, and cost of medical service in rural districts throughout the United States is published in a recent issue of *The Farmer's Wife.* It is found that the average distance of the farmer from the nearest doctor is just over seven miles; the average time required for the doctor to reach the patient is, in summer, half an hour, and in winter, 50 minutes. Nearly one half of the farmers, however, are not satisfied to patronise the nearest doctor for all troubles, though nearly 90 per cent. will do so for minor ills. Where the choice of medical attendant is exercised, the average distance travelled by the doctor leaps from 7 miles to 19. Specialists are even more remote; 15 per cent. of the farms, for example, have no nose and throat specialist within a radius of 50 miles. The average distance to hospital is 18 miles, and the time needed to reach it 40 minutes in summer and 67 minutes in winter. There is some evidence that the modern public health campaign has penetrated even to remote districts. Two-thirds of the school-children have health inspection at least once a year, though only in about half of these inspections does a physician take any part. A nurse is usually present and active. In the event of sickness in the home, according to over 80 per cent. of the replies, a nurse is available within 12 hours. During the year the "average" farmer spends 105 dollars (about £21) on expense due to sickness. Of this, rather less than half goes in doctor's bills. The average fee charged for a home call was $7.63, for an "office" visit $1.50. It is interesting to learn that 95 per cent. of the homes had summoned a doctor for the birth of the last baby. The average fee for a confinement case is $28.33.

The Prevalence of Undulant Fever.

At a recent meeting of the Georgia State Medical Association Dr. E. A. Banker, jun., drew attention to the increasing importance of undulant fever in this country, and recommended that it should be made a reportable disease in all States. From the State of New York is reported the ironic fate of a health officer who declined to use pasteurised milk, favouring instead a small and well-supervised dairy, which gave milk unusually rich in cream. He fell victim to a continuous fever, and the State department, aiding in the diagnosis, was able to isolate *B. abortus* both from the patient's blood and from the blood and milk of one of the cows. At the same meeting Dr. T. E. Oertel, of Augusta, pointed out that serpents are still plentiful in the South-Eastern States, but that very few of them are poisonous. The great majority are not only highly ornamental but are useful to the farmer by feeding on vermin, and should be protected. The water snakes, however, should be destroyed for the protection of fish. By far the most important of the venomous snakes is the rattle-snake, which is easily recognised. There are also two species of coral snakes in the United States, only one of which is found in the East. During the year 1928 31 cases of snake-bites from poisonous serpents were reported in Georgia.

Possible Danger of Artificial Refrigerators.

The rapidly increasing use, partly no doubt the result of concentrated advertising, of artificial refrigerators in place of the once universal ice-box, lends a special interest to a coroner's inquest held at the beginning of this month in Chicago. The coroner's jury was composed of a group of distinguished scientists, including Prof. Hayhurst, of Ohio State University, and three professors from the University of Chicago. The coroner's chemist gave evidence that death was due to methyl chloride poisoning, and that guinea-pigs placed in the deceased's flat had also died from the same cause. A definite leak had been found in the refrigerator, and the air of the flat was found to be heavily contaminated with methyl chloride gas. The jury found that the cause of death was inhalation of this gas, and recommended that steps be taken to prevent further sickness and death from such causes. The city health officer and other physicians believe that there have been other cases of sickness and death from this cause in recent months.

Public Health Services.

PORT OF LIVERPOOL.

IN his report for 1928 to the Liverpool Port Sanitary Authority Dr. A. A. Mussen mentions 5110 visits of inspection paid to ships, of which 933 (948 last year) had nuisances on board; there were 3131 (3297) dirty forecastles, and 363 (409) foul w.c.'s. He explains that it is when men are leaving ships they permit their forecastles to become nuisances. Complaints are rare when crews are still attached to the ships, and this may be why dirty forecastles are less often noted on foreign ships, for only British ships discharge their crews at Liverpool.

Of 39 cases of enteric fever mentioned as occurring during voyages that brought ships to Liverpool, 23 were among the crews; the same was true of 28 of the 52 varicella cases. Sixty cases of tubercle were landed, their origin being unstated. No cases of cholera, plague, or yellow fever were brought ashore, but 12 rats were found to be infected with plague, none of which, however, was caught ashore. In 1928 plague was prevalent in Aden, Lagos, Rangoon, and Bombay: cholera in Calcutta and Shanghai; and yellow fever in South America and West Africa. Of anthrax, 8 cases appeared in or near Liverpool and one died.

On ships 29,189 (31,357) rats were found, and in the port 2250 (2382)—a decrease in spite of increased activity in the search. The city yielded 16,664 (17,671). This is the third year in which the total found in Liverpool has decreased, the figures being 55,012 in 1926, 51,410 in 1927, and 48,103 in 1928. Rats are decreasing on Liverpool ships, probably because the ships are being better rat-proofed. On 45 "rat-proofed" ships fumigation killed 3·1 rats per ship; on 68 ships, not rat-proofed, fumigation killed 25·5 per ship. On 16 ships of two unnamed companies which rat-proof their ships and keenly trap rats, no rats were found at all; 31 ships of other companies averaged 14 rats per ship. Rats are to be reduced, Dr. Mussen thinks, by careful supervision when loading abroad, by rat-proofing to prevent them from straying round the ship in search of water or nesting places, by trapping, and by periodic fumigation. Cats on board ship are too well fed to be any safeguard. Since October all foreign-going ships of the world have been examined for rats; if found free they get a deratisation exemption certificate, valid for six months; if rats are found fumigation is done and a deratisation certificate, also valid for six months, is issued under the sanction of the International Sanitary Convention. This Convention, signed at Paris in 1926, is set out at length in the valuable Appendix to the report.

The Seamen's Dispensary dealt with 2043 (1843) cases of venereal disease. In every 100 cases there were 33·5 of syphilis (a quarter of them not yet Wassermann-positive), 4·5 of soft chancre, and 62 of gonorrhœa. These are cases, not first infections. Of 101,725 male attendances in all the Liverpool treatment centres, 1579 were for soft chancre; but of 15,265 female attendances, only 4. Of 20,088 aliens who arrived at the port 9 were certified—5 for mental deficiency, 2 for venereal disease, 1 for hyperthyroidism, and 1 for epilepsy. Of 116,083 emigrants, 16 were rejected for infectious diseases. The arrangements for food inspection are given in detail; the amount condemned and supervised was 1967 (2621) tons; in this section of the report is an interesting discussion of the methods of preparation of currants in Greece. The Port Sanitary Authority gives certificates of disinfection before the export of rags, &c., and of the wholesomeness and cleanliness of preparation of exported foods.

This year's report contains much useful information, and the general provisions of the International Convention set out in the Appendix make it clear how greatly the confidence of the world in the work of the Port Sanitary Authorities of the other nations—formerly discussed with so much suspicion—has increased in the last 30 years.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of two large east coast seaport cities:—

Name of city and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Edinburgh .. (428,454)	17·3	13·7	1·05	1·60	2·2	2·1	75/30	39	7·8*
Hull .. .. (297,600)	20·5	12·8	1·21	1·44	2·2	2·3	79/30	30	4·1*

* These figures are not strictly comparable owing to the different methods of classification adopted by the English and Scottish Registrars-General. The figures for puerperal sepsis alone are Edinburgh 2·7, Hull 2·1; and the Hull figure for childbirth becomes 4·6 if three deaths associated with pregnancy and child-bearing be included.

Edinburgh.

Dr. W. Robertson describes a death-rate of 13·7 as a satisfactory figure, but points out that the congested areas sully the vital statistics. Thus the death-rates for St. Giles, St. Leonards, St. Andrews and North Leith wards were 18·5, 16·2, 15·7 and 17·2 respectively. The infant mortality-rate is the lowest ever recorded for the city. The scheme for providing cookery lessons for the mothers, with elementary appliances, such as are available in the poorest homes, has proved a great success. Illustrations are given of the lessons in progress, and of safe playgrounds for the children while the mothers are so engaged. A great point is made of using simple and often neglected valuable foods. One aim of the cookery lessons is to stimulate the housewives to desire a house in which the meals can be prepared with far greater ease. The various housing schemes have already demonstrated their value in the improved health of the children, and it is further hoped that the almost magical effect of a sojourn in a convalescent or holiday home on slum children should result in much more accommodation of this kind being provided. Recently four improvement schemes have been initiated involving nearly 2000 houses. Further progress depends upon the rate of building. Reconditioning is not likely to be of much service in the congested areas of large Scottish towns, in which the old-type of tenement with its long dark passages, gloomy ill-ventilated lobbies and centrally placed stairways prevails. The architect finds that it is cheaper to build new houses than to gut and recondition such old properties. Reconditioning, if it can be done cheaply, may occasionally be of some service for old couples, single persons and childless folk. For growing children the out-lying areas are the places for housing schemes. The worst statistics are recorded in those wards where one and two-roomed houses are most numerous. Thus St. Giles has 1142 single-roomed dwellings and 694 of two rooms, whilst St. Leonards ward has 1206 single-roomed and 2484 two-roomed houses. Many citizens have gladly seized the chance to change over into well-equipped municipal houses. The slum-dweller must now have his turn, says Dr. Robertson, and those who can afford to pay economic rents should not look to corporations to provide houses for them, but get into touch with building societies, &c. Schemes for providing well-conducted hostels for men and women are taking definite shape.

Turning to infectious diseases, Dr. Robertson points out that economies have been effected by treating more of the scarlet fever cases in their homes. Immunisation against diphtheria among school children can only proceed slowly with the present staff. The hospital experience during the year showed that immunisation by toxoid-antitoxin injections did not ensure absolute protection among the nurses. There were two cases of diphtheria in nurses, who had apparently been successfully immunised, but in each case the attack was mild and recovery rapid. On the other hand, there were no cases of scarlet fever among the immunised nursing staff. Dr. David Lees, the V.D. medical officer, brings out several interesting points. A much larger number of patients now come to the clinics to have their condition investigated, who, after searching tests, show no evidence of venereal infection. Thus the non-venereal cases attending the clinic have increased year by year from 727 in 1924 to 2362 in 1928. Repeated examinations are necessary to discover evidence of the gonococcal infection in ophthalmia cases, if a silver preparation has been used before attendance at the clinic. Vulvo-vaginitis in children, usually the result of sleeping with infected parents, requires long periods of hospitalisation for its cure. In-patient treatment is much more valuable in female infections and increased bed accommodation, especially for married women, is an urgent necessity. Intensive in-patient treatment for a few weeks often saves much time and suffering. The number of defaulters, who discontinued treatment before being cured was 863 and the report of the nurses, who follow up these defaulters and endeavour to get them to resume attendance, shows how hopeless this work frequently is, and justifies the proposals for some form of compulsion.

The death-rate from pulmonary tuberculosis was the lowest ever recorded and there is a satisfactory decline in non-pulmonary tuberculosis. During the year 16 patients were admitted to the Polton Farm Colony and 11 discharged. The expenses for the upkeep of the colony amounted to £3097, and the receipts from the sale of pigs, poultry, eggs and other produce were £1557—a net expenditure of £1540.

The testing of the Victoria Hospital tubercle-free herd revealed only one reactor, which had a small lesion in the mediastinal glands. The municipal farm has been reconditioned and during the spring and summer a herd of about 80 tubercle-free cattle was purchased, amongst which at the November retesting these was one doubtful reactor. All the municipal hospitals are now supplied with milk from this farm. The city cow population is 3421, and amongst these 48 tuberculous cows were found during the year and eliminated from the herds. The incidence of tuberculosis in the city and district as revealed by post-mortem statistics at the abattoirs, says Mr. A. Gofton, the chief veterinary inspector, shows no material change as compared with former years. Of 110 bulk samples of country milk 6 or 5 per cent. were found to be tuberculous—a smaller percentage than the average of recent years. Of the 187 samples of milk taken under the Sale and Food and Drugs Acts the city analyst reported 42 as adulterated. The average milk fat of all these statutory samples was only 3·48 per cent., which may be compared with the average composition of similar statutory samples, also including the adulterated samples, in the report of the Lancashire public analyst for 1927. It is there shown (p. 7) that the aggregate samples, numbering 87,981, taken in eight districts in the North of England over a period of years the average fat was 3·64 per cent., whilst the lowest average among the eight districts (Liverpool) gave an average of 3·60 per cent. One dealer in Edinburgh with two previous convictions against him was fined £35 for selling milk 30 per cent. deficient in fat and containing 38 per cent. of added water. There is said to be room for more antenatal work in Edinburgh, especially in the outlying parts of the city. Dr. T. Y. Finlay (M. & C.W.M.O.) points out that this work should be in close association with a maternity hospital and that, to be really effective, it should be in the charge of obstetric specialists, or expert doctors, who are in daily contact with midwifery practice. The fact that the health visitor is seldom in direct touch with the antenatal clinic also detracts greatly from the real usefulness of her visit.

The chief sanitary inspector, Mr. A. W. Ritchie, draws attention to the failure of householders to see that their water cisterns are cleaned every six months. This raises the point that no householder ought to use Edinburgh's excellent water for drinking purposes after it has passed through a cistern, even if it is cleaned out every day and that each house should be supplied with at least one tap direct from the main for drinking and culinary purposes. Liverpool have special powers to enforce this.

Hull.

Dr. W. Allen Daley (whose appointment as divisional medical officer to the London County Council has recently been announced) reports that the year has been a busy one, in planning for the unification of the medical services of Kingston-upon-Hull, and preparing for important developments with respect to the establishment of the new isolation hospital, the extension of the city's boundaries, and the taking over of the medical work now done by the Guardians. The interavailability of the clinics has worked successfully. Thus there were 11,315 attendances of pre-school children and expectant and nursing mothers at the Education Committee's clinics, and 733 of school children, and 1096 of tuberculosis cases at the M. & C.W. light clinic. The East Hull clinic is to be erected on the site adjoining the East Tuberculosis Dispensary and will provide for East Hull all clinics and treatment supplied by the M. & C.W. and school medical departments. The various authorities have also adopted a scheme for the inter-change of their medical staff. Thus medical officers can be taken from routine work and turned on to emergency work. Again, during holidays, school medical officers can be given work in other departments. Assistance when needed will be furnished to the port medical officer, who on his side, will take part in administrative work. The new scheme, in fact, provides for the same doctors to work in the M. & C.W., school medical, tuberculosis, and other departments, and this will not only be good for the patients, but will save the officers from getting into watertight compartments and from having a limited outlook. Four of the senior staff will be primarily each in change of a department, while available for work in other departments These four seniors meet the medical officer of health once a month to discuss administrative matters, whilst evening meetings are held from time to time of the whole of the medical staff, numbering 25, for the reading of papers, discussions, &c. The new isolation hospital has made progress. The first four pavilions are completed and it will probably be opened about August, 1929, after which the existing hospital will be adapted for use as a maternity home and infants' hospital to accommodate 81 patients It is intended to make this new maternity home a model of efficiency. At the end of the year the privy conversion scheme was nearly completed, 38,050 out of 40,050 conversions having been completed and 614 unnecessary privies and pail-closets removed. The 1380 remaining privies and pail-closets are mostly in property which has to be demolished or in unsewered areas.

The municipal houses erected numbered 1008 in the suburbs and 12 tenements in the New George-street area, where further demolitions have been effected and another block of eight tenements and four lock-up shops is being erected. Two further improvement schemes will shortly be undertaken. Central heating on the Cookanheat system has been installed in 2650 municipal houses. There is considerable prejudice against central heating among those who are accustomed to coal fires. Complaints have been received that when sufficient heat is raised to warm the bedrooms, the living rooms become unbearably stuffy. A plebiscite among the tenants showed 30 per cent. for and 70 per cent. against central heating, but some of them have changed their minds as the result of six months' trial of the installation. The corporation now contemplate building houses with sash windows, instead of casement, as being more easily openable in bad weather, and they are also constructing open fire-places with the fire in one room and the oven in another. In order to remove grounds for complaint in the centrally heated houses, ventilators are to be fitted in the living rooms. In some cases the tenants have neutralised one of the advantages of the Cookanheat system by using coal instead of a smokeless fuel. The municipal building programme is being extended and probably 1500 houses and flats will be erected in 1929. In all present or future schemes bricks are being used in preference to concrete or other patent forms of construction. On the East Hull estate there were 40 parlour houses to let at the end of the year, but there is still a demand for parlour houses in North and West Hull and a vigorous demand for the smaller type of corporation house at all-in weekly rentals of 12*s.* 2*d.* and 13*s.* 6*d.* for two and three-bedroomed houses respectively. Dr. Daley points out, however, that the housing problem is not solved until houses have been erected at rentals which can be paid by families of five or six with incomes from £2 to £3 per week.

The Hull medical committee on cancer, at the suggestion of the Ministry of Health, is to investigate cancer of the breast, uterus and rectum. Lectures on the early diagnosis and treatment of cancer are given to medical men and women, and the committee are taking steps to secure an increased amount of radium for the treatment of cancer in the city. Hull like Edinburgh, recorded its lowest infantile mortality figure in 1928, and this in spite of a hot summer and an increase in the diarrhœa deaths. The hours of bright sunshine were 1339 in 1928, 1118 in 1927 and 1299 in 1926. Dr. Daley compares the diarrhœa deaths in 1928 with the hot summer of 1911, when infant welfare work was in an undeveloped condition. In 1928 there were 64 diarrhœa deaths under 1 year, 8 between 1 and 2 years, 2 between 2 and 5 years and 8 over 5, whereas in 1911 there were 423 under 1 year, 105 between 1 and 2, 26 between 2 and 5 and 64 at ages over 5. There was an outbreak of small-pox during the summer, which lasted until November and gave rise to 65 known cases. The outbreak began with a family which contracted the infection in a town in the West Riding. They had stayed during Whitsuntide in a house where there was supposed to be chicken-pox. The disease was very mild in character and there were no deaths. In most of the cases the onset was characterised by headache, dizziness and a feeling of "swimminess," associated with vomiting; backache was not a common feature, and in only four cases was sore-throat complained of. Dr. Daley gives full details and shows how the spread of infection was apparently helped by continuous desks in the schools. The infectivity of the disease was not nearly so great as that of small-pox of a generation ago. As the first cases had about four weeks' start of the intelligence department, the task of searching out new cases in order to restrict the outbreak was one of great magnitude. It is hoped to develop an anti-rheumatic centre in connexion with the medicinal baths. Dr. Daley points out that insured persons in Hull consumed 22 per cent. more medicine than the average for the area.

The reductase test has proved satisfactory as a preliminary bacteriological test for milk. Of 82 samples of "outside" milk examined for tubercle, eight or ten per cent. gave a positive result. In following up the eight positive cases, tuberculous cows were only discovered on three occasions. In the remainder the offending cows had probably been sold. An East Riding cow-keeper, who sent two tuberculous cows to a Hull slaughter-house, was fined £25 for failure to notify. A "urinary" enteric carrier, who was under observation in 1927, was to be considered free from infection if four consecutive negative tests were obtained; after three negative tests in August and September, the October sample proved positive and he is still under observation. It has been decided to erect an orthopædic hospital of 100 beds adjoining the sanatorium and isolation hospital at Cottingham. There is a striking reduction in the notifications of ophthalmia neonatorum during the last two years. During 1928 651 cases were admitted to the maternity home for confinement and there were no maternal deaths. Early induction of labour was needed for 37 of the cases, and 32 of the babies were discharged alive. Of the five infants who were lost, one was the baby of an epileptic, one of a patient suffering from severe albuminuria, one was macerated and two died of pemphigus neonatorum. About 25 per cent. of the expectant mothers attended a municipal antenatal clinic. Among the 1561 women who so attended, there were only two maternal deaths—i.e., one death for 780 confinements—whilst among those who did not attend a clinic, there was approximately one death for 197 confinements.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 27TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 129 (last week, 144); scarlet fever, 1764; diphtheria, 933; enteric fever, 58; pneumonia, 852; puerperal fever, 35; puerperal pyrexia, 97; cerebro-spinal fever, 12; acute poliomyelitis, 12; acute polio-encephalitis, 1; encephalitis lethargica, 20; dysentery, 4; and ophthalmia neonatorum, 120. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on July 30th–31st was as follows:—Small-pox, 161 under treatment, 9 under observation (last week 173 and 3 respectively); scarlet fever, 1426; diphtheria, 1626; enteric fever, 12; measles, 317; whooping-cough, 339; puerperal fever, 25 (plus 12 babies); encephalitis lethargica, 123; "other diseases" 24. At St. Margaret's Hospital there were 15 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 (1) death from small-pox, 3 (0) from enteric fever, 33 (5) from measles, 7 (3) from scarlet fever, 24 (5) from whooping-cough, 13 (2) from diphtheria, 44 (10) from diarrhœa and enteritis under two years, and 20 (3) from influenza. The figures in parentheses are those for London itself.

Liverpool reported 7 deaths from measles, and Manchester and Bradford 3 each. Liverpool also reported 5 deaths from diarrhœa and enteritis, and Manchester and Salford 3 each.

The number of stillbirths reported during the week was 244 (corresponding to a rate of 35 per 1000 births), including 34 in London.

British Dental Hospital.—The annual report of this institution, the primary object of which is the establishment of centres at which dental treatment is available for persons unable to pay for private treatment, shows that last year the number of patients' attendances was 19,426. There are nearly a score of treatment centres and clinics in various parts of London, some of them with maternity, tuberculosis, and children's departments; at the Lewisham L.C.C. school dental, minor ailments, and aural central clinic there were 4815 attendances. Arrangements are being made for the establishment of additional clinics, and for the treatment at reduced fees of adolescents between the ages of 16 and 21, who are ineligible for dental benefit. Adolescents between the ages of 14 and 16, who are not insured persons, are already provided for by the hospital.

EXHIBITION
OF
DRUGS, SURGICAL INSTRUMENTS, FOODS, AND APPLIANCES AT THE BRITISH MEDICAL ASSOCIATION MEETING.

THE exhibition in the City Exhibition Hall, Manchester, which was open from July 22nd to 26th, was unusually complete and well arranged and gave practitioners attending the annual meeting of the B.M.A. an opportunity of refreshing their memory of products and appliances new and old. Ample space was provided for the exhibits and in every case the attendants were ready with expert advice. It is impossible to do more than indicate some of the products which attracted attention.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

1. *General Drug Exhibits.*

[12] and [35] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, E.C. 4), showed a series of preparations with the hall-mark "O.S. & Co.," including Roboleine and Vitad, the latter being the unsaponifiable fraction of cod-liver oil containing a high concentration of vitamins A and D, a palatinoid being equivalent to one-half or a whole teaspoonful of cod-liver oil.—[23] Bayer Products, Ltd. (10, St. Dunstan's-hill, E.C. 3), drew attention to a range of well-tested synthetic remedies including Adalin, Helmitol, Luminal, Phanodorm, and especially Avertin, a basal anæsthetic administered per rectum with advantages alike for surgeon, patient, and anæsthetist; also the Iso-double ampoule of Neo-salvarsan.—[33] The Saccharin Corporation, Ltd. (72, Oxford-street, W. 1), showed among their specialties Novocain, Glaucosan, Trivalin, and Causticin.—[36] Boots Pure Drug Co., Ltd. (Nottingham), had a large exhibit of fine chemicals and packed specialties including Sulphostab and Stabilarsan, an improved "914" for intramuscular injection, approved by the Ministry of Health. Bismostab contains a high concentration of metallic bismuth in isotonic glucose. Among other preparations Hexylresorcinol and Acriflavine were shown as well as Ephedrine and Insulin, at a present price to the patient of 1*s.* 8*d.* per 5 c.cm. ampoule of 100 units.—[48] Burroughs Wellcome and Co. (Snow Hill Buildings, E.C. 1) exhibited products resulting from recent scientific research and other preparations of outstanding importance in various branches of medicine, including micro-organism displays of scarlet fever, diphtheria, syphilis, influenza, pneumonia, leprosy, tuberculosis, and malaria. A number of plants selected from their Dartford farm reminded visitors that certain alkaloid-yielding plants can be cultivated to perfection in England.—[49] Sandoz Chemical Works (6, Wigmore-street, W. 1) had on view a new method of administering allium sativum and examples of Calcium-Sandoz, Sandoptal, Felamine, Femergin, Lobeline, and Scillaren.—[50] Schering, Ltd. (6, Lloyd's-avenue, E.C.3), called attention to Veramon as a safe and successful analgesic, Atophan, a popular uric acid eliminant, and Solganal, a new gold product of low toxicity for intravenous injection in tuberculosis and leprosy.—[61] and [62] Crookes Collosols (22, Chenies-street, W.C. 1) were showing original colloidal preparations for medicinal use with especial emphasis on Collosol Calcium, as employed in osteomalacia, tuberculosis, urticaria, and menorrhagia.—[67] Hoffmann-La Roche Chemical Works, Ltd. (51, Bowes-road, N. 13), over and above the well-known Omnopon total opium alkaloids, Sedobrol sedative bouillon, exhibited a tasteless non-toxic aperient known as Isacen with the composition diacetyl-di-hydroxy-phenyl-isatin. They also supply Thyroxin.—[70] Reynolds and Branson, Ltd. (Leeds), had on view a large series of elixirs, liquors, syrups, and tablets along with a vaccine for rheumatoid arthritis.—[71] May and Baker, Ltd. (Battersea, S.W. 11), commenced an exhibit with Novarsenobillon, Metarsenobillon, Metarseno-argenticum, running on through Stovarsol, Tryparsamide, and Stovaine to a series of vaccines and other remedies.—[73] Allen and Hanburys, Ltd. (48, Wigmore-street, W. 1), in addition to the various Allenburys foods and the "Byno" series of tonics, showed a number of "Polyglandin" preparations, as well as Insulin, Chrismol, liver products, and a selection of sera and vaccines prepared by the Lister Institute.—[76] Evans, Sons, Lescher, and Webb, Ltd. (60, Bartholomew-close, E.C. 1), demonstrated specialties manufactured at Liverpool and Runcorn. The biological products included Hepatex, a convenient form of liver extract for oral administration, Hæmex, and Infundibulin; among pharmaceutical specialties was Bi-drox, a stable form of hydrogen peroxide.—[85] Parke, Davis and Co. (50, Beak-street, W. 1) had on view many preparations manufactured at their Hounslow laboratories, including Metatone, Alophen pill, and Cascara evacuant. Their standardised cod-liver oil contains in each fluid ounce at least 18,500 units of vitamin A and 3000 units of vitamin D. Gland preparations included Estrogen, an extract of reproductive gland tissue, standardised in terms of rat units; also Pituitrin, Pitocin, Pitressin, and a preparation known as Thio-Bismol for intramuscular injection which being water- and tissue-fluid soluble is painless.—[91] Hough, Hoseason and Co., Ltd. (Bridge-street, Manchester), showed pharmaceutical specialties including elixirs of Formasal, Uralia, Lecitone, and Cardiotone.—[97] C. J. Hewlett and Son, Ltd. (35, Charlotte-street, E.C. 2), had a large exhibit of original preparations including Antiseptic cream, Liquor santal, Mist. pepsinæ co., Mist. damianæ co., and Hormonigen.—[99] British Drug Houses, Ltd. (City-road, N. 1), illustrated their pioneer work in the synthesis of vitamin D and the manufacture from natural sources of vitamins A and B, with an exhibit of Radiostol, Radiostoleum, and Radio-Malt. Other products shown were Acetylcholine, Liver Extract, Ephedrine, and Thyroxine.—[108] Lambert Pharmacal Co. (St. Louis, Mo. Agents: S. Maw, Son and Sons, 7–12, Aldersgate-street, E.C. 1) exhibited Listerine Brand antiseptic and demonstrated its germicidal action on various bacteriological cultures.

2. *Special Drug Exhibits.*

[11] Reed and Carnrick (Jersey City, U.S.A. Agents: Coates and Cooper, 41, Great Tower-street, E.C. 3) offered samples of such glandular preparations as Peptenzyme, Nephritin, Protonuclein, Pancrobilin, and Trophonine.—[30] Bristol-Myers Co. (112, Cheapside, E.C. 2) offered Sal Hepatica, Ipana tooth-paste, and Ziratol, a non-toxic hæmostatic antiseptic.—[31] J. F. Macfarlan and Co. (32, Bethnal Green-road, E. 1) exhibited Opoidine, a British preparation of alkaloids of opium, and catgut ligatures in glass tubes in American style, prepared according to Lister's and other formulæ.—[32] Anglo-American Oil Company, Ltd. (Camden Town, N.W. 1), had on view three well-established preparations: Nujol, an intestinal lubricant, Mistol, a combination of menthol, camphor eucalyptol, and chlorbutol for use in an atomiser, and Flit, a liquid insectide in spray form.—[53] Bemax Sales, Ltd. (7, St. James's-street, S.W. 1), called attention to a natural vitamin food and tonic in highly concentrated form. A month's supply of Bemax for an adult costs 2*s.* 6*d.*—[54] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C. 1), besides Angier's Emulsion, Bemax, and Californian Syrup of Figs, showed a large range of Seabury and Johnson's plasters.—[58] Kaylene, Ltd. (7, Mandeville-place, W. 1), offered a colloidally reversible hydrated silicate of alumina of great purity and other combinations of Kaylene, as well as Colonol Liquid Paraffin.—[60] Scott and Turner, Ltd. (Gallowgate, Newcastle-on-Tyne), showed Andrews Liver Salt, a pleasant saline aperient with brisk effervescence, leaving a clear solution.—[61] and [65] Deshell Laboratories, Ltd. (Braydon-road, N. 16), offered the Petrolagar Brand Emulsion, for the treatment of intestinal stasis, containing 65 per cent. of pure medicinal paraffin

atomised by hydraulic pressure and held by an emulsion of agar-agar. Four different formulæ are available.—[77] and [78] Armour and Co., Ltd. (St. Martin's-le-Grand, E.C. 1), had an exhibit of preserved glands in natural colours and offered Glanoid medicinal products of animal origin with a special demonstration of liver products.—[89] C. R. Harker, Stagg and Morgan, Ltd. (London, E. 1), offered their entirely British Petrolax, an emulsion containing 65 per cent. pure liquid paraffin of high viscosity, combined with agar-agar and free from starchy matter.—[95] Virol, Ltd. (Hanger-lane, Ealing, W. 5), besides their special combination of marrow fat, malt extract, eggs, lemon syrup, salts of lime and iron, showed also Virolax, a liquid paraffin containing 40 per cent. of virol, recommended for use in intestinal toxæmia and the disorders arising therefrom.—[101] The Regulin Syndicate, Ltd. (W. Bredt, 41, Great Tower-street, E.C. 3), offered Regulin (Helfenberg) for the regulation of intestinal function, consisting of agar-agar with 3¼ per cent. extract of cascara; also Blutan, Pneumarol, and Valofin.

3. *Toilet Preparations.*

[57] Kolynos Inc. (Chenies-street, W.C. 1) presented their dental cream, containing antiseptic properties without grit, as well as a denture powder and a skin soap.—[88] The Pepsodent Co. (8, India-street, E.C. 3) offered a dentifrice with an acid reaction, due to the presence of fruit acids, and a polishing agent composed of tricalcium phosphate and calcium sulphate.

FOOD AND DRINK.

[5] H.A.G. Coffee Co., Ltd. (40, Theobalds-road, W.C. 1), demonstrated a caffein-free coffee, cleansed also of impurities such as wax, without affecting the flavour or aroma.—[9] Stower's (Alex. Riddle and Co., Ltd., Bancroft-road, E. 1) showed a lime-juice cordial, first introduced in 1862, with the newer concentrated unsweetened juice, as well as lemon- and orange-squashes.—[20] Montgomerie and Co., Ltd. (Ibrox, Glasgow), showed Berina foods for infants and invalids, and Bermaline bread.—[21] Saorstát Eireann (15, Regent-street, S.W. 1) had excellent samples of creamery butter, dried and condensed milk, honey, and eggs from the Irish Free State.—[25] Cow and Gate, Ltd. (Guildford), added to their usual display Lacidac, a lactic acid milk powder, and Hemolac, a milk food for the treatment of nutritional anæmia in infancy.—[27] Sister Laura's Infant and Invalid Food Co., Ltd. (Bishopbriggs, near Glasgow), invited the medical profession to sample a food to be used with fresh undiluted cow's milk. —[37] and [40] Nestlé and Anglo-Swiss Condensed Milk Co. (6, Eastcheap, E.C. 3), besides their standard milk, milk food, and pure thick cream, displayed Lactogen, a dried milk modified by the addition of lactose and made on modern principles.—[39] Ingram and Royle, Ltd. (45, Belvedere-road, S.E. 1), brought forward numerous imported mineral waters, including Vichy-Celestins, Contrexeville "Pavillon," Evian Cachat, Carlsbad, and Hunyadi János.—[51] Oxo, Ltd. (Thames House, Queen Street-place, E.C. 4), showed Oxo, Oxo Cubes, Hospital Oxo, and Lemco, along with three organic extracts Oxoid, Liveroid, and Splenoid.—[56] Maison Ackerman-Laurance (St. Hilaire-street, Florent, near Saumur, France) gave special prominence to their exhibit of sparkling Saumurs, whilst on the same stand Messrs. Francesco Cinzano (Turin) exhibited their Italian vermouth.—[59] Energen Foods Co., Ltd. (Willesden, N.W. 10), showed the Energen bread and other foods, originally prepared for diabetic patients, now designed for the dietary of other metabolic disorders; also a series of Energen cereals.—[79] Vitalia, Ltd. (17A, Boniface-street, Westminster Bridge-road, S.E. 1), called attention to a meat juice prepared by a cold process which retains the natural vitamins and organic salts.—[90] Benger's Food had its usual display jars, showing the special features of the food, along with other products such as Liquor pancreaticus, Liquor pepticus, and Liquor thyroidin.—[92] Plasmon, Ltd. (66A, Farringdon-street, E.C. 4), called attention to an analysis of Plasmona, a concentrated and easily assimilable food preparation containing lipoid, liver, and protein components; also to Splenex, a pure extract from the spleen of the calf.—[94] Cadbury Brothers, Ltd. (Bournville), gave free sample cups of Bournville cocoa and showed other interesting products of the chocolate industry.—[102] Hovis, Ltd. (Macclesfield), demonstrated the processes used in manufacturing their well-known flour and offered samples for tasting.—[105] Frank Cooper, Ltd. (Victoria Buildings, Oxford), described the manufacture of "Oxford" marmalade and fresh fruit preserves.—[107] Jewsbury and Brown, Ltd., exhibited their Citoda water, a special soda water for medical purposes. They supply non-alcoholic wines and cordials.—[113] William Gaymer and Son, Ltd. (Attleborough and London), had their usual exhibit of dry cyder made from English apples.

SURGICAL INSTRUMENTS.

[6] Charles F. Thackray (Park-street, Leeds) had a compendious exhibit of instruments for abdominal and general surgery, with equipment of modern design for operating units.—[17] London Surgical Supply Co. (45, Church-road, N. 1) displayed a fine series of cystoscopes, sigmoidoscopes, urethroscopes, and bronchoscopes with a special collection of genito-urinary instruments, a large proportion of them being of stainless steel.—[22] Albert Browne, Ltd. (Chancery-street, Leicester), demonstrated Freund's new hysteroscope for detecting placental remains, and Zeiss's Evacuator for removal of fragments of stone under optical vision.—[24] Arnold and Sons (John Bell and Croyden, 50, Wigmore-street, W. 1) had on view every form of surgical equipment including their pedestal operation table on an oil-pump base, electrical instrument sterilisers, French's venesection apparatus, special syringes for varicose vein injection, and a series of ligatures and sutures subjected to strict bacteriological tests in their own laboratories.—[26] John Weiss and Son, Ltd. (287, Oxford-street, W. 1), displayed several new additions to their range of ophthalmic instruments and appliances, as well as equipment for the general surgeon, such as Robert Jones's bone instruments, Harrison's urethroscope, Putti's tourniquet, and Wilfred Harris's needles for trigeminal injection.—[28], [29], and [45] Mayer and Phelps (50, New Cavendish-street, W. 1) had a large selection of instruments and apparatus of original design for general and regional surgery, many in stainless steel. Popper's hæmostatic guillotine, an ingenious device crushing with 200 lb. pressure, and Lambert Rogers's skull plough with protective guard for the dura deserve special mention.—[41] F. C. Rein and Son (30, Charing Cross-road, W.C. 2) displayed their Diatonic Audiometer and an advanced type of hearing device known as the Viteron Compensator Model.—[47] Down Brothers, Ltd. (21, St. Thomas's-street, S.E. 1), had an exhibit covering the whole field of general and special surgery including Souttar's craniotomy instruments, Sinclair's instruments for fractures, Lane Joynt's skin-grafting instruments, Reavell Moseley electric suction apparatus, and much else.—[66] General Acoustics, Ltd. (77, Wigmore-street, W. 1), displayed Acousticon aids for the deaf with 50 different electrical types, each of which can be regulated in 110 degrees of volume.—[68] J. Gardner and Son (22, Teviot-place, Edinburgh) included in a comprehensive selection of instruments Fraser's laminotomy forceps, Wilkie's abduction splint, Douglas Guthrie's retractor and tongue forceps, and many others.—[72] Allen and Hanburys, Ltd. (48, Wigmore-street, W. 1), had on view the St. Bartholomew's Hospital latest model operation table with self-locking device and head clamp, instrument cabinets and tables in non-corrodible metal, and instruments for the introduction of radium needles and radon seeds.—[75] The Holborn Surgical Instrument Co., Ltd. (20, Thavies Inn,

E.C. 1), showed chrome-plated surgical instruments of all descriptions with electric diagnostic outfits and other devices.—[84] Billings and Sons, Ltd. (305, Oxford-road, Manchester), offered a number of improvements in surgical instruments and appliances such as Eve's Halometer, Wrigley's tonsil guillotine, Sankey's warm ether vapour apparatus, and Scannel's new apparatus for whole blood transfusion.—[90] R. H. Dent (309, Oxford-street, W. 1) displayed the latest models of the Ardente range of hearing aids.—[106] The Genito-Urinary Manufacturing Co., Ltd. (28A, Devonshire-street, W. 1), showed a range of special instruments, cystoscopes, lithotrites, and instruments for the application of radium.—[114] James Woolley, Sons and Co., Ltd. (Manchester), besides a large exhibit of galenicals, also showed surgeons' bags, stainless steel surgical instruments, blood transfusion apparatus, sterilisers, and syringes.

SURGICAL AIDS: HOSPITAL AND LABORATORY EQUIPMENT.

[2] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, W. 1), illustrated many medical applications of heat including the Ultradescent Luminous Heat Ray Appliance with vita-glass bulb. Their Subaqueous Bath fittings permit of airtight and watertight colonic irrigation free of smell.—[4] Restiform Specialities, Ltd. (Pembroke-place, Liverpool), demonstrated a hospital bed so constructed that the patient merely by his own movement can at will adjust the angle at which he is lying through seven positions. —[8] Whitfield's Bedsteads, Ltd. (109, Watery-lane, Bordesley, Birmingham), had a selection of "Lawson Tait" bedsteads and a special bed-lifter.—[14] Campoirette, Ltd. (252, Regent-street, W. 1), showed the Camp Physiological Supports for abdominal treatment.—[15] Antiphlogistine was displayed as the best-known method for the continuous application of moist heat. By osmosis and cutaneous stimulation it maintains the circulation and aids in eliminating toxins.—[10] Short and Mason, Ltd. (Macdonald-road, Walthamstow, E. 17), exhibited a series of accurately calibrated "Tycos" instruments—sphygmomanometer, thermograph, micro-barograph—as well as urinalysis glassware.—[34] Holophane, Ltd. (Elverton-street, S.W. 1), demonstrated the transmission by ultra-violet rays of Holviglass, which is colourless, permanent, and stronger than ordinary glass.—[42] Ronuk, Ltd. (Portslade, Sussex, and 16, South Molton-street, W. 1), showed their floor polish and preservative stain, together with weighted polishing brushes suitable for hospitals.—[43] Cambridge Instrument Co., Ltd. (45, Grosvenor-place, S.W. 1), laid emphasis on their Portable Electrocardiograph which weighs in all 110 lb. and has most of the virtues of the standard pattern.—[40] Chas. Hearson and Co., Ltd. (24, Fenchurch-street, E.C. 3), had a display of Research Apparatus, pathological, biological, bacteriological, and biochemical, and a good selection of well-known makes of microscope, and were demonstrating Venules.—[52] The Inhaling Drug and Apparatus Co., Ltd. (Windsor House, Victoria-street, S.W. 1), showed the Spiess-Drager apparatus for nebulising various medicaments in a current of oxygen, the diameter of the particles being in the neighbourhood of 10 μ.—[63] H. E. Curtis and Son, Ltd. (7, Mandeville-place, Wigmore-street, W. 1), exhibited their devices for securing the support of ptosed organs and various forms of hernia.—[74] J. Nesbit-Evans and Co. (Wednesbury, Staffs.) showed many kinds of bedstead, including the "Anti-accident" children's cot and the "Hey-Groves" Special orthopædic bedstead.—[81] and [82] The "Vita" Glass Marketing Board (Aldwych House, W.C. 2), describing their product as the only British window glass admitting the natural health-giving rays of sunlight, announced that already over 100 schools and nearly 200 hospitals have been fitted with it.—[98] Spencer Corsets, Ltd. (Banbury, Oxon., and 96, Regent-street, W. 1), had a variety of surgical supports and garments including a corset for the treatment of sacro-iliac strain.—[108] The Condensed Gas Co., Ltd. (171A, Oxford-road, Manchester), showed their novel "Titan-Ese" control valve for gas cylinders which is designed to eliminate all need for elaborate gas stands incorporating fine-adjustment devices. They offered facilities for making apparatus to the purchaser's design.—[112] Theodore Hamblin, Ltd. (15, Wigmore-street, W. 1), set out a large number of ophthalmological instruments and aids—among them the New Lister Morton ophthalmoscope, a convenient Harrison Butler hand slit-lamp, and a tubular resistance for using ophthalmoscopes from the main current. They also showed Speclettes, which are folding spectacles for the pocket.—[115] Kodak, Ltd. (Kingsway, W.C. 2), exhibited X ray negatives on "Dupli-tised" X ray film, together with dental film negatives and cinematographic apparatus and accessories for clinical photography.—[117] Philips Lamps, Ltd. (145, Charing Cross-road, W.C. 2), showed their "Metalix-Portable" X ray apparatus, which can be worked from any electric light socket. Among X ray tubes on view was a deep therapy tube, Type F, for operation at 220,000 volts and a miniature tube for skin therapy by the Bucky method.—[118] Messrs. Schall and Son, Ltd. (75, New Cavendish-street, W. 1), displayed a selection of the X ray and electro-medical apparatus which in their experience is most popular for cottage hospitals and general practice. Their Diathermy Special Surgical Model supplies a cutting current and is designed for the use of surgeons employing the electro-surgical technique described by Harvey Cushing and Wyeth. —[119] Hoskins and Sewell, Ltd. (Bordesley, Birmingham), drew attention to devices by which their hospital bedsteads have lately been improved. They showed a wheeling ward screen and a "Luxor" adjustable bedstead which can be used in seven different positions.

MISCELLANEOUS.

[1] The Medical Insurance Agency (B.M.A. House, Tavistock-square, W.C. 1) offered evidence of its expanding work and of the benefits obtainable by insuring persons or property under its auspices. Grants made to medical and other charities now amount to £22,980.—[44] The Food Education Society (29, Gordon-square, W.C. 1) described its work in arranging lectures and cookery demonstrations, and exhibited useful publications on dietetics and hygiene.—[55] The British Medical Bureau (12, Stratford-place, W. 1) set out advantageous terms on which it assists in the transference of practices and makes arrangements for locum tenents, resident patients, and accountancy.—[69] The Medical Sickness, Annuity and Life Assurance Society, Ltd. (300, High Holborn, W.C. 1), drew attention to their liberal sickness, accident, life, educational, and partnership assurance policies. The Society is now prepared to lend money for house purchase.—[83] The Hot Springs of Bath had an exhibit illustrating their manifold amenities, and [100] Harrogate called special attention to the systematic training of the staff of its bathing establishments.

Many of the principal medical publishers displayed copies of their new books and new editions.

HOSPITAL COÖRDINATION AT BRISTOL.—The Bristol Hospitals Representation Committee, which has been considering the best means of coördinating the work of the city's hospitals and medical institutions, has recommended the creation of a hospitals council. It is suggested that the functions of this body should be to collect and publish information as to the hospital needs of the area, the sufficiency of beds and finance, to prevent overlapping, to consider and criticise proposed extensions of existing and the erection of new hospitals, and to propose and advocate such extensions and erections. The scheme has been endorsed by the council of the Lord Mayor's Hospital Committee at a meeting at which Dr. R. A. Askins, the medical officer of health, stated that the Bristol hospitals were in some respects overlapping, and in others competing or not meeting the public demand.

Correspondence.

"Audi alteram partem."

AURAL DISEASE AND BATHING.

To the Editor of THE LANCET.

SIR,—In answer to the inquiry by "F.R.C.P." as to the "special measures to prevent excessive contamination of swimming baths," it may be stated that the system of continuous filtration, disinfection, and aeration provided by the various types of special plant installed for that purpose in a large number of the public baths in London and the provinces has gone far to meet the need for counteracting their pollution, as well as the call for economising the water-supply. Additional precautions, including the direct supervision of bathers before entering the bath, and attention to details of their personal cleanliness, such as are reported to be stringently applied in the United States, though affording further safeguard against risk of contamination, are probably considered too exacting for application in this country and likely to be strongly resented by the British bathing public. It is true that evidence as to the presence or absence of the *B. coli* group is regarded as supplying a convenient standard of bacterial pollution, in addition to the enumeration of the total organisms per c.cm. The standard recommended by the American Public Health Association is that they should not yield more than 1000 organisms per c.cm. after 24 hours' incubation at 37° C. in over 10 per cent. of samples of swimming bath water, with no single count of more than 5000 per c.cm., and the presence of *B. coli* in not more than two out of five samples of 10 c.cm. of water taken on the same day. Unless special investigations are required, particular attention is not usually paid to streptococcal contamination as a routine, although there is little doubt that its presence can be detected without difficulty in subculture tests from the primary plate cultures. As an example may be quoted a qualitative analysis,[1] made some years ago, of water from a small covered swimming bath, detailing the various organisms identified in an approximate count of 4000 colonies per c.cm. Subcultures from a number of scattered colonies showed that over 50 per cent. belonged to the proteus and *B. coli* groups, 12 per cent. were *Staphylococcus pyogenes aureus*, and 4 per cent. *Streptococcus fæcalis*, in addition to a similar proportion of a Gram-negative diplococcus (possibly *Micrococcus catarrhalis*), *Staphylococcus albus*, and *Sarcina lutea*. Chemical analysis also is helpful in affording evidence of degrees of pollution, and, especially when chlorination is used for disinfection, the estimation of the amount of available free chlorine, on account of its bactericidal action, can and should be regularly carried out by simple test, or by the use of the chloroscope, to ascertain that the necessary 0·2 parts per million free Cl is maintained.

The question of the prevention of pollution of swimming baths formed the subject of a detailed discussion at a meeting of the Medical Officers of Schools Association[2] in May, 1927, and was fully reported in the Association's annual report for that year. It is significant that, as compared with the attention paid to the safeguarding of the general public, precautions to ensure the hygienic condition of swimming baths in the great majority of our private and public schools leave much to be desired.

I am, Sir, yours faithfully,

August 3rd, 1929. J. GRAHAM FORBES.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. A. B. Cox is placed on the Retd. List with rank of Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. E. H. Parkinson to be Surg. Lieut.

Proby. Surg. Lt. (D) W. R. Young to be Surg. Lt. (D).

The King has approved of the award of the Royal Naval Volunteer Reserve Officers' Decoration to Surg. Lt.-Comdr. J. Lorimer.

ROYAL ARMY MEDICAL CORPS.

Maj. W. B. Laird retires, receiving a gratuity.

Maj. T. H. Dickson retires on ret. pay.

Lts. G. Anderson, R. J. G. Hyde, and R. V. Franklin to be Capts.

ARMY DENTAL CORPS.

Capt. A. V. Milnes to be Maj.

ARMY RESERVE OF OFFICERS.

Army Dental Corps: H. Wade, late Capt., Ind. Army, to be Capt.

TERRITORIAL ARMY.

Lt. G. W. Robinson to be Capt.

S. Newsom to be Lt.

Capt. G. F. Wilson, having attained the age limit, relinquishes his commn.

Capt. Alexander Graham Bryce (late R.A.M.C.) to be Capt.

Capt. D. Stewart, from T.A. Res. of Off. (4th/5th Bn. R. Scots), to be Lt.

Lt. R. E. Rees (late 6th Bn. R.W. Fus.) to be Lt.

Supernumerary for service with O.T.C.—A. J. Parer to be Lt., supern. for serv. with Med. Unit, Univ. of London Contgt., Sen. Div., O.T.C.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt. E. L. Hanc [illegible], from the Active List, to be Lt.

RESERVE OF AIR FORCE OFFICERS.

E. J. Mockler resigns his permanent commn. in the Royal Air Force and is granted a commission as a Flight Lt., Class D.i.

INDIAN MEDICAL SERVICE.

Lt. Mohan Lal Ahuja to be Capt.

Lt. (on prob.) F. W. H. Caughey to be Capt. (prov.) (on prob.).

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 24TH.

Grinding Wheel Closed at Sheffield.

Mr. HOFFMAN asked the Home Secretary whether his attention had been drawn to the closing of the Corporation-street grinding wheel in Sheffield, which had thrown out of employment 40 to 50 men; and what was the reason for this step taken by the factory inspector.—Mr. CLYNES replied: It is reported to me that the conditions at these premises have been very unsatisfactory, and in particular that some of the most important provisions of the Regulations for the grinding of cutlery and edge tools are not complied with. This Code of Regulations was made as long ago as 1925 to protect the workpeople from the grave danger of silicosis of the lungs; a period of three years was allowed before some of the Regulations became operative, so as to give owners and occupiers of premises an opportunity of making any necessary alterations in the ventilating and other arrangements, but notwithstanding this and repeated warnings from the factory inspector since January last, the owners of the property have not found themselves able to bring it into compliance with the law. In these circumstances the inspector came to the conclusion, which I think was fully justified, that he could not acquiesce in work being continued under these unsatisfactory conditions until the premises were put in order. I am glad to say, however, that the hon. Member would appear to have been misinformed as to the number of persons likely to be thrown out of employment; the inspector reports not only that the number working there has been much smaller than 40, but that most of these are obtaining, or have obtained, places elsewhere, and that so far as he can judge only three or four are still seeking places.

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[1] The Pollution of Swimming Baths, School Hygiene, 1912, iii., 79.

[2] See THE LANCET, 1927, i., 1143.

THURSDAY, JULY 25TH.

Nursery Schools.

Lady CYNTHIA MOSLEY asked the President of the Board of Education whether he could state plans for the more general extension of nursery schools; and whether he proposed to ask for powers to require local authorities to establish nursery schools in their areas.—Sir CHARLES TREVELYAN replied: I am considering the best way of securing an extension of nursery schools, but I cannot make any definite statement before the House rises for the recess.

Contagious Abortion and Malta Fever.

Mr. GUINNESS asked the Minister of Agriculture whether his attention had been drawn to evidence recently published connecting outbreaks of undulant or Malta fever in human beings with the consumption of milk from cattle suffering from contagious abortion; and whether he would take any action to clear this matter up, either by veterinary research or in conjunction with the Medical Research Council.—Mr. BUXTON replied: I understand that the Ministry of Health will shortly issue a report containing the evidence, mainly obtained abroad, on which is based the theory that a form of undulant fever is caused by the bacillus which produces abortion in animals. The publication of this comprehensive report will attract the attention of medical and veterinary practitioners and research workers to the study of this question on which so far as this country is concerned there is at present very little information.

Hospitals and Motor Accidents.

Mr. LOUIS SMITH asked the Minister of Transport whether, in view of the accumulation of accidents directly or indirectly due to motor traffic which had to be treated in the hospitals of the country, often to the exclusion of local patients, he would investigate the possibility of legislation aimed at permitting such hospitals to recover expenses as in the analagous case provided by Section 16 of the Local Government Act, 1929, or by some earmarked addition for the benefit of the hospitals to the statutory motor licence or driver's licence.—Mr. HERBERT MORRISON replied: I am advised that Section 16 of the Local Government Act, 1929, applies to hospitals maintained by local authorities. I do not think that it would be practicable to apply similar provisions to other hospitals or to impose an additional statutory charge for drivers' licences with a view to dividing the proceeds among them.

Manufacture of Vaccine Lymph.

Mr. GROVES asked the Minister of Health if he would supply particulars of the various changes which had been made in the manufacture of vaccine lymph issued by his department since the system of public arm-to-arm vaccination was abandoned.—Mr. GREENWOOD replied: My hon. friend will find a full statement on the technique and procedure adopted in the preparation of vaccine lymph in the Report of the Vaccination Committee, 1928, pp. 16–17.

Vaccination.

Mr. BROAD asked the Minister of Health whether he was prepared to guarantee that any child or person vaccinated with Government lymph would not be seriously injured by the operation; and, if it was not possible, whether he would consider the desirability of introducing legislation to secure that compensation should be given in such cases to the parents or dependents, as the case might be.—Mr. GREENWOOD replied: It is impossible to give an absolute guarantee that no person vaccinated with Government, or any other, lymph will suffer injury, but I may point out that the lymph produced by the Government Lymph Establishment complies in all respects with the standards laid down in the regulations made under the Therapeutic Substances Act. As regards the second part of the question, as at present advised, I could not undertake to introduce legislation on this subject.

Mr. BROAD asked the Minister of Health when rabbits first began to be used in the production of Government lymph supplies; whether any cases of post-vaccinal encephalitis were reported in this country prior to such introduction of rabbits; and whether his medical advisers had considered the desirability of dispensing with the use of rabbits for the purpose in question.—Mr. GREENWOOD replied: Rabbits have been systematically used for this purpose since 1902. No case of post-vaccinal encephalitis was reported in this country until December, 1922. As regards the last part of the question, the desirability of dispensing with the use of rabbits has been considered, but it was not deemed necessary to recommend any change in the present practice.

Pollution of the River Lea.

Major CHURCH asked the Minister of Health whether he was aware that the River Lea from Tottenham lock downwards through the districts of Hackney and Homerton was, and had for many years been, in a foul condition; and whether, as this stretch of the river was a menace to the health of residents near its banks, he would take steps to ensure that the river was restored to a reasonable standard of purity.—Mr. GREENWOOD replied: Several large schemes of sewerage and sewage disposal have been carried out at heavy cost in recent years by local authorities with a view to improving the condition of the river. I am arranging for a visit of inspection in the near future.

Report on River Pollution.

Rear-Admiral BEAMISH asked the Minister of Agriculture whether the report of the Standing Committee on River Pollution, which the Ministry undertook to issue after a decision reached in February, 1928, could now be issued.—Mr. BUXTON replied: The preparation of this report involves an analysis of a large number of river surveys. I anticipate that the draft report will be ready for the consideration of the Standing Committee in the autumn, and the review of river surveys will include those carried out in 1928.

Water Supplies.

Sir WILLIAM DAVISON asked the Minister of Health whether, in view of the menace to the health of London through an impending shortage of water in London, he would make an inquiry as to the amount of water available; and what, if any, restrictions in the use of water were immediately required or contemplated.—Mr. GREENWOOD replied: I am assured that no serious shortage of water in London is to be expected, because of the large storage capacity which has been provided by the Metropolitan Water Board. The restrictions now in force have been imposed because of the very large increase in consumption and to prevent possible difficulties of distribution in certain areas. I understand that no further restrictions are contemplated.

Removal of Panel Practitioners.

Mr. DAY asked the Minister of Health whether he could give the reasons for the removal of the 46 insurance practitioners who had been removed from the medical list since 1918.—Mr. GREENWOOD replied: The reason in each case was that the Minister was satisfied after the prescribed inquiry that the continued inclusion of the practitioner in the medical list would be prejudicial to the efficiency of the medical service of the insured.

War Pensioners and Tuberculosis.

Mr. DAY asked the Minister of Pensions the number of war pensioners suffering from tuberculosis who were at present receiving treatment in sanatoria, and the number of such cases that were in sanatoria attached to a village settlement.—Mr. F. O. ROBERTS replied: The total number of pensioners at present receiving treatment in sanatoria is 1044, of whom, so far as can be ascertained, 68 are in sanatoria attached to village settlements.

Food Council and Milk Prices.

Mr. WISE asked the President of the Board of Trade what was the view of the Food Council concerning the 60 per cent. to 100 per cent. margin over the farmers' prices to be charged by the milk combine and other distributors under the scheme now under consideration; and what he proposed to do.—Mr. W. GRAHAM replied: The scheme under consideration is a complicated one, designed to apply to the milk trade throughout both England and Wales. The Food Council consider it necessary to consult the associations of milk distributors in order to have the details more clearly before them, and the matter will accordingly be discussed with those associations as soon as practicable. The scheme, if approved, would not in any case come into force until Oct. 1st.

All-India Medical Council.

Major GRAHAM POLE asked the Secretary of State for India if the Government of India had made any progress towards the establishment of an All-India Medical Council; and why no steps had been taken to appoint a government commissioner of medical qualifications and standards despite the fact that this appointment was provided for in the existing law and had been approved in principle by the central and provincial governments.—Mr. BENN replied: The Government of India recently convened a conference of representatives of provincial governments to consider the proposal to create an All-India Medical Council. I have not yet received a report of the conference. I hope to be able shortly to make an announcement regarding the appointment of a Commissioner of Medical Qualifications and Standards.

Removal of Trade Refuse.

Sir GEORGE HAMILTON asked the Minister of Health whether, in view of the divergence of opinion as to the correct definition of trade refuse, he would consider the question of amending Section 42 of the Public Health Act, 1875, and Section 48 of the Public Health Acts (Amendment) Act, 1907, to permit a local authority to treat refuse from shops under the same heading as house refuse and to collect it without charge, thus altering the present situation whereby the refuse from one shop was house refuse and from another shop trade refuse.—Mr. GREENWOOD replied: This matter has already been noted for consideration when an opportunity occurs to amend the Public Health Acts.

Eyesight Injuries in Engineering Workshops.

Mr. JAMES WILSON asked the Home Secretary whether he was aware of the injury caused to the eyesight of employees in engineering workshops through the lodgment of foreign matter in the eye; and whether he would make arrangements for the appointment of an eye specialist in engineering towns, at which such employees could receive treatment on production of their medical card.—Mr. CLYNES replied: I am aware of the liability to eye injuries in many engineering processes, and the first-aid arrangements which are required to be made at every factory provide for the first-aid treatment of these injuries. Arrangements, however, for the provision of any specialist treatment which may be necessary subsequently are outside the scope of the Factory Acts, and all I can offer is to bring the hon. Member's suggestion to the notice of my right hon. friend, the Minister of Health.

Health of Metropolitan Police Constables.

Lieut.-Colonel HENEAGE asked the Home Secretary the hours of employment of police constables of the Metropolitan police on traffic duty; and the number of cases of illness or overstrain which had resulted from these hours.—Mr. CLYNES replied: The duty period is eight hours with a break of half an hour for refreshments. I am informed that there is no evidence of cases of illness or overstrain resulting from the length of the duty period.

Miners and Anthracosis.

Mr. HOPKIN asked the Secretary for Mines if he would assure miners who suffered from anthracosis that they would have compensation at least to the same extent as those who suffered from silicosis and under the same conditions.—Mr. CLYNES replied: By anthracosis I understand the hon. Member to mean the blackened condition of the lungs which is sometimes caused by inhalation, over a considerable period, of coal dust. I have at present no evidence that this condition disables the workman, but an inquiry is in progress under the direction of the Health Advisory Committee of the Mines Department, and the matter will be further considered when the results of this inquiry are available.

THE LATE DR. STANLEY BOTT.

WE have already recorded the death of Dr. Stanley Bott, at the age of 50, after a long period of indifferent health. He was a student of the London Hospital, which he entered in 1900. Qualifying as M.R.C.S. five years later he visited Australia as a ship's surgeon, and then undertook a series of house appointments at Dorchester, Reading, and finally at the Westminster Hospital, where he was resident obstetric officer. With this experience behind him he took over a practice at Caistor in Lincolnshire, in a scattered agricultural district. He had few interests outside his work, on which he was extremely keen, and though a somewhat reserved nature prevented his making many friends, his services were deeply appreciated by patients, whilst his knowledge and solid virtues were appreciated by his colleagues. In 1921, Dr. Bott took the M.D. degree of Durham University. During the war, however, he had been over-burdened by extra duties, and in 1923 he had a serious breakdown in health, and was obliged to give up his professional activities. For the past year or two he had been living at Broadstairs. He leaves a widow.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination, held from July 1st to 24th, the following candidates were approved in the undermentioned subjects, but are not eligible for the diplomas of the Colleges:—

Medicine.—S. Ahmad, Punjab and London; H. S. Atkinson, London; G. O. Barber, Cambridge and St. Mary's; J. E. L. Bendor-Samuel, London; J. H. Bentley, Univ. Coll.; J. G. Bowen, London; G. G. Cameron, Guy's; A. Caplan, St. Bart.'s; G. J. Clarke, Guy's; H. O. Clarke, Dublin; H. W. Davies, King's Coll.; L. Farris, Liverpool and Charing Cross; Doreen P. Firmin, Cambridge and Westminster; J. F. Fisher, St. Bart.'s; A. M. Fratel, Newcastle-on-Tyne; H. S. H. Gilmer, St. George's; R. McN. Glover, Westminster; P. E. Glynn, Leeds; M. B. W. Gray, London; A. Guirdham, Oxford and Charing Cross; Verna Hackett, Westminster; Kathleen M. L. Hall, Royal Free; Cicely L. Hingston, St. Mary's; Mary A. Hughes, Charing Cross; Eugenie C. Illingworth, Leeds; K. S. Keele, Guy's; N. F. Kendall, St. Bart.'s; Mary L. R. Kennard, St. Mary's; E. J. Kerr, Birmingham; A. H. Lendon, Adelaide; A. Lister, London; W. D. Lovelock-Jones, Cardiff and Univ. Coll.; H. S. A. Malik, St. Thomas's; F. N. Marshall, Manchester; P. H. Merlin, Birmingham; Ruth Milne, Royal Free; C. W. Morley, Cambridge and St. Mary's; J. N. O'Reilly, Middlesex; I. E. Phelps, St. Bart.'s; N. L. Price, Bristol; D. S. Raju, Guy's; C. R. Salkeld, St. Thomas's; L. Savronsky, London; S. Scher, Univ. Coll.; K. M. Seedat, Bombay and Charing Cross; Violet R. Sharp, Royal Free; G. C. Sheldon, King's Coll.; C. H. Sherwood, Birmingham; T. Singh, Punjab and Charing Cross; L. A. H. Snowball, King's Coll.; H. J. Stracey, St. Thomas's; J. M. Thomas, Cardiff and Univ. Coll.; V. Thorne-Thorne, Cambridge and St. Bart.'s; and Eileen A. L. Webb, Royal Free.

Surgery.—S. G. Allen, London; G. H. Bateman, King's Coll.; T. S. Belcher, J. E. L. Bendor-Samuel, and J. G. Bowen, London; W. D. Brown, Cambridge and London; P. C. Chakravorty, Middlesex; Rosa E. Chamings, Royal Free; J. L. Clapham, St. Thomas's; A. H. Clegg, Leeds; S. C. S. Cooke, Middlesex; H. D. Cronyn, St. Mary's; T. Davies, St. Bart.'s; N. R. Donald, Liverpool; A. N. Duggal, Lahore; R. M. Ealand, Bristol; A. Eckford, Guy's; L. Gabbé, Cape and Guy's; R. M. Glover, Cambridge and Westminster; P. E. Glynn, Leeds; M. B. W. Gray, London; A. H. Gurney, Cambridge and St. Bart.'s; Y. A. A. Hammouda, Cairo and St. George's; R. D. Harding, King's Coll.; C. C. Harvey, Cardiff and Univ. Coll.; E. Harvey, Middlesex; Columba M. D. Heathcote, Charing Cross; C. F. Hecker, Adelaide and London; L. Hershfield, Middlesex; P. Y. Hicks, St. Thomas's; H. B. Jackson, Middlesex; W. D. G. James, Cardiff and St. Mary's; J. L. Jekyll, Cambridge and London; H. Y. Khwaja, London; A. H. Lendon, Adelaide; E. L. Littler and R. W. McConnel, King's Coll.; G. K. McKee, St. Bart.'s; E. J. Mann, Birmingham; E. Marks, St. Mary's; Eileen M. Massey, King's Coll.; E. C. W. Maxwell, St. Thomas's; F. C. Mayo, King's Coll.; P. H. Merlin, Birmingham; L. B. Neel, St. George's; J. E. Newton, Bristol; J. N. O'Reilly, Middlesex; A. P. M. Page, St. Bart.'s; B. W. Paine, Univ. Coll.; L. H. Peiris, Ceylon and King's Coll.; J. Petro, St. George's; J. R. F. Popplewell, Guy's; N. L. Price, Bristol; H. Ramsay and J. Richardson, Middlesex; N. D. Sane and L. Savronsky, London; J. G. Scadding, Middlesex; S. Scher, Cape and Univ. Coll.; D. P. Settna, London; T. M. Spilhaus, St. Thomas's; H. H. L. Spitz, Leipzig and Middlesex; R. Stanley, N. Stevens, and H. J. Stracey, St. Thomas's; A. Taylor, Manchester; D. M. Thomas, Cardiff and Middlesex; E. G. Thomas, Univ. Coll.; K. S. Thompson, London; T. F. Tierney, St. Bart.'s; C. Wall, London; E. M. Ward, St. Bart.'s; V. W. L. Wells, Guy's; L. H. Wharton, Bristol; A. J. White, Middlesex; E. R. Willis and B. Yuill, London.

Midwifery.—W. Addey, Manchester; A. M. M. M. Ali, Middlesex; J. E. G. Baker, London; J. C. Banerjea, Calcutta; A. Barber, St. Bart.'s; G. O. Barber, Cambridge and St. Mary's; J. H. Bartlett, St. Mary's; F. Bartholomew, St. Thomas's; A. K. Basu and J. H. Bentley, Univ. Coll.; M. V. Bhajekar, Middlesex; I. Billig, St. Thomas's; S. Bochenek, St. Bart.'s; C. C. Bryson, Cambridge and Middlesex; D. R. Buchan, Birmingham; A. Burkhardt, Univ. Coll.; C. L. Carter, St. Bart.'s; H. M. Chappel, Univ. Coll.; F. W. Chippindale, Guy's; L. P. Clarke, St. George's; A. F. H. Coke, St. Mary's; H. Coorland, St. Bart.'s; W. H. Croft, Birmingham; T. Davies and A. F. Davy, St. Bart.'s; A. L. Devi, Royal Free; A. N. Duggal, Lahore; M. P. Ellis, Univ. Coll.; E. H. Evans, Univ. Coll.; R. E. M. Fawcett, St. Bart.'s; C. L. Ferguson, London; Catherine F. Forrest, Royal Free; R. H. Franklin, St. Thomas's; A. M. Fratel, Bombay and Durham; J. D. J. Freeman and A. J. Gibbs, St. Thomas's; R. T. S. Goodchild, London; D. R. Goodfellow, Manchester; C. G. Gordon-Wilson, and R. K. Goyal, London; A. H. Grace, St. Bart.'s; P. R. Graves, St. Thomas's; Charlotte Gray, Univ. Coll.; Verna Hackett, Westminster, R. H. Hadley, Melbourne; B. Halfpenny, Middlesex; C. J. K. Hamilton, Liverpool; C. C. Harvey, Univ. Coll.; E. Harvey, Middlesex; Rowena M. Hickman, Bristol; Cicely L. Hingston, St. Mary's; F. K. S. Hirschfeld, Melbourne and London;

B. Horwitz, Cape and London; E. N. Jenkinson, St. Bart.'s; G. L. Johnson, Columbia Univ.; E. K. Jones, London; H. J. Knight, St. Mary's; L. J. Lannaman, St. Bart.'s; P. Lansel, Middlesex; J. B. Lloyd, London; S. McDonald, Durham; J. S. MacVine, St. Bart.'s; Margery L. Maltby, Royal Free; I. W. H. Mansfield, Middlesex; F. N. Marshall, Manchester; F. C. Mayo, King's Coll.; B. R. Medlycott, Guy's; C. W. Morley, St. Mary's; I. B. Morris, Guy's; P. D. Mottet, Univ. Coll.; F. Murray, London; J. E. Newton, Bristol; T. R. Pahwa, Glasgow; C. H. Paull, Bristol; D. D. Payne, St. Thomas's; W. Phillips, Univ. Coll.; J. O. Poynton, Charing Cross; L. D. Pringle and D. S. Raju, Guy's; H. Ramsay and G. E. Ranawake, Middlesex; P. V. Reading, Guy's; J. M. Reese, St. Mary's; J. I. Rerrie, St. Bart.'s; Colleen Rice, Charing Cross; J. Richardson, Middlesex; J. F. Riches, St. Thomas's; A. H. T. Robb-Smith, St. Bart.'s; T. G. Robinson and L. K. Robson, Guy's; K. M. Ross, St. Bart.'s; J. G. Scadding, Middlesex; S. Schenkman and A. Scher, London; M. Schlaff, St. Bart.'s; J. M. Searle, London; H. Silverstein, St. Bart.'s; C. Skinner, Guy's; Edith M. P. Smith, Charing Cross; B. T. Squires, Guy's; J. E. S. Stephens, St. Bart.'s; A. E. Stevens, London; F. H. Stevenson, Guy's; T. S. Stone, London; G. L. Stroud, St. Mary's; R. F. Taaffe-Finn, St. Bart.'s; K. T. Tasker, London; R. S. Taylor, Middlesex; E. G. Thomas, Univ. Coll.; W. E. Thomas, Cardiff and Bristol; T. F. Tierney, St. Bart.'s; C. Wall, London; Mary J. Westall, Royal Free; A. J. Whitaker, Univ. Coll.; V. M. White, London; T. H. N. Whitehurst, St. Bart.'s; E. G. Wilkins, Middlesex; D. A. Williams, Cardiff and Univ. Coll.; R. C. Williams, St. Thomas's; Rose E. Williams, Royal Free; and T. H. Wilson, St. Thomas's.

Pathology.—E. F. Adams, Manchester; J. E. G. Baker, London; F. Bartholomew, St. Thomas's; A. Burkhardt, Univ. Coll.; F. W. Chippindale, Guy's; A. F. H. Coke, St. Mary's; P. Frankenberg, St. Bart.'s; E. J. Goldsmith, St. Thomas's; R. T. S. Goodchild, London; P. R. Graves and P. Y. Hicks, St. Thomas's; S. W. Holmes, St. Mary's; O. Ive, Guy's; E. K. Jones, London; H. J. Knight, St. Mary's; F. P. L. Lander, Middlesex; L. J. Lannaman, St. Bart.'s; P. A. T. Lowden, St. Thomas's; J. S. MacVine, St. Bart.'s; J. H. G. Mason, Middlesex; I. W. Matheson, St. Bart.'s; J. E. L. Morris, Liverpool; P. D. Mottet, Univ. Coll.; J. M. Reese, St. Mary's; D. Y. Richardson, Durham; H. Silverstein, St. Bart.'s; T. S. Stone, London; Marjorie V. N. Sudds, Royal Free; W. E. Whaite, Manchester; A. J. Whitaker, Univ. Coll.; and T. H. Wilson, St. Thomas's.

THE Royal College of Physicians of London will be closed for the summer vacation from August 12th to Sept. 14th, inclusive.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on August 1st, with Lord Moynihan, the President, in the chair.

Dr. Aly Ibrahim, Dean of the Faculty of Medicine, Cairo, who was elected an Honorary Fellow in November last, attended and signed the Roll of Honorary Fellows.

On the recommendation of the Museum Committee, it was decided to establish a research scholarship of £500 per annum, payable out of the general funds of the College, tenable from year to year, for a period not exceeding seven years.

Membership of the College was conferred on 141 of those whose names appeared on p. 257 of THE LANCET last week, and upon Marjorie E. Roberts, Royal Free Hospital. Diplomas were granted jointly with the Royal College of Physicians, according to the list published on the same page.

The King of Egypt paid a visit to the College on Aug. 2nd, and was made an Honorary Fellow. Lord Moynihan, the President, on presenting the Diploma, referred to the College's close connexion with the Egyptian School of Medicine. Fellows and Members of the College had been teachers in the School, and until recently the post of Dean had been held by an English Fellow. The present Dean, Dr. Aly Ibrahim, had not long ago been made an Honorary Fellow, and within recent years nine Egyptians, trained in the School at Cairo, had become Fellows by examination. He also referred to the great personal interest taken by His Majesty in the Faculty of Medicine at Cairo, and the Kasr-el-Aini Hospital. King Fuad, having signed the Roll of Honorary Fellows, inspected the Museum and other parts of the building.

A MEMORIAL NURSES' HOME.—Princess Mary last week opened a new nurses' home at the Royal West Sussex Hospital, Chichester, which has been built as a memorial to the late Dr. David Ewart, who was for many years associated with this institution as surgeon. The Princess also unveiled a memorial to Dr. Ewart.

A WELSH MATERNITY HOSPITAL.—A maternity hospital is being added to the Montgomeryshire Infirmary, at Newtown, and when the foundation-stone was laid last week by Mrs. David Davies, it was stated that this is the first institution of the kind in Mid-Wales.

EPSOM COLLEGE.—On every recent Founder's Day at Epsom College there has been a steady record of progress, showing that the intimate connexion of the school with medicine is associated with advance in the general status of the College as a public school. Proceedings this year were no exception to the rule. Prior to the prize-giving, the Council entertained 150 guests at luncheon, and over a thousand parents and friends of the College were present on Saturday, July 27th, when Lord Eustace Percy gave away the prizes. In doing so he took as the main point of his address to the boys the need for understanding one's fellow men and women—that he held to be the prime point in what he understood by the word "education." General education meant getting to know men and women, to know the minds of men and women, to sympathise with them, and in the fullest sense to understand them. The world would not fail for lack of specialists, but it might very well fail for lack of people with simple human understanding and the power of handling other fellows. That was the cement that kept society together, and in this country they never needed it more than to-day.

The Headmaster, Mr. Arnold Powell, having detailed the successes of the school during the past year in examinations, Dr. Raymond Crawfurd, Chairman of Council, in moving a vote of thanks to Lord Eustace, referred to the business side of the school's affairs. The scale of masters' salaries, he said, had been considerably increased during the present year, additions had been made to the dietary, and many improvements had been effected for the well-being of the boys, such as alterations in the swimming bath, the provision of an electrolyser for disinfection, the building of a new changing room for one of the houses, the utilisation of Lord Beaverbrook's donation for the furtherance of scientific education, and the provision of a new cricket practice pitch, the gift of Mr. Chudleigh. Referring to changes to take place in the immediate future, he mentioned the building of a new rifle-range, and considerable structural alterations at Wilson House. He hoped, finally, that the building of the new sanatorium would not long be delayed, as, with its completion, the Council would consider their main plans of enlargement to have been brought to a successful conclusion.

During the afternoon the present generation administered a sound hiding to the Old Boys on the cricket field. They declared their first innings closed on the Friday with the fine score of 370 for 3 wickets, to which the Old Boys replied with 302 all out. The College again declared with 210 for 8, and the Old Boys could only total 178 in reply. J. D. W. H. Pettigrew, in the first innings, scored 180 not out for the school, giving only one chance, and C. S. Taylor hit hard in each innings for 83 and 52 not out respectively.

On Saturday evening the College Dramatic Society gave a performance of Mr. Bernard Shaw's "St. Joan."

THE Minister of Health has appointed Mr. H. W. S. Francis to be a Principal Assistant Secretary, and Mr. R. H. H. Keenlyside and Mr. J. N. Beckett to be Assistant Secretaries of the Ministry.

METROPOLITAN ASYLUMS BOARD.—A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, N.15, by Dr. F. H. Thomson, the Medical Superintendent, on Mondays and Wednesdays at *4.45 P.M.*, and alternate Saturdays at 11 A.M., beginning on Wednesday, Oct. 2nd. Particulars may be had from the Clerk to the Board, Victoria Embankment, E.C. 4.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A special course in Diseases of Children will be given at the Queen's Hospital for Children from August 13th to 21st. It will occupy the whole of each day with demonstrations, operations, and lectures. Courses in September will be held as follows: Diseases of the chest, Brompton Hospital, Sept. 9th to 14th; diseases of infants, Infants Hospital, Sept. 9th to 21st; psychological medicine, Bethlem Royal Hospital, Tuesday and Saturday mornings, from Sept. 10th to Oct. 5th; medicine, surgery, and the specialties, Westminster Hospital, for men graduates only, Sept. 16th to 28th. An experimental all-day course in gastro-enterology will be given at the Prince of Wales's Hospital, Tottenham, from Sept. 30th to Oct. 4th. Post-graduates interested are asked to apply early for the syllabus. The Metropolitan Hospital, Kingsland-road, will give an experimental all-day course in medicine, surgery, and the specialties, from Oct. 21st to Nov. 2nd. A course for the M.R.C.P., Lond. examination will be given at 8.30 P.M. on Tuesday and Friday evenings, from Oct. 15th to Dec. 6th, at 11, Chandos-street, Cavendish-square, W. Full particulars of all courses are obtainable from the Secretary of the Fellowship, at 1, Wimpole-street, London, W. 1.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 12th, to SATURDAY, August 17th.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal-green, E. Special Course in Diseases of Children, Demonstrations, Operations and Lectures. All day Course.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W.—Special Course in Urology. Afternoons and evenings.—Further particulars from the Fellowship of Medicine.

Appointments.

JAMESON, R. C., M.D., C.M.Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Leeds North District.

RAWSON, W. F., F.R.C.S. Edin., Hon. Surgeon to the Waddilove Samaritan Hospital for Women, Bradford.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Birkenhead General Hospital.—Cas. S. £100.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bournemouth, Royal Victoria and West Hants Hospital.—H.S. At rate of £120.

Bradford Children's Hospital.—H.S. and H.P. Each £120.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Burnley, Victoria Hospital.—H.P. £125.

Burton-on-Trent, General Infirmary.—2nd Res. H.S. £150.

Cardiff, King Edward VII. Welsh National Memorial Assn.—Area Asst. Tuber. Physician. £600.

Cardiff City Mental Hospital, Whitchurch.—Res. Clin. Asst. 50 gns.

Carlisle, Cumberland Infirmary.—H.P. Also H.S. to special Departments. Each at rate of £155.

Cheshire Joint Sanatorium, Market Drayton, Salop.—H.P. £250.

Cheshire, Royal Hospital.—Asst. M.O. £350.

Dewsbury County Borough.—Asst. School M.O. and Asst. M.O.H. £600.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. and H.P. Each at rate of £125.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

General Lying-in Hospital, York-road, S.E.—Res. M.O. At rate of £100.

Glasgow, Govan District Asylum.—Jun. Asst. M.O. £325.

Golden Square Throat, Nose and Ear Hospital, W.—H.S. £100.

Harrogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.

Hull Royal Infirmary.—Second H.S. At rate of £150. Also Cas. H.S. At the rate of £130.

Ilford Emergency Hospital.—Hon. Aural S. Also Sen. H.S. £150.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. At rate of £120.

Jewish Maternity Hospital, Underwood-street, E.—Res. M.O. At rate of £50.

Leicester, North Evington Infirmary.—Res. M.O. £250.

Lincoln, Bracebridge Mental Hospital.—3rd Asst. M.O. £350.

Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. At rate of £200.

Liverpool, St. Paul's Hospital, Old Hall-street.—H.S. £100.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Lowestoft and North Suffolk Hospital.—H.S. £120.

Manchester and District Radium Institution.—Asst. Radiologist. £250.

Manchester Victoria Memorial Jewish Hospital.—Sen. H.S. £250. Also Jun. H.S. At rate of £125.

Milford, Surrey County Sanatorium.—2nd Asst. M.O. £400.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150.

Nottingham General Hospital.—Asst. Res. Cas. O. At rate of £150.

Nottingham Children's Hospital.—Res. H.S. At rate of £150.

Portsmouth Royal Hospital.—Cas. O. At rate of £100.

Richmond Royal Hospital.—Jun. H.S. £100.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Rotherham Hospital.—H.P. £180.

Royal Air Force Medical Service.—Temporary Commissions.

Royal Eye Hospital, St. George's-circus, S.E.—12 Salaried Refractionists. 12 Clinical Assts. Also 1 Pathologist.

Royal Waterloo Hospital for Children, &c., Waterloo-road, S.E.—Clin. Assts.

St. Mary's Parish Infirmary, Highgate-hill, N.—Radiologist. £125.

Scarborough Hospital and Dispensary.—Two H.S.'s Each at rate of £126.

Sheffield, Jessop Hospital for Women.—Sen. Res. O. £250.

Swansea Hospital.—H.S. £150.

Swindon and North Wilts Victoria Hospital.—Hon. Aural Surg.

University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.

Warwickshire, King Edward VII. Memorial Sanatorium.—Sen. H.P. and Jun. H.P. At rate of £275 and £200 respectively.

Weston-super-Mare, Queen Alexandra Memorial Hospital.—Res. M.O. £130.

West Bromwich and District General Hospital.—H.S., H.P., and Cas. H.S. Each at rate of £200.

West Riding of Yorkshire.—County M.O.H. £1600.

Wigan County Borough.—Clin. Tuber. O. and Asst. M.O.H. £750.

Winchester, Royal Hampshire County Hospital.—Res. H.S. £150.

Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Jun. H.S. At rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Carnoustie (Angus) and Ringwood (Hants).

Births, Marriages, and Deaths.

BIRTHS.

BAKER.—On July 30th, the wife of Ormonde A. Baker, M.B., Langton's Meadow, Farnham Common, Bucks, of a son.

CASSELLS.—On July 28th, at The Old Oak House, Pembridge, Herefordshire, the wife of Dr. David A. K. Cassells, of twin sons.

SHAW.—On July 22nd, at Lower Baggot-street, Dublin, the wife of Captain G. W. B. Shaw, R.A.M.C., of a son.

SPENCER-PAYNE.—On July 30th, at Hempsted Lodge, Woodside Park, the wife of A. Ll. Spencer-Payne, M.R.C.S., L.R.C.P., L.D.S., of a daughter.

MARRIAGES.

SALEEBY—BILLINGE.—On July 30th, at St. Augustine's, Kilburn, Caleb Williams Saleeby, M.D., F.R.S.E., to Muriel Gordon, eldest daughter of the late Rev. Robert Burland Billinge, of Ulverston.

DEATHS.

GORDON.—On July 24th, at Pembroke-mansions, Dublin, Thomas Eagleson Gordon, M.Ch., President, Royal College of Surgeons in Ireland, aged 62 years.

HIGHET.—On July 20th, at a London nursing home, Hugh Campbell Highet, M.D., D.P.H., of Radley House, Winchester, late of Bangkok, Siam, aged 62 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1929.

THE Index and Title-page to Vol. I., 1929, which was completed with the issue of June 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

For complete scale of advertisement charges apply to THE MANAGER.

Notes, Comments, and Abstracts.

ARROWROOT,

ITS MEDICINAL AND DIETETIC VALUE.

BY JOHN CAMPBELL, PH.D.,
HON. SCIENTIFIC ADVISER TO THE WEST INDIA COMMITTEE.

FOR generations genuine arrowroot has been regarded by the medical profession as a valuable food in sick-room dietary. The word "arrowroot" is derived from the Indian term Ara-ruta, meaning a "mealy root," and it well describes the characters of the rhizome of the *Maranta arundinacea*, grown in the British West Indies, from which the genuine arrowroot is prepared. The plant is a native of tropical America and was formerly largely cultivated in Bermuda, but the manufacture of arrowroot has ceased in that island and is now centred in St. Vincent.

The objects aimed at in the preparation of arrowroot are the preservation of its colour and flavour, with the elimination of fibre and the bitter principles which are present more or less in all starch yielding rhizomes and roots. The fresh rhizomes are washed, pared, washed, and then graded to a fine pulp. The subsequent operations involve frequent dilutions with water and straining before passing to the settling table, where the supernatant fluid is drained off. The residue is then washed until the effluent runs clean, after which it is transferred to the drying house and air dried. The colour and flavour depend upon the efficiency of the washing, straining, and settling processes, and the different grades of arrowroot indicate the degree to which the purifying and eliminating processes are carried.

The manufacture of arrowroot as carried out under present conditions in the West Indies is not based on up-to-date methods; no modern machinery is used and the process is laborious and wasteful. Efforts are now being made by the West India Committee to introduce modern machinery, in properly constructed factories, which will reduce the cost of production, and lower the price of this valuable carbohydrate food.

The statement often met with in text-books that arrowroot is specially prone to absorb moisture and foreign flavours is not justified. In a special research inaugurated by the West India Committee it was found that arrowroot starch was neither better nor worse than other starches in that respect, and that this reputation was probably due to the careless way in which arrowroot was formerly packed for export, and marketed in this country.

The following is an analysis of St. Vincent arrowroot compared with potato, maize, and cassava starch.

Analyses (Willmott).

—	St. Vincent arrowroot.	British arrowroot.		Brazilian arrowroot (cassava starch, Manihot utilissima.)
		Potato starch.	Cornflour (maize starch).	
Moisture ..	15·15	16·20	11·91	14·16
Protein ..	0·10	0·12	0·40	0·18
Fat ..	0·02	0·03	0·10	0·03
Starch ..	84·45	83·37	87·37	85·41
Fibre ..	0·03	0·03	0·05	0·03
Ash ..	0·25	0·25	0·17	0·19
—	100·00	100·00	100·00	100·00

The energy value of St. Vincent arrowroot is 112 calories per ounce. The analysis shows it to be a very pure amyloid food, characterised by an extremely low protein and fibre content; this confirms the statement of most authorities that it leaves practically no residue in the digestive tract. The ash contains calcium, potassium, and iron as phosphates, chlorides, and silicates. The phosphorous content of the ash amounts to 21·2 per cent.

In most text-books the vitamin content of arrowroot is given as nil, but recent experiments made at the Lister Institute appear to show that root starch—i.e., arrowroot—contains a hitherto unnoticed constituent not present in cereal starch. When the protein of the rat diet is dried before being added to the daily ration, certain deficiencies in the nutrition are evident. If, however, arrowroot starch is added to the diet as a carbohydrate constituent, this deficiency is rectified, but not by wheat, rice, or maize starch. The nature of this constituent has not been determined, but if not an actual vitamin, it has an allied action.[1]

The most important property of starch is the quality of forming with water a jelly at a temperature which varies for the different varieties of starch. The starch molecule is generally considered to consist of amylose, found principally in the internal part of the grain, and amylopectin found mainly externally. The amylopectin confers the property of gelatinisation. The amylose is the "granulose" and the amylopectin the "farinose" of the older nomenclature. From the dietetic standpoint the gelatinising properties are the more important, as they concern the breaking up and bursting of the granules and the setting free of the nutrient constituents for digestion. The more thorough the gelatinisation the more rapid and thorough the assimilation and the less the residue of undigested matter. As an average of many tests Willmott obtained the following gelatinisation point of the named starches:

St. Vincent arrowroot..	73° C.	Maize	70° C.
Cassava	66° C.	Potato	65° C.

The high gelatinisation point of St. Vincent arrowroot ensures a thorough breaking down of the starch granules and confirms the observation that arrowroot is the most digestible form of starch.

This conclusion is confirmed by the researches of A. Dobroslavine who found that arrowroot required less saliva to produce a given quantity of sugar than all other starches, and that equal quantities of saliva acting on arrowroot and other starches produced more sugar in the arrowroot digestion in a shorter time than in cereal starches.[2]

In the earliest references the term "arrowroot" was reserved for the starchy products of the various species of the *Maranta*, especially *arundinacea*. Among the substitutes for genuine arrowroot are the following: "British arrowroot" is merely potato starch. "Cornflour" is prepared from maize, and is sometimes sold as "British arrowroot." "Brazilian arrowroot" is the starch prepared from manioc (*Cassava-Manihot utilissima*). Tapioca is prepared from this starch by the addition of water, and drying by heat. Formerly the *Maranta arundinacea* was a source of "Australian arrowroot," but of late years the species Canna has replaced it, the chief being *Canna edulis*, commonly known as tous-les-mois. "East Indian arrowroot" is prepared from various species of *Curcuma*, such as *angustifolia*, *leucorrhiza* and *rubescens*. It is one of the most common adulterants of genuine arrowroot. Another form also termed "East Indian arrowroot" is manufactured in Southern and Eastern Asia, Madras, and the Malabar Coast from Travancore starch. It is known locally as tik-tikur. "Portland arrowroot" is prepared from the lily *Arum maculatum* and the tubers of the *Arum macrorhizum*, yielding 20 per cent. of starch, cultivated in the island of Portland and other South Sea islands, and in India. It is used often as an adulterant of genuine arrowroot. "Tahiti arrowroot" is prepared from the species *Tacca oceanica* or *T. pinnatifida*. Locally it is known as "pia." Its starch yield averages 38–30 per cent. "Guiana arrowroot" is the starch prepared from the yam (*Dioscorea alata*). In Brazil it is known as farinha-de-cara. It gives a 20 per cent. yield of starch. "Florida arrowroot" or Zanna starch is derived from the tuberous stems of the *Zanna floridana*.

These substitutes, especially the preparations from maize and potato, do not possess the dietetic properties of genuine arrowroot. It is therefore desirable that in all cases "St. Vincent arrowroot" should be specified.

Arrowroot is a valuable food in diarrhœa, those cases where vegetable fibre is contra-indicated, and where a diet is required leaving no residue in the alimentary tract. When used in small quantities in conjunction with milk and heated to the gelatinising point of the starch, it breaks up the coarse curd rendering the milk more digestible. With agar-agar it forms an excellent base for the administration of the mineral salts used in the radiography of gastro-intestinal disease.

THE READESK.

WE have received from Mr. W. Ross Key, of 97, Douglas-street, Glasgow, a sample Readesk, which is an apparatus for holding a book securely and at a proper distance from the eyes when reclining in a chair at any angle or resting on a bed. It consists of an expanding frame (on the principle of the "lazy tongs") for holding the book, with pins to hold down the pages, the frame being kept in a comfortable angle before the face by a cord passing round the neck of the reader. Some little pains have to be spent at first in adjusting the apparatus, but when once in position it is quite satisfactory in use, and should prove a boon not only to invalids, but to readers who like to have a hand free when smoking.

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[1] See Bio-chemical Journal, 1927, xxi., 713.

[2] Bull. Soc. Chem., 1887, xxv., 452.

TREATMENT OF ITCHING DERMATOSES.

ACCORDING to M. Friedlander,[1] Lebedjew was the first to try intravenous injections of a 10 per cent. sodium bromide solution in pruriginous affections, and his results led to a scientific enquiry in Vienna, where the advantages of the method were confirmed. Ekzebrol, which is a 10 per cent. solution of strontium bromide in 20 per cent. glucose solution, was the direct outcome of these investigations, and is prepared for the market by the firm of Tosse (Hamburg.) The drug is administered exclusively by the intravenous route, and during the injection gives rise to a feeling of warmth, which spreads rapidly over the whole body, and of which the patient must be warned. Friedlander has never noted any ill-effects, and in one or two cases without prominent veins he has even ventured to inject the drug deeply into the glutei. This route, however, is painful, and the patients did not submit to more than two injections. The usual procedure is to administer a 10 c.cm. ampoule three times a week.

The results are described as variable. Sometimes the pruritus was controlled after three injections, in other cases as many as 16 had to be given before the symptom disappeared. Ekzebrol, it is stated, can be used both in primary general pruritus of unknown or obscure ætiology, and in that which follows or is associated with psoriasis, lichen ruber planus and eczema. Failures of course occur with this, as with all other methods, if the cause cannot be ascertained and removed.

PUBLIC HEALTH IN KENYA.

A REPORT on the Colony and Protectorate of Kenya, recently issued, states that the land area is 221,800 square miles in extent, and the water area, which includes the larger portion of Lake Rudolf and the eastern waters of the Victoria Nyanza, 4011 square miles. Mount Kenya, after which the colony is named, is 17,040 feet in height, and is capped by perpetual snow and ice. There are no marked seasonal changes such as winter and summer. At high altitudes the diurnal variation of temperature is high, being as much as 30°F. in some places, but the mean temperature varies little from month to month. The range of temperature between different parts of Kenya is very wide. At Lamu, on the coast, the mean shade temperature is 80° F. At Mombasa it is 77°F. In Kisamu, on the Victoria Nyanza it is 72·5°F. In the Rift Valley and highland areas the mean temperature is normally between 58°F. and 65°F. The rainfall is generally well distributed. Precipitation varies considerably with the physical configuration of the colony. According to a census taken in 1926, the number of Europeans in the colony was 12,529, of Asiatics (excluding Arabs), 30,583, and of Arabs 10,577, whilst the estimated African population in 1927 was 2,847,632.

In the section of the report devoted to public health it is stated that after the visit to the colony of Dr. J. B. Orr, of the Rowett Research Institute, in 1926, in connexion with the proposed pasture investigation, the subcommittee of the Civil Research Committee decided to extend the scope of the investigation to problems of human as well as animal nutrition. With funds provided by the Empire Marketing Board, two special research officers have been employed in the country, not as independent investigators, but working in closest collaboration with the local people. During 1927 two new centres, namely Kitui and Teita, were opened in the Native Reserves. A medical officer of health has been appointed to Nakuru, on account of the considerable development which is taking place in the township, and also because of the urgent necessity of instituting sanitary measures at this centre of the grain trade. Besides his duties at Nakuru, the medical officer has been responsible for both Eldoret and Kitale. The first appointment of a medical officer of health to a Native Reserve took place in the latter half of the year, and has proved a complete success. Local native councils have taken an increasing interest in health matters, and large sums of money are being voted by the councils for medical and other objects. On the coast useful measures are being taken against hookworm infestation. The willing coöperation of the people holds out great promise of definite results. Throughout the Reserves generally work is being organised, so that information about diseases, and instruction in simple hygiene, is given, as well as treatment, while at the same time information about the pathological condition of the population is being collected. The country has been free from epidemics of serious disease. Plague requires watching, but no outbreaks of any magnitude occurred during 1927. Small-pox was introduced into Nairobi from India, and uneasiness was caused from the fact that cases came under notice from a considerable area, extending as far out as the Fort Hall Reserve. Original cases had remained concealed. Probably owing to the wholesale vaccination campaign conducted two years ago, the outbreak did not assume any magnitude. The epidemic of malaria experienced in 1926 did not recur, possibly owing to the fact that the rains generally were on the short side. The problem is to be tackled energetically in Nairobi; the Government made available a sum of £20,000, to be expended during 1928, the municipality and railway authorities sharing in the expense. The International Sleeping Sickness Commission, part of whose labours were conducted in Kenya, has completed its work. It was possible during 1927 to conduct a comprehensive population survey of the lake shore. Over 200,000 individuals were examined, and only 380 cases of trypanosomiasis were detected, these mostly being found in three well-defined areas. In one small location, consisting of a population of 800 odd, over 100 cases were found. Measures to deal with the most thickly infested areas are being undertaken. The small area referred to as being especially heavily infected is to be evacuated. Other steps will include clearing of the lake shore and the construction of watering-places. All cases which were found were adequately treated, in order to render them non-infective.

Progress of the scheme for the provision out of loan funds of hospitals in various parts of the country has not been as rapid as was hoped, but a small hospital at Kiltui is practically completed, while work has been commenced on a hospital and other medical buildings at Kakamega Station.

AN INGENIOUS TRUSS.

THE "Colquhoun" truss for hernia consists of a steel spring, to which is fitted a pneumatic appliance consisting of a back pad situated at the centre of the spring, with air connexions communicating with the front pad or pads, which cover the site of the hernia. The pads are inflated by the wearer to the extent he finds most comfortable; the valve is then closed, and the pressure in the appliance remains even. The back pad serves a double purpose: (1) it substitutes a soft air cushion for the hard spring, and (2) transfers the pressure to the front pads in conformity with the movements of the wearer. The pads are constructed to include some of the well-known product "Sorbo." While rendering them practically immune from puncture, this does not interfere with the automatic movement of the air, and makes it possible to use a much softer pad than can be employed with nearly all steel spring trusses. The softness of these pads allows them to conform readily to the contour of the body, while the action of the spring, combined with the automatic pressure exercised, gives a soft yet firm holding. This pressure, which owing to the construction of the spring occurs only directly under the pads, has a natural lifting tendency on the front pad or pads, instead of a direct inward action. Any cough or sudden movement is resisted first by the air cushion and then by the spring of the truss. Owing to the special construction, it is claimed that perineal straps are unnecessary

The principle on which this appliance is designed is distinctly ingenious, and the truss should prove comfortable to wear. It is manufactured by the Uterpress Co., 65, Atlantic-road, Brixton, London, S.W., and a patent has been applied for.

NEW WOMEN'S WARDS AT GRAVESEND.—The Marchioness of Carisbrooke last week opened new women's wards at the Gravesend and North Kent Hospital.

PRESTON ROYAL INFIRMARY.—The sum of £10,000 has been allocated to the building fund of Preston Royal Infirmary by the trustees of the estate of the late Alderman T. Parkinson, who was thrice mayor of Preston.

NORTHAMPTON GENERAL HOSPITAL.—Mrs. J. G. Sears, of Collingtree Grange, Northamptonshire, has given £5000 to the Northampton General Hospital, £3000 of which is to be allocated to the purchase of radium.

A NEW ORTHOPÆDIC HOSPITAL.—A new hospital for cripples was opened on August 3rd at Harlow Wood, near Mansfield, on a site given by the Duke of Portland. There are two wards of 40 beds each, and the total cost of building and equipment was £35,000.

NEW HOSPITAL AT BOGNOR.—It is proposed to erect at Bognor a county hospital to commemorate the King's convalescence in the neighbouring hamlet of Aldwick. A site, together with a promise of £5250, has been given by an anonymous donor, and a committee has been appointed to further the scheme.

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[1] Derm. Woch., June 6th, p. 810.

Hunterian Lecture

ON THE

TREATMENT OF VARICOSE VEINS AND VARICOSE ULCERS BY INJECTION.

Delivered before the Royal College of Surgeons of England on Feb. 8th, 1929,

By REGINALD T. PAYNE, M.B. Lond.,

FELLOW OF THE COLLEGE; CHIEF ASSISTANT TO A SURGICAL UNIT AT ST. BARTHOLOMEW'S HOSPITAL.

In introducing the subject of the injection treatment of varicose veins and varicose ulcers, the opening words of Mr. Warrington Haward, in his Hunterian Lectures on "Phlebitis and Thrombosis," given in 1906, are apposite. "It has always seemed to me that our interest in a disease should be in proportion not to the rarity, but to the commonness of its occurrence." Varicose diseases are common among all classes of the community; they cause untold discomfort and suffering amongst their victims, and in an insidious manner they are responsible for considerable economic loss. Moreover, modern feminine fashion tends to make them a social stigma. It will, I think, be conceded that the operative treatment of varicose veins is far from ideal; in the majority of cases the method is only palliative, and there is a large group for whom surgery has had hitherto little or nothing to offer on account either of the severity of the disease or the presence of complications. For these patients the crêpe bandage and the elastic stocking have been ever-present reminders of surgical failure. During recent years operative measures have been increasingly replaced by injection treatment, and while opponents of the latter are inclined to regard it as a return to the dark ages of surgery, its protagonists have tended to consider it a panacea for all forms of varicose disorder. In its modern conception injection treatment consists essentially in the intravenous injection of substances which act by damaging the endothelium of the vein and so lead to a localised thrombosis. This thrombus is then organised, and the vein left as a thin fibrous cord in the subcutaneous tissues. The process as a whole is frequently referred to as thrombo-sclerosis.

Historical Review.

The idea of introducing chemical substances into blood-vessels with the object of producing localised thrombosis is far from new. The method was first employed in 1851 by Pravaz, the inventor of the hypodermic syringe, in an attempt to cure aneurysms by the injection of ferric chloride solution. In the same year Desgranges and Valette and others of the Lyons school carried out this treatment, with a certain measure of success, in cases of varicose veins. Two years later, in 1853, both Chassaignac and Follin were using the method in Paris and showed cases at the Société de Chirurgie, but the former reported fatalities from septic complications. Broca was still using ferric chloride in 1860, and it was not till 1884 that this substance was finally abandoned as the result of further fatalities recorded by Weinlechner. The accidents arose from two causes: firstly, ferric chloride is a coagulant of blood, and secondly, sepsis was only too frequently introduced at the time of the injection. Pulmonary emboli, septic thrombo-phlebitis, septicæmia, and extensive local sloughing were the inevitable sequelæ.

In 1854 Soquet, professor of pharmacy at Lyons, introduced iodo-tannic solution, and this was employed successfully by Desgranges and Barrier, who in the same year reported 16 cures without accident. The thrombi produced by this method were firm, but the severe pain they caused necessitated rest in bed for some time. Other substances tried at this time include chloral hydrate and persulphate of iron. After 1876 perivenous injections became popular for varicose veins, hæmorrhoids, rectal prolapse, and varicocele, as there was considered to be less danger from septic complications than with intravenous methods. Englisch, Marc See, and Broca used alcohol injections in the treatment of varicose veins. As late as 1894 Deloro was defending the iodo-tannic method, but at this period all intravenous methods were in disfavour owing to the increasing use of operative measures.

At the beginning of the present century Tavel, of Berne, obtained good results with the use of intravenous 5 per cent. phenol, but combined this with proximal ligature of the saphenous vein. Schiassi, of Bologna, in 1908, used an aqueous solution of iodine and potassium iodide injected distally, but also resected a small portion of the vein locally to prevent emboli. Borchards in 1910 discovered that intravenous salvarsan cured varicose veins and was equally successful with other arsenical preparations. In 1918 Hanschell, as a result of experience of the thrombosing action of quinine when given intravenously for malaria, employed this drug in the treatment of varicose veins with some success. At this time, however, intravenous methods on the whole were certainly not popular, they were used rather tentatively, and the general opinion was that the successes were obtained more by good fortune than by wisdom.

Current Methods.

To Prof. Linser, of Tübingen, belongs the credit of trying intravenous methods in a large number of cases. Starting in 1911, this worker has successfully used 1–2 per cent. solutions of mercury perchloride in over six thousand cases. The disadvantages of this drug are those common to all mercurial preparations, and in more recent years sodium chloride has been substituted. In 1916–17 Prof. Sicard, of Paris, observed that veins were frequently obliterated as the result of injections of intravenous luargol, and soon recognised that this was due to the free soda in the solution. In 1918 he found that neutral sodium carbonate led to thrombosis and sclerosis of veins. On account, however, of the extensive sloughing which it produced in the subcutaneous tissues, it was soon abandoned in favour of the much less toxic sodium salicylate. With this drug Prof. Sicard and his co-workers have had marked success in a large series of cases. Nobl of Vienna has confirmed Linser's results with mercury perchloride, and Genevrier in France has popularised the quinine and urethane method. Many other drugs have been tried including sodium citrate, mercury biniodide, the double hydrochlorate of quinine and urea, and glucose.

In this country experience of injection therapy is confined to four or five years, but the accumulating results support the earlier work of the continental observers. The solutions most favoured are the sodium salicylate and the quinine and urethane preparations.

The Circulation in Varicose Veins.

The question of the circulation in varicose veins is a perplexing one and I do not think it is necessary to enter into it fully, but certain aspects of recent experimental work are fundamental. The essential feature of this work is that in patients with established varices of the internal saphenous vein the blood flow in this vein is, under certain conditions at least, peripheral and directed away from the heart. Magnus, using the Volkmann hæmodrometer, has shown that, in patients with a positive Trendelenburg sign, the blood flow is distally directed in the internal saphenous vein when the limb is in the vertical position, but if the limb be raised to 45° or more the flow is either stationary or is directed towards the heart in a rather slow stream. Jentzer has confirmed the work by radiographic methods. He found that an intravenous injection of strontium bromide into a varicose internal saphenous vein travelled distally. This work receives further support from Magnus's experiments with the skin microscope.

He has shown that in varicose conditions, with the limb at varying angles, the capillary blood flow in the skin of the lower leg is markedly increased immediately the hæmodrometer records a distal flow.

Admitting for the moment the validity of these experiments, the condition of the circulation in the varicose limb is as follows. Blood from the deeper parts of the limb passes upwards in the femoral vein, and on reaching the saphenous opening some of this pours into the valveless saphenous vein and travels distally. Theoretically, this blood may again reach the deeper veins via existing collaterals, or, on the other hand, may only do so after passing through the capillary bed once more, in a reverse direction. That at least part of the blood takes the latter course is suggested by Magnus's experiments. Under certain circumstances, therefore, the blood flow in the capillaries of the lower part of the varicose area is reversed in direction, and is composed of "used" blood. Granted these abnormal mechanical conditions in the circulation, physiological changes inevitably follow in the blood itself, and as a result of these tissue nutrition is impaired. Without accepting these views in their entirety, it is possible to admit that they provide the most logical explanation available of the development and the persistence of varicose ulceration, as well as of the conditions under which healing of this ulceration may be brought about.

DISCUSSION OF CASES TREATED BY INTRAVENOUS INJECTIONS.

During the past two years 230 cases of varicose veins have come under may care, the majority in the out-patient department at St. Bartholomew's Hospital. The sex incidence was 44 males and 186 females, Injection treatment has been given in 206 cases, the age limits in this group being 16 and 76 years respectively. There has been no selection, and all cases have been treated provided definite contraindications did not exist. Fully 50 per cent. of the patients would have been regarded as quite unsuitable for surgical measures, on account either of age, general condition, the extent of the varicosities, or the presence of dermatitis or ulceration.

The quinine and urethane method has been the one of choice, and of this 1525 injections were given; 150 injections of sodium salicylate were also given, but their use was confined to patients who were intolerant of quinine or in whom there existed contraindications to its use. The quinine and urethane method was chosen from the point of view of determining its efficacy and limitations, rather than from any preconceived ideas of its superiority to other drugs.

Of the total 206 cases treatment is complete in 140, while 54 are still under treatment. Twelve patients have abandoned treatment, four on account of intercurrent disease and eight without giving any reason. Treatment in all cases has been ambulatory, no serious complication necessitating the patient's admission to hospital has arisen, and there has been no mortality. Out of the 230 cases of varicose veins treated, 24, or approximately 10 per cent., were found to be unsuitable for injections on the following grounds:—

Acute phlebitis	5	Psychoneurosis	3
Phlegmasia alba dolens ..	8	Bilateral ankle œdema ..	1*
Typhoid thrombosis ..	3	Varicules only	1
Pregnancy	1	Acute psoriasis	1
Age (74)	1		

*Unilateral varicose veins.

The reason for the rejection of these cases will be discussed more fully later, when dealing with the contraindications to injection treatment.

Detailed case-histories were taken from all patients with special attention to symptoms, the age at onset, pregnancies and the menstrual history, the occurrence of deep or superficial phlebitis, the development of dermatitis and ulceration, and a history of cardiovascular-renal disease. In all cases where any atypical symptoms or signs were present a complete general examination was made in addition to local examination.

Technique of Injections.

The quinine and urethane preparation is of the following formula:—

Quinine hydrochloride ..	4·0 g.
Urethane	2·0 g.
Aq. dest.	ad 30 c.cm.

The active principle causing damage to the endothelial lining of the vein is the quinine, the urethane merely raising its solubility in aqueous solution. On standing, the solution slowly deposits crystals of quinine hydrochloride; these can easily be redissolved by warming to body temperature. The sodium salicylate solution is made up in strengths of 20 per cent., 30 per cent., and 40 per cent.

The actual technique is similar for the two solutions. The patient stands in a good light and an Esmarch tourniquet or Martin's bandage is applied proximal to the proposed site of injection. The object of this is to render the veins prominent during the insertion of the needle, and in all cases it should be removed before the injection is made. The patient then lies down and the region of the proposed injection is carefully cleaned with ether. A 5 c.cm. record syringe carrying a No. 17 needle is filled with the required amount of solution and introduced obliquely through healthy skin into the lumen of the vein. The plunger is then slightly withdrawn to confirm the fact that the needle is in the lumen. At this point the tourniquet is removed, allowing the vein to collapse and ensuring that the quinine and urethane solution reaches the vein walls in a high concentration. As a rule, 1 c.cm. in 15 seconds is about the average rate of injection, but no force must be used and the time must depend to some extent on the resistance encountered. Pressure is then applied with an ether swab over the site of injection and the needle is withdrawn, the swab being kept in position for two minutes. The puncture is dressed with collodion on a pledglet of wool, and when dry the whole is covered with a small square of wool and firmly bandaged. The maintenance of digital pressure after injection, the collodion dressing, and the bandaging are designed to lessen the risk of leakage of blood mixed with injection material into the subcutaneous tissues around the site of puncture. Leakage is almost certain to cause local complications. The patient goes home, and returns at the end of a week for further treatment. All the patient's usual activities are permitted, rest is not enjoined, but the normal reactions which follow injection are explained.

Considerable discussion has centred round the question of the position during the injection, many workers preferring to have the patient standing. This was done in some of the earlier cases but abandoned because many of the patients objected. On theoretical grounds, it might seem desirable to insist on rest for 10–15 minutes after the injection to prevent any possible aspiration of blood into the deeper veins, but this has not been carried out and no untoward effect has been noted.

Dosage.

It is advisable to commence with a small dose of quinine urethane solution and for the first injection 0·5 c.cm. is invariably employed. This has a twofold object, the first being to test the local reaction of the veins to the solution, and the second to discover whether or not the patient possesses any special idiosyncrasy towards quinine. Subsequent injections are, in practically all cases, 2 c.cm. per dose, which can generally be relied on to thrombose 5–6 inches of a vein. Larger doses may be necessary in a few cases, but more than 4 c.cm. should never be given at one sitting. It is important to follow cases closely to see exactly what degree of thrombosis injections are producing, for individual differences play a large part and injections must be regulated accordingly.

The technical details for sodium salicylate solutions are the same as for quinine, except in dosage. Injections should begin with 2 c.cm. of 20 per cent. solutions, which will usually thrombose about 4 inches of vein. Later injections must be regulated according to the amount of thrombosis produced. If the 20 per cent. solution is adequate, injections may be confined to this; if inadequate the 30 per cent. or 40 per cent. solutions must be tried in doses up to 4 c.cm. until the requisite effect is obtained. It is important to bear in mind the fact that veins appear to establish a remarkable tolerance towards salicylate solutions, as a consequence of *which they fail to thrombose.* For this reason the surgeon should work as rapidly as possible up to a dose and strength which produces the required effect.

Whichever solution is used I do not think it is desirable to attempt to produce more than about 5 inches of thrombosis each time; if more is done the method is likely to cease to be strictly ambulatory, owing to the discomfort produced.

Site.

In general, treatment should be commenced in the most distal part of the limb, and each succeeding injection given proximal to its predecessor. This enables the operator to distinguish at once thrombosed from non-thrombosed veins. An exception to this rule is made when the varicose condition involves the region of the ankle-joint. Veins in this position should always be left till all others have been treated; they are then usually found to be entirely symptomless and very much smaller in size. If, however, it is decided to inject this region, it is as well to bear in mind that boots and shoes are likely to cause considerable discomfort during the thrombosis.

Using the doses described above, injections will be necessary at intervals of approximately 4–5 inches along the course of varicose veins, and in this way the whole saphenous tract may be treated to within about 4 inches of the saphenous opening.

In the earlier cases, while the total amounts injected were the same as those now used, the dose was given at two or three sites spread over about 5 inches of vein. This has now been given up entirely in favour of the injection of the whole dose at one site. The results have been just as satisfactory and much less discomfort is caused.

Reactions.

1. *Quinine.*—Injections should be entirely painless, apart from the prick of the needle as it penetrates the skin; pain during the injection shows that the fluid is finding its way into the subcutaneous tissues and is an indication for discontinuing the injection at once. Thrombosis begins between 12 and 24 hours after the injection and is accompanied by slight swelling, aching, and tenderness of the vein. This pain is invariably accentuated by postural changes, and is especially noticeable in the morning. As a rule the thrombosed segment becomes partially adherent to the overlying skin as a result of mild periphlebitis but, although this occasionally shows a linear bruising, redness is unusual. After about four days the vein begins to shrink, and this process continues for at least three months. Local tenderness disappears at the end of a fortnight, but bruising may take six weeks to clear up, and at times a slight permanent pigmentation is left. All these reactions are more severe where the vein is situated over bony prominences which prevent its sinking back into the subcutaneous fat. Patients show marked individual variations in the degree of reaction. The subsequent discomfort is in most cases slight and rarely limits activity. In the present series four cases lost two days' work each, and one case one day, in consequence of more than usual discomfort.

Constitutional effects due to quinine were observed in 4 per cent. of the cases and included nausea and vomiting, tinnitus, headache, and a transient intermenstrual loss. In women quinine injections must not be given during menstruation. No general quinine reactions were seen in the male cases.

Abnormal local reactions, due to leakage of blood mixed with the quinine solution into the subcutaneous tissues, are also occasionally seen. In their mildest form these consist of blood blisters, half an inch in diameter, which dry up in about three weeks. If the local process is more severe necrosis occurs, leaving a small eschar which heals in four to six weeks. These eschars were produced in eight cases in the first 500 injections, and in three cases in the last 1000 injections. The high incidence in the former group *was due to the fact that in these the punctures were* dressed with collodion only, whereas in the latter group the special precautions described were adopted. It is highly important, I think, that this type of complication should be guarded against by all possible means, for it provides an entry for sepsis with all its attendant dangers. In the present series, however, no septic complication has been seen. This necrosis sometimes occurs at sites remote from the injection, through a vein which is very thin-walled at that point. In such cases the dosage has been too high. Three cases showed rather more extensive thrombosis than was intended, in that this reached from the region of the knee to the mid-thigh, a distance of 8 inches. These all occurred in veins which possessed no obvious tributaries and in which, therefore, the effects of stagnation were likely to be marked.

2. *Salicylate.*—The use of sodium salicylate solutions has in the present series been confined to cases which showed an idiosyncrasy towards quinine or in those associated with pregnancy. Salicylate invariably gives rise to considerable cramp-like pain during the actual injection, but the subsequent discomfort is usually less than with the quinine method. No local lesions have been observed, but the two solutions seem equally likely to produce these. Varicose veins rapidly develop a tolerance to sodium salicylate, and for this reason the doses and strength of the drug has to be increased as treatment proceeds. Occasionally this results in failure to achieve thrombosis even with large doses of the 40 per cent. solution. Quinine injections have never failed.

RESULTS IN UNCOMPLICATED CASES.

I will not attempt to present the results in statistical fashion, as this is extremely difficult. Only too often varicose veins are but a part of the clinical picture, which is obscured in no small degree by other associated conditions, of which the commonest are flat feet, hallux valgus, and the various forms of arthritis. On the whole, therefore, clinical impressions appear to be more reliable. Since injection treatment gives 100 per cent. cure in cases not associated with other pathological conditions, it can, I think, be justly inferred that, in so far as the veins are concerned, similar results are obtained in cases where the picture is complicated by the presence of other diseases.

Even from a comparatively early stage of treatment patients begin to experience relief. Bandages and elastic stockings are abandoned, usually before injections are completed, although the final functional and cosmetic results are not seen until at least three months after all treatment has ceased. From the functional standpoint, patients in whom moderate activity was only possible with limbs swathed in mummy fashion can now work and play in comfort. From the cosmetic standpoint, limbs which once resembled Saxon gouty ballusters are restored to more conventional outlines. From both these standpoints, treatment appears to be equally successful in all the various types of veins. The small and early varix of the calf, the dilated and tortuous entire saphenous vein, and the advanced, diffuse, arborescent veins of the lower leg, all respond well. Injection methods are also applicable to the spidery varicules so often seen in women; these are often almost symptomless and in the present series they have only been treated when complicated by recurrent subcutaneous ruptures. Whichever type of case is considered, one of the most striking features of treatment is the remarkable recovery of tone and elasticity of the thinned and atrophic skin after obliteration of the veins.

All cases should be kept under observation for at least a year after treatment has finished.

He has shown that in varicose conditions, with the limb at varying angles, the capillary blood flow in the skin of the lower leg is markedly increased immediately the hæmodrometer records a distal flow.

Admitting for the moment the validity of these experiments, the condition of the circulation in the varicose limb is as follows. Blood from the deeper parts of the limb passes upwards in the femoral vein, and on reaching the saphenous opening some of this pours into the valveless saphenous vein and travels distally. Theoretically, this blood may again reach the deeper veins via existing collaterals, or, on the other hand, may only do so after passing through the capillary bed once more, in a reverse direction. That at least part of the blood takes the latter course is suggested by Magnus's experiments. Under certain circumstances, therefore, the blood flow in the capillaries of the lower part of the varicose area is reversed in direction, and is composed of "used" blood. Granted these abnormal mechanical conditions in the circulation, physiological changes inevitably follow in the blood itself, and as a result of these tissue nutrition is impaired. Without accepting these views in their entirety, it is possible to admit that they provide the most logical explanation available of the development and the persistence of varicose ulceration, as well as of the conditions under which healing of this ulceration may be brought about.

DISCUSSION OF CASES TREATED BY INTRAVENOUS INJECTIONS.

During the past two years 230 cases of varicose veins have come under may care, the majority in the out-patient department at St. Bartholomew's Hospital. The sex incidence was 44 males and 186 females. Injection treatment has been given in 206 cases, the age limits in this group being 16 and 76 years respectively. There has been no selection, and all cases have been treated provided definite contraindications did not exist. Fully 50 per cent. of the patients would have been regarded as quite unsuitable for surgical measures, on account either of age, general condition, the extent of the varicosities, or the presence of dermatitis or ulceration.

The quinine and urethane method has been the one of choice, and of this 1525 injections were given; 150 injections of sodium salicylate were also given, but their use was confined to patients who were intolerant of quinine or in whom there existed contraindications to its use. The quinine and urethane method was chosen from the point of view of determining its efficacy and limitations, rather than from any preconceived ideas of its superiority to other drugs.

Of the total 206 cases treatment is complete in 140, while 54 are still under treatment. Twelve patients have abandoned treatment, four on account of intercurrent disease and eight without giving any reason. Treatment in all cases has been ambulatory, no serious complication necessitating the patient's admission to hospital has arisen, and there has been no mortality. Out of the 230 cases of varicose veins treated, 24, or approximately 10 per cent., were found to be unsuitable for injections on the following grounds:—

Acute phlebitis ..	.. 5	Psychoneurosis ..	.. 3
Phlegmasia alba dolens	.. 8	Bilateral ankle œdema	.. 1*
Typhoid thrombosis	.. 3	Varicules only ..	.. 1
Pregnancy	.. 1	Acute psoriasis ..	.. 1
Age (74)	.. 1		

*Unilateral varicose veins.

The reason for the rejection of these cases will be discussed more fully later, when dealing with the contraindications to injection treatment.

Detailed case-histories were taken from all patients with special attention to symptoms, the age at onset, pregnancies and the menstrual history, the occurrence of deep or superficial phlebitis, the development of dermatitis and ulceration, and a history of cardiovascular-renal disease. In all cases where any atypical symptoms or signs were present a complete general examination was made in addition to local examination.

Technique of Injections.

The quinine and urethane preparation is of the following formula:—

Quinine hydrochloride	..	4·0 g.
Urethane	..	2·0 g.
Aq. dest.	..	ad 30 c.cm.

The active principle causing damage to the endothelial lining of the vein is the quinine, the urethane merely raising its solubility in aqueous solution. On standing, the solution slowly deposits crystals of quinine hydrochloride; these can easily be redissolved by warming to body temperature. The sodium salicylate solution is made up in strengths of 20 per cent., 30 per cent., and 40 per cent.

The actual technique is similar for the two solutions.

The patient stands in a good light and an Esmarch tourniquet or Martin's bandage is applied proximal to the proposed site of injection. The object of this is to render the veins prominent during the insertion of the needle, and in all cases it should be removed before the injection is made. The patient then lies down and the region of the proposed injection is carefully cleaned with ether. A 5 c.cm. record syringe carrying a No. 17 needle is filled with the required amount of solution and introduced obliquely through healthy skin into the lumen of the vein. The plunger is then slightly withdrawn to confirm the fact that the needle is in the lumen. *At this point the tourniquet is removed,* allowing the vein to collapse and ensuring that the quinine and urethane solution reaches the vein walls in a high concentration. As a rule, 1 c.cm. in 15 seconds is about the average rate of injection, but no force must be used and the time must depend to some extent on the resistance encountered. Pressure is then applied with an ether swab over the site of injection and the needle is withdrawn, the swab being kept in position for two minutes. The puncture is dressed with collodion on a pledglet of wool, and when dry the whole is covered with a small square of wool and firmly bandaged. The maintenance of digital pressure after injection, the collodion dressing, and the bandaging are designed to lessen the risk of leakage of blood mixed with injection material into the subcutaneous tissues around the site of puncture. Leakage is almost certain to cause local complications. The patient goes home, and returns at the end of a week for further treatment. All the patient's usual activities are permitted, rest is not enjoined, but the normal reactions which follow injection are explained.

Considerable discussion has centred round the question of the position during the injection, many workers preferring to have the patient standing. This was done in some of the earlier cases but abandoned because many of the patients objected. On theoretical grounds, it might seem desirable to insist on rest for 10–15 minutes after the injection to prevent any possible aspiration of blood into the deeper veins, but this has not been carried out and no untoward effect has been noted.

Dosage.

It is advisable to commence with a small dose of quinine urethane solution and for the first injection 0·5 c.cm. is invariably employed. This has a twofold object, the first being to test the local reaction of the veins to the solution, and the second to discover whether or not the patient possesses any special idiosyncrasy towards quinine. Subsequent injections are, in practically all cases, 2 c.cm. per dose, which can generally be relied on to thrombose 5–6 inches of a vein. Larger doses may be necessary in a few cases, but more than 4 c.cm. should never be given at one sitting. It is important to follow cases closely to see exactly what degree of thrombosis injections are producing, for individual differences play a large part and injections must be regulated accordingly.

The technical details for sodium salicylate solutions are the same as for quinine, except in dosage. Injections should begin with 2 c.cm. of 20 per cent. solutions, which will usually thrombose about 4 inches of vein. Later injections must be regulated according to the amount of thrombosis produced. If the 20 per blood is to be maintained. Any lesion of intima, be it chemical, physical, mechanical, or bacterial, will lead to a secondary thrombosis in the damaged area. All that injection does is to produce localised endothelial damage by means of drugs which act either by physical or chemical properties. The actual cure is brought about by physiological changes which occur as a result of this damage. Many observers have made histological studies of veins, both in man and in animals, at varying intervals after the introduction of sclerosing substances. Jentzer, using a solution of sodium salicylate with collargol, has demonstrated these changes, the latter drug being added to show the limits reached in the vein wall by the solution. Whereas the greatest change occurs in the intima, there are concomitant changes in the media and even in the adventitia. These experiments were carried out both in man and animals. This work has been confirmed by Benet and Verne using sodium salicylate solutions on rabbits. Wolff has carried out similar experiments on dogs, using corrosive sublimate, and Hanschell has observed the histological changes in man after quinine injections.

Summarising the results of these workers, the process may be described as follows. The earliest change occurs in the endothelium and consists in a swelling of the cells; soon these begin to proliferate towards the lumen of the vessel, become more globular in shape and resemble primitive mesenchyme cells. On this very irregular surface blood platelets are deposited; and around these there forms a very adherent thrombus composed of fibrin, red blood cells and a few white blood cells. On about the fourth day organisation of the thrombus commences by the invasion of the proliferated endothelial cells. Similarly, at a very early stage, hæmorrhages occur in the media, the muscle cells lose their rounded appearance, and there is a round-cell infiltration. At about the end of a week the distinction between thrombus and vein wall is beginning to be lost, and the process of fibrosis continues slowly, till, at the end of about three months, the vein is represented by a thin fibrous cord. The gross specimens also show that from the earliest stages the thrombus is densely adherent to the vessel wall. It is undoubtedly to these histological changes that we must turn when we seek to explain the rarity of pulmonary embolus as a sequel of injection treatment.

PULMONARY EMBOLI.

A method of treatment which relies on the formation of an intravenous thrombus, during the development of which the patient is allowed to continue his normal activities, must supply an answer to the very pertinent question as to the risk of pulmonary embolus from the migration of the clot. That answer can, I think, be given. Taking major surgical operations as a whole, pulmonary embolus is responsible for one death in approximately every thousand cases. Most writers are agreed that this risk is considerably increased in operations on varicose veins, but very few large series have been published to demonstrate this. In two groups of cases quoted by Goerlich and Jeannel respectively, of 1501 operations on varicose veins, five deaths from pulmonary embolus were recorded, giving an incidence of about 1 in 300. In discussing the risks of injection treatment these figures should be borne in mind. In a recent paper McPheeters and Rice have analysed the fatalities following injection treatment. A total of 53,000 treated cases has been recorded in the literature, with only ten fatalities Of these, seven were directly attributed to the injection. The causes of death were: three from non-infected pulmonary embolus, one from pulmonary embolus associated with thrombophlebitis, and one each from septicæmia, mercury poisoning, and thrombophlebitis. There were three other deaths from pulmonary embolus, but these occurred in patients who had some other condition which might equally well have accounted for the embolus. Taking the total fatalities from all causes, including sepsis, this gives an incidence of 1 in 5300 cases. Linser quotes 6000 cases, Nobl 2960 cases, and Sicard and Gaugier "many thousand cases," all without fatality.

These figures speak for themselves. They show at least that, as far as practical results go, the risk to life of injection treatment is very much less than the risks associated with operative measures. All forms of intravenous therapy have their inherent risks; and to this rule the injection treatment of varicose veins is not an exception, but in practice these risks have been shown to be slight.

CONTRA-INDICATIONS.

The contraindications may be summarised thus:—

1. *Deep thrombosis.*—In cases in which thrombosis of the deep veins of the limb has been followed by a compensatory dilatation of the superficial ones, injections should not be given, for any interference with the latter veins will certainly further impede a circulation which is already doing its best to carry on. In practice the commonest condition of this type is phlegmasia alba dolens, and a rule should be made that in patients with a definite history of this condition varicose veins should never be injected, no matter how far the limb has recovered from its previous œdematous state. In this group typhoid thrombosis will also provide a small number of cases.

2. *Acute phlebitis.*—Veins should never be injected in patients with acute phlebitis, and in practice no cases of this type have been treated until an interval of at least six months has elapsed since the attack has subsided. Acute phlebitis is in many cases probably a low-grade infection, and to stimulate further thrombus formation at this time is an invitation to septic complications. Disregard of this rule has been responsible for some of the reported cases of septic thrombophlebitis with embolus formation.

3. *Intra-abdominal tumours.*—In all cases the primary condition must be treated before considering treatment of the veins.

4. *Cardiovascular disease.*—There does not appear to be any real objection to treating these cases provided compensation is adequate. The present series includes two cases of mitral stenosis treated successfully.

5. *Skin disease.*—The presence of some active skin disease will in a few cases contraindicate injections.

6. *Pregnancy.*—As a general rule injection treatment should not be given during pregnancy. After this is over the veins usually show marked improvement and the injections should then be given. In patients in whom veins are giving rise to severe discomfort during pregnancy treatment is, however, justified. The quinine method must, of course, not be employed, but good results can be obtained with salicylate solutions.

CONCLUSIONS.

Injection treatment is a much safer procedure than operation; the method is one which is applicable to a much wider group of cases; the technique is simple, but perhaps this very simplicity is an invitation to abuses; the treatment is ambulatory, and the results good both from the functional and from the cosmetic standpoints; the method is of great prophylactic value against varicose ulceration, and even when this is present healing can be promoted in the majority of cases. It is too early to be dogmatic about recurrences but, if they should occur, injection provides a ready means of dealing with them. For these reasons I submit that injection therapy represents a distinct advance on operative methods in the treatment of varicose veins and varicose ulcers.

In conclusion I will quote the words of our President in connexion with this subject: "In surgery the search is always for simplicity. Complicated and cumbersome methods which are inherently dangerous give way by degrees to simpler and safer procedures. In surgery, as in the other arts, the easy way is often the outcome of long experience and of trial and error."

AN EXAMINATION OF THE PATHOLOGICAL EFFECTS OF STREPTOCOCCAL TOXIN AND HÆMOLYSIN ON RABBITS,

WITH SPECIAL REFERENCE TO THE ÆTIOLOGY OF PURPURA FULMINANS.

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DURING the past three years I have had occasion to observe in some 250 rabbits the effects of administering streptococcal toxins and hæmolysins intravenously in fatal and sublethal doses. In the following paper an account of the clinical signs and pathological changes is offered.

The extensive literature on streptococcal toxins is concerned chiefly with the effect of intradermal injection into man. Effects ascribed to its action on other tissues, either in man or in animals, are often complicated by the fact that either living organisms or hæmolysin were also present or both. Such effects as nephritis or arthritis by toxic absorption in man are at present merely hypothetical.

Observations of Previous Workers.

It is necessary to read far back into the literature to find records of pure toxic effects on animals. The most interesting paper, which unfortunately I did not find until this work was concluded, is that of Laitinen,[1] who in 1896 precipitated cultures of a streptococcus with ammonium sulphate or amyl alcohol, or both, and injected the redissolved product into rabbits. He described hæmorrhages in pleura, pericardium, kidneys, peritoneum, and diaphragm, but published *no* histological details. He produced paralysis by direct injection into nerves, and claimed to be the first to have concentrated the toxin.

Roger, in 1892,[2] precipitated the toxin with alcohol, and found gross diarrhœa, convulsions, and death within four days in rabbits. He was able to immunise rabbits, but only with heated toxin. Many other authors, at or about this period, succeeded in killing rabbits with toxin. Their methods are sometimes subject to criticism—as, for instance, where three-months' old cultures in richly albuminous fluids were used. Perhaps the fact that these early workers did not have available protective antisera has distracted attention from their work. More recently, Stoddard and Woods[3] and Duval and Hibbard[4] have studied the nephritis produced in rabbits by the toxin. Parish and Okell[5] have used unconcentrated toxin, and protected rabbits against death with antitoxin.

Duval and Hibbard produced a glomerulo-nephritis in rabbits by a special technique. They first immunised rabbits with scarlet fever strains other than that of Dochez; later they injected living streptococci of the same strains into the peritoneum. The rabbits were killed after some hours' delay, and the peritoneal exudate, devoid of organisms, killed other rabbits on intravenous injection of 5 c.cm. Apart from the nephritis, no lesions were found, and the markedly glomerular nature of the lesions is not in conformity with my findings.

These authors failed to kill rabbits with living organisms of the types used. This is not in conformity with the work of Okell and Parish, frequently confirmed by me, on the ease, amounting to certainty, with which rabbits can be so killed, using the Dochez strain. They also failed to kill them with large doses of filtrates of cultures grown for 14 days. I have frequently found doses of from 2·5 c.cm. to 5 c.cm. fatal when 72-hour cultures of "Dochez" were used. But when strains of streptococcus, media, duration of culture, and breed of rabbits all vary, comparison is difficult. Apparently the injections were not controlled by antitoxin, and the effects were not necessarily due to the toxin as ordinarily understood.

This paper is important, as the authors base on their results the theory that the toxin is an "endotoxin," due to autolysis, or lysis by the immune rabbit, of streptococci. The evidence for this is at present inadequate. I have frequently found that filtrates of cultures do not kill in doses of 2·5 c.cm., but when concentrated to one-tenth the volume solutions have killed in doses of 0·1 or 0·25 c.cm. This may be due to extraction by alcohol of some toxin from the organism, which is then precipitated by the absolute alcohol.

Gray,[6] in a valuable and well-documented paper, produced nephritis in rabbits and in rats by using large doses of scarlet fever streptococcal filtrates. He found the changes to be chiefly glomerular; one of his published photographs is almost identical with Fig. 7. He stressed the absence of interstitial change or round-cell infiltration, and also the impossibility of giving chronic lesions.

Hartley[7] has precipitated toxin with acetic acid after dialysis. According to Besson,[8] Bonome and Bombicci also used acetic acid, after treatment of cultures with sodium hydroxide; I have been unable to confirm the reference which, however, has been widely quoted on Besson's authority. Hartley used this concentrated toxin to estimate the strength of antitoxic sera. Simultaneously, I published[9] a method of concentrating the toxin by ice-cold absolute alcohol; this toxin was also used to estimate the strength of antitoxic sera.

Thus for over 30 years it has been known that lethal effects can be produced on rabbits by concentrated streptococcal toxins; and my method at least is not new. It is, moreover, well known in the concentration of other toxins.

The Present Investigation.

The experiments summarised above are in some cases open to criticism. Where large volumes, up to 30 c.cm. of fluid are injected, the possibility of non-specific results arises. Where antitoxin controls are not used there is no proof of toxic action. Where early cultures are used, or cultures in serum broth, the action of hæmolysin is *not* excluded.

In the experiments I am about to record the volume injected rarely exceeded 2 c.cm. Controls were invariably used; a standard control was 1·0 c.cm. of intravenous antitoxic serum, administered just before injection. No control ever died. Hæmolysin was always absent—a point which is elaborated below. In order to avoid elaborate protocols it may be stated that no statement is made which was not confirmed on at least four rabbits, that in most a considerably larger number was used, and that over 150 rabbits were killed by intravenous injection.

The technique used may be given in full.

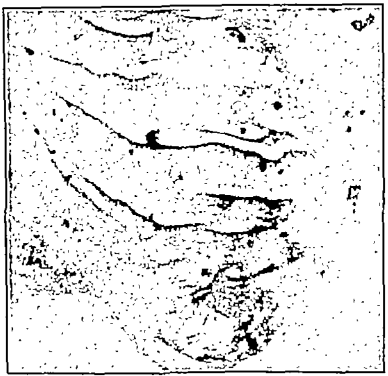
The medium used has been 2 per cent. peptone beef broth, brought to a pH of 7·6 before sterilisation (about pH 7·4 after sterilisation). The streptococcus (the scarlet fever strain "Dochez") is grown on a simple agar slope for 24 hours, and the whole slope culture, washed off with saline, is inoculated into 500 c.cm. of the medium in a litre flask. After 72 hours, 20 c.cm. are taken, cooled in a refrigerator, and then precipitated in 100 c.cm. ice-cold absolute ethyl alcohol. It is left standing for 12 hours at 0° C. Most of the precipitate adheres to the sides of the flask. The supernatant fluid is centrifugalised, and the whole deposit in 2 c.cm. of normal saline, with 0·25 per cent. phenol, is dissolved at 37° for 45 minutes, and frequently shaken. It is then filtered through a Seitz filter, and diluted 1 in 20,000, 1 in 50,000, and 1 in 100,000. 0·2 c.cm. of these dilutions is then injected intradermally into a Dick-positive person (R. J. V. P.). If a strongly positive reaction does not take place at 1 in 50,000, the culture is discarded; such preparations have been found useless on animals. If a good reaction is produced, the bulk of the culture is precipitated similarly, but redissolved in saline without phenol.

Many batches of toxin fail to yield a sufficiently high titre. While the richness of the growth is no guide to the titre of the toxin, I find that too alkaline or acid a reaction is unsuitable for toxin production. It is essential to use a human skin injection as a test of any batch of toxin, otherwise many animals may be wasted. The toxin can be dried in vacuo over sulphuric acid, and then preserves its full potency for at least six weeks.

In the course of these experiments, it was found that three successive batches of toxin prepared as above failed to give any skin reaction on the Dick-positive subject, and failed to produce any symptoms in rabbits. On plating out the culture on to blood agar, it was found that the organism was now of α-hæmolytic and *viridans* type. It has preserved these characteristics on subculture. The obvious criticisms, that the strain had got mixed, or that the strain was originally mixed, cannot be refuted. But the recent work of Grinnell[10] indicates that, when single-cell strains of scarlet fever streptococci are used, mutation from β- to α-hæmolysis is found, and that this change is associated with diminished virulence to mice. Reference to this change is also made by Todd[11] and Frobisher and Denny.[12] The change in my strain occurred when the stock organism had been allowed to grow eight days without subculture. A fresh strain from the Lister Institute was found to give good toxin, and to be of β-hæmolytic type.

Since the publication of my paper,[illegible] I have had to amplify and correct it in certain respects. In the first place, I formerly stated that 3-day cultures were the best for toxin production. Further experiments show that, while 24-hour cultures contain no rabbit-killing toxin, 72-hour and 14-day cultures contain apparently equal amounts, if the same batch of medium and the same innoculum is used throughout. Furthermore, I have found the titre of toxin, both when estimated by skin tests and by rabbit-killing effect, to vary enormously in different batches of media, grown under apparently identical conditions.

FIG. 1.



Gastric hæmorrhages; death in 48 hours following intravenous injection of 0·25 c.cm. of toxin.

I have throughout used male chinchilla rabbits, of two pounds weight. On intravenous injection I find so small a dose as 0·1 c.cm. to be occasionally fatal. A dose of 0·5 c.cm. is, however, the most probable minimal lethal dose, and in fact I use 1 or 2 c.cm. when the object aimed at is the death of the animal—e.g., when it is required to study the same toxin by intraperitoneal injection. This preparation contains no hæmolysin, which is not precipitated by absolute alcohol; neither the addition of fresh serum to the redissolved precipitate nor its oxidation or reduction renders it hæmolytic. The precipitate has been redissolved at 37° C. and at room temperature, but remains non-hæmolytic. It has been put up at pH ranges from 8 to 6 without showing power of hæmolysis. I underline this point, as, in using simple filtrates of streptococci, hæmolysin will be injected in many cases as well as toxin, though frequently it will not pass through a filter. And whatever may be the case with other organisms, streptococcal toxin and hæmolysin are quite different substances, with quite separate actions on the rabbit's tissues.

In studying hæmolysin, 6-hour serum broth cultures of the same organism were centrifugalised and the clear supernatant fluid was examined for hæmolysin. Hæmolysis at a dilution of 1 in 80, using 0·5 per cent. sheeps' cells, was accepted as a sufficient strength. The animals used had all been immunised by several small doses of toxin. Thus the effects of hæmolysin were studied, without the complication of toxic effects.

Clinical Effects of Streptococcal Toxin.

1. *On Intravenous Injection.*—The animal remains well for an hour after injection. It then becomes restless and stops eating. Diarrhœa sets in after the second hour and remains a marked symptom till death. Breathing becomes laboured and noisy; the eyes are closed and water profusely at times. Death occurs, as a rule, after a lapse of between 6 and 24 hours. Animals dying early often die in convulsions; those dying late have shown paralysis of limbs, intense conjunctivitis, great wasting, and continued diarrhœa. No death has occurred after a lapse of five days. No animal eats between the time of the onset of symptoms and death; if an animal begins eating it survives.

Between breeds of rabbits there is a great variability of sensibility to toxin, and in any one breed there is a definite individual variability to the toxin precipitated by absolute alcohol. If small doses of toxin are administered at 48-hour intervals it is possible to kill rabbits by a cumulative effect. If a rabbit recovers from one dose of toxin and is subsequently given another after a lapse of seven days, a very high degree of immunity has been acquired. As much as 15 c.cm. has been given to an immune rabbit without causing symptoms of any sort, though the same toxin was lethal to other rabbits at a dose of 0·5 c.cm. I have never succeeded in producing fresh symptoms in a rabbit which has been allowed to recover from one injection for seven days. Such rabbits have been used for the hæmolysin experiments described below.

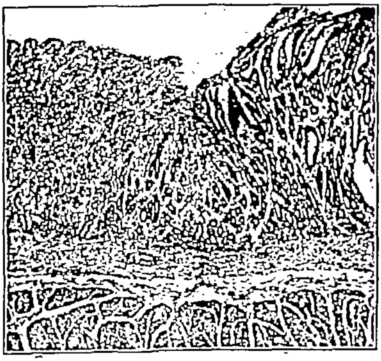
2. On *Intramuscular Injection.*—Small doses produce no effect. Ten times the dose necessary to kill by intravenous injection are required to produce symptoms by intramuscular injection. The symptoms are then similar to those found on intravenous injection, but up to the present no animals have died.

3. On *Administration by Stomach-tube.*—Of six rabbits given, by this route, from 10 to 100 times the dose fatal to other rabbits by intravenous injection, five showed no signs, and one was very ill immediately after administration and died in a few hours. No post-mortem changes were noted, and death was attributed to damage in manipulation.*

4. On *Intradermal* and *subcutaneous injection* of small doses no signs follow.

5. *Intraperitoneal injection* is fatal, but requires large doses. The changes are identical with those following intravenous injection, but the peritoneum is very much more congested.

FIG. 2.



Pyloric end of stomach: epithelial necrosis; ulcer; death in 24 hours following intravenous injection of 1 c.cm. of toxin. (× 100.)

6. *Administration directly into large or small intestine* has not yet been studied; experiments on this point are now in progress.

Blood Changes.

On intravenous injection there is great leucocytosis, but as this also occurs when antitoxic serum is given as a control it cannot be called specific. Four hours after intramuscular injection a marked polymorphonuclear leucocytosis is found, which is absent in immune rabbits. A count of 4000 cells, with 80 per cent. lymphocytes, has been converted into a count of

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* Dietrich[11] has found tetanus toxin innocuous to mice when administered by mouth, save when bile is added.

25,000, with 75 per cent. polymorphs. This is in conformity with the results obtained by Holmes[14] and Ledingham[15] with diphtheria toxin. Blood-urea has not been found to rise; in fact there is usually a slight fall.

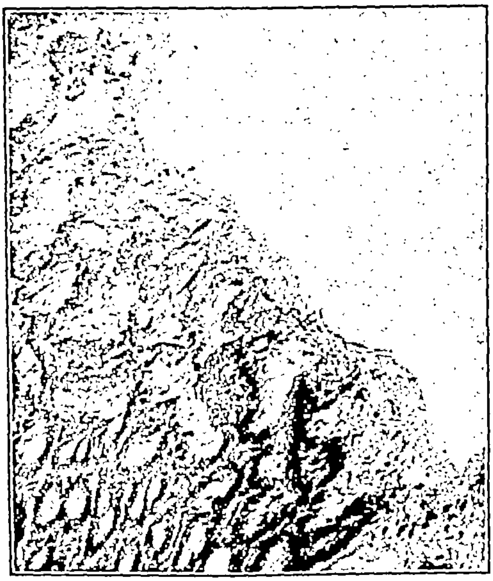
Post-mortem Changes.

1. On *intramuscular injection*, the animal being killed 24–48 hours later. No local changes, apart from needle trauma, are found in the muscles. Renal changes, slight in degree, but similar in nature to those described below, are found. No other changes were noted.

2. On *Intravenous Injection.*—In female rabbits the intense congestion of mammary vessels, first found by Hartley (loc. cit.) in his experiments on concentrated streptococcal toxin, has since been noted by me. The whole peritoneum is congested, especially that of the uteri. Subserous hæmorrhage has sometimes been noted, especially in the colon and cæcum. The bladder is usually full of urine, which does not contain blood, but does contain epithelial casts. The liver is normal; the spleen is of normal size, but is frequently very soft. The suprarenal glands are normal. The whole colon and cæcum are full of liquid fæces and of flatus. There is no macroscopic blood. The small intestine is normal, save that the Peyer's patches appear congested.

The stomach, in about 75 per cent. of the cases, shows hæmorrhagic lesions, widely distributed over the greater curvature, especially at the cardiac end. These are raised blebs, covered with epithelium, and staining the food in contact with them. Sometimes large confluent hæmorrhagic erosions are found In the pylorus depressed serpiginous lesions, which are shallow acute ulcers, are rarely found. The presence of these gastric lesions is independent of dosage, but appears to be related to the duration of symptoms; those animals dying late show them most markedly. Perforation of ulcers was never found. Animals recovering after acute symptoms, or saved by the later injection of antitoxin, never showed hæmorrhagic lesions, but did show white patches of similar distribution and contour. Administration of toxin by stomach-tube fails to produce these lesions; it must be remembered that the rabbit's stomach is never empty, even after a week's starvation, and that the gastric ferments might well destroy toxin. The administration of sodium bicarbonate by stomach-tube before intravenous injection of toxin does not prevent these lesions.

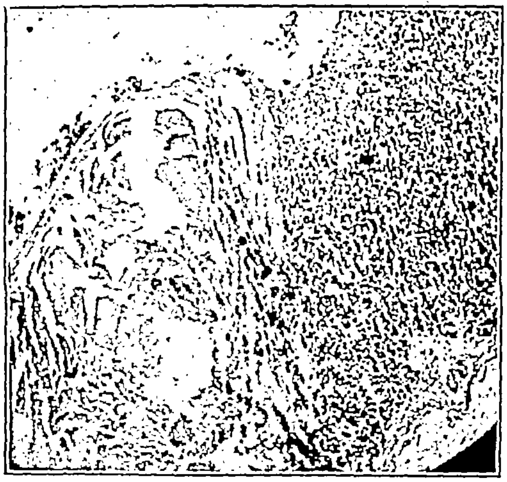
FIG. 3.



Greater curvature of stomach; rabbit killed seven days after injection of 0·5 c.cm. of toxin intravenously; severe illness; recovery. Section through white patch. (× 180.)

The kidneys are of deep plum colour, especially in the medulla and cortico-medullary junction. The right kidney is invariably more affected than the left. The lungs sometimes show hæmorrhagic consolidation of small areas at the bases; there is no general exudate. The heart on one occasion showed endothelial hæmorrhages of the musculæ papillares. The brain and spinal cord showed no lesions even in animals dying of convulsions. The joints showed no changes, either in animals dying after one dose or killed after repeated doses.

FIG. 4.



Cardiac end of stomach; section through hæmorrhagic area; death in ten hours following intravenous injection of 2 c.cm. of toxin. (× 100.)

Microscopical Examination.

1. *Kidneys.*—The glomeruli are engorged with blood, and have an exudate between Bowman's capsule and the glomerular tuft. There is marked vacuolation of the endothelium of the glomerular tuft. Elsewhere there is intense engorgement, which is most marked in the medulla between the collecting tubules. The epithelium is very greatly affected. As a rule the convoluted tubules show the greatest change; there are marked degenerative changes, the nuclei do not stain, and the cell walls are broken down. In cases where death has been caused by repeated small doses at intervals of four days there are areas of complete necrosis in the convoluted tubules. The collecting tubules show casts and a serous exudate; as a rule they preserve their staining properties very well, and the epithelial casts found in them are apparently derived from the convoluted tubules. On several occasions, however, the collecting tubules have shared in the widespread epithelial necrosis, and the epithelium is found to have desquamated. Epithelial casts are found in the urine taken after death from the bladder. I have not found any indications pointing with certainty to interstitial infiltration with leucocytes or interstitial fibrosis; but nearly all my rabbits have died within seven days of injection.

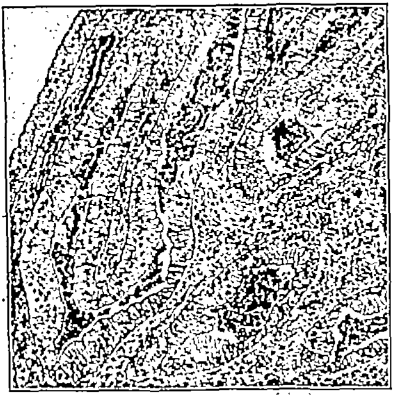
2. *Stomach.*—Lesions are confined to mucosa. There is necrosis of the epithelial cells only; the fibrous trabeculæ are unaffected. The depressed pyloric lesions and the raised cardiac lesions differ only in the presence of hæmorrhage in the latter. Such hæmorrhage is either a slight capillary leak or a large clot lifting the overlying epithelium, but confined to the mucosa. The margin of the lesions is sharply defined. Large Gram-positive bacilli were pointed out to me by Prof. Dudgeon in these lesions. The white

patches in the mucosa previously referred to in a rabbit ill for seven days are seen to be due to a superficial necrosis of the epithelium without hæmorrhage.

Experiments on Other Animals.

1. *Man.*—Reference has been made to the work of Hartley, whose advice at certain stages of my experiments I gratefully acknowledge. He finds, by his method, that the skin-test substance is concentrated to the same extent as the rabbit-killing substance, and argues that they are probably identical. O'Brien[16] confirms these statements, and suggests that the method will prove of great value in the estimation of antitoxin. On imitating Hartley's method on the toxin precipitated by alcohol I find the same results, with the proviso that the end-point both of skin-test and of rabbit-killing substance, owing to individual variation of susceptibility, is difficult to determine. In one Dick-positive person a hot bath was found to convert a negative to a positive skin-test. Very elaborate experiments would be necessary to determine identity, on which doubt has been thrown by Dochez,[17] Sacquepée,[18] Ciuca, Balteanu and Toma,[19] and Cooke,[20] among others. In solution the rabbit-killing substance appears to deteriorate with time, and on heating; this fact might be correlated advantageously with skin-test changes. Two forms of precipitate are found in the solution, when kept: (1) a crystalline deposit, which appears to be phosphatic; (2) an insoluble amorphous precipitate. Injection of both into animals is innocuous, and deterioration of toxin is not necessarily due to their appearance.

FIG. 5.



Kidney; collecting tubules. Normal epithelium; casts in lumen of tubules. Death in six hours following intravenous injection of 2 c.cm. of toxin. (× 160.)

Dudgeon and Hope-Simpson[21] found that *Staphylococcus aureus* precipitin antigens, when put up against homologous antisera, gave precipitins of two types, one of which was granular and crystalline, and the other flocculent and amorphous. It is possible that failure to obtain specific results in the precipitin experiments alluded to below was due to the spontaneous appearance in this preparation of a precipitate, which normally only occurred on admixture of specific antisera.

I find, using strains of streptococci isolated by me from human infections, that the fact that a strain will yield a skin-test filtrate does not imply that, when concentrated by alcohol, symptoms can be produced in a rabbit. But this may merely be a matter of the amount of toxin produced. Apart from the skin-test proper, experiments have been performed: (1) By dropping toxin on to the skin of the arm without breaking the surface, which has no effect. (2) By dropping the toxin into the conjunctival sac. This was three times performed, unintentionally, on a Dick-positive person. It is followed within an hour by intense conjunctivitis, blurred vision, and malaise, lasting for 48 hours. (3) Toxin on the human tongue produces a slight burning sensation.

2. *Guinea-pigs* were repeatedly given up to 100 times the dose fatal to an individual rabbit, both intravenously and intramuscularly. No clinical signs followed, and when killed no changes were found.

3. *Mice* can be killed by toxin, but they are immune, relatively to the rabbit, and require large doses, which give irregular results.

4. *Cat.*—Two cats were injected intravenously with 4 c.cm. of a toxin lethal to rabbits in a dose of 0·5 c.cm.; one was given in addition 1 c.cm. of antitoxin and remained well, showing no lesions when killed. The other, when killed after four days severe illness, showed the renal lesions illustrated in Fig. 8.

5. *Dog.*—No effect save vomiting followed the intravenous injection of 14 c.cm. of the same toxin as was used for the cat, and when killed there were no lesions.

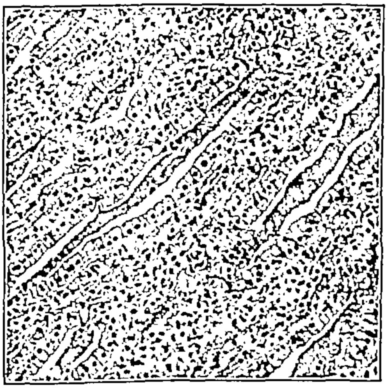
Precipitin Experiments.

Reference may be made to an attempt to estimate antitoxin by precipitin tests. The concentrated toxin gives a precipitate on dilute antitoxin, and dilute toxin on concentrated antitoxin. This is non-specific, and is also given by antisera to tetanus and diphtheria, and by normal horse serum, both when no antiseptic is added and when 0·1 per cent. formalin or 0·25 per cent. phenol is added (see Eagles[22]).

Discussion.

Too much importance should not be attributed to negative findings in this series. Since death occurs in a space of a few hours in most cases, it outpaces all save the most fulminating human infections. These experiments bear no comparison with what might occur when toxin is made and absorbed from a relatively small acute or chronic focus. In order to imitate that the method most likely to be attended with success would be to give intramuscular injections at short intervals, as by this route the toxin makes the animal ill, and keeps it ill for several days, but does not kill it. Such experiments are now being carried out.

FIG. 6.



Kidney; collecting tubules; normal epithelium; exudate in lumen. Death in 24 hours following intravenous injection of 1 c.cm. of toxin.

Therefore, although only one case showed cardiac lesions none showed evidence of arthritic or chronic renal changes, none showed evidence of iritis, and very few involvement of the central nervous system; these experiments as yet have no bearing on the question of chronic focal lesions and their metastatic result. Similarly, the experiments indicate that streptococcal toxin, if swallowed, is innocuous; they do not indicate what might happen if manufactured in other parts of the gut.

The positive results may be considered in order:—

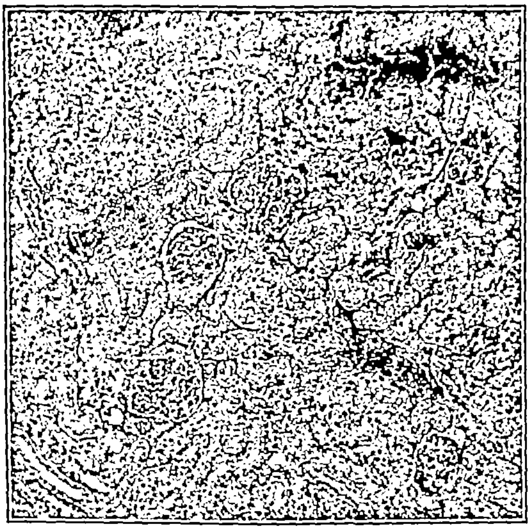
Renal Lesions.—These are not typical of scarlatinal nephritis. There is no interstitial change, even in animals surviving after severe symptoms. Glomeruli are relatively little affected. In fact, the greatest change is the intense engorgement of vessels, even to the extent of widespread hæmorrhage. While much of the parenchymatous degeneration may be secondary to this there is evidence that the proximal portions of the tubular system are specifically injured. The absence of a rise in blood-urea is probably to be neglected, in view of the early deaths. It is surprising that blood is absent from the urine.

The literature on nephritis due to experimental injection of bacterial toxins has been collected by MacNider,[23] and the specific effect on the convoluted tubules is shown to be common to many different toxins.

Gastric Lesions.—Perhaps none of the conditions in which clinical inspiration has postulated focal sepsis as causa causans has been more stressed than gastric ulcer. It is a uniform practice to remove faulty teeth in this condition. Apical cultures give conveniently positive streptococcal findings, and I have yet to meet with a sterile root, using whatever vaunted technique. But, save in acute abscesses, the streptococcus found is non-hæmolytic, and in a few cases investigated by me has failed to yield rabbit-killing toxin.

Bolton collects a long series of acute streptococcal infection associated with acute gastric ulcer. These include puerperal sepsis, scarlet fever, the suppurative stage of small-pox, and erysipelas; and many other conditions are mentioned in which, though the organism is not noted, it is probable that the streptococcus was present. But most authorities agree that such a complication is altogether exceptional. I have only met personally one possible case, where hæmatemesis with gastric erosion complicated cerebral abscess of streptococcal origin. Hæmatemesis, as opposed to frank gastric ulcer, is, however, related in another way to streptococcal infection, and this will be considered below in connexion with purpura.

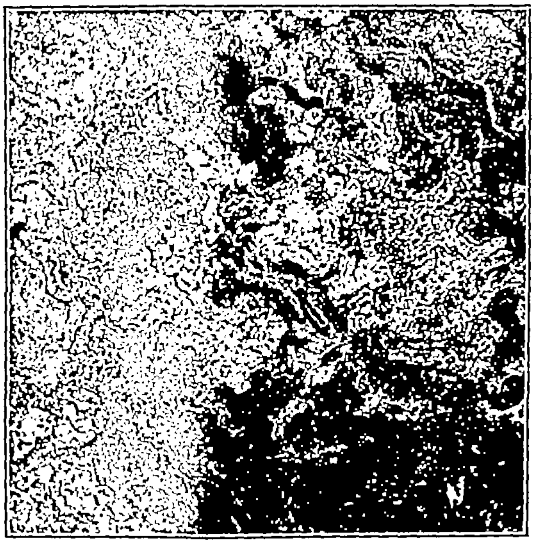
FIG. 7.



Kidney; glomeruli and convoluted tubules; exudate in capsule, and degeneration of convoluted tubules. Death in 24 hours following intravenous injection of 2 c.cm. of toxin. (× 100.)

Reference must nevertheless be made to the work of several authors on the relationship between chronic focal sepsis and chronic gastric ulcer. There is an hypothesis that streptococci localised in certain arbitrary situations may thence be transported in the blood stream, and by ingrained affinity settle down exclusively in new localities. This is particularly the view of Rosenow,[24] and the point must be stressed that gastric ulcer, on this view, is a septicæmic phenomenon, essentially involving localisation of living organisms. New evidence on this point has been produced by Haden [25] and by Nickel and Hufford.[26] These authors, by intravenous injection of living streptococci isolated from human cases of "focal sepsis," produced a high percentage of gastric hæmorrhages and ulcers. The photomicrographs appear to me to resemble the lesions produced by the toxin alone.

FIG. 8.



Kidney; cortex; complete necrosis of convoluted tubules. Death three weeks after the first of three injections of unconcentrated toxin, free from hæmolysin. (× 100.)

Thus elective localisation seems to be unnecessary as an hypothesis for the production of such lesions. It is true that streptococci were present in the lesions produced by the above authors. Prof. Dudgeon pointed out to me large Gram-positive bacilli in the ulcer shown in Fig. 2. I am unable to identify it; *B. subtilis* has been consistently grown from ulcer surfaces in these cases. However, if gastric lesions are produced by the toxin, circulating organisms might then settle there as a secondary event, whether they be streptococci or other organisms.

It is highly questionable how far the rabbit may legitimately be used as an experimental animal for gastric ulcer investigations. There are nearly fifty ways known of giving a rabbit gastric lesions of hæmorrhagic type, and Aschoff[27] states that it suffers from them spontaneously.

While, then, the direct relationship between streptococcal toxin and gastric ulcer is questionable, this series goes to show that elective localisation is not essential to ulcer formation. Finally, chronic or perforating lesions were not produced.

Purpura Fulminans.

In the ultimate analysis, a percentage of human cases of severe and fatal purpura appears to be due to endothelial trauma. An excellent discussion of these cases is given by Frank[28]; the following case, investigated by me, and under the care of Prof. MacLean, may serve as typical.

A girl, aged 8, was admitted to St. Thomas's Hospital with widespread purpura, hæmatemesis, melæna, hæmaturia and epistaxis, and high temperature. Bleeding time, coagulation time, blood count and differential count, and platelet count were normal. There was great abdominal pain and tenderness.

No diagnosis was at first offered. A small abrasion was then noticed on the right thumb; it was of a week's standing. From it a hæmolytic streptococcus was isolated; within 24 hours a culturally similar organism was isolated from a superficial abscess over the left olecranon process (? acute bursitis). Blood culture was not performed. Large volumes of scarlet fever antitoxic serum (Burroughs, Wellcome and Co.) were administered intravenously and intramuscularly, as much as 50 c.cm. per day being given. All the symptoms rapidly improved, and eventually hæmaturia alone remained. Intermittent crops of purpura were controlled by serum. The child was discharged suffering from albuminuria, which has since disappeared.

A second somewhat similar case has been brought to my notice by Prof. Dudgeon, and for the following notes I am indebted to Dr. J. W. Hope-Simpson.

A female child, aged 1 year 7 months, was admitted with history of six weeks' cough and dyspnœa. An operation was performed for empyema and a pneumococcus found. Three months later she was readmitted, and on aspirating the chest a hæmolytic streptococcus was found. Fourteen days later a very large ecchymosis about 8 in. by 2 in. appeared on the left calf, and later on similar patches developed on both elbows, both feet, both wrists, the backs of the hands, and both knees. The patches were firm, slightly raised, and plum-coloured. Further patches appeared in different places until death, which took place one month after readmission.

Post-mortem Examination.—Hæmolytic streptococci were grown from the heart blood. 0·5 c.cm. of agar slope emulsion was injected into the muscles of a rabbit, but without effect. There were numerous bright hæmorrhages on the omentum and visceral peritoneum, but no general peritonitis. The spleen was normal in size, and a film showed streptococci. There were hæmorrhages in the substance of the suprarenal glands and all around them. There were hæmorrhagic spots under the pleura. The blood in the heart had not clotted.

The above cases are admittedly rarities, but many similar ones have been reported and are referred to in the paper by Frank (loc. cit.). In all specific fevers purpuric forms are known. In the case of the meningococcus and pneumococcus an intercellular hæmolysin is found, which may be responsible for the purpura; it has been shown that the intracellular pneumococcal hæmolysin can cause non-fatal purpura in mice.

But the influence of streptococcal toxin may sometimes be the main factor. Ikeda[illegible] has shown that in purpuric small-pox direct blood-films show streptococci during life and that post mortem there are submucous hæmorrhages throughout the gut. He attributes the purpura to the streptococcus. In scarlet fever, the purpuric form is a well-known entity, known to the Germans as *Zweite Krankheit*, and Frank defines scarlatinal nephritis as renal purpura. The association of burns, on the one hand with sepsis, and on the other hand with ulceration of the intestinal tract, is perhaps suggestive in view of the gastric lesions in rabbits. The acute oral sepsis of blood diseases in their terminal stages is associated with purpura, and the bacterial infection may perhaps, in addition to the platelet deficiency, be a cause of the purpura by absorption of toxin.

The rabbit does not appear to get cutaneous hæmorrhages. I have occasionally noted blue marks in the skin, but these appear to be due to the normal pigment of the chinchilla rabbit. On the other hand, the intense mammary hæmorrhages noted by Hartley occur in organs developmentally of cutaneous origin and fall under this category. Elsewhere, all the lesions found may be explained on the basis of specific endothelial damage. The analogy between the deaths in this series of rabbits and purpura fulminans in the second week of scarlet fever appears to me complete. In the rabbits in which estimation of platelets was made there was, in fact, no diminution. But opinion is divided on the diminution of platelets in human purpura fulminans, and in the case recorded by me it was not present.

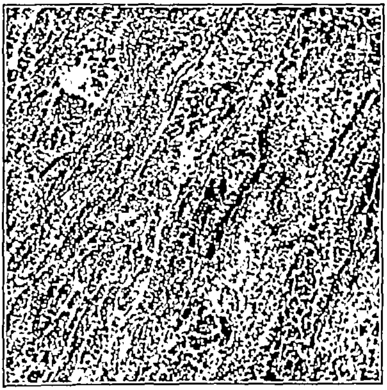
The suggestion arises from these experiments that, wherever purpura is associated, directly or indirectly, with acute streptococcal infection, it is due to the toxin of the streptococcus. In such cases, the use of antitoxic serum is indicated. It is necessary to specify antitoxic sera, since bactericidal sera are still obtainable and are devoid of antitoxic properties.

Hæmolysin.

The fact that, up to the present, analysis has failed to define "toxins" or "hæmolysins" in terms of chemical structure necessarily tends to much confusion of thought and of nomenclature.

The phenomena associated with their presence may be due to the formation by bacterial metabolism of fresh substances; they may equally be due to physical changes on the media, such as changes in the state of colloidal aggregation or of surface tension. Both words refer only to phenomena; the deduced substances have only hypothetical, though very plausible, existence. In writing of them, it is necessary either to beg the question and refer to them as substances of definite structure, or to use clumsy periphrases. I have therefore followed current use, and employed the conventional terminology.

FIG. 9.



Kidney; medulla; hæmorrhagic necrosis of collecting tubules. Death in 12 hours following intravenous injection of 2 c.cm. of toxin. (× 100.)

Kolmer[illegible] defines toxins as follows:—

> "Bacterial toxins may be defined as poisonous products produced by bacteria in both living tissues and artificial culture media. An essential property of a toxin lies in the fact that we can immunise a subject against it, and are able to demonstrate the presence of an antitoxin within the serum of an immunised animal."

If we adopt this definition—and no better one seems available—the alcohol precipitate which I have employed contains toxin.

However, early cultures of certain streptococci have the property of lysing red cells. Is this substance a toxin? And is it the same substance?

By general admission, it does not comply with the second paragraph of Kolmer's definition; antibody formation is never found. I find animals immunised against toxin to be susceptible to hæmolysin; and find antitoxic sera devoid of antihæmolysin "in vitro." Other antitoxic sera, such as diphtheria antitoxin, do contain antihæmolysin, and there are some who suppose the substances to be identical.† But this is not true of the streptococcus, as far as we know. It would be absurd to presume that the mechanism of all hæmolysis is identical in fundamental characteristics. For example, hæmolysis by sera from animals immune to the red cells of other animals requires "complement" for its completion; streptococcal hæmolysins I find unaffected by fresh serum. Streptococcal hæmolysin may be as distinct from other hæmolysins as it is from the immune hæmolysin.

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† Mason and Glenny[illegible] titrate the toxin of *B. welchii* by estimating its hæmolytic power.

It is unnecessary here to refer in detail to the literature on streptococcal hæmolysin. It is fully collected in a paper by Cesari, Cotoni and Lavalle.[32] To their summary may be added that recent work tends to point to variability in hæmolysin production of a given strain, and to the confinement of hæmolysin production, in certain strains, to anaerobic cultures.

McLeod[33] has suggested that all toxic effects of the streptococcus may be due to the same substance, and with Channon, has recently shown that a filtrate which is hæmolytic also lyses white cells in vitro. These two authors also ascribe both the latter actions *to one substance.* But Frobisher[34] *has found* a tissue-digesting enzyme in streptococcal filtrates, and, since this is present in non-hæmolytic and hæmolytic filtrates, assumes a distinction between the two properties.

The hæmolytic power of streptococcal strains varies greatly, and "Dochez" is rather poor, rarely yielding hæmolytic filtrates capable of lysing 0·5 per cent. red cells at a dilution of over 1 in 100. Channon and McLeod used a very much more powerfully hæmolytic strain, and succeed in killing rabbits by intravenous injection of 10 c.cm. They produce hæmoglobinuria, hæmorrhagic lesions throughout the body, and focal necrosis of the liver. Other authors have used centrifugalised cultures, since hæmolysin does not always pass a filter and, if it does, loses much of its hæmolytic power.

In no case, so far as I can find, has any author used antitoxic sera in the investigation of the effects of hæmolysin. Thus experiments are apt to be confusing since, if a filtrate is used, toxin as well as hæmolysin may be present and, if centrifugalised cultures are used, living organisms are present in addition. In order to obtain high titre hæmolysin, it is essential to add serum to cultures. In the preparation of toxin, serum has never been used by me; and thus I cannot say whether in fact toxins appear, in a strength capable of killing a rabbit in serum cultures at a period when hæmolysin is high in titre.

The effect of intravenous injection of hæmolysin was tested on 20 rabbits. In doses of 10 c.cm. a filtrate hæmolytic up to a dilution of 1 in 80 on 0·5 per cent. cells produced no clinical effects; the rabbits had all been previously immunised against toxin. When killed, no changes were anywhere demonstrated. On intraperitoneal and intramuscular injection, however, local hæmorrhage was found.

The reasons why streptococcal toxin and hæmolysin are not identical may be summarised as follows:—

1. Toxin is absent, using the rabbit as test animal, in precipitated cultures up to the first 24 hours.
2. Hæmolysin is at its strongest at some period between the sixth and twenty-fourth hours.
3. Toxin is found at the seventy-second hour, and may persist till the fourteenth day at least.
4. Hæmolysin, under the conditions of these experiments, is usually absent at the seventy-second hour and always at the fourteenth day.
5. Toxin can be precipitated by alcohol and acetic acid.
6. Hæmolysin cannot be precipitated by such precipitants. The addition of fresh serum to the redissolved precipitate, oxidation by bubbling air through the fluid, or reduction by Neill and Mallory's[36] method, and the adjustment of the reaction to ranges between pH 8 and pH 6 fail to return hæmolytic properties to the solution.‡
7. Toxin, on injection into muscles, produces no local changes, but severe general symptoms and renal changes.
8. Hæmolysin, similarly injected, produces a typical tabby-cat striation of muscles, due to punctate hæmorrhages and hæmorrhage into fascial planes. It produces no *general symptoms.*
9. Toxin, injected intravenously or intramuscularly, *produces extreme leucocytosis.*
10. The injection of hæmolysin causes leucopenia, as is shown below in one series of four rabbits; actually 14 were used at different times. A 24-hour filtrate of 5 per cent. serum broth culture of Dochez (titre 1 in 80 using 0·5 per cent. red cells) was injected in 10 c.cm. doses intravenously. All animals had previously been immunised against toxin and 24 hours before the experiment 1 c.cm. of antitoxin was administered intravenously in addition.

Rabbit.	Before experiment.	4 hours after.	6 hours after.
1	10,500	5,600	8,400
2	11,300	7,700	6,900
3	7,000	4,600	6,400
4	11,900	7,900	Aborted

The leucopenia appears to be due to a diminution in the lymphocytes—e.g., in rabbit 1:—

	Before injection.	4 hours after.
Polymorphs	15	49
Small lymphocytes	82	47
Eosinophils	1	2
Mast cells	2	2

This leucopenia may perhaps be related to the leucocyte destruction shown by Channon and McLeod; it may equally be due to shock following intravascular hæmolysis. The red cells never showed any change after injection of hæmolysin.

In view of the marked differences between streptococcal hæmolysins and other hæmolysins, it was thought possible that it might be a crystalloid in spite of statements that it cannot be dialysed.

Thin collodion sacs were made and sterilised in 75 per cent. alcohol. Thence they were placed in saline. A 24-hour serum broth culture of Dochez was procured, and the titre of its hæmolysins found to be over 1 in 80 using 0·5 per cent. cells. A suspension of 0·5 per cent. human cells was then prepared in the same medium, and 2 c.cm. were placed in a sac; the sac was suspended by a thread in the culture. After 24 hours there was no hæmolysis. Therefore the hæmolysin appears not to be a crystalloid.

Discussion on Above Results.

Parish and Okell[37] have pointed out that, while rabbits can be protected against death within a few days, after injection of living organisms, by antitoxic serum, chronic infections are never prevented. That has been my own experience with rabbits immunised by toxin injections; peritonitis and arthritis were the terminal infections. In human infections with hæmolytic streptococci antitoxic serum is often dramatic in its effect. Infections with α-hæmolytic strains, on the other hand, and with certain β-hæmolytic strains not biologically distinct from the Dochez strain, were completely unaffected by the serum used.

The toxin of the streptococcus therefore seems to be only one of many weapons of the *streptococcus*, and peculiar to some strains, in my experience all β-hæmolytic. All the lesions caused by the toxin may be explained on the basis of endothelial damage, and antitoxin can only protect against that factor in streptococcal infection—a factor only rarely predominant.

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‡ One experiment on the attempted reduction of the precipitate may be given in full. Neill[35] found that many bacterial hæmolysins became inactive, on being kept, through oxidation. This was true of *B. welchii* and of the streptococcus. Further, the intracellular hæmolysin of the pneumococcus is precipitable by absolute alcohol. It is then, however, inactive, but can be reactivated by reduction. It was therefore possible that the precipitate from my cultures contained inactive hæmolysin. A six-hour culture of the streptococcus, which was hæmolytic up to 1 in 80 against 0·5 per cent. sheep's cells, was precipitated as above described, and redissolved. A 24-hour culture of *B. welchii* was similarly treated. On testing the redissolved streptococcal preparation was non-hæmolytic; the *B. welchii* preparation showed concentration of the hæmolysin. 0·1 g. of $Na_2S_2O_4$ was placed in a tube. Immediately before use 25 c.cm. of 0·1 M. phosphate buffer solution, pH 7·4, was added. 0·2 c.cm. of this solution was taken and added to 1 c.cm. of the redissolved precipitate, and the volume made up to 2·2 c.cm. with the phosphate buffer. The mixture was immediately placed in an anaerobic jar and evacuated; it was then left for 30 minutes. No evidence whatever of hæmolysin was found. In order to control this experiment a filtrate of "Dochez" which had lost hæmolytic power on being kept, and a similar one of *B. welchii*, were treated by Neill's technique. Reactivation was found, but it was incomplete; in neither case was the final titre of the reduced hæmolysin equal to its initial highest titre. This last experiment was kindly carried out for me by Dr. L. S. Penrose. Channon and McLeod (loc. cit.) also failed to reactivate completely streptococcal hæmolysin by that technique.

Hæmolysin, as made by the Dochez strain, appears to be in itself comparatively innocuous. Even 20 c.cm. of an unusually vigorous preparation was devoid of effect in a rabbit immune against toxin on intravenous injection. It does, however, produce peritoneal hæmorrhage on intraperitoneal injection, and petechial hæmorrhage on intramuscular injection into toxin-immune rabbits.

The different results obtained by other writers may be due in part to the use of strains with greater power of hæmolysin production. As, however, in no case were antitoxin controls used, they may also be due to the injection of toxin. It is true that early cultures must be used to obtain hæmolysin, and that early cultures contain little toxin when no serum is used in the medium. The use of serum may conceivably modify toxin production, and the simultaneous injection of toxin and hæmolysin may produce effects not found with the injection of either substance separately in the doses used.

Finally, the action of toxin and hæmolysin in the tissues may well modify the further pathogenic action of the streptococcus itself.

Experiments are being performed to determine the minimum lethal dose of living organisms when injected, with and without hæmolysin, in toxin-immune rabbits.

Summary.

1. Certain strains of streptococcus produce both toxin and hæmolysin. The pathogenic activity of streptococci is not dependent solely on the toxic power, since animals immune to it may yet be killed by living organisms, although surviving longer than controls.

2. Toxin and hæmolysin are different substances, formed in culture at different times, producing different lesions in the rabbit, differing in their behaviour to globulin precipitants and in their power to evoke immune bodies.

3. Toxin, in rabbits, produces leucocytosis, hæmorrhagic nephritis, hæmorrhagic erosion and ulceration of the stomach, and hæmorrhagic lesions in mammæ, lungs, and peritoneum. It produces no changes locally on intramuscular injection.

4. The hæmolysin of "Dochez" produces leucopenia, local hæmorrhage on intramuscular injection and on intraperitoneal injection, in animals immune to toxin. Otherwise it is devoid of effect under the conditions of these experiments.

5. The human conditions best paralleled by the lesions of this toxin in rabbits are those found in purpura fulminans.

My thanks are due to the following: to Sir C. S. Wallace and Prof. H. MacLean for facilities for this work; to Prof. L. S. Dudgeon for advice and criticism; to Dr. A. L. Basham for the photomicrographs, prepared in the Unit Laboratory; to Dr. R. A. O'Brien for the strain of organism and the antisera used; and to my assistant, Mr. P. Carter, for his help and many valuable suggestions.

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INTERNAL DERANGEMENTS OF THE KNEE-JOINT.*

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"Internal derangements of the knee-joint" is an arbitrary term without logical basis. In this paper I shall confine my remarks to injuries to the menisci, injuries to the spine of the tibia, and loose bodies.

In all cases where I suspect one of these three conditions I do a complete exploratory operation, splitting the patella vertically and pulling the two halves widely apart, so as to expose the joint as fully as possible. I believe that this is the only way to be certain of dealing with the particular trouble which may be present. With one minor exception (see later) I have observed no ill-effects from this procedure, and I believe it to be harmless.

Technique of Operation.

The whole limb, having been shaved and painted with iodine, is raised in the air, and a rubber bandage tourniquet is applied to the middle third of the thigh. The limb is lowered on to a sterile towel and a sandbag is placed beneath the buttock to counteract the tendency of the limb to rotate outwards. A second sandbag is put beneath the knee.

A vertical incision through the skin and subcutaneous tissues is made in the mid-line, starting from a point 5 in. above the patella and extending to a point 3 in. below it. The edges of the wound thus made are slightly undercut, and are hidden from the area of operation by sterile towels clipped on with tissue forceps. The patella is split vertically with a chisel and mallet; with a fresh scalpel the split in the patella is continued up between the fibres of the quadriceps tendon and down between the fibres of the ligamentum patellæ, for the full extent of the wound. The two halves of the patella are drawn widely aside with special retractors and at the same instant the knee is fully flexed by a third assistant. The subpatellar pad of fat is divided in the middle line down to the tibia. The whole joint is exposed and the abnormal condition present is dealt with.

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* Based on a paper read before the Swiss Society of Surgery at Zug on May 28th, 1929.

The two halves of the patella are then allowed to fall together and the whole gap between the split fibres of the quadriceps, the two halves of the patella, and the split fibres of the ligamentum patellæ is closed with one long continuous suture of chromic catgut. The stitches pass actually into the joint in bringing together the fibres of the quadriceps, then into the fibrous tissue covering the front of the patella, and again pass deeply to bring together the divided halves of the sub-patellar pad of fat. The skin wound is closed with interrupted horsehair. White gauze and three layers of cotton-wool are applied to the knee with a 6-in. bandage and the tourniquet removed. I employ no splint. When the patient is back in bed a small pillow is placed beneath the knee, a cradle is placed over the foot, and the end of the bed is raised on blocks. The patient is encouraged to start moving on the third day, to get up with crutches at the beginning of the third week, and to be back at work in six weeks.

In a series of 41 cases operated on at one hospital by this method there were found :—

	Cases.
(1) Mesial meniscus split or detached	17
(2) Lateral meniscus split or detached	4
(3) Loose bodies	10
(4) Spine of tibia fractured	5
(5) Joint normal, though injured meniscus suspected..	4
(6) Joint normal, though loose body suspected ..	1

(1) *Mesial Meniscus Split or Detached* (17 cases).—In every case the loose or torn piece of cartilage was cut cleanly away from the part which remained fixed in place; that is to say, the whole cartilage was not always removed, but only the abnormal portion.

(2) *Lateral Meniscus Split or Detached* (4 cases).—In none of these had a diagnosis been made of injury to the lateral meniscus.

CASE 1, a girl of 22, a restaurant worker, was seen on March 24th, 1927. Four months previously she had stooped to pick up something and felt the left knee click suddenly. This was followed by a great deal of swelling which, however, subsided in a week. Since then she had felt a click whenever she straightened the knee, which jarred her and was uncomfortable; occasionally there was pain and swelling on the outer side of the joint. On examination a definite click was felt just before full extension and a lesser click on beginning flexion. Both clicks appeared to be on the outer side of the knee-joint. A month later the patient stated that several times she had had difficulty in straightening the knee. At operation on July 5th, 1927, the anterior half of the lateral meniscus was found loose and split.

CASE 2, a boy of 10, was said to have broken his right leg four years before, and complained of his right knee letting him down frequently. He said it clicked and hurt whenever he ran and made him fall. On flexion the tibia dislocated inwards; on extension the dislocation reduced audibly.

At operation on July 26th, 1927, the lateral meniscus was found loose, displaced inwards, and enlarged to quite ten times its normal size. It was lying on the articular surface of the tibia and completely interfering with normal movement. On section the enlarged meniscus was solid right through; there was no cyst formation.

CASE 3, a man aged 34, had hurt his right knee three weeks previously when playing football. He had heard something click, felt a sudden great pain, and had to stop playing. The knee was bent and he could not straighten it; it had remained bent ever since. I tried to reduce under gas, but failed. At operation, five days later, the lateral meniscus was found split transversely and the anterior cruciate ligament partly torn through. The loose anterior portion of the meniscus was removed.

CASE 4 is still under treatment. When first seen on March 21st, 1929, he told me he had had a cartilage removed from his right knee at University College Hospital, London, 17 years before. The knee had never been quite sound since. Two months ago he was getting out of bed when his right knee became fixed suddenly in the bent position. This has since happened five or six times.

At operation on April 15th a portion of the lateral meniscus was found loose in the joint, attached by its posterior cornu only. It was enlarged to the size of an irregular pea or orange pip, and had evidently been moving in and out between the bones. The anterior cruciate ligament did not exist; shreds of it were found and were sutured together. The scar of the first operation is on the inner side. I suggest that the surgeon was dealing with a case of ruptured anterior cruciate ligament which had taken up the anterior cornu of the lateral meniscus with it, and that he removed all the lateral meniscus he could reach and the anterior cruciate as well.

(3) *Loose Bodies* (10 cases).—Two of these were remarkable.

CASE 1, a shoeing-smith aged 30, stated that two months earlier he had been shoeing the hind hoof of a horse when it suddenly pulled back while he was stooping and caused him to over-extend his right knee violently. It was frightfully painful for two or three minutes and he hardly knew how to bear it; then the pain eased off and he went on with his work. Next day the knee was twice the size of the other and very painful, but he went to work and remained at work until three weeks before examination, when, in turning round sharply, the knee gave way and became bent and remained so for two or three days. He could feel something loose under the skin on the outer side, which he could move about.

At operation a slice of articular cartilage the size of a shilling was found almost completely detached from the outer and lower aspect of the mesial condyle, and a much smaller portion was completely loose and free in the joint. The cavity in the condyle from which the pieces of cartilage had come was healed over in its whole extent with a thin bluish-white film.

CASE 2 was a man aged 58 with advanced osteo-arthritis of the right knee. The joint was tightly distended, apparently with fluid, and it was for this distension that he sought relief. On opening the knee large masses of bright yellow fat-like material welled up out of the joint. There was quite half a pint of this, and it was present in the joint under considerable pressure. The joint itself showed advanced osteo-arthritis, with erosion of cartilage and hypertrophied synovial fringes. The yellow material was completely free in the joint, and was considered by me to be a lipoma which had somehow become detached. On section and microscopical examination, however, the following report was received :—

"The masses appear to be composed of a fibrinous material. Although in a few places a vessel and a small amount of fibrous tissue can be seen, for the most part there is no organised structure; fat is not present."

(4) *Spine of Tibia Fractured* (5 cases).—Four of these cases have already formed the subject of a communication by me which has appeared in the *Journal of Bone and Joint Surgery*. They were operated upon within a fortnight of the injury. In each of them, when the patella had been split and the two halves drawn widely apart, the knee being fully flexed, the fragment of bone torn out of the top of the tibia was seen lying in the intercondylar notch, attached above and posteriorly to the anterior cruciate ligament and externally to the anterior horn of the lateral meniscus. The place from which it had been torn was represented by a deep hole in the upper surface of the tibia. Attempts to replace the fragment were entirely prevented by the lateral meniscus, which appeared to have become shrunken or contracted. It was therefore divided with a tenotome at a point a quarter of an inch away from its attachment to the fragment. With a pair of dissecting forceps the latter could then be put back exactly in place in the top of the tibia, the anterior cruciate ligament being still attached to it. With the forceps holding the fragment the knee-joint was moved from complete flexion to complete extension, in which position there was no tendency for the fragment to shift when the forceps was removed; in fact, the condyles seemed to ram it home most effectively. So no suture of any kind was used, the limb being enclosed at once in plaster. After a month the plaster was removed and massage and gentle movements started. Three of the cases recovered completely; the fourth, in which the head of the tibia was also fractured, was not able eventually to flex the knee to less than 80 degrees.

The fifth case was not seen until eight months had elapsed, and occurred in a chauffeur, as the result of a motor accident. He spent three months in bed, and the knee had been bent ever since at an angle of 120 degrees. It was impossible to straighten it because of a bony block. The lateral X ray showed a large shadow in the joint anteriorly in the angle between the femur and the tibia. At operation a mass of bone was found here, rising up from the floor of the anterior intercondylic fossa; this was chiselled off, allowing the knee to be straightened. Seen six years later, May 9th, 1929, he was completely cured, except for the last 10 degrees of extension. He had been at work ever since discharge.

(5) *Joint Normal, though Injured Meniscus Suspected* (4 cases).

In one case I used the "internal lateral" route instead of the split patella, and had a very poor view of the joint. As I could see nothing wrong I closed the wound. Now, after six and a half years, he complains that his knee still goes wrong and locks, so there is evidently some derangement which should be attended to.

In the second the menisci were healthy, but a tag of fat was lying in between the tibia and internal femoral condyle, and was removed. I doubt, however, whether this could have been the cause of the symptoms. A year later the patient reported he had been back at his work as a blacksmith for 11 months; his knee was normal.

In a third case, where there was a history of two attacks of locking and the diagnosis had been made by my assistant, nothing abnormal was found. Seen three and a half years later the knee was normal and never troubled the patient at all. He is at work as a slot-gas collector, and has to carry heavy bags full of copper coins.

The fourth case is noteworthy; it occurred in a girl of 18. Her doctor wrote: "to see Mr. Roth for ? dislocation of the semilunar cartilage. The knee is flexed and cannot now be extended." The patient informed me it was her fifth attack of locking. I tried to reduce, but failed, then had gas administered and reduced at once. As she had had so many attacks I advised operation and opened the knee five days later. To my surprise the interior of the knee was normal. Seven months later the knee became locked again, and again two months after that. I advised a knee-cage. When seen for the last time after some months the knee seemed perfectly sound. Was this a case of hysterical knee?

(6) *Joint Normal, though Loose Body Suspected.*—In this case X rays showed a shadow behind joint, but nothing was found at operation.

Remarks.

The small number of meniscus cases is explained by the fact that it is my custom to reduce displacements where possible under gas, and not to advise operation unless the displacement occurs a second time. In a very large number of cases it never does occur again. Where operation is decided on I believe, as already stated, that the surest way to avoid mistakes and obtain complete relief of symptoms is to split the patella and have a clear view of the joint. Sepsis has been entirely absent. In one case superficial sepsis occurred in the lower part of the wound, but there were three unusual factors to consider: there was some delay in the sterilisation of the instruments, it was a fresh theatre sister's first day with me, and my assistant was away ill. I ought not to have operated. Under normal conditions sepsis does not occur.

Fear of non-union between the divided halves of the patella is groundless. Clinically, at least, no damage is done to this bone and no unfavourable effect is produced. Where an X ray has been taken years later slight osteo-arthritic changes have been observed, but they do not seem to be of the slightest importance. I suggest that the *division of the patella* is much less harmful than a horizontal or oblique section of the internal lateral ligament. I believe that the operation for the removal of damaged menisci done by this method gives a 100 per cent. cure. It enables the surgeon to remove accurately and completely the whole of the loose or torn portion and, on the other hand, it ensures that he will not remove undamaged structures.

I have written to all these patients, and of the 21 meniscus cases 10 have come to see me. They are all perfectly well, at intervals of from one to six years after operation. There has never been any return of symptoms and all of them profess and appear to be perfectly recovered. At the worst one or two complain of slight aching in damp weather, or of not being able to kneel on a hard surface with comfort. Yet I have seen statistics published by other surgeons where unsoundness of the joint has persisted in from 30 to 40 per cent. of cases. Such statistics naturally bring discredit upon operative treatment and encourage recourse to unqualified bone-setters.

I can conceive of no other method which will give the perfect view required for reposition of the bone in fracture of the tibial spine and for the removal of loose bodies.

Post Scriptum.—The difficulty of operating through a small lateral incision is recognised by Prof. Fritz Steinmann, of Berne, who has devised a new instrument, the "meniscotome." This is made on the same plan as a tonsillotome. The ring of the instrument is made to encircle the free end of the detached meniscus and is pushed back along it as far as it will go; the knife then slides across the ring and cuts off the meniscus. Prof Steinmann claims that in this way none of the loose part can ever be left behind and that so little damage is done to the knee that the patient may be allowed up to walk on the day after operation.

Clinical and Laboratory Notes.

THE ASSOCIATION OF HUMAN AND CANINE JAUNDICE,

WITH AN ILLUSTRATIVE CASE.

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AND
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It has always been surprising that so few cases of Weil's disease should be reported in this country, considering that as many as 20 to 30 per cent. of adult English wild rats harbour leptospiras which are almost certainly pathogenic to man. At one time it appeared possible that the epidemics of "infectious jaundice," which are by no means rare among school-children, might be ascribed to leptospiral infection, but the more fully these epidemics have been investigated the more unlikely it seems that they are due to this cause (Cockayne, 1912; Morgan and Brown, 1927; Booth and Okell, 1928). The present view, almost universally held, is that the infectious jaundice of children is a disease sui generis. In 1925 (Okell, Dalling, and Pugh) it was shown that the common malignant jaundice (or "yellows") of dogs was due to infection with *Leptospira icterohæmorrhagiæ*. When the close intimacy that exists between human beings and dogs is considered it becomes even more surprising that leptospiral disease, which is *par excellence* a contact infection, does not occur more frequently in man.

Leptospiral disease in dogs is a disease of high mortality; 90–100 per cent. of the affected puppies may die and some foxhound kennels lose as many as half of their annual puppies in this way. The disease affects practically all breeds of dogs, but is most common in kennelled dogs such as foxhounds and beagles. The signs, symptoms, and post-mortem appearances closely resemble leptospiral disease in man and other animals. Jaundice and hæmorrhagic signs are almost constantly present, petechial or even massive hæmorrhages in the lungs being particularly characteristic. In puppies intussusception, the result of hæmorrhagic enteritis, is a frequent terminal complication. For a more detailed description of the disease reference may be made to the paper already referred to (Okell, Dalling, and Pugh, 1925).

Records of the association of human and canine jaundice are very few. The first case we have been able to trace was that reported by Krumbein and Frieling in 1916, where two officers, living in the same room as a dog suffering from jaundice, developed what appeared to be typical Weil's disease. This observation

tion antedated the recognition of the leptospira as the cause of Weil's disease. Uhlenhuth and Fromme (1919), in their classical paper on leptospiral jaundice, mentioned a case of jaundice in the dog which they proved almost conclusively to be leptospiral. They were investigating an area where human cases of Weil's disease occurred, though there was no direct connexion between the canine and any human cases. When it became evident that such a common disease as "yellows" in dogs was of a leptospiral nature inquiries were made with a view to tracing cases of associated human and canine jaundice (Okell, 1925), but only two instances were discovered, one of which was reported to us by Prof. R. D. Passey, the other by Dr. R. Stirling and Mr. Lornie, M.R.C.V.S., of Perth.

The following case has recently come under our notice:—

A. B., aged 52, first whip of a pack of foxhounds, had been nursing several puppies affected with "yellows" and had performed several post-mortem examinations with naked hands during the three to four weeks previous to the onset of his illness. He had also been bitten by a fox about ten days previously, but nothing abnormal had been noted in the fox. On Dec. 11th, 1928, he had been hunting and had been suddenly seized with shivering and intense pains in the back, loins, legs, arms, and neck. He had to go to bed immediately.

On Dec. 12th, when first medically examined, he was flushed and obviously ill. Temp. 101° F., pulse-rate 140. His conjunctivæ were intensely congested and there were definite hæmorrhages beneath the conjunctival membrane. At this stage there were well-marked pulmonary signs and symptoms—patches of bronchial breathing and expectoration of blood-stained sputum. There was little cough and the respiration-rate was not appreciably increased. A provisional diagnosis of mild broncho-pneumonia was made at this stage.

On the fourth day of the illness jaundice became apparent. It quickly deepened to an intense orange yellow colour and with the onset of jaundice the temperature rapidly fell. The fæces were pale and the urine nearly black with bile-pigment. There was no tenderness over the hepatic area. The liver and spleen appeared to be of normal size. During the first week there was intermittent hiccup and on two or three occasions slight epistaxis. The pulmonary signs quickly cleared up and the jaundice deepened almost to a bronzed colour by the tenth day. At this time the posterior cervical glands were noted as enlarged and the lymphatic vessels in the region as thickened.

The diagnosis of Weil's disease was now almost certain. 10 c.cm. of antileptospiral serum of known potency was then given and five days later a further 10 c.cm. By the end of the fourth week albuminuria was detected which persisted for about eight to nine weeks; the patient made an uneventful recovery except for a slight exacerbation of temperature at the end of the third week of illness. Examination of the urine during the fourth week proved negative for leptospiras both on direct examination and by guinea-pig inoculation. The distance of the case from the laboratory made it impossible to investigate the pathology of the case in detail. From the clinical course of the disease alone, however, an almost certain diagnosis could be made of Weil's disease.

It should not be overlooked that the possibility of human beings contracting Weil's disease from affected dogs appears on theoretical grounds to be no slight one. So far as is known the pathogenic leptospiras consist of one species of micro-organism and infection from one animal's species to another is experimentally easy. The greatest risk is no doubt in the handling of internal organs—e.g., at post-mortem examination—since these usually contain the leptospira. The virus is easily transmissible by skin contact, and though we have never been able to infect guinea-pigs by placing virus on the intact skin we have been able to transmit the disease with regularity by placing a drop of virus-containing organ extract on a slightly scarified area.

Possibly the association of human with canine jaundice is not so uncommon as the recorded cases would suggest, and it is in the hope of attracting the attention of medical and veterinary practitioners, particularly in rural areas that we have thought it worth while to report this case.

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ON THE MODE OF ACTION OF IRRADIATED ERGOSTEROL

UPON THE MYELIN FORMS OF LECITHIN.

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DURING an inquiry into the factors which initiate and promote the formation of myelin threads and droplets by lecithin when in contact with water, it was found that irradiated ergosterol (vitamin D) exercises a marked effect.

A solution was made in chloroform of approximately equal parts of ergosterol and pure lecithin. The lecithin used was prepared by Levene's process, and was kindly obtained for me from America by Prof. H. McLean.

The solution was divided into two portions. Portion A was exposed in a quartz tube to the rays from a mercury-vapour lamp for half an hour at a distance of 18 inches. Portion B was kept as a control. A drop from each portion was then allowed to evaporate on a slide. The film deposited from A appeared to the naked eye more translucent and homogeneous than the more opaque granular deposit from the non-irradiated B. On adding a drop of normal saline to each film and covering with a cover-slip, examination under the microscope showed a marked activation of the lecithin (by hydration or water absorption) in the radiated portion A. The lecithin begins almost immediately to form droplets and throw out myelin threads, especially in the thinner areas of the film. The rosettes of needle crystals formed by the irradiated sterol deposited from the chloroform solution also show lecithin droplets and threads round their edges.

The non-irradiated film is considerably slower in showing activity. Under dark-ground illumination the difference between the irradiated and the non-irradiated film is more easily appreciated.

It is important to examine the films at once, and at short intervals, because the active phase, during which the protrusion of myelin threads and the formation of droplets takes place, is a transitory one, and ceases sooner in the more fully hydrated and irradiated than in the non-irradiated film. Examination of the two films with polarised light shows that the myelin threads or projecting worm-like processes, which grow from the surface and edges of the deposited lecithin (as hydration proceeds) polarise well, while the isolated droplets which bud from the ends of these myelin stalks give a bright appearance with a terminal dark Maltese cross. The arms of this black cross correspond to the vibration planes of the polarising prisms (like a starch grain). The polarising capacity, which expresses the physical and not the chemical character of the material, is most marked along the edge or skin of the droplet or thread where the pellicle is thickest. As the threads grow in size the wall becomes thinner and the polarising capacity less marked. Thus, the film which contains the irradiated ergosterol undergoes hydration sooner, and passes more rapidly into the expanded thin-walled phase, than the more slowly reacting non-irradiated film.

A careful study is being made of the staining reactions of lecithin under different conditions, irradiated and not irradiated. Much has been learned, but the problem is so large and so complex that much more investigation is necessary before final or useful results can be arrived at. I have confirmed Prof. J. B. Leathes's observations[1] that the presence of cholesterol in the proportion of one part of cholesterol to four parts of lecithin does not inhibit—in our experience it actually increases—activity in lecithin when covered with water. Neither does cholesterol, in this concentration, inhibit the activating effect of vitamin D on lecithin, though it is possible that it might do so when present in larger proportions.[1]

It is necessary to inquire whether the activating effect is still present when the concentrations used more nearly resemble those present in the body during life. If we assume (see Leathes[2]) that in 100 g. of wet body-weight the amount of lecithin will be about 2 g., and if we regard the effective dose of vitamin D as 2 mg. in rickets (K. H. Coward[3]) then we have some indication of the relative proportions of ergosterol and lecithin to use outside the body in order to make these in vitro and in vivo experiments comparable.

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[1] THE LANCET, 1925, i., 958.

For convenience of experiment we worked with an 8 per cent. solution of lecithin in chloroform, a 2 per cent. solution of cholesterol in chloroform, and a 0·0001 solution of ergosterol in chloroform. To exclude any possible effect of radiation on the lecithin itself when irradiated in solution with ergosterol, we irradiated the ergosterol in a quartz tube and then added the unradiated lecithin solution in equal volume. After evaporation, a drop of distilled, recently boiled, water, or normal saline. was placed on the film, which was then examined, covered or uncovered, under the microscope.

At this low percentage, in which the ergosterol lecithin ratio presumably corresponds with that existing in the living body, the effect of the irradiated as compared with the non-irradiated sterol is slight. The difference becomes easily recognisable when the strength of the ergosterol is raised to 0·001 per cent. and becomes very marked when the strength of 0·01 per cent. is reached.

The following experiment shows that the effect on the lecithin is due to vitamin D, and not to any peroxide of ergosterol which forms on the irradiation of the sterol in contact with the air.

If two films or smears of ergosterol are made on a glass slide and irradiated, one in the air and one through a film of water covered by a quartz slip, the air being thus excluded, only the irradiated sterol from the film protected against contact with the air activates the lecithin. The sterol irradiated in contact with air fails to do so.

The question arises whether we can associate these findings with the changes which can be observed in living cells as the result of exposure to the action of irradiated sterol. I have shown[4] that living leucocytes, when incubated in blood or in blood serum on a thin film of irradiated ergosterol in a closed cell, respond sooner and more strongly than corresponding cells incubated on an ergosterol film which has not been previously irradiated. The cells in the irradiated film show increased pseudopodial activity, and they elaborate droplets of iodophil substance sooner and in larger quantity than *the cells* in the non-irradiated film. I have also shown in earlier papers that this formation of iodophil substance depends on nuclear and cytoplasmic changes, especially in the perinuclear lipoid-protein membrane. The significance of this observation lies in the observed influence of certain fat-soluble substances on this perinuclear membrane, which is now believed to be composed, in part at any rate, of lecithin, possibly in combination with cholesterol and other proteid substances.

Thus we have some evidence, based on experimental and direct observation, which suggests that irradiated ergosterol (vitamin D) exerts its influence primarily on the lipoid rather than on the protein elements in the cell. In this way it renders the cytoplasmic and perinuclear lipoid membranes more permeable, and increases nuclear cytoplasmic interchange.

Does the irradiated sterol produce this change in the cell membranes as the result of an inversion of phase of the constituents in a fat-water emulsion, or does it reverse the orientation of the lecithin molecules, thus directing the hydrophil chemically active pole towards the exterior?

My observations, if applied to rickets, suggest that the vitamin D acts on the bone cells concerned in calcification and speeds up their calcium-phosphorus metabolism by acting on the lipin constituents (especially the lecithin moiety) of the cells, and by facilitating interchange through the pericellular and perinuclear membranes, enables these cells to extract the calcium phosphate from the blood.

If, as I hope, they can be confirmed, a further step will, I think, have been taken in the fuller understanding of the mode of action of one of the fat-soluble vitamins on the organism.

I desire to acknowledge the great help I have received from Mr. Frank Young in this investigation, and also from Prof. Leathes's Croonian Lectures, published in THE LANCET in 1925.

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[2] Ibid., p. 803.

[3] Quoted by Rosenheim and Webster, THE LANCET, 1927, ii., 622.

[4] Trans. Brit. Assoc. (Physiol. Sect.), 1927.

A CASE OF

ILEOCÆCAL INTUSSUSCEPTION WITH SPONTANEOUS REDUCTION.

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A SOMEWHAT unusual case of intussusception was recently admitted to Ancoats Hospital, under the care of Mr. E. E. Hughes, with whose permission the following notes have been written.

A male child, aged 11 months, was seized with collicky abdominal pain at midday and vomited twice. He was taken to Dr. J. Scanlan, who found blood on his finger-tip after doing a rectal examination and diagnosed the case as one of intussusception. On arrival in hospital, examination revealed a quite definite tumour, of typical shape, to the right of and above the umbilicus, and also an emptiness in the right iliac fossa. This was at or about 6 P.M. The child at the time seemed very ill with intermittent abdominal colic, but subsequently quietened down considerably and did not vomit again.

Before going to the operating theatre I examined the abdomen and could find no tumour of any kind. The rectum contained fæces. The advisability of operation seemed doubtful, for I had not personally found any evidence in support of the diagnosis, save a definite history and the report of previous examinations. An enema was given, which produced a good result stained with blood and mucus. Laparotomy was decided upon, the possibility of spontaneous reduction being mooted but dismissed as highly unlikely. I may add that there were no purpuric or arthritic symptoms at this or any other stage of the illness.

On opening the abdomen I found the cæcum in its normal position, but both it and the last six inches of the ileum and appendix were deeply congested and œdematous. So altered was the appendix, that it seemed advisable to remove it.

The most curious feature of the case was that on taking a final review of the abdominal contents I discovered another, and obviously early, intussusception in the small intestine, about two inches long. There was no blueness or turgidity, so that this could not possibly have been the apex of the original one. It was reduced and the abdomen closed. At the time it did not seem justifiable to take out enough small intestine to make sure whether the second intussusception was the result of normal or retro-peristalsis. At the end of the operation 5 c.cm. of normal saline were injected into either flank and the baby was put back to bed with radiant heat and rectal salines. Recovery was uneventful.

I conclude with, I think, sufficient justification that this was a case of spontaneous reduction of an ileocæcal intussusception. Whether the second condition would have progressed or not it is hard to say. It is conceivable that, if retrograde, it may have been caused by the same retroperistaltic waves that produced the self-reduction. In any case, the tale seems worth telling; H. W. Carson[1] says that the spontaneous cure of intussusception is so rare that very few surgeons have seen a case and that the few recorded examples are almost legendary.

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[1] Modern Operative Surgery, London, 1924, i., 694.

LIVERPOOL OPEN-AIR HOSPITAL FOR CHILDREN.—The annual report of this hospital, at Leasowe, Cheshire, states that an important advance in the treatment of crippling disease in childhood has been made by the opening of the new treatment block. The chief feature of the building is the artificial light department in which carbon-arc and mercury-vapour lamps of the latest pattern are installed to provide general light treatment for 12 lying or 50 sitting cases per hour; as it is possible to work these lamps for five hours a day, the needs of the 200 children in the hospital can be met adequately. The patients stay for periods varying from three months to nine years.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 284.)

SECTION OF MEDICINE.

CARDIO-AORTIC SYPHILIS.

Prof. GEORGE MURRAY (Manchester) presiding, Dr. JOHN COWAN and Dr. J. STEVEN FAULDS (Glasgow) opened a discussion on Syphilis of the Heart and Aorta. They began by quoting estimates of the incidence of syphilis in the general population. Osler and McCrae had long ago estimated an incidence of 12 per cent. for Berlin and 15 per cent. for Paris. The speakers gave an estimate, based upon Wassermann reactions among their own ward cases, of 8·6 per cent. in males and 7·2 per cent. in females. Carey Coombs's figures were 9 per cent. in hospital and 4 per cent. in private patients. The incidence of syphilis among patients with defective hearts was estimated by Allen at 19·7 per cent.; Dr. Cowan and Dr. Faulds found it to be 17·7 per cent. when based upon Wassermann reactions of their patients, while if the diagnosis was based upon naked-eye pathological findings the incidence was 15·3 per cent. All these estimates probably erred upon the conservative side.

Pathological Lesions.

The pathological lesions recorded were those observed in a thousand consecutive necropsies; of these, 390 presented some disease of the heart or aorta, 60 of which were considered to be due to syphilis. The lesions found were endarteritis obliterans, aortitis, aortic valve disease, gumma, and myocardial fibrosis.

Endarteritis obliterans affected short lengths of vessel, but in their whole circumference, always narrowing the lumen and frequently accompanied by thrombosis. The interna and adventitia were always thickened and showed new-formed elastic tissue, the media being either thinned or little altered. Gross calcareous or fatty changes were rare. Prof. R. Muir held the opinion that the lesion represented the reaction to an irritant approaching the arterial wall from without. Endarteritis obliterans was characteristic of syphilis in all its stages, and was the important primary change in aneurysm and myocardial ischæmic fibrosis.

Specific Aortitis.—These lesions occurred as soft, gelatinous, greyish elevated plaques of considerable thickness, which might coalesce and later become contracted, thinned, and pearly white. The first part of the thoracic aorta was the site of election. The early lesions started in the adventitia and involved the nutrient arteries of the aortic wall, giving rise to weakening and resorption of the media with consequent weakening of the aortic wall. This process led to potential or actual aneurysm. The aortic cusps and the coronary vessels might be involved, but lesions of the mitral valve segments were insignificant and played no proportionate parts in the production of chronic mitral disease.

Aneurysm might possibly be produced by weakening of the aortic wall by ulcerative processes other than those of syphilis, but was most commonly of specific origin.

Chronic Aortic Valvular Disease.—The pathological lesions were admittedly very varied, the causes multiple, and the results upon the valve more dependent upon the site of the injury than on the cause. Valve lesions could take various forms, and their ætiology could not easily be determined.

Atheroma was by far the most common vascular lesion, peculiarly liable to attack vessels of the heart, brain, and limbs with the aorta. The causes were general, arising in the battle of life and accompanying increasing years. Atheroma is often present in addition to rheumatic and specific infections, making the resultant lesion impossible to classify.

Myocardial disease was mostly only a side issue. The occurrence of a true syphilitic myocarditis, or of localised gummata, was rare, the myocardial changes being for the most part the secondary effects of coronary occlusion and, therefore, not in themselves specific, but dependent upon the degree of occlusion.

Pericarditis of syphilitic origin was hardly ever seen, though cases of proliferative mediastino-pericarditis, taking origin beneath the diaphragm, might occur.

The Clinical Data.

Aortitis of the infective type was chiefly caused by syphilis; the lesion per se produced no symptoms even when extensive in area and advanced in degree. Patients suffering from large aneurysms, extensive aortic valve lesions, and coronary infarcts were able still to carry on their employment. Although the symptoms of specific heart lesions were similar to those arising from any other cause, paroxysmal attacks of pain and dyspnœa at night were more common in the specific than the rheumatic group, owing to the coronary involvement. In the syphilitic group continued pain was suggestive of aneurysm rather than pericarditis; palpitation was due to throbbing vessels rather than to abnormal rhythm, and œdema to local pressure rather than the effects of gravity. The appearance of the patients was thin, emaciated, and sallow, abnormal pulsation sometimes appearing above or below the clavicles. A systolic aortic murmur often preceded a diastolic one, although aortic stenosis was rare; the second aortic sound was increased and the radiogram showed an increase in the aortic shadow.

The association of aneurysm with syphilis was stressed by Dr. Cowan and his collaborator; in a series of 66 cases of chronic aneurysm 49 were found to be syphilitic. The age-incidence both of syphilitic heart disease and of aneurysm was from 40 to 60; both tended to occur 10 to 20 years after infection, although cases had been recorded within 12 months of primary infection.

Chronic aortic valve disease was regarded as due to syphilis in 30 per cent. of a series of 274 cases; but there was a sex difference, the incidence being over 30 per cent. in males and under 20 per cent. in females, and also an age difference, the percentage rising to 50 between the ages of 40 and 60 in males. The incidence of syphilis and rheumatism in the series was the same, but the incidence of aortic disease in men between 40 and 60 with no antecedent history was very suggestive of a specific origin.

The physical signs differed little in the two groups, but accentuation of the pulmonary second sound, common in rheumatic cases, was rare in the syphilitic group, since rheumatism commonly, and syphilis rarely, affected the mitral cusps. Evidence of aortic aneurysm or dilatation of the aorta suggested a specific origin of the lesion, but the final diagnosis might frequently depend upon the recognition of stigmata elsewhere or a positive Wassermann reaction. Not only mitral valvular disease but acute endocarditis was rare in syphilis, while in the rheumatic group reinfection from acute endocarditis may occur and leave unmistakable signs at necropsy.

Myocardial Disease.—Examination of the series of cases failed to give any estimate of the frequency of syphilis as a causative factor in myocardial disease; the age-incidence was a decade later than that usual for syphilis. The conclusion arrived at was that the degree of coronary damage was a much more important factor than the original cause of the disease.

Angina.—The relation of syphilis to angina was discussed. The speakers considered the physiological basis of the pain to be the relative anoxæmia of the cardiac muscle. Seven necropsies were recorded in three of which specific aortitis was found. They pointed out, however, that the average age of incidence was a decade later than that for specific aortitis.

Diagnosis.

Dr. Cowan and Dr. Faulds said that the four great causes of cardiac lesions were rheumatism and bacterial endocarditis in the earlier years of life, involving the valves and pericardium, and syphilis and atheroma in later life, involving the valves and arteries. Syphilis must be recognised as an important cause of heart disease, occurring most frequently in males between 40 and 60, the symptoms being entirely cardiac. Aortitis and aneurysm were usually, aortic disease, myocardial disease, and angina frequently, syphilitic; mitral disease and pericarditis were never syphilitic.

The clinical history might mislead; the Wassermann reaction, if positive, was important, but if negative might mislead, since 25 per cent. of cases of syphilis might give a negative reaction in the tertiary stage, though a full routine examination might reveal other definitely specific stigmata to complete the diagnosis.

Treatment.

Treatment of cardiac lesions as such differed in no way from that of similar lesions of other origin. From the constitutional point of view, the disease was still active and required active treatment. The choice between the sterilisation by arsenical compounds and the older method of administering a long course of mercury and iodides must be made.

The speakers held that the older long-continued method was much to be preferred, except in those patients who showed no signs of cardiac deficiency; but they stated with emphasis that the true treatment of cardio-aortic syphilis was preventive, every case which occurred nowadays being due to error, either on the part of the patient or on that of his medical adviser.

Discussion.

Dr. S. Boyd Campbell (Belfast) confined his remarks to the serum reactions in the blood in cases of cardio-aortic syphilis, with the changes resulting from treatment. Among 55 cases of aneurysm the Wassermann reaction was found negative in 11. Variations in the results were found by various techniques. The degree of positiveness was usually slight, while provocative N.A.B. injections rarely produced any change. A series of graphs were shown recording the positive units by the Dreyer method before, and during, treatment; several showed a considerable fall, in some cases to negative, followed by a slight rise. The records extended over varying periods up to four years. The method of dosage remained constant, small amounts of N.A.B. up to 0·4 g. were given, accompanied by the continued exhibition of mercury and iodides. Another series of graphs showed a marked rise in the serum reaction as the result of the first course of treatment, followed subsequently by a fall almost to normal. Two cases were recorded where a superimposed bacterial infection in a treated case occasioned a sudden rise in reaction with death. Treatment had originally been undertaken in those cardiac patients who responded badly to treatment on general principles. They showed material improvement under antispecific treatment, but only if the first part of the treatment was carried out while the patient was confined to bed. Dr. Boyd Campbell believed that once treatment had begun it must be maintained for the rest of life, and that probably two courses per year would always be required.

Dr. J. Crighton Bramwell (Manchester) confined his remarks to the disturbances of the cardiac mechanism. He said that it was difficult to find an adequate criterion of the syphilitic origin of a lesion. In premature ventricular contractions, for example, tea, coffee, tobacco were known to be capable of producing the arrhythmia in susceptible subjects. The presence of a positive Wassermann reaction proved nothing. Where groups of ventricular extrasystoles occurred and disappeared under antispecific treatment, the possibility of a syphilitic origin had to be considered. Paroxysmal tachycardia was known to be rare in cardio-aortic syphilis. Dr. Bramwell said that in 26 of his own cases where the nature of the arrhythmia had been established by the electrocardiogram no clinical evidence of syphilis had been obtained, and similar findings had been reported by other workers. Heart-block had in the past been regarded as most frequently due to syphilis, but increased knowledge had shown this to be wrong. In his own series of 23 cases clinical evidence of syphilis was found only three times, and these summed with other records in the literature gave 105 cases, with syphilis as a cause in 20. Heart-block of high grade, even causing Stokes-Adams attacks, might occur in paroxysms. There was on record a case where the heart was observed to change from normal rhythm to complete heart-block with convulsive seizures on two days out of eight, and then to return to normal rhythm. These attacks were attributed to a pyrexia with joint pains which occurred almost simultaneously. Auricular fibrillation arose from three main causes: (*a*) rheumatic infection of long standing; (*b*) degenerative myocardial fibrosis; (*c*) toxæmia as in thyroid disease. There was no evidence that syphilis was likely to be a common cause. Dr. Bramwell had come to the conclusion that heart-block was the only disturbance of cardiac mechanism which was frequently due to syphilis, the condition of pulsus alternans being common to all degenerative cardiac changes.

Prof. A. S. Warthin (Michigan) spoke of the histological findings in syphilis, particularly those in the heart muscle. He recalled the fact that cardiac myxo-gumma was first referred to in 1826, the observation remaining unnoticed until his own corroborative work many years later, when a similar condition was found in a congenitally syphilitic heart, and he was able to demonstrate large numbers of spirochætæ in the gelatinous areas scattered throughout the ventricular wall. Prof. Warthin showed a series of microphotographic lantern slides to demonstrate the histological changes of acute exacerbations of syphilis in the ventricular myocardium of two patients who died with dramatic suddenness; death in early life was due to congenital syphilis, and that in later life to the acquired disease—in both cases when the disease had existed for 20 years. Each series of slides was introduced by a short résumé of the clinical history; then slides of the macroscopic appearance were followed by those illustrating microscopical changes under progressive degrees of magnification up to the tissue reactions around the individual spirochæte. The yellowish, semitranslucent, gelatinous patches of the macroscopic lesion, the proliferation of all nuclei in the affected area, the multiplication of the single nuclear tissue cells, the intercellular œdema, the want of change in the majority of the muscle-fibres, the vacuolation and œdema of the connective tissue with proliferative thickening of the endocardium were clearly represented. Prof. Warthin stated that 20 to 60 per cent. of all post-mortem material at his hospital showed definite evidence of latent syphilis in which the spirochæte could be demonstrated. He pointed out that such lesions as had been shown could be found in the wall of the left ventricle at its junction with the septum in every male case of syphilis, but that this was not true of the female.

Dr. F. Parkes Weber (London) asked Prof. Warthin what were the Wassermann reactions in his cases of syphilitic myocarditis, and also whether cases of thoracic aneurysm had been found due to any disease other than syphilis, particularly in young people. Aneurysms of cerebral vessels were known to give rise to sudden severe cerebral hæmorrhage before the age of 30.

Dr. J. Speares (Dublin) reported a high frequency of positive findings of aortic aneurysm by routine X ray examination of heart cases, having found thoracic aneurysm in 42 instances among 600 cardiacs, with vocal cord palsy in 13 instances. Among this group the Wassermann reaction was found to be negative 15 times. Tracheal tug as a physical sign was criticised, the speaker only having found it present once in 61 cases of thoracic aneurysm. He considered the value of the Wassermann reaction in cases of myocardial damage to be very doubtful owing to the total want of correspondence between the clinical and pathological findings.

Dr. D. NABARRO (London) reported the occurrence of chorea and rheumatic heart disease in a child aged 8 at the Hospital for Sick Children, Great Ormond-street, who developed keratitis while under treatment. He was found to have Hutchinson teeth and a strongly positive Wassermann reaction, and under adequate antisyphilitic treatment made an almost complete recovery, including a negative Wassermann reaction.

Sir HUMPHRY ROLLESTON pointed out that the lesions found in the acute exacerbations of visceral syphilis were in their nature secondary rather than tertiary syphilitic phenomena. He asked how far to-day syphilis might be regarded as actually cured by modern treatment, in view of the continued record of reinfections.

Dr. H. J. STARLING (Norwich) discussed the indications for Wassermann test in heart disease. He considered that aortic valve lesions, pallor, wasting, and a grade of illness disproportionate to the lesions found, or a reluctance to recover, all called for this investigation. He reviewed the coexistence of syphilis with other infections, and the possibility of exacerbation from any active sepsis in the course of active antisyphilitic treatment.

Prof. JOHN HAY (Liverpool) criticised the discussion on the grounds that although syphilis might be the original cause of a cardiac lesion, yet the illness from which the patient suffered and for which treatment was sought was cardiac failure. It followed that to treat the antecedent syphilis might do harm rather than good, while to deal with the essential symptoms of circulatory insufficiency was the essential clinical demand. He suggested that a percentage of 30–60 of all hospital autopsies showing definite signs of syphilis was one three or four times greater than anything accepted as probable in this country. He asked Prof. Warthin for any possible explanation of this discrepancy and also for any data to estimate the cardiac reserve in that series of cases reported by him in which dramatically sudden death occurred and revealed at autopsy a widespread generalised syphilitic myocarditis.

Dr. G. J. LANGLEY (Manchester) reported the Wassermann results from cases in his own cardiac clinic. The only case of thoracic aneurysm occurring in the past ten years which gave a negative Wassermann test was found at post-mortem to have no aneurysm. Aortic disease constituted 12½ per cent. of all cardiac lesions. 42 per cent. were rheumatic and 35 per cent. syphilitic; 18 per cent. showed thoracic aneurysm. Myocardial degeneration, as shown by a form of electrocardiogram differing widely and grossly from normal, occurred 43 times, of which the Wassermann reaction was positive three times in 16 cases. In nine cases of complete bundle-branch block the Wassermann reaction was only partially positive in one, being negative in all the others. Dr. Langley did not, therefore, regard syphilis as being the usual cause of gross myocardial disease.

Prof. WARTHIN, in reply to various inquiries, stated that 40 years ago the State of Michigan as a lumber camp was infected with a peculiarly virulent type of syphilis, which might explain the very high percentage of findings at the autopsies of to-day. He reiterated his figures of 30–60 per cent. of syphilis for all hospital autopsies. He stated that even with the special Kahn test, much less with the ordinary Wassermann test, many results were negative in cases which later were proved histologically to be syphilitic; even in such diseases as thoracic aneurysm the Wassermann reaction and Kahn test were not unc[illegible]nly both quite negative. He discussed the [illegible]in of syphilitic histological changes in the [illegible]lis was common in the testis, but was never found in the ovary; it was common in the heart, central nervous system, and aorta of man, but rare in woman. He further stated that syphilis tended to remain entirely latent in women till after the menopause, when acute exacerbations were common. His experience of actual cure was that it never occurred. Treatment must be maintained certainly for five years, and probably longer; immunity might be established, but probably not for all strains of the spirochæte. Reinfection so-called could be explained on two heads: (1) The second chancre was not a true chancre; in some cases he had demonstrated the absence of spirochætes, the lesion being septic in origin. (2) In other cases, the reinfection was due to another strain of the organism. He knew of only two causes for thoracic aneurysm: syphilis, and the *Streptococcus viridans* of bacterial endocarditis.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

THE VOLUNTARY BOARDER.

Prof. JUDSON S. BURY (Manchester) presided over this Section.

Dr. HENRY YELLOWLEES (London) opened a discussion on the present position of the voluntary boarder. He said that there were three classes of "mental" institutions in this country: the county or borough establishments for rate-supported patients, the privately owned "licensed houses," and the registered mental hospitals. In addition to rate-aided patients, many of the county asylums could, and did, admit paying patients at a low figure, but no patient could be admitted to these institutions unless he had been certified and a magistrate's order for his "detention" obtained. This was probably the greatest blot on our present lunacy administration. Only the licensed houses and the registered hospitals received voluntary boarders. A voluntary boarder was a person who entered the institution on his own request, and was free to leave it at 24 hours' notice, should he desire to do so. The all-important statement must be added that a voluntary boarder might only remain under care so long as he was definitely desirous of doing so and capable of expressing his desire. In other words, expressed willingness to remain was the sole criterion of a patient's suitability to stay in a mental hospital on a voluntary basis. A very profound degree of mental disturbance was quite compatible with a wish to remain under care, but in practice this was not considered. So long as the patient wished to stay in hospital he remained a voluntary boarder, and therefore a legally sane man, whatever his symptoms might be. Once let this willingness to remain falter, disappear, or fail to be expressed, and the patient must be certified as of unsound mind. There was no more pitiable *reductio ad absurdum* than this, that the deciding factor as to a person's legal sanity or insanity was simply whether or not he could express a desire to remain in hospital. It took for granted that the patient meant what he said, and would not say what he did not mean.

A more important question was that of the patient who, having entered a mental hospital of his own accord, became, owing to illness, incapable of expressing his wishes one way or another. It was this problem of the non-volitional case which had always been the centre of controversy, and had led to the familiar criticism that if a patient, fearing an acute mental attack, entered a mental hospital, he would not be permitted to remain when the very illness for which he sought care supervened, should it render him incapable of expressing his wishes. Also, it must be noted, that the cause of the patient's lack of volition had nothing whatever to do with the case. Should a patient suffering from the nervous and mental after-effects of, say, concussion, seek admission, and subsequently lapse into unconsciousness, there was not the faintest doubt that, as the law stood, he ought to be either certified or removed. And if this was so, how much more was it true of confused patients, of irritable, excited patients, of patients who were swayed hither and thither by constantly varying delusional fancies, and of melancholics whose entire loss of volition and querulous objection to deciding anything were among their fundamental symptoms? All such patients, and many others, said the law, must be removed or certified.

The Interpretation of the Law.

Our Lunacy Act said very little indeed about voluntary boarders. So far as it concerned itself with them at all, it regarded them purely from the point of view of the liberty of the subject. It looked on them as people who had taken the risk of jeopardising their personal liberty and must be safeguarded from any unscrupulous persons who might attempt to take advantage of this fact. The conception of a voluntary boarder as a sick person seeking advice, treatment, and care in a medical establishment was utterly foreign to the Act. The unenviable task of interpreting and administering the law as to voluntary boarders fell on the Board of Control, and, taking it all over, the result was such a reasonably broad and common-sense interpretation that all concerned had cause for thankfulness. The voluntary boarder had particular cause for gratitude. Among many other things, the Board of Control did all it properly could to avoid or postpone the certification or removal of the non-volitional case. When there was any ground for expecting return of volition in a reasonable period a week or two's grace was usually granted, particularly when, as almost always happened, the relatives urgently desired it. Nevertheless, the non-volitional patient could not legally remain in a mental hospital. That was the crux of the whole matter; it was the problem which had so far proved insoluble, and seemed likely to remain so until the public view of mental illness and its treatment had been completely re-educated and the law entirely recast.

Alternatives to Certification.

Assuming that care and treatment at home were impracticable, as they were in a majority of cases, there was no alternative to certification. There were, however, two other possibilities which might be legalised. First, it might be made legal to retain such a patient in a nursing home, "free from the taint of lunacy." Dr. Yellowlees mentioned this only to condemn it. To begin with, he said, why should the nursing home be given authority to retain certifiable patients without certificate when such authority was withheld from the mental hospital? Further, such a course would deprive the patient of what was incomparably the best means of treatment for him. There was no form of disposal for mild or severe mental cases to compare for one moment, as regards efficiency, economy, and results with residence in a modern mental hospital. The speaker had held that view when he was a medical superintendent. He held it equally firmly and expressed it more readily now that he was no longer engaged in institutional work. Secondly, it might be made legal to retain uncertified in the mental hospital a voluntary boarder who had become non-volitional. This was the ideal, but how it was to be contrived was hard to see. In the present state of public opinion, Dr. Yellowlees confessed he could imagine no workable system of "safeguards" which would be likely to meet with general acceptance. The best that the Royal Commission could suggest was an elaborate process of provisional certification. It was a clumsy sort of compromise which would have been unworkable, and in any case did not meet the difficulty. As things were, however, there was no alternative to certification if the voluntary boarder who had become non-volitional was to remain. One practical difficulty immediately presented itself. If the patient was certifiable, and his relatives wished him to remain where he was and were content that he be certified, was it fair to proceed with this and retain him as a certified patient? A majority of the public regarded it as a gross breach of faith in the case of a patient who wished to leave. Many mental hospitals went the length of refusing to keep as certified those who had been with them as voluntary boarders, and there was something in this as a gesture, though it was hard to see what principle was involved.

The process of certification should not be necessary, but it would remain so until we had provided a more satisfactory alternative, and, in particular, until we had solved the problem of the non-volitional case. That it was utterly distasteful to both the lay and medical public there was not the slightest doubt. A large majority of the public regarded avoidance of certification as the first and greatest consideration in mental illness. This was in many ways a pity. There was much to be said in favour of certification in many cases, even under the existing law, and most of the public horror of it was the result of ignorance and prejudice.

The Grading of Patients.

The dread of "asylums," as apart from the mere process of certification, was of course what affected the intending voluntary boarder, though to a much less degree, strangely enough, than it did the relatives of the certified patient. It was the old question of "grading" which was at the bottom of it all. The extraordinary variety in the symptoms and needs of the patients admitted to a central hospital of any size, along with the constant dead weight of irrecoverable chronic cases, presented a problem which needed—among many other things—almost unlimited space, staff, and money for its solution. For some years he had been convinced that this difficulty was being met in the wrong way—namely, by keeping mild cases away from the mental hospital, which, with all its drawbacks, was infinitely the best place for them. Dr. Yellowlees had long thought that we should begin at the other end, and remove to completely separate and independent branches of the mental hospital the chronic, unpleasant, and noisy cases. It would need more than two separate establishments to do the thing ideally, and, of course, the branches, though entirely separate, would have to be near enough for quick and easy interchange of patients. A scheme of the kind was actually in preparation in London just now, the pioneers being the Governors of St. Luke's Hospital. When completed, the reorganised St. Luke's would consist of three separate establishments, one in London and two near it—one of them for quiet, recent, coöperating patients; the second for noisy and troublesome acute cases and irrecoverable chronic ones; and the third for convalescents. He mentioned this scheme, not to discuss it, but to show what could be done and was being done in the face of quite extraordinary difficulties. It was to the general body of the profession that we might fairly look for help. There could be no better outlet for the organised activity of the profession and of the B.M.A. than a combined effort to bring just a little more science, broadened humanity, a little more practical good sense, into our dealings with sufferers from the saddest of all human ills.

Conditions in Scotland.

Prof. G. M. ROBERTSON (Edinburgh) said that while Dr. Yellowlees had restricted his observations on laws and practice to those prevailing in England, he (Prof. Robertson) proposed to supplement his remarks by an account of the laws and practice in Scotland. The experiment of treating patients suffering from mental disorders voluntarily was first tried in Scotland in 1862. The voluntary patients who were admitted to mental hospitals in Scotland under the 1862 Act were all of unsound mind, and any person could be admitted as a voluntary patient provided he made a written application to that effect. After admission to a mental hospital he might continue to enjoy the status of a voluntary results in later childhood and puberty could be prevented. Whilst the diagnosis of adenoids might be easy in the hands of the expert there were a large number of cases where the mass of adenoid tissue removed at operation was out of all proportion to the symptoms present. Hence their removal was important in every suspected case. The conditions in the patient calling for the services of the expert were: mouth-breathing, respiratory catarrhs, all aural conditions from deafness to otitis media, recurrent and persistent febrile attacks with no other cause, and a familial tendency to adenoids which was notable especially among Jews. The diagnosis of tonsillar enlargement was usually easy; the difficulty was to know when to operate and when not to operate. Local medicinal treatment could do much good in some cases; it might lead to a fibrosis of the tonsillar tissue analogous to that occurring normally at 14 to 16 years of age. If, after one attack treated medically, there was one relapse, then the tonsils should be removed. In conclusion, Dr. Goodfellow spoke strongly against the (in his opinion) almost unjustifiable removal of tonsils and adenoids in the out-patient departments of hospitals, and condemned the practice of allowing children to go home a few hours after operation.

Miss **GERTRUDE HERZFELD** (Edinburgh), speaking as a general surgeon, said she was interested in the relationship of tuberculous cervical glands to tonsils and adenoids. During the last five years 646 cases of cervical gland tuberculosis had been dealt with by radical operation at the Edinburgh Children's Hospital. In a large number of these the tonsils appeared healthy and not enlarged, and therefore they must have failed in their protective function. The tonsils had been examined histologically in her last 17 cases, and in 9 of them signs of early tuberculous infection were present. Cervical tuberculous glands, she said, very rarely appeared after tonsillectomy for simple hypertrophy, so that this operation at an early age might prevent the development of such infection in later childhood. Other children who required tonsillectomy were those with simple enlargement of the cervical glands, those who had had pneumococcal or other infections which might reach the blood stream through the tonsils, and those who suffered from general weakness and hypotonia, as shown, for instance, by flat-feet. The diagnosis of adenoids was not always simple. The possibility of a retropharyngeal abscess should always be borne in mind, and digital examination carried out in all doubtful cases, especially those of short duration. In Miss Herzfeld's opinion skilful removal of the tonsils with the guillotine was the best method of tonsillectomy.

Dr. **DAVID NABARRO** (London) gave the result of some investigations carried out by Dr. R. A. Macdonald and himself. The organism of rheumatism was often said to be found in the tonsils. They examined bacteriologically the streptococcal flora in 50 tonsils removed from rheumatic children and 48 from non-rheumatic patients. Whilst admitting that the classification of streptococci was not yet very satisfactory they did not find any marked difference in the streptococcal flora of the two groups; in other words, the rheumatic cases could not be told from the non-rheumatic ones. Although tonsillectomy was of value in acute rheumatism the causal streptococcus had not yet been established. The considerable difference of opinion amongst investigators made it very difficult to correlate their findings. It was probable that the soil was more important than the seed and hypersensitiveness to streptococci might be the cause. The tonsils might well be the place where repeated small doses of infection occurred giving rise to this hypersensitiveness. Thus tonsillectomy in rheumatic cases was probably a valuable therapeutic and prophylactic measure.

Dr. **JEFFREY RAMSAY** (Blackburn) said that infected tonsils were a potential or actual source of danger to their owners. Sometimes it was hard to say whether the tonsils were infected or not, and it was in such cases that tonsil puncture, devised by Dr. C. M. Pearce and himself, was most useful. He described the details of his method and pointed out that both tonsils should be examined, since one might be healthy and the other diseased. In over 60 per cent. of cases he was able to obtain streptococci in culture. Hence the method was of value for the detection of these cases, and by the removal of these tonsils rheumatism could be prevented. Tonsil puncture was valuable, too, in the detection of cases of diphtheria "carriers." He quoted one case where a swab from the surface of the tonsil yielded but a feeble growth of diphtheria bacilli, yet tonsil puncture showed the presence of very virulent organisms.

Dr. **F. C. EVE** (Hull) demonstrated his method of tonsil suction by means of his simple instrument. By suction the tonsil could be turned inside out and the pus obtained could be shown to the patient. He also showed another instrument, for therapeutic use, by means of which, he claimed, the tonsillar crypts could be cleared out and disinfected. Tonsillectomy was admittedly the better treatment, but was often out of the question, especially in adults. If septic tonsils were cleaned out by a course of suction before enucleation the danger of hæmorrhage could be minimised. His simple instruments afforded the general practitioner an opportunity, diagnostic and therapeutic, which was not available to him before.

Mr. **DENNIS BROWNE** (London) doubted if the tonsil had any defensive mechanism. Further, it was not possible to say whether nasal catarrh was due to adenoids or caused the adenoids, or whether both were due to a common cause. Turning to the choice of operation for the removal of tonsils he insisted most strenuously that the method of dissection was superior in every way to the guillotine.

Mr. **F. H. DIGGLE** (Manchester) advised against digital examination of adenoids because it frightened the children, and said that in his experience, too, adenoids did recur after efficient operation. Tonsils and adenoids might subside with efficient nasal hygiene and never recur, though nasal drill and hygiene in his hospital practice had not had beneficial results. Mr. Diggle used both the method of dissection and the guillotine. Even after complete removal of the tonsils freedom from further sore-throats could not be guaranteed.

Dr. **H. BRACEY** (Warwick) spoke from the point of view of the school medical officer. Slight rickets, a bad stance, flat feet, and a general flabbiness of the body and even some flabbiness of the mind might result from diseased tonsils and adenoids. He asked Mr. Jones if he had met with cases of adenoids in which the only symptom was headache.

Dr. **ESTHER CARLING** (Berkshire) said that she had charge of a small sanatorium for potentially tuberculous children. Many of them suffered from diseased tonsils, and in her experience the improvement obtained after removal of the tonsils and adenoids was very gratifying. There was no doubt that many children were labelled as suffering from suspected tuberculosis when they were really suffering from tonsils and adenoids. Dr. Carling joined with Dr. Goodfellow in declaiming against the practice of removing tonsils and adenoids in the out-patient departments of the hospital, with early despatch home.

Dr. **C. P. LAPAGE** (Manchester) expressed his belief that tonsils and flat feet were associated, the flat feet resulting from the hypotonicity consequent upon the toxæmia occasioned by the tonsillar sepsis. In heart disease, too, there was a condition of toxæmia, and it was not wise to refer to such cases under the term of chronic rheumatism. Post-operative general medical measures and nasal hygiene were matters of considerable importance.

Dr. **H. T. ASHLEY** (Manchester) said that all tonsils and adenoids did not require removal, though in suitable cases there was no more important operation. The incidence of sore-throats in a small rheumatic clinic under his charge was very high, although nearly all the children had had their tonsils removed.

Prof. C. W. Vining (Leeds) after enumerating the diseases in which he considered removal of tonsils beneficial, said that in rheumatism the operation had no considerable value. Removal of the adenoids did not prevent chorea. In asthma, enuresis, glandular fever, tuberculous glands, or recurrent pneumonia he had not seen benefit from tonsillectomy. He decried the present tendency for the wholesale removal of tonsils and adenoids in school-children.

Dr. S. Stephenson *put in a strong plea against* children going home soon after operation at the hospital out-patient department, and after Mr. Arnold Jones had briefly replied to the discussion, a resolution was passed by the meeting to the effect that removal of tonsils and adenoids in children should not be done as an out-patient operation, and that provision should be made for them to be kept under observation for at least 48 hours.

Reviews and Notices of Books.

Causes and Prevention of Maternal Mortality.

By Henry Jellett, B.A., M.D. Dub., F.R.C.P.I., Consulting Obstetrician to the Ministry of Health, New Zealand; Consulting Gynæcologist, Rotunda Hospital, Dublin; late Master, Rotunda Hospital. London: J. and A. Churchill. 1929. Pp. 300. 15s.

This book is a contribution towards the reduction of the rate of maternal mortality. The views expressed are based upon the author's experience as Master of Rotunda Hospital and in the practice and teaching of obstetrics and gynæcology in Dublin as well as on that gained in his present position of consulting obstetrician to the Department of Health, New Zealand, where he is attempting to tackle the problem of the high maternal mortality-rate in New Zealand.

In this volume Dr. Jellett deals amongst other related subjects with the care of the pregnant woman, the education of the maternity nurse and midwife and of the medical adviser, the equipment of the private maternity hospital, and the general management of labour and the puerperium. Interesting, and to British readers, unflattering comparisons are made between the training of medical students in certain continental countries, especially Holland, and that in the medical schools of Great Britain and Ireland. In the University of Utrecht, for example, where the length of the medical course is six years, instruction in theoretical midwifery begins in the second year and continues during the third, fourth, fifth, and sixth. By the end of the fourth year the student has already had over 500 hours teaching in theoretical midwifery! In the fifth and sixth years the teaching is mainly clinical, but still eight hours weekly are, in addition, devoted to special instruction in practical obstetrics. In Amsterdam University "the number of teaching hours in obstetrics is equal to that in general surgery." Is it a coincidence that the maternal mortality-rate in the British Empire, including New Zealand and Australia, is 4·22, whereas in the Scandinavian countries and Holland it is only 2·53 per 1000 live births? Dr. Jellett believes that no scheme will go far towards reducing maternal mortality in this country until midwifery is allotted in the medical curriculum a place at least equal to that of surgery, but that when the training of the doctor is adequate, a scheme in which antenatal supervision is carried out by the doctor and normal labours are conducted by the midwife, with the medical practitioner, specialist, and hospital facilities available when necessary, will go far to solve our high maternal mortality-rate. The doctor he considers an unsafe accoucheur for normal cases, first, because he is liable to carry infection, and secondly because he is liable to be in a hurry, and therefore the two essentials of midwifery—asepsis and the avoidance of interference—are crowded out. The reader may well ask how the general practitioner is to acquire special skill if he only sees abnormal cases, or how he is to be rendered safe for abnormal cases if his contact with infected wounds in practice is liable to cause him to infect cases that are normal. Clearly the patient whose labour turns out to be abnormal is doubly unfortunate.

Referring to the methods of Dr. I. W. Potter (of *Buffalo, not of New York) à propos of* unnecessary interference with labour, Dr. Jellett states that in every case he "dilates the cervix manually shortly after labour begins, turns the normal vertex presentation into an abnormal foot or feet presentation, and extracts the child." In fairness to Dr. Potter it should be stated that he does not interfere until the os is fully dilated. In a final chapter on the causes and prevention of maternal mortality Dr. Jellett sums up what he believes to be the essential points to which future effect must be directed—viz., efficient medical education in obstetrics, efficient training of midwives and maternity nurses, the improvement of maternity hospitals, the general recognition of the facts that labour must be carried out under aseptic conditions, and that it is not permissible to interfere with normal labour, and, finally, antenatal supervision and care. In the latter it is essential that "the patient should find a sympathetic atmosphere in order that she may learn to view the clinic as an advisory centre where her various troubles are always willingly considered."

The book is written in vigorous style, and deserves to be read by all who are interested in an improved midwifery service.

Epidemiology Old and New.

By Sir William Hamer, M.A., M.D., F.R.C.P., formerly Medical Officer of Health and School Medical Officer, County of London. London: Kegan Paul, Trench, Trübner and Co., Ltd. Pp. 180. 9s.

In this book Sir William Hamer has brought together the views on epidemiology which he has so often expressed in the annual reports of the L.C.C. and in contributions to the proceedings of learned societies. Those who are familiar with the work will probably agree that the title might well have been "Old Epidemiology Rediscovered," for, although the author reveals by casual reference his familiarity with the work of the newer epidemiologists, the main trend of the argument is toward showing that Sydenham had got hold of most of the truth and that the particularism of the nineteenth century closed our eyes to the fundamental immutability of the laws governing the rise and fall of epidemics. Repeatedly, therefore, attention is directed to the remarkable similarity of the "epidemic constitutions" at the end of the seventeenth century and the "settings" of influenza in our own times.

The book opens with a review of epidemiological thought from Sydenham to to-day. Chapters follow upon the recent influenzas, contrasts and resemblances between the epidemics in London of Sydenham's *time and the present day, the germ theory, and* a plea for return to the Hippocratic method. Historically, influenza is shown to be an endemic disease with periods of violent epidemic exacerbation preceded and followed by outbreaks of fever with local manifestations in the cerebro-spinal system. It is maintained that these "settings" are so constant that the variants, influenza, cerebro-spinal fever, polio-encephalitis, and poliomyelitis and lethargic encephalitis ought not to be regarded as separate, specific diseases. Sir William seems to have little faith in the theory that the micro-organisms hitherto identified are the main cause of the communicable diseases, preferring to describe them rather as "associated organisms," but he gives no valid explanation of the constant relation of a definitely recognisable micro-organism such as the meningococcus with a definite clinical entity such as cerebro-spinal fever. While his broad generalisations will be hard to refute, his attitude to bacteriology is surely too iconoclastic. There may be a middle view. It is conceivable that, just as vaccinia may predispose to an infection causing encephalitis, the diseases known as cerebro-spinal fever, poliomyelitis, and epidemic encephalitis may become prevalent as the result of a symbiotic association of the micro-organism concerned with the virus of influenza in some particular phase of its life-history. Moreover, the modern theory of the epidemic could not have been formulated without investigation which depended upon knowledge arrived at primarily by laboratory methods. It is true, however, that the obsession of the professional mind with micro-organisms made it difficult for a small band of epidemiologists in the latter half of the nineteenth century to keep their confrères alive to broad epidemiological conceptions such as those of Sydenham, and we owe a debt of gratitude to men like Creighton and Hamer for reminding us of the things which had been noted about the behaviour of "fevers" before recognition of their specificity had blinded us to their temporal and local associations with one another.

This book, packed with references as it is, is indispensable to everyone whose interest in epidemics, and especially those of influenza, extends beyond their immediate clinical manifestations.

ULTRA-VIOLET THERAPY.

Les rayons ultra-violets en thérapeutique. Second edition. Par Dr. J. SAIDMAN *et associés.* Paris: Gaston Doin. 1929. Pp. 840. Fr.100.

Dr. J. Saidman has entirely rewritten his original text-book on actinotherapy, greatly enlarged it and brought every section well up to date. The book is divided into technical, physiological (including physical and chemical) and therapeutic sections. All are well documented and clearly written and contain summaries of the most important work in every field of the subject. The vague theories and assumptions frequently found in text-books on actinotherapy are fortunately absent. The author's own experiments are quoted, especially his researches with monochromatic light at the Institute of Actinology in Paris, and recent English and German work is reviewed very fairly. The therapeutic section is distinguished by a sanity of outlook rare among enthusiastic exponents of ray therapy. There are few statements at which one could cavil. The section on pulmonary tuberculosis is perhaps the least satisfactory, since the dangers of irradiating patients with early spreading lesions is not sufficiently stressed. This is one of the few conditions with which we are acquainted in which light treatment can do serious harm and if it is used at all it should be only by those who combine sound knowledge of actinotherapeutic technique with wide clinical experience of phthisical patients. Dr. Saidman's book would gain in value if some of the sections were further condensed, for the reader with little leisure is liable to be put off by verbosity.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXII., No. 3. Pp. 349–716. July, 1929.—Further observations on the nature of bacterial resistance to bacteriophage, by F. M. Burnet (Melbourne). Bacteriophage resistant strains do not necessarily change their phase (smooth or rough) in becoming resistant; they may be serologically identical with the parent strain.—An investigation of the serological relationships of 26 strains of pasteurella, by J. T. Cornelius (London). The serological groups into which a majority of the strains fall show no relationship to the animals from which they were derived.—The histogeny of teratomata, by G. W. de P. Nicholson (London). A teratoma is not homologous with an embryo; it is the result of self-differentiation of totipotent cells with the coördinating influences of an individual.—The pathological action of light, by A. G. Levy (London). On the mouse's skin, the actions of visible light in mice sensitised with hæmatoporphyrin are the same as those of ultra-violet light on ordinary animals. Stasis is produced in the vessels with exudation of plasma and subsequent necrosis; there is also hypertrophy of the epidermis.—Animal strains of hæmolytic streptococci, by J. Smith (Aberdeen). Strains from cows, horses, and guinea-pigs cannot be distinguished from human strains.—Æsculin fermentation and hæmolysis by enterococci, by O. Weatherall and J. H. Dible (London). Ability to grow in bile media and ferment æsculin are useful characters.—The influence of dilution on the carcinogenic effect of tar, by I. Hieger (London). Undiluted tar was not more effective than a 10 per cent. solution in benzene; 1 per cent. was much less active than 10 per cent.—The modifying influence of dichlorethylsulphide on the induction of tumours in mice by tar, by I. Berenblum (Leeds). A trace of mustard gas prevents tar from producing tumours by its action on the skin.—The significance of coccal organisms in experimental poliomyelitis, by R. W. Fairbrother (London). The cocci found by various observers in infantile paralysis are either air contaminations of cultures or terminal invaders.—The histology of experimental poliomyelitis, by E. W. Hurst (London). The disease is an inflammation of the whole nervous system with special involvement of the anterior horn cells which are directly poisoned by the virus. Microglia plays an important part in the cellular reaction.—Red cell diameters in 100 healthy persons and in pernicious anæmia: the effect of liver treatment, by C. Price-Jones (London). The healthy mean diameter ranges from 6·7 to 7·7 μ with a mean of 7·2. An excessive variability of diameter is even more characteristic of pernicious anæmia than a high mean diameter. Liver treatment, effective in curing the anæmia, brings the red cells towards, but not always quite up to, the normal level.—A statistical study of cholelithiasis, by D. M. B. Gross (Leeds). Local disturbances of an inflammatory kind are mainly responsible for facted stones, general metabolic factors (diabetes, atheroma) for the solitary cholesterol stone.—The action of a cytotoxic antiserum on tissue cultures, by J. S. F. Niven (Glasgow). An anti-embryo serum kills normal kidney, liver, or intestine, mouse cancer and fibroblasts, macrophages, &c. When powerful, it inhibits subsequent autolysis.—The nature of the lesions in generalised vaccinia in rabbits, by J. McIntosh and R. W. Scarff (London). The yare due to the specific virus and not to the activation of a latent infection with—e.g., pasteurella.—Innervation of human cancers, by H. Oertel (Montreal). By a modified silver method the author finds appearances which he interprets as a nervous organisation forming an integral part of cancers.—The effect of inhibition of connective tissue growth by means of substances present in tissue extracts, by T. B. Heaton (Oxford). This paper receives comment on p. 342.—Intravitam and supravital staining, by D. F. Cappell (Glasgow). A comprehensive account of the dyes used and their effects; just how cells stain depends on their state of functional activity at the moment. The reticulo-endothelial apparatus is considered in detail and the author concludes that the dust cells of the lung are epithelial in origin.—Books received.—Proceedings of the Society.—The fragility test in cases of jaundice, by W. T. Hillier (Birmingham). Best applied quantitatively.—Growth and reproduction of *B. tuberculosis*, by A. D. Gardner (Oxford). Follows ordinary lines; no evidence of any complex life-cycle.

NEW WARD OF EVESHAM HOSPITAL.—A 14-bed ward for men has just been added to Evesham Hospital and named "The Burlingham Ward" in recognition of the services rendered to the institution by the family of that name during the 50 years of its existence. Mr. Charles Burlingham, who was present at the opening ceremony, became secretary when the hospital was opened.

THE LANCET.

LONDON: SATURDAY, AUGUST 17, 1929.

A YEAR'S WORK IN THE MINISTRY OF HEALTH.

THE annual report of the Ministry of Health (1928-29) contains as usual an account of activities, many of which have a distinct medical bearing, although the report of the Chief Medical Officer of the Department is published in a separate volume. The record of the Ministry was, of course, prepared before the present Government had taken office. It deals with the more important business transacted by the Department during the twelve months, but does not cover matters of routine or detail, while the reports by the general inspectors on the administration of the poor-law during the year are omitted, because these are published separately with a reprint of the section in the main Report which deals with the subject.

A policy of continuity has been recently the marked feature of the health and sanitary legislation of this country, and the fact emerges immediately from this Report. Ten years ago, during the passage through Parliament of the Ministry of Health Act, it became obvious that there should be an overhaul of the system responsible for any direct health service to the country. The Local Government Act of 1929 is directed to the provision of remedies which have been found necessary during the ten years which have elapsed since the establishment of a single department of Government responsible for the supervision of the public health—i.e., the Ministry of Health. A prominent defect in the older pattern of organisation was constituted by the special areas which fell to the control of boards of guardians, whose duties as separate and independent authorities overlapped the duties of public health authorities in many directions. As far as medicine is concerned the responsibility placed upon the guardians to supply medical and surgical relief for the destitute was in many ways a reduplication of effort and a source of endless inefficiency. Before the Ministry of Health came into existence this anomaly had been pointed out and definitely recognised by successive Governments since 1917, and at last the administrative and financial arguments for the change have prevailed—in the words of the Report "what was then desirable has since become necessary and inevitable by the narrowing of rateable resources." The National Health Insurance Act, 1928, based on the recommendations of the Majority Report of the Royal Commission, has made many improvements of detail which have necessitated a considerable number of orders and regulations. But the essential scheme remains as at first laid down, when it represented the policy of continuity by its recognition, as a State measure, of the efforts previously made by individual members of the medical profession to furnish medical attendance on a coöperative basis for those of the public whose means did not allow of their undertaking the separate responsibility of payment. How the medical efforts were exploited by lay companies is an old story, but the National Insurance Act, in its original shape, killed the gross abuses. For the most part the new provisions came into operation on Jan. 1st, 1929, and are referred to in many parts of the Report, which makes valuable reading for all who would understand the working of the Insurance Medical Service.

The extent of that Service in 1928 gives figures to be noted. In England alone 14,300 doctors were during last year in insurance practice, while medicines and appliances were being supplied as part of medical benefit at some 9000 shops of pharmaceutical chemists. As the number of insured persons entitled to medical benefit, an analysis of whose claims appears in an earlier section of the Report, was about 13,900,000, we find the old ratio of doctor to population preserved in the latest development of coöperative practice, and the large figures we are dealing with must be remembered when we come to consider the price. Medical benefit for this community cost £8,500,000, of which sum insurance doctors received nearly £6,200,000 for discharging their normal responsibilities in attending and treating insured persons; and about £1,840,000 of the balance was paid to insurance pharmaceutical chemists for the supply of drugs and appliances. The residue was expended, in sums small by comparison with the amounts already stated, in financial adjustments necessitated by the granting of medical benefit in special conditions or circumstances. For example, about £200,000 was paid to country doctors on account of mileage, a figure that will not appear in the least excessive to those who know the demands made by a practice where the activities ramify rather than concentrate. Assistance was also rendered in such matters as the maintenance of telephones, motor cars, and branch surgeries, while about £100,000 was paid to practitioners for medicines and appliances supplied by them as part of emergency treatment, for medicines administered by them personally, and for medicines dispensed by them in country districts where no pharmaceutical chemists could be reached by the patients. Further sums of about £66,000 and £15,000 were paid on account of insured persons who exercise their option to make their own arrangements for treatment. The number of these is small, a fact which suggests that the depreciating view of the panel practitioner, which not so long ago could always be expected from a certain type of critic, has found no public reflection. In which connexion we may refer to the sections in this Report dealing with the investigation on the one hand with alleged excessive prescribing, and on the other with falling away from the standard of treatment. These abuses are practically absent when the bulk of the work is considered.

THE CONCEPTION OF NEPHROSIS.

THE label "chronic parenchymatous nephritis" has long been regarded as unsatisfactory, since patients suffering from albuminuria with œdema show great variation in the clinical course of their disorder and in response to treatment. A school of observers in America and Germany, of which A. EPSTEIN, F. MUNK, F. VOLHARD, and T. FAHR are perhaps the principal exponents, have attempted to separate off a group of patients in whom vascular lesions are completely absent, and for whom the prognosis is believed to be good, provided that a high protein diet, often coupled with thyroid medication, is instituted. The term nephrosis, as distinct from nephritis, given to this syndrome has not been generally accepted by physicians and pathologists in

Great Britain, and the views of the champions of the new classification have been frequently misunderstood or imperfectly appreciated. Most of them have been inclined to regard the syndrome as a disorder of general metabolism rather than as a disease of the kidney. Certain clinical features are essential if a case is to be placed in the category of pure nephrosis, as the term is understood by those who have supported its adoption. These clinical features are: (1) A generalised œdema with an intense albuminuria. (2) A urine of good concentration, of which the daily output is inclined to be diminished, containing no blood or any abnormal elements except albumin, fatty and hyaline casts, and doubly refractile lipoid droplets. (3) Complete absence of signs of cardiovascular involvement—i.e., a normal blood pressure, absence of cardiac hypertrophy, and a normal fundus oculi, except possibly for signs of œdema. (4) A blood picture which shows no abnormality in its chemical constituents other than increase in cholesterol and in the ratio of globulin to albumin. L. Aschoff has justly emphasised the absence of evidence of vascular involvement as the essential feature of this group of patients, distinguishing them from those suffering from severe and progressive "mixed nephritis" with a bad prognosis. Epstein and others contend that cases of true nephrosis are relatively common and are so benign that the absence of data on their morbid anatomy is readily explicable. This view is challenged by many pathologists, who contend that cases of so-called nephrosis are merely cases of Bright's disease in which the glomerular lesion has been so slight as to escape observation for a time; but that if they are watched over a proper period the usual downward course of inflammatory disease of the kidney will become apparent.

This criticism is supported in a brief but admirably written review [1] by Dr. H. A. Christian. He refers to interesting experiments, still unpublished, in which the blood protein of dogs was kept low for a long time by means of venesection, anæmia being prevented by the reinjection of the washed red blood cells. These dogs were found to develop œdema and a general picture indistinguishable from that of nephrosis. He goes on to express his belief that a primary renal lesion is probably always the initial disease in cases of human nephrosis, and that it is the leakage of albumin consequent on this lesion which is responsible for the whole of the remaining picture. It is certain, as Dr. Christian points out, that autopsies on patients with a history of œdema and albuminuria showing no lesion of the renal glomeruli or, indeed, any renal disease beyond some degeneration of the tubules, are rare. When such cases are discovered the cause of death is usually a pneumococcal infection of the ascitic fluid. Summarising the investigation, Dr. Christian concludes that, after all, not much more is known to-day than was understood by the older clinicians by the terms parenchymatous nephritis, amyloid disease of the kidney, syphilis of the kidney, the lipæmia of certain cases of nephritis, and the pasty pallor, œdema, and languor of some forms of nephritis. Extensive tubular degeneration in certain types of large white kidney has been known for a long time. Older descriptions of amyloid kidney and syphilitic nephritis, allowing for differences in terminology and lack of some new laboratory methods, correspond extremely closely with those of "lipoid" nephrosis. Diminution of concentration of plasma protein was noted by Bright in 1836, as was the milkiness of the serum; he says, "if the blood is drawn it is often buffed or the serum is milky and opaque; and nice analysis will frequently detect a great deficiency of albumin." Changes in the albumin-globulin ratio have been the subject of study for many years, and opalescent serous effusions were also demonstrated long ago. Lower basal metabolism had to await clinical methods for its determination, and this, according to Christian, is about the only new feature that recent investigations have added to our knowledge of the group of patients with extensive œdema of renal origin. Many British physicians will endorse this opinion.

Those interested in this abstruse problem will welcome a new publication[2] by another American observer, H. Elwyn, whose previous book on nephritis was read with interest in this country. His new work, which is devoted almost entirely to a discussion of the mechanism of production of œdema in various conditions, appears to be largely a compilation from the German and American literature, and students of the subject will regret the entire omission of reference to the work of A. Osman, F. Widal, C. Achard, G. A. Harrison, T. Izod Bennett, and other English and French workers in this field. The book is stimulating in the emphasis which it lays on the aspect of œdema as a compensatory mechanism designed to maintain the equilibrium of the circulating and tissue fluids of the body. The author belongs to the school which regards nephrosis as a condition in which there is an initial primary renal lesion, but he differs from Christian in that he accepts the possibility of distinguishing these cases for purposes of prognosis. In the section on treatment Dr. Elwyn gives a practical account of the employment of ammonium chloride, calcium chloride, and the new mercurial substances, such as novasurol and salyrgan, without laying much emphasis on the occasional untoward effects from these substances which have been reported.

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THE TREATMENT OF PNEUMONIA.

Contradictory instructions on the proper way to treat pneumonia still abound in the literature. Specific treatment has certainly advanced in recent years, but though potent polyvalent serums are now available reports show their virtue to depend mainly on the type of infecting organism. In those fortunate districts where type I. is the most common infection serum treatment has given surprisingly good results when injected early and in large doses. Two years ago Prof. Ludolph Krehl spoke enthusiastically of its merits from his experience in Heidelberg at the meeting of the Deutsche Gesellschaft für Innere Medizin held at Wiesbaden in April, 1927, and reports from other European sources have confirmed his conclusions. According to many American workers specific therapy is also successful against type II. when a highly potent serum is given in large quantities early in the course of the disease.

In a controlled series of cases R. L. Cecil and W. D. Sutliff[3] found that the death-rates of infections with type I. treated with and without serum were 32 and 18 per cent. respectively; for infections with type II. the corresponding figures were 52 and 39 per cent. Unfortunately, patients infected with types III. and IV. are not helped by the serum, and since in different countries and in different epidemics the proportion of the types varies considerably serum treatment is not yet of universal application. Other forms of specific treatment are legion, which is only another way of saying that none is really specific. Optochin, introduced by **MORGENROTH** in 1911, has never been widely employed because the difference between the therapeutic and toxic doses is so very small. Vaccines are not generally popular, though **W. H. WYNN** and others have reported their successful use when given very early. To assess the value of any form of therapy is difficult in such a variable and self-limiting disease, and the practitioner must fall back, therefore, on general principles. But these are not yet really established, even in respect to important decision whether the patient is to be protected from all draughts or nursed as far as possible out of doors. The courage needed for enjoining the open-air régime in inclement weather is considerable and family doctors will be relieved to hear that the fashion is not unchallenged. There is some support in recent literature even for the practitioner who would nurse his pneumonias with closed windows. Prof. **YANDELL HENDERSON**,[4] asserts that closure of a bronchus or bronchioles is a determining factor in the development of pneumonia. He claims that the deep breathing induced by carbon dioxide has proved capable of preventing such closure and of keeping the lungs open, and that therefore inhalation of carbon dioxide not only offers prophylaxis in the early stages of pneumonic infection, but may be of therapeutic value even in advanced stages of the disease. Even more unconventional are the views recently advanced by Dr. G. G. **CORNWALL**[5] who regards "cold air treatment" as definitely dangerous. He puts the safeguarding of the patient from chills as second in importance only to the avoidance of unnecessary examinations. British physicians will endorse this piece of advice, for it is an accepted canon in most of our schools that, once a diagnosis of lobar pneumonia has been made, it is unnecessary to examine the patient's back for at least seven days. The temperature chart, the pulse, the quality of the heart sounds, and the data available by percussion over the front of the chest will be amply sufficient to tell the doctor all he needs to know. The drugs valued by Dr. **CORNWALL** are those stimulants and sedatives which are used with nice judgment in all countries by keen physicians. With some of his precepts few will agree, for Dr. **CORNWALL** aims at underfeeding (the maximum allowed is 1200 calories), and he holds moderate constipation to be not undesirable. He looks upon many of the symptoms of pneumonia as mere manifestations of ameliorative and reparative processes calling for no meddling. Views based on a considerable experience should not, however, be overlooked. Dr. **CORNWALL** supplies a review of several hundred patients in two groups. The first group were not treated strictly in accordance with his ideas and showed a mortality of 30·6 per cent.; a second similar group on whom the treatment which he calls "physiological support" was practised showed a mortality of 17·6 per cent. The only form of treatment common to all methods of treating pneumonia seems to be that enjoining rest in bed, and the only lesson emerging at present is that unless this is insisted on the prognosis is bad.

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[1] Jour. Amer. Med. Assoc., 1929, xciii., 23.

[2] Edema and its Treatment. New York: The Macmillan Company. 1929.

[3] Jour. Amer. Med. Assoc., 1928, xc., 2035.

Annotations.

"Ne quid nimis."

HEALTH IN BRITISH INDUSTRIES.

YEAR by year the annual reports of the Chief Inspector of Factories recount the activities of a health service which has done and is doing an immense amount to ensure the well-being of our industrial workers. Dr. J. C. Bridge's report[1] for 1928 tells of a combination of depression in many industries with activity in such luxury trades as motor cars, tobacco, wireless, artificial silk, chocolates, and gloves. Industry continues to grow rapidly round London, attracted by a great market and port. The small workshop is rapidly disappearing before the large factory, as labour-saving devices replace manual work, and this is a change for the better when a modern machine bakery displaces an underground bakehouse, or a "ready made" factory gets rid of tailors' and dressmakers' dens. Much attention is being paid to accident prevention, particularly by safety-first methods. Over 70 per cent. of industrial accidents are unconnected with machinery, and about a quarter are due to persons either falling or being struck by falling bodies. About one accident in ten becomes septic through infection—a high proportion when all accidents do not result in wounds. An account is given of the spread of safety organisations in various industries and of the consequent reduction in accidents which fell in our engineering works from 18·0 per 100 persons in 1924 to 6·8 in 1928; apart *from humane considerations such reduction is, of* course, a sound economic proposition. The welfare order for bakehouses, which calls for the provision of wholesome drinking-water, has disclosed the absence of such water in a number of districts of twentieth century Britain. Extension of welfare departments in works, large and small, is reported, with organised supervision by doctors and others of the health of operatives. Gradually employers are perceiving that money is saved by preventing sickness. Here an important development is occurring in the elimination of silica dust, and with it silicosis, from grinding metals. The grindstone has been almost entirely superseded by the abrasive wheel, which originates far less dust and liberates little or no free silica. The new wheels work better and quicker, and even the Sheffield "little mesters," with their almost passionate devotion to their sandstones, are ceasing to demand the right to have "tuberculosis if they wanted to." Many will read with delight the historical account of the cutlery trade to which a chapter is devoted; it will often be quoted. Of particular interest is the account given of two fatal cases of "acute" silicosis, due to inhaling dust of silica with an alkali generated in making scouring powders composed of soda ash, soap powder, and ground silica. They occurred in women after two and four years' exposure respectively. Hitherto, silicosis has been regarded as a disease of *middle-aged* men who have had many years' exposure to the dangerous dust. Another pulmonary trouble has also been recognised, due to inhaling asbestos dust generated while weaving this inorganic fibre; it produces a fibrosis which tends to be fatal. Lead poisoning continues to decline; there were 1058 cases in factories in 1900, 505 in 1910, and only 230 in 1928. In addition, 87 cases occurred from painting buildings which to-day causes far more cases of lead poisoning and fatalities than any other occupation. Anthrax has diminished in the woollen trade, but infection through hides and skins has increased. Cancer of the skin, with 175 cases, remained steady and undiminished; oil contributed 105 of these cases, nearly all in mule-spinning, with the scrotum as the site affected in 60 per cent. Dermatitis claimed considerable attention, due often to substances, notably alkalis, used to clean the skin after work; they dissolve the grease which holds the superficial skin cells together, leaving the ubiquitous germ to penetrate to the relatively unprotected deeper layers. Other cases originated from oil and "suds" in engineering. A clean skin and an emollient application prevent these troubles. The general impression to be gained from reading the report is that health depends far more than is often thought upon the way life is lived, and that sickness and disease are earned by exposure to faulty environment.

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[4] Jour. Amer. Med. Assoc., July 13th, 1929.

[5] Med. Jour. and Record, 1929, cxxix., 661.

[1] Annual Report of the Chief Inspector of Factories for the Year 1928. Cmd. 3300. H.M. Stationery Office. 1929.

THE JAW-WINKING PHENOMENON.

THERE is an anomaly, first noticed in 1883 by the late Mr. Marcus Gunn, which affects certain people, most of whom have a partial congenital ptosis, generally unilateral. It is noticed that in these people, when the mouth is opened, and especially when the lower jaw is turned to the same side as the eye with ptosis, that eye is opened; when the mouth is closed the lid falls again. A. Léri and J. Weill[1] have lately reported this anomaly in two patients—a mother and son—and this is interesting because a familial incidence has rarely been noted before. In the mother the affection was bilateral, which is also very exceptional. The son had facial asymmetry, with partial atrophy of the side affected with ptosis. A similar facial asymmetry was seen in a daughter also (third generation) but she did *not* show the jaw-winking phenomenon. As regards causation, the explanation which has obtained most acceptance is that of Mr. Bishop Harman,[2] who attributes the condition to atavism. He points out that the first gill-slit or "spiracle" of fishes, which is homologous with the human external auditory meatus, is surrounded by a deep and also by a superficial muscle. The deep muscle extends to the lower jaw which it depresses, and is homologous with the external pterygoid in man. The superficial one closes the orifice of the spiracle and also extends to the upper eye-lid which it closes. These two muscles are antagonistic. Anyone who watches fishes in an aquarium will see that when a fish opens its mouth the operculum covering its gills swings open too. In the same way when one of the subjects of this anomaly opens his mouth the orbiculus palpebrarum ceases to act, and the levator, though generally weak in these cases, has it all its own way. This is the explanation which finds favour in England, but the French authors we have mentioned are not satisfied with it, and prefer to regard the phenomenon as a "functional association" analogous to those seen in some cases of hemiplegia.

GROWTH-INHIBITING SUBSTANCES.

SUBSTANCES—or supposed substances—which encourage growth have become very familiar in recent years. The tissue-culturist adds embryo extract to get the tissues to grow in vitro, the nutritionist gives the observed rats vitamins. The assumption is made with considerable regularity that failure to grow is due to the absence of something which promotes growth rather than to the presence of something which retards or inhibits growth. The demonstration of growth-inhibiting substances in animal and vegetable tissues is therefore of rather particular interest and may have far-reaching implications. Dr. T. B. Heaton, of Oxford, showed some time since that extracts of animal organs had a thermostable property (conveniently spoken of as a substance) of selectively inhibiting the growth of fibroblasts from fowl embryos in tissue cultures; on the growth of epithelium from the skin or bowel it had no influence. He now (*Journal of Pathology and Bacteriology*, 1929, xxxii., 565) follows this idea out in greater detail. All tissue growth in vertebrates depends on the coördinated and commensurate growth of the connective tissue with its blood-vessels. A substance which obstructs the growth of fibrous tissue should therefore impede growth as a whole. He shows that from animal tissues yeast and especially malt extracts may be made which delay the metamorphosis of tadpoles and the regeneration of amputated parts in newts; given intraperitoneally to young rats they cause immediate cessation of growth which is resumed when the dosing is omitted; pregnant guinea-pigs stop increasing in weight and abort. These are the general results of extracts which are active in preventing the growth of fibroblasts in tissue cultures; extracts which are negative to this test have no effect in the whole animal. Analogous experiments with the Jensen rat sarcoma gave similar results, the tumours ceasing to grow, and in some instances being completely absorbed. Dr. Heaton's observations are not perhaps in all instances as ample as might be wished, but they seem to open the way to an interesting and important line of inquiry.

THE LESIONS OF ACUTE RHEUMATISM.

Dr. A. F. Bernard Shaw has just published some valuable histological researches on the lesions of acute rheumatism. The source of the material was a girl of 15 who died from rheumatic fever and chorea. The exhaustive pathological and histological study made of this case is recorded in minute detail with many illustrations in the current issue of the *Archives of Diseases in Children*. Dr. Bernard Shaw shows that the virus of rheumatic infection has a predilection for connective tissue. The initial lesion there is a necrosis of the collagen followed by a focal infiltration with mobile cells including lymphocytes, plasma cells, macrophages, and many polymorphonuclears. The process is well seen in the Aschoff nodes in the myocardium, but is by no means uncommon in such widely different places as the tendinous slips of muscle, aponeurotic tissues, and arterial adventitia. The lesions in the walls of the nutrient arteries of the heart valves, coupled with those primarily in the connective tissue of the valves themselves, bring about a condition of valvulitis which may exist—and on the right side of the heart probably often does exist—without actual break of endocardial continuity. Valvulitis is, of course, often a precursor of endocarditis. The liability of a purely valvular lesion to advance to endocarditis depends on the degree of circulation of the virus permitted within the valve by its intrinsic arterial tree and the amount of mechanical stress to which the valve is exposed. Anatomical research on the intrinsic vascularity of the valves and physical assessment of the stresses to which each is exposed would lead to the theoretical assumption that endocarditis would involve the valves in the following order of frequency—mitral, aortic, tricuspid, pulmonary. This is the precise order of frequency found in practice, and therefore the suggestion that endocarditis is partly due to advancing valvulitis, caused by intrinsic arterial and connective tissue lesions, and is not transmitted only through the blood, is well supported.

In addition to discussions on the mechanism of the production of rheumatic endocarditis Dr. Bernard Shaw gives full and new descriptions of the widespread local manifestations of the general rheumatic infection in the heart muscle, the brain and meninges, the serous membranes, the muscles, the visceral arteries and veins, and the lymphoid tissue. Generally speaking, the brunt of the attack is borne in the first place by the connective tissue which presents focal necrotic lesions as the primary event and secondary cellular infiltration leading to the formation of a node. As a result of his histological researches the author dissents from the view that a deposit of fibrin forms the essential basis of a node. He is careful to explain that valvulitis may exist without subsequent or associated endocarditis, and some of his descriptions of the architecture of the lesions suggest that the primary lesion of the rheumatic virus, wherever it occurs, shows a strong tendency to heal. On the other hand, in the case described, the tricuspid valve showed abundant microscopic evidence of valvulitis but none of endocarditis, and the inference is that in many cases the valves of the right side of the heart in rheumatic fever are the site of valvulitis without clinical or macroscopic evidence of frank endocarditis.

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[1] Bull. de la Soc. Méd. des Hôp. de Paris, July 8th, p. 875.

[2] Trans. Ophthal. Soc., 1903, xxiii., 356.

Dr. J. Purdon Martin, in our columns last year,[1] showed in a case of chorea a sharply defined vascular lesion at the base of the brain in the body of Luys. This structure is subjacent to the thalamus and is probably in contact with both cerebellar and pyramidal fibres. In Dr. Martin's case the lesion caused an illness indistinguishable in many respect from rheumatic chorea, and he therefore indicated the body of Luys as a probable site for focal rheumatic infection in ordinary common chorea. Dr. Bernard Shaw found no adequate anatomical bases for the chorea in any part of the brain.

THE RED CELL SEDIMENTATION TEST.

THE red cell sedimentation test has found but little popularity in England and is far less generally used here than abroad. This is perhaps fortunate since our knowledge of its significance in clinical medicine is still far from complete. Nevertheless, the subject now has a large literature, and there is no doubt that the test offers us aid in diagnosis and prognosis that can no longer be ignored. The two methods employed in carrying it out are very simple, and the minimum of apparatus needed is easily available for every practitioner. Both depend upon the rate at which the red cells sink in citrated blood on standing, and they differ only in the way in which results are recorded and in minor details of technique. Numerous modifications of these methods, which are associated with the names of Fahraeus, Linzenmeier, and Westergren, have been proposed, and results are usually given either in terms of the time taken for the deposit of red cells to reach a given height, or in terms of the height reached by the column in a given interval of time.

The diversity of the standards used by different workers and the variation in method have made it difficult to compare results, and have undoubtedly been partly responsible for the disrepute in which the test is held by many. Whichever method is adopted, all are agreed that normal healthy persons show a high suspension stability of the blood, which is to say, that the separation of red cells and plasma is slow. What this depends upon is not fully understood, and probably no single physico-chemical mechanism is entirely responsible. Prof. F. Reiche[2] has lately studied the relationship of the sedimentation-rate to some of the chemical constituents present in the blood, and to some of its physical properties such as the coagulation time and bleeding time. His investigations have been performed upon over 4000 patients, and include estimations of almost all the important substances that may be quantitatively determined in the serum and in blood. He could, however, find no one factor that could be causally related to alterations in the rate of sedimentation. This did not, for instance, depend upon the number of red or white cells present, nor upon the hæmoglobin percentage, nor upon the clotting power of the blood. Nor could Reiche confirm the suggestion that the protein content of the serum was the important factor, for variations in fibrinogen and albumin-globulin ratios were present with independent variations in sinking time. The number of platelets has also been thought to affect the rate of sedimentation, as has the size of the red cells as apart from their numbers; but apparently neither is in fact causally concerned. The amounts of chloride, calcium, cholesterin, sugar, and non-protein nitrogen were found to be independent of the suspension power of the blood.

An examination so thorough should command respect, and it must be confessed that at present no one knows what are the essential changes in the blood which increase the speed of sedimentation, or what are the factors which maintain its normal suspension stability. Despite this ignorance, however, certain general conclusions may justifiably be drawn from practical experience, and they are none the less valuable for an absence of explanation of these results. Thus it may be stated that abnormally rapid sedimentation of the red cells is always associated with organic disease and excludes a purely functional disorder. This alone is a help in differential diagnosis, for example, in neurasthenia and early phthisis. The most strongly positive results (i.e., the most rapid sinking) are usually found in those conditions in which tissue destruction, autolysis, and absorption of breakdown products are occurring; and may thus to some extent separate purulent from non-purulent, and acute from chronic inflammations. Negative results are of less significance in excluding such conditions; thus a normal reaction is occasionally noted in even advanced organic disease, and may sometimes be recorded in severe pulmonary tubercle—a condition in which the test has been widely applied as an aid to prognosis. On the other hand, positive results are very seldom seen in the absence of such disorders, except in the first two to three months of pregnancy. For the diagnosis of carcinoma the test is valueless. As a guide to the existence of latent toxæmia from the presence of a septic focus, and in the exclusion of purely neurotic conditions a positive result is of considerable significance. As an index of the progress of cases of both acute and chronic infections, notably in phthisis, the gradual return to normal of the sedimentation time of the red cells is of definite value. Many exaggerated claims have been made for its specific relationship to individual diseases, but within limitations this simple test seems to have its uses.

ASSISTED ALPINE CURES.

THE Queen Alexandra Sanatorium Fund, of which the annual report for 1928–29 has just been issued, made it possible last winter for 52 men and women to make a prolonged stay at Davos, when apart from such help they would not have been able to do so. For the last four seasons the practice has been to make block grants of £2 (50 francs) a week, allowing patients to choose their own accommodation from a list of approved establishments; and this grant scheme has worked well in practice, those who have been assisted by the Fund having recognised the responsibility which such a trust implies. Only two complaints were received from the visiting physicians in Davos, and one patient who was described by her medical attendant as "a happy-go-lucky young woman" nevertheless did extremely well. The Fund which gives these grants is the product of the sale of the Queen Alexandra Sanatorium which was built in Davos for British patients of small means some years before the war. As it proved impossible to reopen the sanatorium after the war at a fee within the reach of the class of patient for whom it had been intended, the Council of the Fund was faced with the alternative of altering the whole character of the institution, or of selling the building and devoting the proceeds to helping patients of small means to get treatment in Alpine climate in some other manner. The ordinary income of the Fund is about £2000 a year and it has recently been augmented by amalgamation with the St. Moritz Aid Fund, a smaller though similar organisation with its former seat in the Engadine. Last winter the assisted patients included two medical practitioners, two dentists, six students, three nurses, and many other professional persons. The average stay was 108 days and the medical records state that the disease was arrested in 2, apparently arrested in 5, much improved in 16, improved in 18 and slightly improved in 3. Both lungs were already affected in 31 cases, and 17 of them were febrile at the commencement of treatment. It is the desire of the Council of the Fund to give priority to those whose disease is such that a winter in the Alps may ensure a cure or consolidate one already begun, and it is hoped that the medical practitioners up and down the country, on whose recommendation the grants are made, will coöperate with the Council in selecting cases at an early stage of the disease. A second line of defence consists in the fact that a certificate of medical suitability must be obtained from one of the honorary examining physicians to the Fund. A list of these physicians and application forms are issued on request by the local secretary, Mr. W. G. Lockett, the British Consulate, Davos Platz, Switzerland.

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[1] A Contribution to the Study of Chorea, THE LANCET, 1928, ii., 315.

[2] Med. Klin., 1929, xxiii., 899.

A TREATMENT CAMP FOR CHILDREN.

IN the *World's Health*, the organ of the League of Red Cross Societies, there is usually something encouraging about the work these societies are doing in so many parts of the world. From the July number we learn how concerned South African public opinion is becoming about bilharzia, which is widespread there. Adults can come into the towns for treatment, but it is difficult to get tartrate of antimony injections to the infected children on the scattered farms. To Dr. Theron, assistant medical inspector of schools in the Rustenburg district, came the idea: why not gather the children in their holidays into a treatment camp? The suggestion caught on and help came from every side. The Transvaal Province gave £100, doubled later, and the Rustenburg primary school was rearranged as a temporary hospital with seven dormitories, an injection ward, and a room for urine analyses. Patients brought their own blankets and pillows, bedsteads were borrowed locally; mattress cases were lent by the Defence Department, the straw to fill them was begged from neighbouring farmers, who further gave much of the necessary food; Rustenburg municipality presented electric light and the extra water needed; Johannesburg school clinic lent the medical equipment; the South African Medical Institute of Johannesburg provided the distilled water, and the Red Cross gave the drugs. Two nurses were engaged, and 32 teachers and senior school girls, volunteering each for four to seven days, were invaluable in keeping the children employed and amused between their injections and entertainments. The camp opened with 60 children, but some were unsuitable and some were removed by friends; nevertheless, 49 completed their course, and all but one lost their hæmaturia. The parents paid £40 towards the cost of the camp which, thanks to local generosity, closed with a balance which it is proposed to use in providing a swimming-bath for Rustenburg, to diminish infection in future. The camp is considered a great success and was visited by many medical men. Could children with this disabling disease have spent their Christmas holidays more advantageously?

ADAPTATION OF THE EYE TO DARKNESS.

THE Medical Research Council issues a report[1] summarising the literature (chiefly German) on the dark adaptation of the eye. On the whole, variations in the sensitiveness of the retina in a state of dark adaptation are remarkably constant, not only in the same, but in different persons, and these may be due to the individual state of health, as is indicated by the recent discovery of the association of night-blindness with vitamin deficiency. A great deal of experimental work has been done on various aspects of the subject, such as the latent period between stimulus and sensation (Empfindungszeit), the duration of the primary sensation (Empfindungsdauer), the duration of what is called the colourless interval, the regional variations in the sensitiveness of the dark-adapted retina, and especially the question of dark adaptation at the fovea. It is said that foveal adaptation is now established, though this is hard to prove because it is almost impossible to fix an object of threshold intensity which is small enough to affect the fovea alone. Anyhow, the adaptation is very slight and only occurs during the first few minutes. The vexed question of the presence or absence of the Purkinje phenomenon (change of relative brightness of different colours as dark adaptation increases) at the fovea is still unsettled, most investigators finding no evidence for its presence. This and other questions discussed in the report are important in their relation to the physiology of the rods and cones, the duplicity theory, and colour vision. They have also an immediately practical bearing on aviation, for in testing the visual fitness of an airman for night-flying it is desirable to determine both his absolute sensitiveness for light and his rate of recovery after the relative blinding which follows exposure to light for short periods. Finally, the report considers dark adaptation in certain pathological conditions. The theory that what vision there is in total colour blindness is due entirely to rod function is supported by the frequent presence of a central scotoma. Night-blindness is the opposite condition in which the function of the rods is supposed to be defective. It is well known that in retinitis pigmentosa dark adaptation is especially defective. It is said to be defective in glaucoma and also in true optic neuritis, but not in choked disc.

THE GENESIS OF TROPICAL NEURASTHENIA.

WHILE all students of European life in the tropics admit that neurasthenia is a common phenomenon, few of them agree about its cause. Lieut.-Colonel Berkeley Hill contributed to the Seventh Congress of The Far Eastern Association of Tropical Medicine, held in British India in 1927, the transactions of which have now reached us,[1] an able paper on Mental Hygiene of Europeans in the Tropics. Such terms as "Punjab head" "West Coast head" imply the popular recognition of the existence of a form of neurasthenia which may take various shapes. Europeans living in the tropics are prone to a neurotic syndrome, the germ of which is a state of hyperexcitation manifested in general irritability. Although hyperexcitation may appear as a symptom of any form of psychoneurosis, it is manifest most consistently in anxiety neuroses. Symptoms, apart from worry and anxious expectation, may, in both sexes, take the form of hypochondria, which may be related to sunstroke, glare, and bowel complaints. Following Freud's conception of ætiology, Col. Berkeley Hill concludes that the prime factor in this anxiety neurosis, at any rate in men, is voluntary abstinence from sexual intercourse. The typical syndrome is found to be accentuated in the European doomed to live in an out-of-the-way place. Here the absence of others of his own race and class may bring about a loss of self-respect, and some degree of alcoholism may develop. Alcohol reduces the inhibitory forces in every direction, and a loss of control over the emotions is an early symptom. Occasionally Europeans in the tropics suffer from outbursts of anger or from a brooding melancholy. The far-reaching importance of psychological studies is a subject hardly appreciated in India. Col. Berkeley Hill notes that in the civil employment of the Government of India there are at present only four Europeans and two Indians who have had any special training in psychopathology. In the great cities of Calcutta, Bombay, and Karachi there is no European or Indian neurologist or psychiatrist with European qualifications, and in the numerous schools and colleges throughout India *there is no provision for adequate instruction* in nervous and mental diseases.

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[1] Medical Research Council: Reports of the Committee upon the Physiology of Vision. II. Dark Adaptation (a Review of the Literature) by Dorothy Adams. London: H.M. Stationery Office, 1929, pp. 138.

[1] Calcutta: Thacker's Press and Directories, Ltd., 1929, i., 865.

APPOINTMENTS TO THE MEDICAL RESEARCH COUNCIL.

BY an Order of the Committee of Privy Council, Viscount D'Abernon and Mr. A. G. Church, M.P., have been appointed members of the Medical Research Council on the retirement of the Earl of Balfour and Sir Charles Trevelyan. Lord D'Abernon will succeed Lord Balfour as Chairman of the Council. By another Order, made after consultation with the Medical Research Council and with the President of the Royal Society, Dr. J. J. R. Macleod, Regius professor of physiology in the University of Aberdeen, and Mr. Wilfred Trotter, honorary surgeon to University College Hospital, have been appointed members of the Council in succession to Prof. E. P. Cathcart and Sir Charles Sherrington, who retire in rotation on Sept. 30th.

BRONCHIECTASIS IN CHILDHOOD.

THE clinical picture of fully developed bronchiectasis is fairly obvious but the early stages are apt to pass unrecognised, and this is the aspect of the disease which has attracted most attention of late years. In summarising the present position Dr. Edward Thorpe[1] points out that the exact ætiology of an essentially chronic disease of this kind is often hard to determine. So many serious infectious diseases of early childhood may damage the respiratory tract, and they often follow one another so surprisingly quickly that more than one may start the early changes in the bronchial walls. Most observers agree in placing broncho-pneumonia first among the forerunners, especially when it is associated with measles or whooping-cough. The cause of this is not quite clear, but in many such cases infection is kept up by an unhealthy condition of the nasopharynx which is only too common at this age, and such a sequence of events is especially prevalent among ill-nourished children who have had rickets. A vicious circle may be established so that the child is never free from recurrent respiratory diseases which have either begun in the lungs and augmented the infection in the upper air passages, or have started in the sinuses and tonsils and have increased the damage to the lining membrane of the bronchial walls. Saccular bronchiectasis, abscess formation, and empyema are but natural sequelæ of the primary infection. Prevention is therefore all-important. Adequate convalescence after broncho-pneumonia should be secured wherever possible, and the public should be made to look on measles and whooping-cough as potentially serious diseases. Early diagnosis is by no means easy on clinical grounds alone and radiological help should be invoked long before the condition has become self-evident. A positive result is, of course, evidence of disease, but negative findings should be accepted with reserve. In suspicious cases intratracheal lipiodol may be used; the technique is not difficult, the risk is negligible, and the radiogram obtained will sometimes reveal an unsuspected amount of disease. The treatment of such a case is difficult; any infective focus in the nasopharynx should be dealt with, and prolonged convalescence is needed. Of recent years collapse therapy has been tried in some of these cases with good results, despite the relative mobility of the mediastinum in children. As a rule, 12 months' treatment suffices. It is found that in advanced cases the results of inducing pneumothorax are poor, owing to the resistance to collapse offered by the hardened walls of the bronchiectatic cavities. In these circumstances Thorpe advocates repeated bronchoscopic lavage, a measure which has not yet found much favour in this country, owing to the difficulties of technique and the prolonged institutional treatment required. The established disease is a source of distress to all concerned, but could certainly be prevented as a rule by adequate convalescent treatment of its precursors, especially measles and broncho-pneumonia.

AN EPIDEMIC OF GLANDULAR FEVER.

IN 1889 Pfeiffer described a disease in children in which there was fever, generalised swelling of the lymphatic glands, and enlargement of the spleen and liver. Eighteen years later Turk found that a similar symptom-complex was associated with well-marked lymphocytosis, and in 1920 the epidemic nature of the disorder was recognised in America. In this country in 1921 Letheby Tidy and others described cases of infective mononucleosis and identified it with the glandular fever of Pfeiffer. Since then many other cases have been described, the latest contribution to the literature being an account of an epidemic in Berne last year. Dr. E. Glanzmann[1] records that there were in all some 70 cases, 45 of them being distributed among 16 families, 2 to 4 of whose members were affected. Analysis of the notes he made on these cases enables him to give a clear account of the disease. The incubation period seems to be from seven to eight days and the earliest manifestation is a swelling of the lymphatic glands. The occipital and retro-auricular glands enlarge first, and later the axillary and inguinal glands. The swellings are for the most part moderately painful and sometimes the arrangement of the swollen glands about the face has suggested mumps. The bronchial glands may also be involved in the generalised lymphadenitis and the spasmodic cough thus caused may resemble whooping-cough. Lymphocytosis being a feature of the blood picture in both mumps and pertussis, it is easy to be led astray in isolated cases of glandular fever simulating either of these disorders. In his original papers Pfeiffer described an abdominal form of glandular fever with abdominal pain and enlargement of lymph glands especially in the ileocæcal region. The presence of an enlarged spleen and other glandular swellings help to make the diagnosis clear. There was a moderate fever in most of Glanzmann's cases, lasting usually one, two, or three weeks; it was of a daily remittent type and came to an end by lysis. Relapses were not uncommon and even when the fever had gone away the glandular swellings sometimes persisted for weeks and even months. Other organs were also affected, the liver being obviously enlarged in most cases and the spleen palpable in one-third to one-half of them. Stomatitis was noted in some of the children, and it was usual to find the lymphoid tissue of the nasopharynx taking part in the generalised lymphatic enlargement. In two cases a fleeting rubelliform rash was observed, whilst conjunctivitis was another occasional manifestation. The blood picture in glandular fever is characteristic, and in the first day or first few days of the illness 80 to 90 per cent. of the white blood corpuscles are mononuclear, though sometimes a polymorphonuclear reaction occurs at first, followed later by the mononuclear picture. The cells present are divided by Glanzmann into three types: lymphoblasts, "lymphocytoid" cells like very large lymphocytes, and still larger "monocytoid" cells. Upon ætiology he has nothing fresh to say, except that the urine of a patient with nephritis complicating glandular fever had no effect when injected into a guinea-pig. For treatment he recommends quinine during the febrile stage, with application of ultra-violet light to such glands as do not settle down after the acute symptoms are over.

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[1] Amer. Jour. Med. Sci., June, 1929, p. 759.

[1] Jahrb. f. Kinderh., July, 1929, p. 250.

A MEMORIAL TO FERNAND WIDAL.

A LETTER in our correspondence columns addressed to Sir Almroth Wright contains the announcement of a movement which we hope will receive hearty support from the medical profession in this country. A group of distinguished Frenchmen, whose names will be familiar to our readers, have decided to form a committee with the object of erecting in the Faculty of Medicine in Paris and at the Hôpital Cochin a monument to the memory of the great pathologist. Already, we are informed, the movement has had international result, those responsible for it having received promises of support from other countries. The project should be received with similar sympathy in this country where many must have had personal relations with Widal, and where all pathologists are familiar with the value of his work.

RADIUM TRUST AND COMMISSION.

A MEETING of the National Radium Trust was held on August 13th under the chairmanship of Lord Parmoor. Viscount Lee of Fareham was appointed Chairman of the Radium Commission and a member of the Trust, which is now constituted as follows: Lord Parmoor, Lord President of the Council (Chairman); Mr. Arthur Greenwood, Minister of Health; Mr. William Adamson, Secretary of State for Scotland; Sir Ernest Rutherford, President of the Royal Society; Sir John Rose Bradford, F.R.S., President of the Royal College of Physicians; Lord Moynihan, President of the Royal College of Surgeons; Lord Dawson, President of the Royal Society of Medicine; Lord Mackenzie, Chairman of the Central Liaison Committee for Voluntary Hospitals in Scotland; Prof. A. H. Burgess, President of the British Medical Association; and Lord Lee of Fareham. The Trust made preliminary arrangements in connexion with the purchase of radium, with a view to placing it as soon as practicable at the disposal of the Commission.

The Radium Commission has now been set up in accordance with the provisions of the Royal Charter, and is composed as follows: Lord Lee of Fareham, appointed by the National Radium Trust; Lieut.-Colonel Smallman, Medical Officer of the Ministry of Health, appointed by the Minister of Health; Mr. H. L. F. Fraser, Assistant Secretary of the Department of Health for Scotland, appointed by the Secretary of State for Scotland; Mr. Sidney Russ, D.Sc., Professor of Physics at the Middlesex Hospital Medical School, appointed by the Medical Research Council; and Mr. G. W. C. Kaye, D.Sc., Superintendent of the Physics Department of the National Physical Laboratory, appointed by the Department of Scientific and Industrial Research. The following members of the Commission have been selected by the Trust from a panel of 12 persons nominated by the heads of the medical profession as "having special knowledge and experience of the application of radium in the treatment of the sick": Dr. J. M. W. Morison, Lecturer in Radiology in the University of Edinburgh; Mr. G. E. Gask, Professor of Surgery in the University of London at St. Bartholomew's Hospital; Mr. W. Ernest Miles, Surgeon to the Cancer Hospital, Brompton; Mr. Comyns Berkeley, Gynæcological Surgeon to the Middlesex Hospital; Dr. Carlton Oldfield, Professor of Gynæcology in the University of Leeds; and Dr. A. J. Hall, Professor of Medicine in the University of Sheffield.

WE regret to announce the death on Sunday last of Dr. William Ewart, consulting physician to St. George's Hospital, in his eighty-first year.

BICENTENARY OF EDINBURGH ROYAL INFIRMARY On August 6th, 1729, the first patient was received at the small Edinburgh hospital which has now become the Royal Infirmary. The bicentenary will be celebrated in October.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XL.—EXAMINATION OF THE BLOOD FOR BILE-PIGMENT.

JAUNDICE is due to the presence of bile-pigments in the body tissues, particularly the skin, the primary underlying condition being, however, an excess in the blood of bilirubin, the chief bile-pigment. The present tendency is to direct more attention to the primary or blood condition and less to the secondary factor, the tissue staining. "Overt jaundice" refers to the condition where the skin colour is visible, in contrast to "latent jaundice" in which, though there is a hyperbilirubinæmia, no skin changes can be seen. Bile-salts are normally present in the blood and if in jaundice these are normal or diminished in quantity, with a hyperbilirubinæmia, the condition is known as "dissociated jaundice."

How Bilirubin reaches the Liver.

Bilirubin is derived from hæmoglobin, the cycle probably being as follows. The hæmoglobin is first broken down into globin and hæmatin. The iron-containing part of the hæmatin is then split off as hæmosiderin and the iron-free remainder of the molecule is converted into bilirubin, either directly or through an intermediate or prebilirubin stage. This final conversion takes place in the cells of the reticulo-endothelial system of the body, which is represented in the liver by the cells of Kupffer. These latter cells line the vascular capillaries and are separated from the bile capillaries by the polygonal or special hepatic cells. As the reticulo-endothelial system is not limited to the liver, being particularly well represented in the spleen and bone-marrow, it follows that bilirubin in the liver may have been formed there (hepatogenous) or may have been brought there by way of the blood (anhepatogenous).

How Bilirubin may Leave the Liver.

From the liver three ways of escape are possible.

(*a*) All bilirubin may pass through the polygonal cells into the bile capillaries; this is the normal course.

(*b*) All may pass away by the vascular capillaries.

(*c*) Part may pass into the bile capillaries, part may leave through the blood.

During the passage through the polygonal cells a change takes place in the bilirubin, the exact nature of which is unknown, but is thought to consist in the removal of a protein radicle. On this change, van den Bergh established the test which bears his name, for he found that the reaction of the pigment to the diazo reagent—i.e., diazotised sulphanilic acid—differed according as the bilirubin had passed through the polygonal cells or not. If the bilirubin has followed the normal course—that is, through the polygonal cells into the bile capillaries—the addition of diazotised sulphanilic acid at once produces azobilirubin, which has a deep violet colour. Bilirubin which has not passed through the polygonal cells requires the addition of alcohol to form azobilirubin, the suggestion being that the alcohol first precipitates the protein radicle and is then able to take up the pigment in solution and so produce the deep violet colour.

THE VAN DEN BERGH TEST.

The full technique of the van den Bergh test is set out in text-books of biochemistry. It suffices here to say that sera or blood plasma from different types of jaundice give different colour and time reactions, which are described as being *direct* or *indirect*, according as the coupling takes place in non-alcoholic or alcoholic solutions.

While the colour, and time required, vary within small limits, according to the observer and the solutions used, the reactions in icteric serum or blood plasma before the addition of alcohol may be summarised as follows.

1. Immediate colour change, maximal in 10–30 secs., bluish violet, intensity dependent on amount of bilirubin, known as the *prompt* or *immediate direct reaction* and characteristic of jaundice due to bile passage obstruction.

2. Colour change beginning in 1 to 15 minutes, or even longer delayed, reddish at first and gradually deepening to violet, known as the *delayed direct reaction* and characteristic of jaundice due to hæmolysis.

3. Colour change at once, reddish at first, slowly or rapidly changing to blue, known as *biphasic direct reaction;* as the rate of change approaches more closely to prompt or delayed types, it is further described as *biphasic prompt direct* or *biphasic delayed direct.* This reaction is the one most frequently present in toxic infective jaundice.

Van den Bergh reaction.	Type.	Pathological change.		Bilirubinæmia.	Jaundice.	Bile-salts.	Resistance to saline hæmolysis.
		Nature.	Site.				
Direct prompt.	Obstructive.	Obstruction.	Biliary passages.	Large.	Marked.	Increased.	Increased.
Biphasic.	Toxic infective.	Damage.	Liver cells.	Varies.	Varies.	Dissociated jaundice.	—
Direct delayed or indirect.	Hæmolytic.	Increased blood cell destruction.	Extra-hepatic.	,,	Inconstant and varies.	,,	Decreased.

The table summarises within very wide limits some of the points of difference of the various uncomplicated types of jaundice In reading it the tendency of types to merge must be remembered.

Quantitative Estimations.

In alcoholic solutions all icteric sera give an immediate reaction known as the *indirect reaction*, and this can be used quantitatively by comparison with known standards, whereas the direct reactions are only qualitative. For purposes of estimation one part of bilirubin in 200,000 is known as a "unit" of bilirubin or a "van den Bergh unit." Normally the amount of bilirubin in the blood, known as the functional bilirubinæmia, varies from 0·2 to 0·6 units (1–1,000,000 to 1–350,000); when obstruction is present bilirubinuria occurs with a concentration of 1–50,000 (approx.); jaundice is said to be present with a concentration of 1–80,000 (approx.), though it may not be visible; in long-standing cases a concentration as high as 1–4000 has been reached.

A New Conception of Jaundice.

As a result of the van den Bergh reaction a new conception of jaundice has been formulated, according to which jaundice may arise in several ways.

1. When the bile-pigment is normally formed, but obstructed after reaching the bile capillaries and then reabsorbed into the blood.

2. When the polygonal cells of the liver cannot deal with the amount of bile-pigment which reaches them. This may be due to (*a*) such damage or functional derangement of the polygonal cells that the pigment passes direct to the general circulation by the hepatic veins; or (*b*) too much bile-pigment reaching normal polygonal cells so that some passes through into the bile capillaries in the normal way, but the excess passes by the hepatic veins into the general circulation.

3. When there is present both damage to the polygonal cells and obstruction in the bile passages. In this case some bile-pigment may get through the partially damaged cells to be obstructed in the bile passages and reabsorbed, while some passes directly to the general circulation by way of the hepatic veins.

It is on these theoretical considerations that J. W. McNee has founded his classification of jaundice :—

1. Obstructive
2. Toxic infective } hepatic jaundice.
3. Hæmolytic jaundice.

While all cases of jaundice can be covered by these three divisions, it does not follow that all clinical varieties can be confined within one division. In a complex organ like the liver one pathological state passes gradually into another, and as McNee puts it, "Toxic jaundice, with varying degrees of damage to the liver cells, may be combined with hæmolysis, and in its later stages with obstruction of the biliary passages as well."[1]

IMMEDIATE DIRECT REACTION.

When the van den Bergh reaction is *immediate direct* the diagnosis is probably obstructive hepatic jaundice at an early stage of its development. Here the bile is normally formed but there is obstruction in the bile passages and the bile is reabsorbed into the blood. A biphasic reaction would not exclude this type of jaundice, for at a later stage complete obstruction may produce liver damage. When this has occurred, however, the jaundice properly belongs to the toxic infective group.

The causes of obstruction are many and varied. They can be classified as :—

(*a*) Obstruction within the lumen of the bile passages —e.g., gall-stones or parasites.

(*b*) Obstruction due to changes in the walls of the larger bile passages—e.g., catarrhal or common hepatic infective jaundice, infective and suppurative forms of cholangitis. (In catarrhal jaundice the van den Bergh reaction may be of the obstructive type at first, but it is extremely variable and in later stages is biphasic and indicative of the toxic infective type. The same applies, and in greater degree, to the various forms of cholangitis.)

(*c*) Obstruction due to pressure on the bile passages from without—e.g., hepatic cirrhosis (jaundice often latent); intrahepatic tumours; malignant glands in the portal fissure, carcinoma of pancreas or stomach; chronic pancreatitis.

Many other possible causes have been mentioned, but a stone in the common duct and tumours of liver and pancreas are probably the most common causes of obstructive jaundice. Other blood characteristics are excessive bile-salts in the early stages, though their production soon ceases; the bile-pigment, however, continues to be formed, so that in the simple obstructive cases there is a definite relationship between the completeness and duration of the obstruction and the degree of jaundice. There is a slight hypercholesterolæmia and the coagulation time is prolonged. The resistance to hæmolysis by hypotonic salt solution is increased and the corpuscles are increased in size, the reverse being the case in hæmolytic icterus. Advanced obstructive jaundice shows a leucocytosis, but not the mild cases unless inflammation or *suppuration is also present.*

BIPHASIC REACTION.

A biphasic reaction is suggestive of toxic or infective jaundice. In this group, as the name implies, we are dealing with some infection or intoxication which produces a degeneration of the liver cells and later probably a cholangitis. The van den Bergh reaction is generally biphasic but may vary from time to time as the condition progresses or as the amount of secondary biliary obstruction fluctuates. Among the conditions classified in the toxic or infective group are catarrhal jaundice, spirochætosis hæmorrhagica, acute necrosis of the liver. Various protozoal and bacterial infections may give rise to this type of jaundice, also chronic cardiac disease with back pressure, and some forms of poisoning or toxæmias, such as those associated with pregnancy. Considering the group as a whole there is less bilirubinæmia than in the obstructive group, and grave liver derangement may coexist with slight jaundice. Bile-salts may be absent from the blood even when jaundice is well marked (the so-called "dissociated jaundice"). Some bile generally reaches the bowel so that the stools are not clay-coloured, but they are often offensive owing to the absence of bile-acids.

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[1] Rolleston and McNee: Diseases of the Liver, Gall-bladder, and Bile-ducts, London, 1929.

Points in the differential diagnosis of the various members of the group are as follows:—

In *Spirochætosis hæmorrhagica* (Weil's disease) there is a polymorphonuclear leucocytosis and later a secondary anæmia; in the early stages the *Leptospira icterohæmorrhagiæ* is present in the blood and later in the urine. In *acute yellow atrophy* the blood shows delayed coagulation, a moderate leucocytosis, and diminished cholesterol; the colon bacillus is sometimes present on culture. In *catarrhal jaundice* there is a secondary anæmia with leucopenia.

REACTION OF DELAYED TYPE.

When the van den Bergh reaction is of the delayed type, or gives no direct response at all, hæmolytic jaundice may be suspected. In this type of icterus the underlying factor is an excessive bilirubinæmia due to the production of more bile-pigment than even a healthy liver can deal with. This excess may be due to: (1) increased destructive agents; or (2) increased fragility of the blood cells.

When it is due to increased destructive agents (so-called secondary cases) the cause of the hæmolysis is more or less known. Blood transfusion with unsuitable donors, streptococcal infections, parasitic infections, poisoning from snake-bite, Addison's anæmia, or blackwater fever may induce hæmolytic jaundice of this kind. On the other hand, the hæmolysis may be due to increased fragility of the blood cells—for example in congenital, hereditary, or familial acholuric jaundice or in acquired acholuric jaundice (often after some infection). How far these two types of acholuric jaundice are separate entities is a debatable point.

Taking the group as a whole hæmolytic jaundice is a "dissociated jaundice," since the bile-salts are not retained in the blood. The tissue reaction may be slight compared with the amount of bilirubinæmia and, finally, the kidney threshold for bilirubin is decidedly higher than in the obstructive type. The icterus is inconstant and varies greatly, there is some degree of secondary anæmia, and the spleen is often enlarged. With regard to special members of the group, the blood picture is that of the primary disease in those of the secondary type. In acholuric jaundice the presence of reticulated red cells (only shown by vital staining) and the undue fragility of the red corpuscles is a constant feature. If normal red corpuscles are placed in varying dilutions of hypotonic saline, hæmolysis starts at about 0·50 per cent., is well marked at 0·45 per cent., and is, as a rule, completed at 0·35 per cent. In acholuric jaundice hæmolysis starts at about 0·70 per cent. and is often completed at 0·50 per cent.

FOUCHET'S TEST AND THE ICTERIC INDEX.

The van den Bergh reaction is quantitative and qualitative. There are two other quantitative tests for bilirubinæmia—Fouchet's test and the icteric index. The former, which is largely used in France, is not so sensitive as the van den Bergh test, but is said to give a positive result in a dilution of 1–60,000 of bilirubin. In estimating the icteric index the yellowness of the serum is compared against a known standard. The normal lies between 4–6, overt jaundice is present when the index is above 15, and latent jaundice lies between 6–16. The index is raised in uncomplicated cases of hæmolytic anæmias, in chronic sepsis especially of the biliary tract, in pneumonia, and in cardiac insufficiency. A source of error is coloration due to pigments from ingested food so that the blood should be taken from the fasting patient. Since the test can be done with the blood available from a finger prick it has certain advantages, but if any doubt exists it should be checked by the van den Bergh reaction. In a case of overt jaundice it presents an easy method of noting the progress of the bilirubinæmia.

CONCLUSION.

In addition to their value as a diagnostic agent in jaundice, the van den Bergh reaction and to a less extent the icteric index are of use in checking treatment and in prognosis. A routine examination of the blood shows the progress of the bilirubinæmia before any change is visible in the skin. The detection of a latent jaundice may be of great value, particularly in cases undergoing treatment with arsenical compounds.

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Special Articles.

RADIOLOGICAL TREATMENT OF CANCER.

RECOMMENDATIONS ON STANDARDS AND TECHNIQUE.

A FORTNIGHT ago[1] we drew attention to the recent work of the Cancer Commission of the League of Nations in connexion with the radiological treatment of malignant disease. The Commission felt that the great publicity now being given to radiotherapy, and the elaborate and costly apparatus and arrangements required for its practice, demanded a collection of international experience. They therefore appointed a subcommission consisting of Prof. C. Regaud (Chairman), Sir George Buchanan (Chairman of the Cancer Commission, ex-officio), Mr. Comyns Berkeley (London), Prof. A. Döderlein (Munich), Dr. J. Heyman (Stockholm), Prof. W. Lahm (Chemnitz), Prof. E. Pestalozza (Rome), and Prof. A. H. M. J. van Rooy (Amsterdam). Dr. Janet Lane-Claypon was appointed special investigator, and the subcommission was charged to report upon: (1) the radiotherapeutic methods which can be regarded as of established utility for the treatment of cancer of the cervix; (2) the possibility of presenting radiotherapeutic results statistically; and (3) the principles which should be accepted to ensure most effective organisation of radiotherapeutic treatment of uterine cancer and to avoid dangers as far as possible.

The Commission met three times during the year 1928-29, and appointed Prof. F. Voltz, Dr. A. Lacassagne, and Dr. Heyman, together with Dr. E. Tomanek (the Secretary of the Commission), to prepare special reports from the clinics of Munich, Paris, and Stockholm. These reports are published in the volume just issued.[2] As we have already noted, the work entrusted to Dr. Lane-Claypon was a statistical study of the results supplied by the three institutes. She spent much time and labour on an attempt to draw conclusions as to the relative value of different methods of treatment, but she found that the three clinics had not followed the same principles in classifying the different forms of utero-vaginal carcinoma, that they had not adopted the same grouping of different stages, and that the methods in use over a number of years had varied even in the same clinic.

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[1] THE LANCET, August 3rd, p. 235.

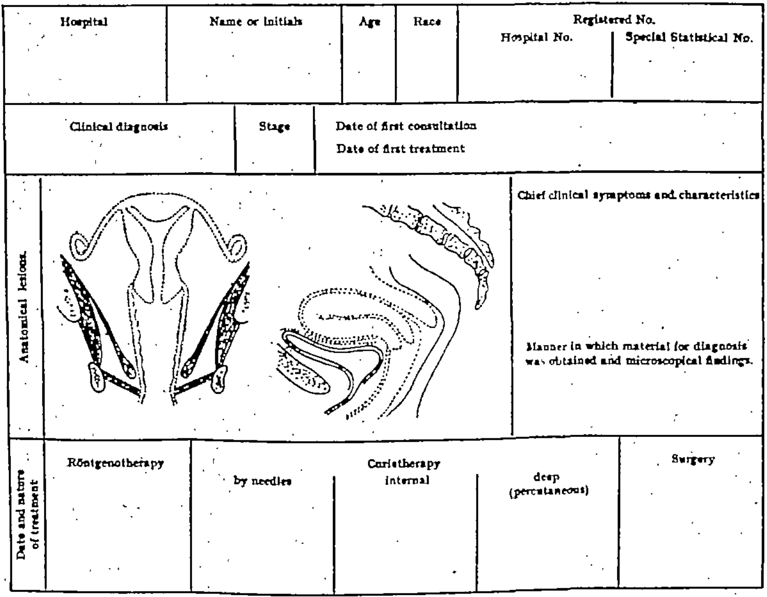
[2] League of Nation's Publications: Health. 1929. III., 5. Pp. 82. Obtainable from Constable and Co., Ltd., London, W.C.

The Commission concluded that no fair correlation of the work of different clinics could be made with the material at present available; its recommendations are designed to ensure a happier result from future inquiries.

Rules for Obtaining Full and Comparable Statistics.

The three institutions submitting reports have agreed to accept a model case-record drawn up by the subcommission (see Figure) and to follow certain rules laid down. The Commission hopes that all radiological institutes will adopt this scheme.

Only cases microscopically diagnosed should be included; adenoma, pre-cancerous conditions, sarcoma, and other non-carcinomatous growths must be differentiated. Growths are to be divided into vaginal, cervical, and corporal as before. A growth should be classed as vaginal only when the cervix is intact, and there is no ground for supposing that it is anything but a primary growth in the vagina. Cases in which a small cervical lesion has disappeared under radiological treatment, while the main part of the tumour is still in the vagina, are to be classed as vaginal. When the cervix has not been examined at the beginning of treatment, diagnosis must be postponed until the situation has been clarified. If, even after radiological treatment, the cervix cannot be examined, the growth should be classed as vaginal if rectal examination shows the cervix and parametria to be clinically free from growth. Carcinoma of the body should be diagnosed only when the cervix is healthy. In the absence of sufficient indications for determining the point of origin, the microscopical report should provide a reasonably safe basis for diagnosis—e.g., pure squamous-celled carcinoma and adeno-carcinoma with mucous secretion are both cervical types of growth. If the cavity of the uterus is enlarged and clinical examination does not differentiate between endocervical carcinoma extending to the body and carcinoma of the body extending to the cervix, the distinction is of theoretical rather than of practical importance. These growths behave like, and should be classed as, growths of the body unless the microscopical picture forbids.



Hospital

Name or initials

Age

Race

Registered No.
Hospital No.
Special Statistical No.

Clinical diagnosis

Stage

Date of first consultation
Date of first treatment

Anatomical lesions

Chief clinical symptoms and characteristics

Manner in which material for diagnosis was obtained and microscopical findings.

Date and nature of treatment

Röntgenotherapy

Curietherapy
by needles
internal
deep (percutaneous)

Surgery

Model case-record card. The front of the card also leaves room for details of accessory treatment, whilst the back is devoted to results. The elaborate particulars of treatment to be entered under the various headings are set out at length in the report.

The stages of anatomical extent are given as follows.

Stage I.—The growth is strictly limited to the cervix uteri. Uterus mobile.

Stage II.—Lesion spreading into one or more fornices with or without infiltration of the parametrium adjacent to the uterus, the uterus retaining some degree of mobility.

Stage III.—(*a*) Nodular infiltration of the parametria on one or both sides extending to the wall of the pelvis, with limited mobility of the uterus or massive infiltration of one parametrium with fixation of the uterus. (*b*) More or less superficial infiltration of a large part of the vagina, with a mobile uterus. (*c*) Isolated metastases in the pelvic glands, with a relatively small primary growth. (*d*) Isolated metastases in the lower part of the vagina. Generally speaking, all cases not falling into Stages II. or IV. to be placed under Stage III.

Stage IV.—(*a*) Cases with massive infiltration of both parametria extending to the walls of the pelvis. (*b*) Carcinoma involving the bladder or rectum. (*c*) The whole vagina infiltrated (rigid vaginal passage), *or one vaginal wall infiltrated along its whole length with fixation of* the primary growth. (*d*) Remote metastases.

For statistical purposes, only cases of cervical carcinoma which have been under observation for at least five years should be included, grouped into (*a*) those treated in the first instance by radiotherapy; (*b*) post-operative recurrences and cases treated by palliative operation; (*c*) those treated by post-operative prophylactic irradiation. Records should also include the total number of patients seeking treatment for cervical carcinoma and the numbers accepted and rejected together with the reasons for rejection, specifying whether it was the general condition or complications, lack of accommodation, refusal to undergo treatment or failure to keep appointment, radiological treatment elsewhere, or any other reason. Clinical diagnosis should be confirmed microscopically, and the number of cases in each of the different stages should be stated among all those accepted for treatment and among those with no signs of the disease five or more years after treatment. Recurrences after total hysterectomy should be classified as local recurrence in the scar, or as distant recurrence. In setting out the results of the treatment, no deduction should be made for patients whose treatment was interrupted or who died or were lost sight of during the first five years after treatment. Figures should be based on the number of cases treated and not on the number examined.

Detailed instructions are given in the report for supplying data relating to technique.

Reports from Stockholm, Paris, and Munich.

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He points out that no such assumption of operative ability could be made, and foreshadows the great difficulty in proper organisation of radiation treatment which will be caused by this attitude on the part of practitioners, and the public assent given to it through ignorance. He deprecates the supply of radium—which may be insufficient in quantity or contained in out-of-date apparatus—to small local hospitals, and the hire of radium by practitioners who order it as they would a drug. The abuse of X rays is, he thinks, less harmful than the abuse of radium.

"The mischief of bad rontgenotherapy lies not so much in that it deprives patients of treatment by other methods which might cure them, as that it deprives internal radium therapy of a valuable ally, which might help to increase considerably the number of patients capable of being cured."

The subcommission recommend the concentration of treatment of cancer of the uterus in a small number of perfectly equipped institutions. It desires to draw the attention of the various authorities concerned to the disastrous results which might arise either by encouraging, or by allowing without any control, the widespread use of radiotherapy for the treatment of cancer, notably cancer of the uterus, in the hospitals or institutions which are maintained by public authorities. Without being able to express a dogmatic opinion on methods of technique, about which specialists still disagree, the Commission wishes to warn medical men and the public against the use of insufficient quantities of radium—the few needles or one or two tubes with which practitioners and small clinics sometimes attempt to treat patients. It insists on the difficulty of providing an effective and harmless deep pelvic irradiation, on the necessary strength of machines and tubes, on the great labour necessary for efficacious treatment, and on the obligation resting on doctors not to allow radiotherapy to pass into unskilled hands.

MEDICINE AND THE LAW.

Dangerous Drugs Regulations: Keeping a Register.

THERE still seems to be some misunderstanding about the obligation to keep a register under the Dangerous Drugs Regulations. A medical practitioner was fined 10 guineas including costs at Manchester on August 7th for failing to keep a register and to enter therein the true particulars of the drugs named in the summons. The defendant had undertaken work at Hull last April, as locum tenent during the absence of a local practitioner on holiday. He had ordered tincture of opium and liquid morphine hydrochloride from a local chemist, but made no entry of these purchases though there were 15 entries in the day-book of drugs used. On the defendant's behalf there was produced in court a small handbook containing particulars of the purchases, and it was apparently common ground that, if these particulars had been entered in the dangerous drugs register, they would have complied with the regulations. Defendant said he considered he had no other book to keep because he had never dispensed drugs above the strength laid down by the regulations. The Hull stipendiary magistrate, in imposing a fine as already stated, held that the statute required the keeping of a proper record of where the drugs came from and what became of them.

Section 7 of the Act of 1920 expressly authorises the Home Office to make regulations requiring persons engaged in the manufacture, sale, or distribution of drugs within Part III. of the Act to keep such books as may be prescribed; it would thus hardly be possible to argue that the regulations were ultra vires. The consolidated regulations, issued afresh last December, contain specific provisions as to the form of the register and the time and method of making entries therein; but there is a special exemption for any duly qualified medical practitioner who "enters in a day-book particulars of every drug or preparation supplied by him to any person, together with the name and address of that person and the date of supply, and enters in a separate book kept for the purpose of this regulation a proper reference to each entry in the day-book which relates to the supply of any drug or preparation."

In the recent proceedings at Hull, instituted by the Director of Public Prosecutions, the prosecuting solicitor mentioned that when the resident practitioner returned from his holiday he found nothing remaining in the surgery of various quantities of tincture of opium, liquid morphine, and morphine tablets which had been left there at his departure. From the necessarily abbreviated report of the case it is not clear how far this statement was relevant to the summons, but apparently there was no sufficient record of the disposal of these drugs. Practitioners, when making holiday arrangements with a locum tenent, will bear in mind the desirability of taking steps to avoid the chance of misunderstanding in such circumstances.

Falsification of Prescription by Addict.

The Dangerous Drugs Acts and similar legislation cannot prevent every danger of abuse of drugs. Poisonous disinfectants are readily purchasable by would-be suicides. Last month a mother (found by the jury to have been "guilty but insane") poisoned her child by administering two dessertspoonfuls of a liquid consisting of a pint of water in which she had dissolved 300 aspirin tablets. Nevertheless, the Acts, so far as any legislation can, make things more difficult for those who would make improper use of drugs, and especially for the drug addict. In another case last month the evidence disclosed a long story of attempts to obtain drugs illegally; the case ended in prosecution and imprisonment, and the defendant will have a chance in prison of curing himself of drug addiction against which, it was said, he had made a good fight. The accused man, Leslie James Stonelake, aged 34, charged at Marlborough-street on July 14th, was stated to have been in April last an assistant engineer in a ship sailing from Australia to London and to have been treated on the voyage by the ship's doctor for asthma and drug addiction. The doctor succeeded in reducing Stonelake's drug consumption from 15 grains to half a grain a day. When the ship reached London at the end of the month, the doctor gave him a prescription for one tablet of hyoscine and one tablet of morphine sulphate; the total amount in the tablets was half a grain, and the prescription was marked "Not to be repeated." Stonelake presented the prescription to a Piccadilly chemist on May 9th, having altered "¼" into "½" and "1" in each case into "12." The chemist, believing the prescription to be genuine, furnished the drugs. On April 27th, 28th, and 29th he had presented prescriptions from another doctor who authorised a "repeat" and had obtained morphine thereby. On April 30th he presented a further prescription from yet another doctor and obtained 24 tablets; on May 11th he presented yet another prescription from a fresh doctor and obtained 24 tablets again. These large supplies at last aroused the chemist's suspicions, and the prosecution followed. A member of the staff of the Marylebone Hospital said the accused came to him from a nursing home which he had left for want of money to continue the treatment there; he was treated with daily reduced doses till June 10th when he ceased to take morphine; he had taken none since. The witness said the defendant had put up a good fight against the drug and could be cured; he had little of the physical or mental degeneration which usually accompanied such cases. The magistrate, Mr. Mead, sentenced the accused to three months' imprisonment in the second division on the charge of being in unauthorised possession of 12 grains of morphine sulphate (under the altered prescription) and dismissed the charge of procuring the drug on May 9th. The accused had, of course, committed several offences; there was also the element of forgery, but with this the magistrate could not himself deal; it was clearly unnecessary to commit the man for trial. The case shows the administration of the law in the best interests of the accused.

Medical Titles.

So far as it is a personal matter, Lieut.-Colonel Kynaston is to be congratulated on the success of his recent appeal to the London Sessions. The upshot of the decision is that he has committed no offence against the Medical Act in continuing to use the title, "M.R.C.S. (Eng.)," though the Royal College has taken that title away. Apart from the personal aspect appointment, radiological treatment elsewhere, or any other reason. Clinical diagnosis should be confirmed microscopically, and the number of cases in each of the different stages should be stated among all those accepted for treatment and among those with no signs of the disease five or more years after treatment. Recurrences after total hysterectomy should be classified as local recurrence in the scar, or as distant recurrence. In setting out the results of the treatment, no deduction should be made for patients whose treatment was interrupted or who died or were lost sight of during the first five years after treatment. Figures should be based on the number of cases treated and not on the number examined.

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The Board wishes to establish these hospitals as a centre, the outlying hospitals doing the general work and referring the special work to the main centre. As the Brisbane General Hospital is somewhat out of date the Board are rebuilding and remodelling it, and it is proposed to build a new hospital to replace the Obstetric Hospital. In the remodelled General Hospital, special complete departments will be established among others for urology, ophthalmology, ear, nose, and throat work, and orthopædics. Each of these departments will be a complete and separate unit. It is hoped to establish later a complete cancer department. A radium department is already in existence, about half a gramme of radium having been lent by the Commonwealth Government for the purpose.

The Pan-Pacific Surgical Conference.

The Pan-Pacific Surgical Conference is being held under the auspices of the Pan-Pacific Union from August 14th to 24th, at Honolulu. The Conference has been organised by Hawaian committees under the general chairmanship of Dr. Nils P. Larsen, and by Pacific Coast States and British Columbian committees under the chairmanship of Dr. George W. Swift. There are 16 sections whose programmes are entirely American, and several symposiums will be prepared. The invitations have been sent to many countries and ten delegates from each Pacific country are being housed and entertained by the committee in Hawaii. Australian delegates are Sir James Barrett, R. H. Pulleine, N. D. Royle, S. Harry Harris, R. P. W. Francis, and Prof. Watson. It is possible that Prof. W. A. Osborne will also attend as a delegate. The objects of the Conference are: to bring together surgeons from countries bordering on the Pacific; to permit the exchange of surgical ideas and methods; and to develop an "acquaintanceship among the surgeons."

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The American Medical Association.

THE eightieth annual convention of the American Medical Association was held at Portland, Oregon, from July 8th–12th. The report of the Board of Trustees records that the Spanish edition of the Association's *Journal* was discontinued after the edition of Dec. 15th, 1928. A number of the South American subscribers transferred their allegiance to the English edition. The special technical journals have all enjoyed an increase in circulation, while the popular magazine *Hygeia* has continued to gain and is now on a self-supporting basis. The fact that it reaches monthly nearly 15,000 school teachers gives an idea of its educational influence in this country. The Bureau of Health and Public Instruction has been responsible for a number of radio lectures broadcasted from Chicago. Some of these health talks have been mimeographed and are available at the offices of the Association.

The Committee on Scientific Research reported expenditure during the year of over $12,000 on grants for research. Except in a few cases this money was devoted solely to necessary expense in connexion with research. The Committee on Trachoma among the Indians recommended that all matters relating to the health of the Indians ought to be transferred to the United States Public Health Service "which has a record of efficiency that is in striking contrast to the dismal failures of the Indian Service." Their investigations had shown them that trachoma is not being treated with any thoroughness, that children with this disease are present in all the schools which they visited and mingle freely with healthy children, thus spreading the infection. They add that "almost none" of the hospitals come up to the standards set by the American Medical Association or the American College of Surgeons.

The subject of fee-splitting was dealt with frankly in the report of the Judicial Council. Some physicians have attempted to find a qualified defence of this practice in the wording of a sentence in the Association's Principles of Medical Ethics, which says that "it is also unprofessional to divide a fee for medical advice or surgical treatment, unless the patient or his next friend is fully informed as to the *terms of the transaction.*" *In order that the intention* of this section should be expressed in unequivocal language the Judicial Council recommended an amendment to read: "When a patient is referred by one physician to another for consultation or for treatment, whether the physician in charge accompanies the patient or not, it is unethical to give or to receive a commission by whatever term it may be called or under any guise or pretext whatsoever." This amendment was warmly endorsed during the convention by the Reference Committee on Legislation and Public Relations and was adopted by the House of Delegates at its second session. The House also adopted a resolution disapproving the recent change in policy of the American Red Cross permitting their nurses to serve patients under the care of osteopaths and chiropractors. At the final meeting opposition was raised against a Bill now before the U.S. Senate Committee, which seeks to impose prohibitive tariffs on foreign surgical instruments, X ray equipment, vacuum tubes, valve tubes, and scientific glassware. It was pointed out that these proposals, if adopted, would add materially to the already high cost of medical care. The resolution was referred to the Board of Trustees.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

CITY OF LONDON.

Statistics.—The estimated population of the City was 11,430, which gives a density of 17·3 persons per acre, as compared with about 60 per acre for the County of London. The resident population has steadily declined from 112,063 in 1861 to the present figure. The births numbered 82 and the deaths 140, giving a birth-rate of 7·2 and a death-rate of 12·2. The deaths from pulmonary tuberculosis numbered 13, from other tuberculous diseases 5, from cancer 16, from heart disease 31, from bronchitis 6, from pneumonia, 7, from other respiratory diseases 0, and there were no deaths from influenza. The corresponding rates were tuberculosis 1·57, cancer 1·4, heart disease 2·7, and respiratory diseases 1·7. The five infant deaths gave an infant mortality-rate of 60, and there were three deaths between 1 and 5 years. That one cannot make deductions from the rates for a small population is well illustrated by the fact that Dr. W. M. Willoughby records no deaths from childbirth, whilst in the comparative table for the London boroughs in the County report the childbirth mortality for the City is given as 12·05, evidently calculated on one childbirth death. The small number of births enables a close personal touch to be maintained between the infant welfare centre at St. Bartholomew's Hospital and the city mothers.

Infectious and Other Diseases.

The great majority of the notified infectious diseases were removed to hospital; thus out of 57 only one case each of scarlet fever, erysipelas, ophthalmia neonatorum, and pneumonia was treated at home. There were no notifications of puerperal fever or pyrexia, and there was no call made on the funds set aside for the nursing of measles, influenza, &c. Dr. Willoughby favours the notification of acute rheumatism in children under 16 years and the establishment of supervisory centres for such in London. The new

London regulations for infectious diseases came into operation on Jan. 1st, 1892. Trench fever has been removed from the list. Cases of malaria, induced therapeutically, need not be notified unless the practitioner in charge thinks that the patient is liable to relapses. In the case of enteric fever and dysentery steps must be taken to protect food against contamination by carriers. The question of bakers' itch came under consideration because one of the metropolitan boroughs sought powers enabling its medical officers of health to enter a bakehouse and examine the staff with a view to the detection of such skin diseases. Dr. Willoughby points out that "bakers' itch" is an indication of the excessive presence of worm- and insect-infested flour at the source of supply or at the bakehouse, and that he felt compelled to advise his Committee against the support of such piecemeal legislation. He thinks this should be merged in the larger subject of disease and cleanliness in relation to all foodstuffs, which is at present under the consideration of the Ministry of Health. The hours of the tuberculosis dispensary, established at St. Bartholomew's Hospital, have been rearranged with advantage. Wards are available for the reception of cases presenting difficulties of diagnosis, and the patients treated include residents of the City and workers in the City. The attendances show a decline owing to the removal of chronic cases as the result of the demolition of the Hutchison-avenue property. The corporation have made arrangements to maintain infectious advanced City cases at St. Columba's Hospital, Swiss Cottage. More use has been made of artificial pneumothorax. The tuberculosis dispensary has been put at the disposal of the College of Nursing for the training of health visitor students. In connexion with the V.D. clinic, also at St. Bartholomew's, in-patient treatment has been discontinued in the interests of economy. The number of cases discharged after completion of treatment was 7, and the number of cases who ceased to attend before final tests was 23 before completing the first course, 13 after one or more courses, and 23 after completion of treatment. Of the 476 venereal cases treated during the year, 445 were residents of London, and the remainder lived in the counties of Essex, Herts, Surrey, and Kent.

Atmospheric Pollution.

Records of atmospheric pollution by the analysis of rain-water are kept at Golden-lane, and a table is given showing the comparison, month by month, between Golden-lane and the Meteorological Office, South Kensington on the West and Victoria Park on the East. During most months of 1928 Golden-lane was considerably worse than the western station and very much worse than Victoria Park. In May, however, the western and eastern stations were about the same and Golden-lane nearly twice as bad. In July the Meteorological Office was much the best. In September the Meteorological Office was slightly better than Victoria Park, while Golden-lane was fivefold worse. In December the Meteorological Office and Golden-lane were each about twice as bad as Victoria Park. An observation is also made every midday at the Guildhall by a modern dry method. It was found that during the year the noon impurity, varied from a half to 5 mg. per cubic metre of air, the latter figure including times of fog. Dr. Willoughby thinks the time is approaching when a bright, smokeless fuel will be generally available for open grates and the solution of the domestic smoke problem.

Milk.

Of 48 samples of milk examined for tubercle, 4 gave a positive result. In one of the 4 the follow-up at the farm revealed tuberculous udders. In 2 cases the follow-up was a failure and the fourth was being investigated at the end of the year. Dr. Willoughby is impressed with the ease of application and the greater certainty of the intradermal test. He quotes figures showing that out of 835 non-reactors to the subcutaneous, 122 reacted to the intradermal test, and that the autopsy confirmed the result in all the 94 animals examined post mortem. He gives as advantages of the new tests: the veterinary surgeon's visits are reduced from 8 to 3; the tested animal need not be kept indoors; its milk yield is unaffected; the test is without risk to pregnant or young animals; and doping by tuberculin does not nullify the test, which can be successfully repeated at intervals of 3 weeks. On Oct. 1st, 1928, Article 29 of the Milk and Dairies Order, 1926, came into operation, according to which churns or vessels used for the transport of milk must bear the name and address of the owner in permanent marking and be provided with a lid without openings and so constructed as to prevent the access of dirt to the milk and the return to the interior of any milk which may have been splashed above the lid. Two prosecutions for milk deficient in fat, 13 per cent. and 26 per cent. respectively, were dismissed by the magistrate because he was satisfied that the milk was delivered as given by the cow. The veterinary officer, Mr. T. D. Young, who has recently paid a visit to Australia and New Zealand to inspect the meat industry in those countries on the invitation of their Governments, taking the meat industries of U.S.A. and Canada en route, reports on meat inspection.

Meat.

Argentina, during 1928, sent to us 470,000 tons of beef, 100,000 tons less than last year, but 76 per cent. of our imported beef. Australia sent 8 per cent. and Uruguay 6 per cent. New Zealand sent nearly 50 per cent. of our imported mutton and lamb, while Argentina sent 27 per cent., Australia 9 per cent., and Uruguay 7 per cent. New Zealand sent nearly half of the imported frozen pork, whilst the Irish Free State increased her shipments of fresh pork by 3500 tons. Denmark supplied 60 per cent. of our imported bacon and Holland 11 per cent. It was hoped that the removal of the embargo against Canadian cattle would increase our supplies of fat and store cattle, but this has not happened, because the Canadians have been able to obtain more money for such animals in Chicago. The Irish Government have passed a new meat inspection law under which meat inspectors will be appointed in Ireland in all places from which meat is exported to Smithfield. All the countries which export mutton and lamb to Smithfield are suffering loss from the condemnation of carcasses affected with caseous lymphadenitis—namely, Argentina, Australia, New Zealand, Chili, and Uruguay—and determined efforts are being made in every case by the Governments concerned to improve the method of examination of the carcasses and offal at the places of slaughter. Mr. Young mentions that Argentina has sent, experimentally, small consignments of "chilled" instead of frozen mutton, and that the appearances of these carcasses during the autumn and winter was so good that it was very difficult to distinguish them from home-killed mutton. The conditions under which meat has been handled and transported to and from the City markets improved greatly during 1928, and in the great majority of cases verbal caution as to thoughtless contraventions of the regulations was all that was required.

Housing.

Dr. Willoughby has made an inspection of all the dwelling houses in the case of which demolition might seem desirable, and he has formed the opinion that the housing question in the City is not now one which would justify the City Corporation in embarking upon any further housing schemes. The City pigeons were reduced by about 2000 during 1928.

Rats.

Dr. Willoughby states that there is a great decrease in the rat population, that owing to constant attention to drains and sewers the brown rat is fast disappearing, and that as new buildings replace old the lessening in number of the smaller black rat will be apparent. Unfortunately, the owner is not responsible for the rat-proofing of buildings, which is a very expensive matter. If the drains are out of order the owner can, of course, be called upon, and this is one effective way of reducing the number of brown rats. Examples of specifications for rat-proofing against the black rat are given in Dr. Willoughby's report and illustrate graphically the expense involved. Present observations suggest that the black rat in the City outnumbers the brown rat by 3 to 1. Poisons and viruses are not much used in the City. The traps which give the best results are the "breakback" and varnish traps—the latter being now in general use and the most successful of all. Some of the wire traps are constructed of wire so fine that captured rats can force their way out.

TYNE PORT SANITARY AUTHORITY.

IN his annual report to this authority Dr. W. E. Harker mentions that during 1928 9377 ships arrived, of which 8431 were inspected. Single cases of measles, mumps, and enteric fever were removed to hospital, but no cholera, plague, or yellow fever came to notice. Defects were noted in 607 ships (side ports defective in 318, water-closets in 122) and dirty accommodation for crews in 877—i.e., 12 per cent. of British and 6 per cent. of foreign ships. Uncleanliness *is likely to develop at the end of a voyage*, and in this connexion it has been pointed out that the crews of British ships are paid off in British ports, whereas foreigners are not. Except 800 tons of wheat sent to Rotterdam, the food imported was found in good condition. The aliens arriving were all clean. Treatment for venereal disease is offered to every ship on arrival; we are not told whether it is ever accepted. There is an official rat-catcher and on 67 vessels 2628 rats were destroyed, none of which were found to be infected with plague. On account of infection, 1057 beds were burnt. Fishing boats are inspected and 20 were cleansed and deodorised. The 18 water-boats were in good condition, and the water of 25 ships was changed; these also had their tanks purified.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 3RD, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 129 (last week 129); scarlet fever, 1776; diphtheria, 812; enteric fever, 50; pneumonia, 688; puerperal fever, 24; puerperal pyrexia, 98; cerebro-spinal fever, 13; acute poliomyelitis, 14; acute polio-encephalitis, 1; encephalitis lethargica, 30; dysentery, 6; and ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on August 6th–7th was as follows:—Small-pox, 134 under treatment, 0 under observation (last week 161 and 9 respectively); scarlet fever, 1353; diphtheria, 1520; enteric fever, 12; measles, 314; whooping-cough, 295; puerperal fever, 23 (plus 18 babies); encephalitis lethargica, 123; "other diseases," 22. At St. Margaret's Hospital there were 17 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 5 (2) from enteric fever, 33 (4) from measles, 2 (0) from scarlet fever, 26 (3) from whooping-cough, 18 (6) from diphtheria, 60 (13) from diarrhœa and enteritis under two years, and 20 (1) from influenza. The figures in parentheses are those for London itself.

Three of the deaths from measles were reported from Stoke-on-Trent, 3 from Manchester, and 6 from Liverpool. Those from whooping-cough included 4 from Sheffield, and 3 each from Walsall, Birmingham, and Liverpool. Nine of the deaths from diarrhœa and enteritis under two years were recorded from Liverpool, 4 from Hull, and 3 each from Stoke-on-Trent, Birmingham, and Manchester.

The number of stillbirths reported during the week was 251 (corresponding to a rate of 30 per 1000 total births), including 42 in London.

Death from Small-pox.

Dr. Vynne Borland, medical officer of health for the metropolitan borough of Bethnal Green, informs us that in the fatal case of small-pox recorded last week the patient was an unvaccinated boy aged 13. On July 7th, the day after the rash appeared, he was taken to the South Wharf Hospital, Rotherhithe, and for the following details we are indebted to Dr. W. J. A. Coughlan, assistant medical officer in the River Ambulance Service. The patient was admitted with an attack of confluent small-pox, accompanied by severe toxæmia. He had suffered for eight years from suprapubic fistula, the result of an accident at the age of 4 years, which caused damage to the bladder and urethra. As a direct result of the attack of confluent small-pox a general septic condition supervened from which he died. "The fatal result in this case," writes Dr. Coughlan, "must be regarded as more directly due to the severity of the small-pox infection than has been the case in previous fatalities which have followed the existing mild form of the disease."

We understand that the cause of death was certified as septicæmia, confluent small-pox, and vesical fistula.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. H. B. Hill is placed on the Retd. List with rank of Surg. Capt.

Surg. Comdr. W. I. Gerrard is placed on the Retd. List at own request.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. G. McConll to *Victory*, for R.N. Hospital, Haslar, for training.

Surg. Lts. G. H. Bradshaw, F. E. Stabler, and C. H. A. Fido (D.) to *Victory*, for R.N. Hospital, Haslar, for training.

ROYAL ARMY MEDICAL CORPS.

Capt. F. T. Boucher, late R.A.M.C., T.F., to be temp. Capt., and temporarily relinquishes the rank of Capt.

ARMY DENTAL CORPS.

Lt. L. A. Barlow to be Capt.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) P. J. Gaffikin, from T.A. Res. of Off., to be Lt.-Col. (Bt. Col.).

Maj. F. H. White, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

INDIAN MEDICAL SERVICE.

Maj. M. Purvis retires.

Lt. (on prob.) J. Acheson to be Capt. (prov.) (on prob.).

DEATHS IN THE SERVICES.

Colonel Alfred Peterkin, C.B., A.M.S., retired, who died at Queen Alexandra's Military Hospital, Millbank, on July 17th at the age of 75, graduated in medicine at the University of Glasgow in 1878. He was a man of magnificent physique, and an old Rugby International, playing for Scotland. He entered the Army Medical Service as surgeon in 1880. In the following year he saw service in the Transvaal War, and in 1902 in the South African War, and received the Queen's medal and two clasps. As an administrative officer he was later employed in Mauritius, South Africa, and in London up to the time of his retirement in 1911. At the beginning of the late war he rejoined for service and was appointed to the charge of the London Command. He had an up-hill fight, as in addition to the ordinary army duties of his position, which in peace time were comparatively slight, he had to deal with five Territorial Hospitals, many private hospitals, the Territorial Units of the two London Divisions (amounting to over 60 Units), all of which, as well as the Guards and the Central Recruiting Depôt at Whitehall, were working briskly. After a short time crowds of wounded arrived, while medical officers were very scarce, and Peterkin dealt manfully with the situation as far as his responsibilities went. A steady, level-headed, and imperturbable officer, Colonel Peterkin was beloved by his juniors and thought much of by his seniors, and when he did not always see eye to eye with the authorities he carried out all orders loyally and thoroughly. He was made a Companion of the Bath during the war. Latterly he did some work for the Ministry of Pensions, and finally joined the Pensions Appeal Tribunals.

Correspondence.

"Audi alteram partem."

A MEMORIAL TO FERNAND WIDAL.

To the Editor of THE LANCET.

SIR,—The enclosed letter explains itself and I propose to do what these distinguished Frenchmen ask me. Will you kindly receive subscriptions for me and allow me to state that I should like myself to subscribe 3 guineas?

I am, Sir, yours faithfully,
ALMROTH WRIGHT.

St. Mary's Hospital, Paddington, August 13th, 1929.

Prof. ALMROTH WRIGHT.

MONSIEUR ET CHER COLLÈGUE,

Les admirateurs, les amis et les élèves du Professeur Fernand Widal ont décidé de former un Comité d'honneur pour perpétuer sa mémoire et répandre son œuvre scientifique. Dans ce but, ils ont l'intention de lui élever un monument, de faire figurer son effigie en médaillon à la Faculté de Médecine et à l'Hôpital Cochin et de publier une édition de l'ensemble de ses travaux.

Un certain nombre de nos collègues étrangers nous ont exprimé le désir de se joindre à nous et nous avons accepté avec joie leur concours.

Nous vous serions reconnaissants de bien vouloir prendre l'initiative de pressentir à ce sujet les personnalités de votre pays qui ont entretenu des relations avec le Professeur Widal et qui gardent pieusement son souvenir. Nous serions heureux de les voir se grouper autour de vous en un comité qui se chargera de recueillir les souscriptions et qui nous aidera dans l'accomplissement de la tâche que nous nous sommes proposée.

Veuillez agréer, Monsieur et cher Collègue, les assurances de notre considération la plus distinguée.

FERNAND BEZANÇON,
76, Rue de Monceau.
ANDRÉ LEMIERRE,
217, Faubourg Saint-Honoré.
PIERRE ABRAMI,
9, Rue de Lille.
MARCEL BRULÉ,
3, Rue Dufrénoy.
EDOUARD JOLTRAIN,
63, Avenue de Villiers.
LOUIS PASTEUR VALLERY-RADOT,
5, Avenue Constant Coquelin.

⁂ We have recorded this movement in an annotation on page 346. Subscriptions to the Fund can be sent to this office, addressed "Widal Memorial, care of The Editor, THE LANCET."—ED. L.

MILDER VACCINATION.

To the Editor of THE LANCET.

SIR,—It may be of interest if I give a short account of recent experience at Scarborough which bears closely on some of the questions raised in your leading article of August 3rd (p. 233).

Of late years there have been two outbreaks in the town, from October, 1924, to June, 1925 (45 cases), and from January, 1927, to March, 1928 (75 cases). The district is, and always has been, poorly vaccinated, the percentage of infants vaccinated in 1924 and 1925 being 30 in each year, but the vaccinal condition of those attacked affords good evidence of the protection afforded. In the first outbreak, out of 45 cases, 40 were unvaccinated, four were vaccinated in infancy, and in one case the vaccinal condition was unknown; the ages of the four persons vaccinated in infancy were 51, 30, 52, and 63 years. In the second outbreak, out of 75 cases, 67 were unvaccinated and eight were vaccinated in infancy, their ages being 25, 32, 46, 47, 48, 49, 50, and 56. These figures speak for themselves, but it will be noted that in 1927–28 the disease attacked patients as young as 25, who had been vaccinated in infancy, and this clearly points to the necessity of *recent* vaccination.

In the first outbreak, of the unvaccinated cases three were vaccinated by the medical officer of health after exposure to infection, but (as it proved) too late to stave off the attack. Vaccination must be successfully performed within three days of exposure to the disease, if the attack is to be averted.

As public vaccinator, I found much opposition to vaccination in Scarborough; only a small proportion take advantage of the conscientious clause on conscientious grounds, and the majority use it as a means of escaping the extra care entailed in attending to a vaccinated arm. Some still think that vaccination will cause the child to develop some other disease, chiefly tuberculosis. The percentages of vaccinations in infants (to births), quoted earlier, give no real idea of the vaccinal condition of the town before and during the two outbreaks. Thus my vaccination register shows that in F. School, out of 178 children vaccinated, 165 had never been vaccinated before; in S.M. School, out of 128 children, 112 had never been vaccinated before; in C. School, out of 225 children, 195 had never been vaccinated before; in the vaccination centre at E., out of 69 persons vaccinated, 52 had never been vaccinated before; and in the centre at S.S., out of 12 persons vaccinated, 8 had never been vaccinated before. The figures for the high school were much better; out of 56 vaccinated, 30 had never been vaccinated before.

During the two outbreaks a number of revaccinations were performed on children under the age of 10. Most of these were unsuccessful. Of the successful cases the majority showed no more than two scars of a previous vaccination. Incomplete vaccination, as shown by only one or two scars, means incomplete safety, but as the Rolleston Committee point out, multiple insertions may perhaps be reserved for those who desire to obtain the maximum protection at one stage. The instruction to public vaccinators by the Ministry of Health is not to revaccinate any child under the age of 10. The lowest age at which revaccination was successfully performed by me was 7 years. This suggests that during an outbreak of small-pox it is wise to revaccinate children of or above 7 years of age, even if they have previously been successfully vaccinated.

In your leading article you say that "it is probable that the lymph now in use is considerably stronger than necessary," and it is noteworthy that in both the Scarborough outbreaks a violent reaction was produced by vaccination in a large number of cases. This reaction is of special significance in the presence of the prevalent mild type of small-pox, since the vaccinal reaction was often more severe than the disease itself. Most cases of small-pox progressed well after the appearance of the rash, whilst many cases of vaccination were confined to bed for as long as a week. Some children were absent from school for two or three weeks. Cases of this violent reaction were chiefly children of school age, and I estimate the percentage as about 20. In most of them on the eighth day the arms appeared to be taking a normal course, but during the next two or three days this reaction had set in. Fever (with temperature often as high as 103° F.), delirium, headache, backache, vomiting, pronounced weakness, and vertigo were common. The arm showed a varying amount of inflammation, from red rings round the vesicles to severe cellulitis extending from the upper arm to the wrist, with redness and œdema. The axillary glands were greatly enlarged and very tender. Supernumerary vesicles were often seen, one child having eight and another ten vesicles from four scarifications. Herpes was frequent on the lips, and one child had a patch of herpes on the breast and neck on the same side as the vaccination.

The same technique was employed in all my vaccinations, and all vaccinations were performed with Government lymph. In a number of cases modifications of the usual method were employed to discover, if possible, any factor which might have some bearing on the production of this reaction. Thus different antiseptics were used to cleanse the skin; the scarifications were made with varying severity, or only half the usual quantity of vaccine lymph was used. No such factor was discovered. It was observed, however, that infants of 4 or 5 months who were vaccinated during the outbreaks did not show the same violent reaction. From this it appeared that the actual presence of small-pox in school-children was an important factor in causing this violent reaction. I may here note that in the first outbreak of small-pox 50 per cent. of cases occurred in children of school age, whilst in the second outbreak the figure was 60 per cent.

A similar violent reaction occurred during the 1923 epidemic in Gloucester, and my experience at Scarborough indicates that in the presence of the present type of mild small-pox Government lymph is too potent. Unfortunately, in the words of the Rolleston Committee there is still "a great lack of information as to the minimal dose of lymph necessary to secure adequate immunity from small-pox."

I am, Sir, yours faithfully,

NATHAN WALSH, M.B., Ch.B.

Scarborough, August 9th, 1929.

MEDICAL EDUCATION.

To the Editor of THE LANCET.

SIR,—The report of Prof. T. J. Mackie's address on medical education, published on p. 298 of your last issue, affords food for thought. I believe that medical men underrate the biological concept of man, of brain + muscle, supported by a bony framework (the skeleton). Much in our teaching of physiology, anatomy, and psychology would benefit by a greater appreciation of this concept, and its corollary the physiological properties of thought. This question, of course, is a big one and is outside the scope of this letter, which is to suggest a few practical ways whereby the student's course can be shortened and simplified with advantage. My suggestions are:—

1. That the students after their first M.B., or its equivalent, be brought into the wards by their physiological teacher to perform the routine pathology of the wards—e.g., the blood-sugar and urea estimations, examinations of the urines, and blood examinations, &c.; and that they should go to all the elementary classes on bacteriology, morbid anatomy, morbid histology, &c., which they now attend after their second M.B. The students at this stage are not taught their clinical physical signs till after, we will say, nine months, but they might, of course, be shown the salient points of a case illustrating physiological or pathological problems. The pathologist (of the teaching staff) could then devote himself to the more difficult problems of pathology itself. The physiologist and the pathologist should oppose each other as counsel in law cases do to arrive at the truth, and each be mutually dependent on each other for his knowledge.

2. That all the present pass examinations should be abolished and the other examinations modified. Instead of them a class-mark should be given and a viva-voce examination held at the end, say, of every six months.

A clever student should be able to pass through the course more quickly than a dull one; as things now stand all students (except those that fail in their examinations) are reduced to the same level; they all pass the first M.B. together, they all pass the second M.B. together, and when they arrive in the wards they all have to start at the same level again; and at the end of their course (five years) not very much, it seems to me, is known of their abilities, or for what branches of the profession that they are fitted; a future researcher, for instance, may be caught young, and helped and educated for that purpose. The present faulty state of affairs was lucidly described in Prof. Lovatt Evans's address before the British Association at Glasgow last year (THE LANCET, 1928, ii., 535).

It seems to me that in our teaching of medicine we might well emulate the law (as mentioned before) in respect to its method of arriving at and of assessing the truth, thus obviating *inter alia* watertight compartments of knowledge.

I am, Sir, yours faithfully,

A. H. MILLER, M.D. Camb.

Bournemouth, August 9th, 1929.

EARLY TREATMENT IN ACUTE ANTERIOR POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—I do not think it would be superfluous to remind ourselves that an epidemic of acute anterior poliomyelitis is very liable to occur at this particular period of the year. It will be remembered that the epidemic of 1926 started that summer and reached its height during the drought. During that epidemic I saw over 150 cases, chiefly in Essex. I was fortunate enough to treat most of them from the very onset of the disease. This was at their own homes, or in fever hospitals, or at the various hospitals to which I am attached. In addition to the ordinary orthopædic treatment it was also possible to give suitable cases the serum from convalescent or chronic cases of the disease with encouraging results. History may be repeating itself, as I have already seen a number of acute cases within the last few weeks.

I would, therefore, plead that the orthopædic surgeon should be allowed to treat the patients, wherever they may be, in fever hospital or elsewhere, from the moment of the onset of the disease, thereby following out, to the minutest detail, the teaching of Sir Robert Jones that the affected muscles should have *immediate* complete and absolute rest in the orthodox positions necessary for optimum utility after the acute stage has passed.

I am, Sir, yours faithfully,

B. WHITCHURCH HOWELL.

Weymouth-street, W., August 7th, 1929.

THE LATE DR. MITCHELL BRUCE.

To the Editor of THE LANCET.

SIR,—I read with a sense of personal loss and keen regret of the death of Dr. J. Mitchell Bruce. I was fortunate enough in 1888 to be with him as a post-graduate at Brompton, and from his lips learned much that I have, year after year, transmitted to my students at the Jefferson Medical College of Philadelphia. The description of his character and methods in your notice of his death is excellent. Of him it may be said: Doctor et scriptor clarissimus, vir carissimus.

I am, Sir, yours faithfully,

Philadelphia, July 23rd, 1929. HOBART AMORY HARE.

AURAL DISEASE AND BATHING.

To the Editor of THE LANCET.

SIR,—My friend Dr. Graham Forbes in his kind reply to my letter in your issue of August 3rd gives an account of the tests employed for the purity of swimming-bath water, but he will not quarrel with me when I emphasise that the ultimate test is the clinical test. In this the consensus of specialist opinion seems clear: (1) that the metropolitan swimming-baths are a real source of danger; (2) that open-air and sea-bathing appears less fraught with danger, from which it seems to follow that the contamination of the water is a matter of moment; (3) that the infecting micro-organism is a streptococcus. There are many loop-holes for error in the bacteriological testing of swimming-baths and the chemical purification of the water possibly by some untrained person. The clinical test remains, and I venture to think that a case has been made out for the scientific reinvestigation of the question with a view to finding the condition of affairs *at its worst.* I should be happy to think that perhaps such work might fall within the scope of Dr. Forbes's own official researches.—I am, Sir, yours faithfully,

August 12th, 1929. F.R.C.P.

Obituary.

EDWARD OCTAVIUS CROFT, M.D. DURH., L.R.C.P. LOND., M.R.C.S. ENG.,

LATE PROFESSOR OF OBSTETRICS IN THE UNIVERSITY OF LEEDS.

Edward Octavius Croft, who died at Headingley, Leeds, on August 7th, was the son of the late Charles Ilderton Croft, F.R.C.S., of St. Laurence Pountney, London, and received his education at University College, London, from whence he qualified with the double English diploma. The branch of medicine in which he later specialised was early indicated by his appointments as resident obstetric assistant to University College, London, resident medical officer to the General Lying-in Hospital, and registrar and pathologist to the North-Eastern Hospital for Children. When in 1885 a new department consisting of an out-patient and in-patient department for the diseases of women was instituted at the Leeds General Infirmary there was also started an extern department for midwifery, the first hon. officer of which was the late Dr. James Braithwaite; Croft being elected resident obstetric officer, the organisation of the extern midwifery department was then to a large extent left in his hands. Such a department was new to Leeds, where until that time the students had gained their experience in midwifery from private practitioners for the most part, and partly from the obstetric work in the workhouse infirmaries. Croft started on a course of reform with tact and vigour, and in a short time the midwifery training in Leeds assumed a new and much more satisfactory position. It is not too much to say that the department was mainly the result of his efforts, for Dr. Braithwaite, with full confidence, left the organisation in his hands.

In 1898 Croft graduated as M.D. Durh. and became demonstrator of obstetrics at the Yorkshire College, and in 1910 he was appointed lecturer in gynæcology in the University of Leeds and subsequently professor of obstetrics. He was also honorary consulting physician to the Workwomen's Convalescent Home at Ilkley, senior hon. surgeon to the Leeds Hospital for Women and Children, and hon. surgeon to the Leeds Maternity Hospital. He was a past president of the North of England Obstetrical and Gynæcological Society and also of the Leeds and West Riding Medico-Chirurgical Society, and acted as an examiner to the Central Midwives Board. Although he was not a prolific writer, he contributed to the transactions of the different societies dealing with the branch of medicine in which he was specially interested, and occasionally to our columns.

In private life Croft was a deservedly popular man. A colleague writes of him: "He was one of the straightest men I have ever met, absolutely honest in every way. An amusing companion, his ready sense of humour showed itself in the way in which he organised regularly the Christmas entertainments at the Leeds General Infirmary."

Medical News.

UNIVERSITY OF LONDON.—Applications are invited for the *William Julius Mickle Fellowship*, of the value of at least £200, which is awarded annually by the Senate to the man or woman who, being resident in London and a graduate of the University, has in the opinion of the Senate done most to advance medical art or science within the preceding five years. Applications must be made in proper form to the Principal of the University not later than Oct. 1st. Particulars may be had on application.

INTERNATIONAL MEDICAL CLUB OF NEW YORK.—Members of the medical profession who intend to visit the United States are informed by the International Medical Club of New York that one of the aims of the Club is to receive and direct such visitors during their sojourn. The objects of the Club are set out in a leaflet which can be obtained from the Chairman of the Liaison Committee, Dr. Fred H. Albee, 30, East 40th Street, New York City; they are briefly the promotion of social and academic relations between medical graduates in America and the establishment of a friendly and scientific union between the Club and organisations with similar aims in foreign countries. It is hoped to get into touch with representatives of medicine in all countries, and ascertain what post-graduate medical opportunities are in existence. The president of the Club is Dr. Jacques W. Maliniak.

DISEASES OF THE NERVOUS SYSTEM.—A post-graduate course on this subject will be held at the National Hospital, Queen-square, from Oct. 7th to Nov. 29th. The general course will consist of 32 clinical lectures and demonstrations at 3.30 P.M. each weekday, except Wednesday and Saturday. There will be teaching in the out-patient department on each weekday except Saturday at 2 P.M., and eight pathological lectures and demonstrations on Mondays at noon. A course of eight lectures on the Anatomy and Physiology of the Nervous System will be arranged on Fridays at noon if there are enough applicants, and 12 clinical demonstrations, chiefly on Methods of Examination of the Nervous System, will be given on Tuesdays and Thursdays at the same hour. Tickets entitling the holder to attend the out-patients clinic may be obtained, and a limited number of students can be enrolled as ward clerks. Application should be made to the Secretary of the Medical School, National Hospital, Queen-square, London, W.C.1.

MATERNITY INSTITUTIONS.—The Scottish Department of Health has approved of the Glasgow Corporation's proposal to build a new maternity hospital. The institution, which will accommodate from 100 to 150 beds, will provide treatment for patients who are unable to pay for nursing-home charges. A site has not yet been selected.—The annual report of the Maternity Centre for Holborn, Finsbury, and the City Border records a busy year. There are 420 mothers on the register, and the superintendent paid 1381 visits. Consultations by doctors dealt with 2206 mothers and 2824 children. The honorary physicians state that "there has been no very marked falling off" in the physique and nutrition of 'the children in consequence of the unsatisfactory economic conditions caused by unemployment and short time.

INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—As we have already announced, the fifteenth annual conference of this Association will be held in the Connaught Hall, Newcastle-upon-Tyne, from Oct. 10th–12th. On the first day, after a formal opening of the Conference by the Lord Mayor, Mr. Henry Mess, Ph.D., will give an address entitled Tuberculosis on Tyneside: a Sociological Survey, and a discussion will follow. In the afternoon Dr. Edouard Rist, of Paris, will speak on the Factors that Produce Pulmonary Tuberculosis, a subject which will be discussed by Dr. A. F. Bernard Shaw, Dr. C. G. R. Goodwin, Sir Thomas Oliver, and others. On Oct. 11th Dr. William Brand will set out a Scheme of National Propaganda regarding Tuberculosis, and later Dr. A. H. Macpherson will give an address on Combined Treatment and Technical Education of Tuberculous Youths. In each case a discussion will follow. Other subjects to be considered include the Teaching of Tuberculosis to Undergraduates (introduced by Prof. Thomas Beattie and Dr. Fergus Hewat), the Training of Tuberculosis Medical Officers (Dr. W. H. Dickinson), Methods of Medical Propaganda regarding Tuberculosis (Dr. Harley Williams), and Dentistry in Relation to Tuberculosis (Dr. William Guy). The address of the Association is 1, Gordon-square, London, W.C. 1.

WORLD LEAGUE FOR SEXUAL REFORM.—The third International Congress of the World League for Sexual Reform on a Scientific Basis will be held at the Wigmore Hall, Wigmore-street, London, W. 1, from Sept. 8th to 14th. The hon. secretary is Dr. Norman Haire, and communications may be sent to him at 127, Harley-street, London, W. 1.

POST-GRADUATE COURSE IN NEUROLOGY AND PSYCHIATRY.—Under the auspices of the American Medical Association of Vienna systematic post-graduate classes in English will be held at Prof. Wagner-Jauregg's Neuro-Psychiatric Clinic and at the Neurological Institute of Prof. Marburg in the University of Vienna from Jan. 2nd to Feb. 15th, 1930. Further information may be had from Dr. E. Spiegel, Falkestrasse 3, Vienna, I.

BRITISH SOCIAL HYGIENE COUNCIL.—Mr. L. S. Amery, M.P., late Secretary of State for Dominion Affairs and for the Colonies, has accepted the chairmanship of the Imperial and International Committee of this Council. It is stated that arrangements are being made for providing missionaries and other social workers who are going abroad with a knowledge of the problems of social hygiene. In this connexion a diploma course has been instituted at Aberystwyth University and others are in view.

INTERNATIONAL TRACHOMA PRIZE.—The Royal Hungarian Minister of Public Welfare and Labour offers a prize of 2000 Swiss francs for an essay embodying independent work on the ætiology of trachoma. Papers already published are eligible for the competition, and the judges may also consider work not submitted for competition, but published between July 1st of this year and June 30th, 1931. Essays may be written in German, English, French, Italian, or Hungarian, and should be sent to the Eye Clinic No. 1 of the Royal Hungarian Peter Pázmány University (Budapest, VIII., Mária-utca 39) not later than June 30th, 1931.

POST-GRADUATE COURSES IN FRANCE.—Dr. C. Laubry is to give a course on Diseases of the Heart and Vessels at the Hôpital Broussais, Paris, from Oct. 7th to 19th. Particulars from Mr. Thiroloix at the hospital. —From Nov. 4th to 16th Prof. Georges Mouriquand and his colleagues will hold a course in pædiatrics at the Clinique Médicale Infantile of the University of Lyons. Application should be made to the Secrétariat de la Faculté de Médecine, 18 quai Claude-Bernard, Lyon, before Oct. 25th.

DONATIONS AND BEQUESTS.—Mr. Francis James Hillier, of Queen's-road, Peckham, left £500 each to Sir William Treloar's Hospital for Cripples, St. Dunstan's Headquarters for Blind Sailors and Soldiers, and Dr. Barnardo's Homes.—Alderman Robert Harold Posnett, of the Mount, Moughland-road, Runcorn, Cheshire, left £500 each to the National Children's Home, Posnet House, Frodsham, and the Runcorn Cottage Hospital.—Mrs. Eliza Andrews, of Ardara, Comber, Co. Down, left £100 to the Comber Nursing Association, and £200 to the Royal Victoria Hospital, Belfast.—Mr. Michael Rogers Oldfield Thomas, of Edward's-square, Kensington, besides other bequests, left £3000 to the London Hospital.—Mrs. Margaret Inglis or Breen, of Broomhide House, Partick, Glasgow, left £2000 to the Royal Hospital for Sick Children for a "Margaret Inglis Breen Ward," and £1000 each to the Royal Infirmary, Glasgow, The Western Infirmary, Glasgow, and Victoria Infirmary, Glasgow.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Courses will be in progress for another week at the All Saints' Hospital (urology) and at the Queen's Hospital for Children (pædiatrics). The former is an afternoon and evening course and the latter lasts all day. Special courses in the following subjects will be given during September: diseases of the chest, Brompton Hospital, Sept. 9th to 14th; diseases of infants, Infants Hospital, Sept. 9th to 22nd; psychological medicine, Bethlem Royal Hospital, Tuesday and Saturday mornings, Sept. 10th to Oct. 5th; medicine, surgery, and the specialties, Westminster Hospital, for men only, Sept. 16th to 28th. An all-day course in gastro-enterology will be held at the Prince of Wales's Hospital, Tottenham, from Sept. 30th to Oct. 4th. The Metropolitan Hospital will hold its first course under the auspices of the Fellowship, in medicine, surgery, and the specialties, from Oct. 21st to Nov. 2nd. This will be an all-day course. The Fellowship proposes to hold another evening course for the M.R.C.P. examination, from Oct. 15th to Dec. 6th, consisting of 16 lectures on Tuesdays and Fridays at 8.30 P.M., at 11, Chandos-street, W. 1. Full particulars of the above and other courses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

WELFARE OF MERCHANT SEAMEN.—The second international conference on the health and welfare of merchant seamen will be held at Geneva from Oct. [illegible]. Particulars are obtainable from Dr. F. H[illegible], League of Red Cross Societies, 2, Avenue Velasquez, Paris.

GIFTS OF RADIUM TO HOSPITALS.—It is stated that a visitor to Westminster Hospital on August [illegible] for the purchase of radium. He did not give his name.—Another anonymous donor has presented £[illegible] worth of radium to the King Edward VII. Hospital at Windsor, where a department for radium therapy will shortly be opened.

MEDICAL RESEARCH COUNCIL.—Under the auspices of the Council H.M. Stationery Office is about to publish a "System of Bacteriology in Relation to Medicine" in nine volumes, each of some 400 pages. The aim of the system, it is stated, is "to give a comprehensive but not encyclopædic survey of our present knowledge of bacteria and spirochætes, with special regard to their relations to the various fields of medical work." It is being prepared by nearly 100 British bacteriologists, each of whom will treat of subjects in which he has taken special interest; each article will represent the judgment of its author on the present state of knowledge, based upon the published work of others and his own experience. Volume [illegible] is the first volume to appear and will be available within a day or two.

PEMBROKESHIRE WAR MEMORIAL HOSPITAL.—A new Children's Ward has been opened by Mrs. Lort-Phillips in memory of her husband, the late Colonel J. F. Lort-Phillips, of Laurenny. The opening ceremony was presided over by Lord Kylsant, Lord Lieutenant of Haverfordwest, which enjoys the privilege of being the only borough possessing a Lord Lieutenant.

APPROACHING REMOVAL OF BETHLEM HOSPITAL.—Sir Lionel Faudel-Phillips, the treasurer, in his annual report to the Governors, states that it is hoped to transfer the hospital from Lambeth to the new buildings at Monks Orchard in the course of next year. The Building Fund stands at £47,763, and another £25,000 is needed to start free of debt. During the past year 437 patients were treated, at an average cost of £4 13s. 8d. per head per week. Of the £[illegible] total expended, £14,111 was recovered by payments in respect of patients.

ROYAL SUSSEX COUNTY HOSPITAL.—The late Mr. Bernhard Baron made several large gifts to this hospital, including £10,000 for the casualty ward opened in April. While that work was in progress he announced his intention of giving £5000 towards the provision of a new operating theatre. In 1928 no fewer than 2200 operations had to be performed in the space originally designed [illegible] but the governors decided that all they could do was to improve the existing theatres on the roof of the hospital. Thanks to Mr. Baron's donation, however, these plans have been changed, and on August 6th sanction was given for the erection of a new operating theatre block.

PRESTON INFIRMARY.—Princess Mary on [illegible] opened a new wing and unveiled a memorial [illegible] at the Preston and County of Lancaster Queen Victoria Infirmary. The building cost £10,000 to erect and equip, and consists of a complete hospital unit of three large wards—one for men, one for women, and one for children—with an operating theatre and other accessories and an entirely new accident ward. Provision has also been made for [illegible] private patients who, while wishing to pay part of the cost of their treatment and maintenance, are unable to afford comparatively high fees in a nursing home. With the beds in the new wards and those in the older part of the building, and the beds in the two convalescent hospitals, there is now accommodation for 400 patients.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

For complete scale of advertisement charges apply to THE MANAGER.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 19th, to SATURDAY, August 24th.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road, S.W. Special Course in Urology. Afternoons and evenings (last week).—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E. Special Course of Instructions consisting of demonstrations, lectures, and operations. Further particulars from the Fellowship of Medicine.

Appointments.

AITKEN, A. G., M.B., Ch.B. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Callington District of the County of Cornwall.

MCLAGGAN, J. D., F.R.C.S. Eng., Consulting Laryngologist to the Metropolitan Asylums Board Sanatoria.

Vacancies.

For further information refer to the advertisement columns.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £150.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham City Education Committee.—Asst. School M.O. £600.

Birmingham General Hospital.—Res. H.P. £70.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bournemouth, Royal Victoria and West Hants Hospital.—Second H.S. At rate of £120.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Brighton, New Sussex Hospital for Women and Children, Windlesham-road.—Hon. Asst. Ophth. S. Also Hon. Anæsthetist.

Burton-on-Trent, General Infirmary.—2nd Res. H.S. £150.

Cardiff City Mental Hospital, Whitchurch.—Res. Clin. Asst. 50 gns.

Cardiff, King Edward VII. Welsh National Memorial Assoc.—Asst. Res. M.O. for Cefn Mably Hospital, nr. Newport. Also 3rd Asst. Res. M.O. for North Wales Sanat., Llangwyfan. Each £250.

Cheadle, Cheshire, Cheadle Royal.—Asst. M.O. £350.

Coventry and Warwickshire Hospital.—Hon. Anæsthetist.

Dundee, Royal Infirmary.—Hon. Asst. P. for Dis. of Children.

East London Hospital for Children, &c., Shadwell, E.—Res. H.S. and H.P. Each at rate of £125.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Hull Royal Infirmary.—Second H.S. At rate of £150. Also Cas. H.S. At rate of £130.

Ilford Emergency Hospital.—Hon. Aural Surgeon.

Kingston-upon-Hull, City and County of.—M.O.H. £1500.

Leicestershire Royal Infirmary.—H.S.'s, H.P., &c. Each at rate of £125.

Lincoln, Bracebridge Mental Hospital.—3rd Asst. M.O. £350.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Liverpool, Walton Institution, Rice-lane.—Res. Asst. M.O. £200.

London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Longton Hospital, Staffs.—H.S. £120.

Lowestoft and North Suffolk Hospital.—H.S. £150.

Manchester and District Radium Institution.—Asst. Radiologist. £350.

Manchester, Royal Infirmary.—Clin. Asst. £35 for six months.

Mexborough, Montagu Hospital.—Radiologist.

Mile End Hospital, Bancroft-road, Mile End, E.—Res. Asst. M.O. £450.

Milford, Surrey County Sanatorium.—2nd Asst. M.O. £400.

Newcastle-upon-Tyne, Hospital for Sick Children.—Res. Sen. H.S. and Res. H.P. Each at rate of £95. Also Jun. H.S. At rate of £100.

National Hospital for Diseases of Heart, Westmorland-street, W.—M.O. to Out-patients. At rate of £125.

Nottingham General Hospital.—H.P. Also Asst. Res. Cas. O. Each at rate of £150.

Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home.—H.S. £200.

Portsmouth Royal Hospital.—Cas. O. At rate of £100.

Plumstead and District Hospital, Plumstead High-street, S.E.—Third Asst. M.O. £300.

Plymouth, South Devon and East Cornwall Hospital.—H.P. At rate of £120.

Rotherham Hospital.—H.P. £180.

Royal Eye Hospital, St. George's-circus, S.E.—12 Salaried Refractionists. 12 Clinical Assts. Also 1 Pathologist.

Royal Northern Hospital, Islington Tuberculosis Dispensary, Holloway, N.—Tuberculosis Officer. £750.

Royal Waterloo Hospital for Children, &c., Waterloo-road, S.E.—Clin. Assts.

St. Helen's Hospital, Lancashire.—Res. M.O. £250.

Sheffield, Jessop Hospital for Women.—Sen. Res. O. £250.

Sheffield Royal Infirmary.—Jun. Aural and Ophth. H.S. £80.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Swindon and North Wilts Victoria Hospital.—Hon. Aural Surg.

Tipton Urban District Council.—M.O.H., &c. £800.

Warrington Infirmary and Dispensary.—Hon. Dental Surgeon.

Warwickshire, King Edward VII. Memorial Sanatorium.—Sen. H.P. and Jun. H.P. At rate of £275 and £200 respectively.

Watford, Herts Peace Memorial Hospital.—Res. M.O. At rate of £150.

West Bromwich and District General Hospital.—H.S., H.P., and Cas. H.S. Each at rate of £200.

West London Hospital, Hammersmith-road, W.—Res. Asst. S. £200. H.P., H.S.'s, &c. Each £100. Also Non-Res. H.S. £5 5s. weekly.

Weston-super-Mare General Hospital.—H.S. £130.

Winchester, Royal Hampshire County Hospital.—Res. H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

BARLEE.—On August 11th, at Hull, the wife of R. J. Barlee, Surg. Lieut.-Comdr., R.N. (retired), of a daughter.

BOURDILLON.—On August 9th, at Stow House, Goring-on-Thames to Sylvia, the wife of L. G. Bourdillon, D.S.O., M.B.—a son.

EVERETT.—On August 5th, at a nursing home, the wife of F. A. Everett, L.D.S., Clapham-road, S.W., of a son.

KEEFE.—On August 3rd, to Dorothy, the wife of Dr. D. E. Keefe, 62, Grafton-road N., Plaistow, E.13—a daughter.

NEWELL.—On August 9th, at Clothorn-road, Didsbury, Manchester, the wife of R. L. Newell, F.R.C.S., of a son.

NUNAN.—On August 8th, at Woodcote Lodge, West Horsley, Surrey, the wife of Patrick Francis Nunan, Kenya Medical Service, of a daughter.

QUENNELL.—On August 8th, at Millfield, near Brentwood, Essex, the wife of W. E. H. Quennell, M.R.C.S., of a daughter.

ROWELL.—On August 7th, at Chapel-street, Belgrave-square, S.W., the wife of G. L. F. Rowell, F.R.C.S., L.R.C.P., of a son (stillborn).

MARRIAGES.

BEARE—HESKETT.—On July 31st, at St. John's Church, Plumpton, Cumberland, Cyril E. Beare, M.B., F.R.C.S., of Dorking, to Annie (Pat) Heskett, of Plumpton Hall, Penrith.

LEYS—TEMPLE.—On August 6th, in London, Duncan Gerard Leys, M.B.Oxf., M.R.C.P. Lond., to Erica Hope, only daughter of Mr. and Mrs. Edwin Temple, Carlton-terrace, Glasgow.

DEATHS.

BUCKLEY.—On August 8th, at Clopton Manor, Kettering, Northants, Thomas William Buckley, M.D., J.P. (late Major, R.A.M.C.), in his 71st year.

CROFT.—On August 7th, at Headingley, Leeds, Edward Octavius Croft, M.D., of 33, Park-square, Leeds.

HOAR.—On August 3rd, at Hollingbury-place, Brighton, Sussex, C. de S. Hoar, L.R.C.P. Lond., M.R.C.S. Eng., aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

WORLD FEDERATION OF EDUCATIONAL ASSOCIATIONS.

(FROM A CORRESPONDENT.)

THIS Federation was first projected by the present President, Dr. Augustus Thomas, Education Commissioner for the State of Maine. It is quite in the International spirit of the time. Its organisation is broadly based among the nations, and probably education is the one concept whose urgency no nation will dispute. It is certain that the nations, both of the East and of the West, have responded to the idea. The meeting just held in Geneva is the fourth; the first was at San Francisco in 1923; the second at Edinburgh in 1925; the third at Toronto in 1927. There is a desire that consecutive meetings should take place in different continents, but where the next meeting will be has not been formally announced.

The Health Section.

The Geneva meeting was a success, as was right in the home of all "internationalisms," as well as of the League of Nations. The Federation has been for ten days the focal centre for several other conferences and discussions, none of them far from its own central idea, which is to provide a non-party platform for all forms of educational theory, practice, and propaganda. But, from the beginning, the Federation established a Health Section, whose proceedings were of practical value at Edinburgh, Toronto, and again at Geneva, for the work of the Section has served to elicit facts and programmes from over thirty nations, including China, Japan, India, Russia, Poland, Latvia, Esthonia, Greece, Roumania, and several others. Western Europe, as well as Canada and the United States, were well represented. The National Teachers' Union of England and the Educational Institute of Scotland both sent large contingents. Naturally, as the Congress was fundamentally educational, the reports presented and discussed at the Health Section dealt with the health of the school ages, and the various methods attempted and proposed for education in health. But in several of the other sections, notably in the section of Rural Education and Agriculture, and the section of School and Parent, health always emerged, and was universally regarded as a necessary condition of all sound school organisation.

In the Health Section it had been arranged that delegates from leading countries should send in advance copies of books, pamphlets, primary official documents of investigations, of administration, of actual and proposed schemes. These many volumes formed a useful reference library; it was well consulted by the representatives of the younger nations, thus showing the true use of these international discussions. The conference was thus able both to learn from the various delegates how far their countries had got in school health administration, to note their readiness to seize on the views of experience, and to reflect on the numerous questionings. Such conversations, set going by the Congress, will promote the intellectual inter-penetration that forms one condition of a safe internationalism. Dr. Alfred Zimmern, of the League of Nations, head of the Geneva School for Intellectual Co-operation, and the author of "The Greek Commonwealth," which is a vital exposition of political ideas and idealisms, made exactly this point in a plenary address, and the Health Section certainly worked in this spirit.

The Chairman's Questionaire.

Prof. C. E. Turner, of the Massachusetts Institute of Technology, Cambridge, was Chairman of the Health Section, which henceforth will cease to be called the "Health Education Section." He had issued early in the year an elaborate questionaire, and the replies formed a very useful way of obtaining precise information from the various countries and of concentrating the discussions. The broad results were formulated in 16 resolutions. Of the 16, the following were the most important: That health one of the first aims of education; that there is need for further training of teachers in methods of health education; that travelling instructors have been found useful to this end; that large-type text-books are desirable; that physiology and hygiene should form part of the instruction in the public schools of every country; that school medical and nursing service should be provided for schools throughout the world, and school-house sanitation (especially hand-washing facilities) should be improved; that there is need for permanent representation of the Health Section in each country, in order that information and documents concerning the progress made in school health may be distributed internationally; that there should be further study of the continuity and cessation of growth in school-children, as an indication of health status; that there is need for greater continuity in the health records of children between the pre-school and the school period; that the teaching of home hygiene, infant and child care should be made universal for girls of adolescent age; that there is need for the study and development of further tests, in addition to weighing and measuring, for determining the health status of school-children; that further study of dental health is necessary; that every university should provide a student, in addition to athletic organisation and health instruction, with a health service, including preventive medical service, communicable disease control, financial aid in sickness, hospital treatment where necessary, and convalescent care.

Some Outstanding Contributions.

Of individual contributions to the Congress, three stand out clearly; first, the excellent address on the International Aspects of Education, by Prof. Gilbert Murray, whose position in relation to the League of Nations and the detailed work of its committees is well known; second, the practical and elegant address by Prof. Léon Bernard, Head of the Institute of Hygiene in the Paris School of Medicine: on the teaching of hygiene in, by, and through the school, stress being laid on "teaching by example"; third, the lecture at the final meeting by Prof. Paul Monroe, LL.D., now Professor of Education in Columbia University, who drew attention in a masterly way to the great educational experiments made, or being made, in China, Japan, the Philippines, and Russia. To many of the audience who had heard dissertations of all sorts on education for a generation this lecture was one of the most striking, forming an effective climax to a week of strenuous work.

A fourth contribution deserving of mention was the address by Dr. Thomas D. Wood, of New York, who spoke as chairman of the united session of the Home and School and the Health sections; this was the mature deliverance of the veteran author of the well-known height and weight standards, which are widely used as tests of school-age, growth, and nutrition.

The Wide Range of Work.

There were some good contributions to the study of physical education which is now taking its place as a definite method of preventive medicine, and which may become primarily a responsibility upon school medical officers. Communications from Hungary and Poland were exactly illustrative of this point.

From both Belgium, through Monsieur de Vuyst of the Belgian Education Department, and France, through Monsieur Varrier of the French Department of Public Instruction, came a survey of the factors in the problems arising out of the different conditions, as far as education is concerned, which prevail in the town and in the country. Such problems, and many others like it, were discussed especially by American representatives and by American members of the International Parents' Association, for in America the educational position arising from immigration, with the extraordinary mixture of cultures and races resulting, requires perpetual and great adjustment.

When the transactions of the Congress are published they will be found to contain illuminating surveys from which educational authorities in many countries will be able to derive practical information and guidance.

Genéva, August 7th, 1929.

FOCAL SEPSIS IN DISEASES OF THE SKIN.

THE doctrine of focal infection, which has hitherto found its chief supporters in England and America, is now gaining adherents on the continent, and A. M. Memmesheimer, a well-known dermatologist of the younger school in Germany, has published a paper[1] in which he seeks to establish a scientific foundation for the now popular hypothesis.

Considering that the claims put forward by such authors as Roberts, Barber, Nord, Semon, and others are based on clinical evidence only, and on material too scanty for satisfactory proof of the alleged association of cause and effect, he set himself to investigate the doctrine in the case of 60 patients, of whom half were sufferers from chronic eczema, and the other half included 14 cases of psoriasis, four of lupus erythematosus, seven of herpes zoster, two of rosacea, and one each of erythema nodosum and erythema multiforme. These were utilised as controls. Of the 33 eczematous cases, 20 were found to have apical "granulomata" as clearly demonstrated by X rays. Six of the 14 psoriasis patients, one of the four with lupus erythematosus, and four of the seven with herpes zoster, afforded similar evidence of apical infection. The proportion of dental infections in the two groups worked out at 70 per cent. to 51 per cent.

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[1] Arch. f. Derm. u. Syph., 1929, clvii., 133.

Memmesheimer here raises the important question whether we should regard the preponderating percentage of dental infections in the eczematous group as evidence of a causal factor, or whether people with the cutaneous idiosyncrasy may not have an associated weakness or lack of resistance in their dental tissues. It might further be argued that dental toxins can sensitise the body to some other exogenous or endogenous poison which would not be capable of producing cutaneous symptoms in their absence. In the hope of showing some of these problems, he examined the elective or specific action of the streptococci from dental foci, and endeavoured to elicit some evidence of their presence, or that of their toxins, in the patient's own blood and tissues. Injections into rabbits and mice were tried, both with single large doses and small repeated doses, designed to imitate toxic absorption in human beings. Mice were found to be relatively immune, but of 27 rabbits inoculated with the massive single dose 15 died, and in 9 of them the streptococci were recovered in cultures from the blood. In no single instance were skin lesions produced, nor did such lesions make their appearance in a similar series (27) injected from day to day.

Complement-fixation tests, both of the blood serum and tissue cells, in 14 patients tested to their own strain of streptococci and to foreign strains, were positive in two cases, and that in a restricted sense only. But removal of the infective foci—i.e., the apical granulomata—cleared up the eczema in 5 out of 15 cases, and Memmesheimer holds that the low percentage of positive findings is by no means conclusive evidence against the doctrine of focal sepsis. Further research on the same lines is, he thinks, desirable.

HEALTH CONDITIONS IN THE FALKLAND ISLANDS.

A REPORT prepared by Mr. J. M. Ellis, Colonial Secretary, has recently been issued by H.M. Stationery Office, dealing with the affairs of the Crown Colony of the Falkland Islands and its Dependencies. Geographically the Falkland Islands lie in the South Atlantic Ocean. In addition to the two main islands, known as the East and the West Falkland, the group comprises about 200 small islands clustered around them, within a space of 120 by 60 miles. The Dependencies are divided into two main groups, the one consisting of South Georgia with the South Orkneys and the South Sandwich Islands, and the other of the South Shetlands with Graham's Land. The area of these Dependencies covers 3,100,000 square miles, or approximately one-fifth of the total area of the British Empire. The population of the colony, which at the end of 1927 was 2286, is European, and chiefly of British descent. The birth-rate during that year was 22·31 per 1000, and death-rate 9·26 per 1000. As in previous years, general diseases were rare, with the exception of tuberculosis, which is common. Its prevalence seems to be aggravated by close inter-marriage and by inadequate housing conditions. Steps are being taken to improve the latter; and it is hoped in the near future to organise a scheme to examine sputums, in the hope of discovering the disease at earlier stages. Chronic appendicitis is also prevalent among the inhabitants of the colony. Communicable diseases, mosquito or insect borne, were entirely absent, and no acute infectious condition was reported during the year. Septic throat and cervical adenitis were troublesome.

Particular care is being devoted to the dental treatment of the school-children, who all receive free attendance. An outbreak of bad colds occurred some time ago, and treatment with stock vaccine did not meet with much success. The colony is devoted solely to sheep farming, and all its interests are subordinate to the production of wool.

The Falkland Islands are bleak and the climate is rigorous but healthy. It is trying to people from the United Kingdom on account of the continuous cold, the lack of sun, and the constant high winds, and also because few opportunities are afforded for outdoor exercise.

INTENSIFYING SCREENS.

WE have received a booklet from Philips Lamps Ltd., entitled Intensifying and Fluorescent Screens, which is devoted mainly to a description of intensifying screens manufactured by this firm. The Philips screen is coated on a celluloid base which, it is claimed, is not easily scratched or damaged, and moreover may be washed with water, petrol, or methylated spirit. From a perusal of the pamphlet it is clear that the manufacturer is alive to those qualities, which a fluorescent screen must possess if it is to be efficient.

The use of an intensifying screen for reducing the exposure required to produce a radiogram dates back to 1897. [illegible] that the yellow green fluorescence [illegible] barium-platino cyanide, though [illegible] screens, is relatively ineffective [illegible], which, unless specially prepared, is only particularly sensitive to violet and ultra-violet radiations. Fluorescence of this character is excited in calcium tungstate by X rays which in consequence forms the active layer of modern intensifying screens. The production of calcium tungstate of high photographic activity free from phosphorescence and in a fine state of subdivision, has, however, necessitated a considerable amount of experimental work. The fine detail of many of the earlier radiograms was confused by the impression of the crystalline structure of the screen, and the afterglow from the latter often destroyed the sharpness of the image; but it may be fairly claimed that the modern intensifying screen is free from these defects.

It is common practice to place intensifying screens on both sides of a film, which leads to a considerable reduction in the time necessary to produce a radiogram. From the photographic point of view there is, moreover, the added advantage that the value of the screen is greatest in the lower densities where it is most required, and hence for instantaneous radiography they are invaluable.

Much of the success obtained with intensifying screens depends not only upon the mechanical qualities of the materials used as the foundation for the fluorescent layer, but also on the casette for holding it close to the photographic film. Experience has shown that both must be such that the screen is held in perfect contact with the film at all points during exposure, otherwise blurring of the image may occur and the screen becomes inefficient. How far improvements in these directions have been made may best be judged by the fact that the intensifying screen is now regarded as an essential part of modern radiographic equipment.

VESALIUS AND THE INQUISITION MYTH.

To the Editor of THE LANCET.

SIR,—Some stories seem to be endowed with immortality It is of no consequence that they have no basis in fact; it is enough that they are tinged with some colour of romance, or that their tragic dénouement excites pity, or that they can be used to make a point in controversy. Truth limps painfully behind and never makes up to them. A recent illustration of this is to be found in Prof. A. V. Hill's lecture on the Enemies of Knowledge. As it is reported in your columns (June 29th, 1929, p. 1389), he spoke as follows: "Vesalius was inspecting *with* the consent of his kinsman the body of a Spanish nobleman recently dead; the heart gave a feeble palpitation when divided by the knife. Vesalius was denounced to the Inquisition and driven from Italy." No doubt Prof. Hill believed he was merely stating facts, and yet there is not a single phrase in this description which will bear examination. It is over 30 years since I first published the proof of its falsity, and I went into the matter with greater detail in the *Edinburgh Medical Journal* in 1914. More recently a short summary of the genesis of the myth appeared in THE LANCET (Jan. 11th, 1928, p. 105). The statements I have made have not been controverted. Indeed I do not know any authority on Vesalius who credits the story. All I can claim to have done is to have examined most closely all the contemporary documents relating to that period of the anatomist's life. If, then, Prof. Hill has discovered fresh documentary evidence, he would confer a boon on students of medical history by publishing it.

I am, Sir, yours faithfully,

Edinburgh, August 12th, 1929. G. MATHESON CULLEN.

NITRATE POISONING: AN EPITAPH.

WE are informed that the following appears on a tomb at Cross Kirk in Eshaness, Shetland.

> Donald Robertson, born Jan., 1783, died June 4th, 1848, aged 65. He was a peaceable quiet man, and to all appearance a sincere Christian and his death was very much regretted and was caused by the stupidity of Lawrence Tulloch in Closeheston (?) who sold him nitre instead of Epsom salts, by which he was killed in the space of five hours after taking a dose of it.

ENLARGEMENT OF HARROW HOSPITAL.—The district served by Harrow Hospital is increasing so rapidly in population that it has become urgently necessary to enlarge the institution. An extension to cost £22,500 has been prepared as part of a larger scheme which it is hoped eventually to carry out. There are at present 40 beds, but the enlargement will comprise wards for 18 additional beds and for 12 paying patients, an X ray department, a new operating block, and quarters for a resident medical officer. Nurses' quarters will be erected in the garden of the hospital. The extension is to be known as "The Stuart Memorial," in honour of the former president, the late Mr. J. N. Stuart.

Lettsomian Lectures

ON THE

RELATIONSHIP OF DERMATOLOGY TO OTHER BRANCHES OF MEDICINE.

Delivered before the Medical Society of London

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LECTURE I.

I HOPE to show in these lectures that Erasmus Wilson [1] was justified in his statement that "cutaneous medicine is a branch of general medicine of no insignificant importance," and for my part I hold very strongly the opinion that a study of the *normal* skin and accessible mucous membranes, and of the commoner changes that occur in them as a result of faulty metabolism, the action of physical and chemical irritants, and of external or endogenous invasion by infective organisms or toxic substances, should serve as the student's introduction to clinical medicine. For it is but logical that he should first be taught to see and interpret what he sees, and it is *in imparting this faculty of observation and deduction* that the dermatologist should find his chief métier in the early stages of a student's training.

PHYSIOLOGICAL FUNCTIONS OF THE SKIN.

It is the merest truism to say that the skin is the buffer between the body as a whole and its environment, and I will not waste time by enumerating its commonly accepted functions. There are, however, certain points in its physiology which are insufficiently realised, but are of profound importance in general medicine. As Ormsby [2] says: "The skin, in view of the number and mode of distribution of its nervous elements, may be regarded as a vast area of sensitive nerve-terminals." In virtue of this it determines to a great extent the reaction of the various organs of the body to external influences—heat, cold, light, and trauma. This it does owing to its close physiological connexion with the vegetative nervous system and the endocrine glands. It is not too much to say that it is through the medium of his skin that the evolution of civilised man has occurred, and for the following reasons.

The differentiation of the various species of animals and of the different types of mankind is in some degree a question of climatic conditions. As Cramer [3] points out, Man, in view of his comparative hairlessness, which handicaps his prevention of heat-loss, could only *have originated in a tropical climate*. But the constant damp heat of the torrid zone affords no stimulus to the endocrine-autonomic system, on the activity of which the maximal development of psychical and physical energy depends. Presumably civilisation dates from the time when a band of primitive men wandered northwards from the tropical zone, and, with the approach of winter, under the unfamiliar stimulus of cold to their naked skins, contrived to obtain artificial warmth, first, no doubt, by digging underground shelters, constructing huts, using the skins of animals as clothing, and later by discovering how to make fire. The action of cold on the skin was doubtless a most *potent stimulus to* Man's inventive faculties, and the means of protection that he gradually discovered made him more or less independent of climatic conditions. Having become so, however, his further development, the differentiation of races, and their subsequent rise or fall have depended on several factors, of which climate, with its local variations through the ages, has been, perhaps, the most important.

Ellsworth Huntington,[4] in his absorbing book "Climate and Civilisation," deals fully with this question. He illustrates in convincing fashion not only the broad effect of climate upon physical and mental activity, and consequently upon national characteristics, but also the influence of the weather at a given time on the degree of efficiency in work and on health. It would appear that "the same conditions of temperature, humidity, and variability which cause people to work quickly or slowly in the ordinary affairs of life seem also to cause their health to be good or poor."

I cannot here even briefly summarise Huntington's data or discuss his conclusions; for our purpose it is enough to emphasise the following points:—

(1) For work and health the best climate is one in which the mean temperature rarely falls below 38° F. or rises above 64°—i.e., an average of about 51° for the whole year.

(2) Apart from the mean temperature, variability of temperature and weather conditions from day to day are factors of great importance, as also is the relative humidity. Moderate changes of temperature are more stimulating than uniformity, a fall being preferable to a rise as regards human efficiency; a mean temperature of from 50° to 60° is the optimum for both physical and mental activities, which diminish rapidly above 65°.

(3) Localities, in which these conditions favourable to efficiency obtain, are exactly those in which human progress has reached its maximum, as may be seen at a glance in the *maps, illustrating the distribution of civilisation, health,* and energy, in Huntington's book.

Let those of us who are inclined to rail against our climate remember that it is largely responsible for the position in the world held by the Anglo-Saxon race to-day. It may not be the most agreeable, but, as Cramer says, *comfort does not make for human progress*.

Now it is clear that it is through the medium of the skin that the influence—stimulating or otherwise—of climatic conditions is exerted, and the significance and explanation of this influence upon human efficiency and health is afforded by Cramer's work on the thyroid-adrenal apparatus. Our sense of well-being, our initiative, and our resistance to many bacterial infections are dependent largely on our vegetative nervous system, which in turn is activated and regulated by endocrine glands, particularly the thyroid and adrenals.

Cramer has shown that heat-regulation is a function of this thyroid-adrenal-sympathetic system. The normal stimulus to this system is *the action of cold on the skin*, particularly the change from a warm to a cold environment. Under this stimulus the adrenals and the thyroid undergo striking histological changes indicative of intense activity; their capillaries dilate and into them are poured the active secretions—adrenalin and thyroxin respectively—which stimulate the sympathetic throughout the body. As a result the cutaneous vessels are constricted to diminish heat-loss, and this constriction, if intense enough, inhibits sweat secretion; the voluntary muscles, the chemical *activity of which, according to Orbeli,*[5] is under the control of the sympathetic, are stimulated, voluntary muscular exercise or involuntary movement—i.e., shivering—being the response to such stimulation; and the liver secretes more glucose into the blood stream, in order to provide the muscles with more fuel, the consumption of which increases heat-production, thus creating a rise in the metabolic rate.

On the other hand, in an animal or person at rest, in a warm even atmosphere, the alveoli of the thyroid remain full of colloid, many of the capillaries surrounding them, which are dilated when the gland is actively secreting, are invisible, and the cells of the adrenal *medulla* are fully charged with adrenalin. Metabolism is quiescent, the demand of the tissues for glucose is minimal, and excess *of food is deposited as fat.* Long-continued exposure to cold will, of course, in time lead to exhaustion of the adrenals and thyroid, and deplete the liver of glycogen; heat-regulation, therefore, fails, there is great heat-loss without a compensatory *heat-production, and death results.*

It is thus easy to understand the virtue of a temperate climate, with its frequent but moderate changes from warmth to cold and vice versa, since such changes tend to keep the thyroid-adrenal-sympathetic apparatus in a state of maximal efficiency, making for vigour of body and mind; on the other hand, the relaxing effect of the constant moist heat of the tropics, which induces physical and mental indolence, and the paralysing influence of long periods of intense cold are likewise explicable.

Here the personal factor comes into consideration. In the struggle for supremacy between the races, both in warfare and in industrial competition, the weakling is of no account, and is merely a drain on his country's resources; it is a question of the *average* standard of physique, mentality, and initiative. We, as doctors, however, have to consider the weakling, and we are all too familiar with the type for whom our climate is the reverse of stimulating. There are many whose endocrine-sympathetic system is unable adequately to respond to the stimulus of cold, and are only happy in warm surroundings. One such type is provided by the thin, hypotonic, ichthyotic person, in whom asthma and its associated symptoms are so common, and who spends his winter shivering and snuffling over the fire. It has long been recognised that these persons present symptoms indicative of thyroid-adrenal insufficiency. Another type which cannot adapt itself to cold weather is represented by the acro-asphyxial girl, who, since the vogue of short skirts, has crowded our out-patient departments in winter on account of a passive erythema, often accompanied by actual œdema and chilblains, involving the lower parts of the legs and ankles. This condition—christened "erythrocyanosis crurum puellaris"—has received a good deal of attention of late, both in this country and abroad. That it depends on a lack of tone of the capillaries in the skin would seem certain, and the general appearance of those in whom it occurs suggests an endocrine insufficiency. In view of its incidence almost exclusively in females, and the frequency of amenorrhœa or menstrual irregularity, one would suspect a disorder of normal ovarian, and perhaps thyroid and pituitary function. These two types, at any rate, if compelled to live a sedentary life, are ill-adapted to a cold or even temperate climate; they both feel and work better in moderately warm countries with abundance of sunlight.

Although, however, the invention of clothing and artificial methods of heat-production have enabled Man to flourish in climates which favour his activities and progress, leading thus to the evolution of our present complex civilisation, yet, owing to the misuse of the very comforts, pleasures, and labour-saving devices that his own ingenuity has created, and to the unnatural conditions under which a large proportion of a civilised population lives, the effect on his purely animal functions has been disastrous. On the one hand we have the self-indulgence in excess of food and drink, and the slothful physical ease, engendered by wealth, which result in the metabolic diseases of plethora, so common among the richer classes; on the other, the diseases of under-nutrition, faulty diet, insufficient sunlight and vitiated air, predisposing to serious infections, such as tuberculosis and rheumatism, that ravage the poor.

A wise Frenchman has said: "L'homme ne meurt pas, il se tue"; he has created his own pathology, and it is a sobering reflection for us, as medical men, that we spend our lives trying to cope with morbid conditions that are for the most part of Man's own making. The study of metabolic functions gone wrong, or of the multitude of infections engendered by civilisation, and the elaborate methods of treatment by drugs, vaccines, sera, and so forth, though of absorbing interest, must nevertheless to the abstract philosopher, appear pathetically humorous.

To anyone who surveys the general trend of medical research and treatment during the past few years it must be obvious that we are getting back to where we started from. While admitting that Man's progress is partly dependent on his control of tem[illegible] by clothing and fuel, when he begins to [illegible] [illegible]ty we strip him and expose his naked [illegible] sun and air, its [illegible] [illegible]lium, or, le[illegible] [illegible]ly, to artificial [illegible] [illegible] we stimu[illegible] functions by hydrotherapy; and, while voting for politicians who solemnly budget for cheap foods of a kind that are precisely the least valuable, or actually harmful, and while admiring the ingenuity of the Chicago meat-packer or the tinned-fruit exporter, we advise our patients to avoid their goods, and eat chiefly the fresh produce of the vegetable garden, orchard, and dairy farm. Although the ancient Egyptians, Greeks, and Romans were all apparently cognisant of the beneficial action of sunlight and cool air on the skin, and of physical exercises, modern civilised peoples have only recently rediscovered this, together with the essential qualities of certain natural foods. The very factors which enabled man to emerge from his tropical lassitude have for generations militated against his physical development and health. Clothing and fuel, which are essential for him if he is to withstand the rigours of winter, he has abused, covering his unfortunate skin, even in summer, with layer after layer of thick impermeable material, and heating his houses, hotels, and public places to such a degree that he creates an atmosphere even more pernicious than that of the torrid zone from which he sprang.

The evil effects of overheated rooms, both on physical energy and on resistance to microbial infection, have been amply demonstrated by the experiments of the New York State Ventilation Commission (quoted by Huntington[4]). This Commission found that even slight overheating (75° F.) throws a burden on the heat-regulating system of the body, there being a marked *decrease in general vasomotor tone*, with an abnormal reaction of the mucous membrane of the nose, leading ultimately to chronic atrophic rhinitis, and, when followed by chill, producing a moist and distended condition of the membranes, calculated to favour bacterial invasion. In animals, exposure to high atmospheric temperatures, particularly when followed by chill, diminishes the protective power of the blood and markedly increases general susceptibility to microbic disease. Similarly, with regard to clothing, the arbitrary dictates of modesty and fashion and the mistaken fear of "catching cold" have robbed the body of one of its chief metabolic regulating mechanisms, and most important defences against infection—namely, the exposure of the skin to light and air.

I have said that civilised man has created his own pathology, but this statement requires some amplification. One can, I think, reasonably compare the diseases to which Man, living an active outdoor life under so-called primitive conditions, is subject, to those of animals in their natural wild state; and similarly those of Man under so-called civilised conditions with those of animals in captivity. In the former case both Man and wild animals are liable to invasion by parasites, conveyed, for example, by biting insects, or in water or food; in the latter case, however, the unnatural conditions have created certain disorders of metabolism and function, which were probably unknown amongst primitive peoples and do not occur in wild animals, and infection with a number of banal and incompletely differentiated organisms that were originally harmless saprophytes, but which have become pathogenic, partly owing to the favourable environment afforded by such metabolic and functional disorders, and partly to the facilities for transference and persistence that overcrowding and other factors supply.

Even in the memory of our generation the kaleidoscope of disease, viewed as a whole, has changed, as Horder[5] illustrated very clearly some years ago in his paper on New Diseases for Old. Briefly stated, the more virulent infections are being succeeded by a variety of subacute or chronic conditions due, as I have said, to organisms that were formerly considered non-pathogenic, and normal habitants of our mucous membranes.

Now I wish to illustrate these remarks in the following way. The skin and the mucous membranes of the mouth, nasopharynx, and intestines have a natural *saprophytic* flora of their own; they may all be invaded and actively infected by organisms foreign to them with the production of well-defined and specific diseases, but their own common saprophytes may under certain conditions become themselves pathogenic, giving rise both to local lesions, and, by invading the blood stream or elaborating absorbable toxins, causing morbid effects in distant organs or tissues.

In a paper I read before the Odontological Section of the Royal Society of Medicine in 1927 [7] I said :—

> "It is clear that in dealing with the question of actual infection with these common saprophytic but potentially parasitic bacteria we have to consider, first, their active growth in the host's tissues, and, secondly, the immediate and remote results of such active infection. The first part of the question is clearly biochemical or metabolic in nature; what, in fact, are the changes that take place in the host that render him a suitable culture-medium for organisms which he normally harbours only as saprophytes? The second part of the question is concerned with the local pathological changes produced by bacterial invasion, and with the possible systemic effects that may arise from it in parts of the body remote from the original site of invasion; in other words, focal sepsis and its results."

EXTERNAL INFECTIONS OF THE SKIN.

The skin is liable to invasion from without by parasitic organisms varying from insects to filtrable viruses. Now it might be thought that in the genesis of these external infections the influence of internal factors hardly comes into play. Nothing is farther from the truth, yet this view was largely held by one German school of dermatologists, which threw scorn on the terms "diathesis" or "soil" so often employed, particularly by the opposing French school. To cite an oft-quoted example, the common ringworm infection of the child's scalp dies out at puberty, and, except in the rarest instances, is never seen on the adult scalp. Why? Not, I think, owing to the development of a general immunity, for as Adamson [8] points out, the ordinary microsporon of scalp ringworm grows in the horny tissues, and excites, as a rule, little or no inflammatory response; but presumably because some change occurs in the horny layer or possibly the sebum of the scalp at puberty, which is inimical to the growth of the fungus, and such a change must be primarily of internal origin.

When we come to consider the common saprophytes of the skin this influence of internal factors is still more apparent. Contrary to popular belief, normal clean skin is remarkably amicrobial. The intact healthy horny layer, although it may harbour organisms on its surface, is never penetrated; only in the mouths of the pilosebaceous follicles does one see a few cocci, lying as Sabouraud [9] insists, as isolated units and not in a state of active growth. Normal sebum is composed of various neutral fats, mixed with fatty acids, which are in combination, not with the tribasic alcohol glycerol, but with the monatomic alcohol cholesterol. These *cholesterol fats* are not easily decomposed by bacterial growth, and are not a suitable culture medium. I repeat that in absolutely normal skin there is no active bacterial growth; on the other hand, in the most trivial infective lesions one finds an astonishing number of organisms, and it is fairly safe to say with Sabouraud and Whitfield [10] that "when an organism is found in a state of active growth upon the skin it is exciting its noxious effect if it has any."

When we survey the list of organisms that may infect the skin we can pick out three that are so commonly present that they may be considered as normal habitants, at any rate in civilised man; they are: the pityrosporon of Malassez, the micro-bacillus of acne, and the *Staphylococcus albus*. Nevertheless, the skin of a normal person in perfect health will show no evidence of active infection with these organisms. I make this statement dogmatically, knowing that, since some degree of such infection is so common, it may be disputed; it is a question of the normal standard.

The active growth of the three organisms named above is predisposed to by that morbid state of the skin which is usually termed *seborrhœa*, by which is meant an excessive and altered secretion of the sebaceous glands; but seborrhœa is only one symptom of the complex that has been variously termed "la kérose" by Darier, the "status seborrhoeicus" by Montgomery, Semon, and myself, and the "seborrhœic diathesis" by Scholtz. I do not mean to imply that these organisms only grow in seborrhœic skins, but seborrhœa is by far the commonest predisposing factor to such growth.

The term "diathesis" employed by the old clinical physicians to designate a predisposition to certain symptom-complexes, which they clearly recognised but could not explain, almost withered before the storm of more accurate knowledge acquired from a study of post-mortem pathology and bacteriology. Sabouraud, to whom we owe so much of our knowledge of external infections of the skin, has himself made some very scathing comments upon it, but we are now returning to the conception of diathesis, because biochemistry suggests and will doubtless confirm its accuracy. Of all diatheses the seborrhœic one is probably the commonest, and for this reason, perhaps, it has been practically ignored in the past by general physicians, who, obsessed by the symptoms and signs of what is called "organic disease," have neglected the tell-tale surface markings of faulty metabolism. The importance of the seborrhœic state in my present thesis is that it exemplifies how a metabolic change resulting from unnatural conditions of life may produce an environment which enables harmless saprophytes to become parasites and produce "skin diseases"; it enables us to study the local defensive reactions of the skin against these several organisms, the underlying factors which predispose to the change from saprophytism to parasitism, and the means of preventing or counteracting this change. As we shall see, however, the skin is not involved alone in the seborrhœic state; the mucous membranes suffer too, and become likewise a prey to their particular saprophytes.

THE SEBORRHŒIC TRIAD OF ORGANISMS.

It is necessary to say a word about the triad of organisms that inhabit the skin, but I shall avoid irrelevant detail.

The Pityrosporon of Malassez.

First discovered by Malassez in 1874 this organism was, so to speak, rediscovered by Unna and named by him "Flaschen-bacillen," and since then has been commonly known as the "bottle-bacillus," an unfortunate name since it is not a bacillus. Sabouraud[11] insisted on its constant presence in a state of active growth in the horny scales of the true pityriasis simplex of Willan—the familiar "scurf" or "dandruff," and he pointed out that it grows exactly in the same way between the superficial layers of the stratum corneum as does the *Microsporon furfur* of *pityriasis or tinea* versicolor, which, although like the pityrosporon of Malassez, had at that time never been cultivated artificially, was nevertheless universally accepted as the causal organism of this condition.

Sabouraud's arguments that the pityrosporon of Malassez must be the cause of simple dry scurf were accepted by most dermatologists, and until recently it has been generally held that the definitely inflammatory group of eruptions, known variously as seborrhœic dermatitis or eczema, seborrhœides, eczématides (Darier), of which the so-called "flannel rash" of Blackfriars Hospital is, perhaps, the best defined, was due to infection with the pityrosporon of Malassez and a *Staphylococcus albus* (the polymorphic coccus of Cedercreutz), growing in symbiosis. The difficulty of determining this point experimentally was largely due to failure to cultivate the pityrosporon; inoculation of the skin with cultures of the above staphylococcus produced merely small superficial follicular pustules.

Sabouraud attempted to grow the pityrosporon on a number of media without success; Whitfield[12] obtained it once in impure culture, but lost it in attempting subcultures; Templeton,[13] in 1926, announced that he had cultured it anaerobically, but the growth was poor. As long ago as 1908, however, W. G. Garner succeeded in growing it on maltose agar and acid glycerine agar, but his achievement was neglected, until quite recently MacLeod and Dowling[14] not only determined its cultural reactions, but also performed some very important inoculation experiments with it.

The organism is one of the fungi imperfecti and belongs to the class Oösporaceæ. It is nearly related to monilia, but differs from it in certain respects; for example, the pityrosporon forms no mycelium in solid media, but mycelial threads are abundant in fluid media, whereas the monilia produces scanty thick mycelium on solid but none on fluid media. By inoculation of cultures of the organism MacLeod and Dowling were able to produce typical figurate seborrhœic dermatitis, indistinguishable both in evolution and appearances from the natural eruption. *Inoculation on normal non-seborrhœic skins* produced a group of follicular papules within 24 hours, which lasted about ten days and then disappeared; in some seborrhœic subjects, particularly those with active seborrhœic dermatitis present, a more acute reaction developed, and a widespread figurate patch sometimes resulted.

It is thus clear that seborrhœic dermatitis, like simple dandruff, is a pure fungus infection due to the pityrosporon; the degree of inflammation produced by the organism appears to depend partly on the site infected, the scalp, though the commonest, being as a rule more resistant than the glabrous skin, and partly on the constitution and habits of the host.

The Acne Bacillus.

First described by Unna and Hodara[15] as the acne bacillus, and later by Sabouraud[16] as the microbacillus of seborrhœa, this organism has been the subject of considerable discussion, particularly as regards its exact rôle in the genesis of simple seborrhœa and of the polymorphic eruption, acne vulgaris. It would be irrelevant to deal with this discussion here, but the following points should be noted: (1) The acne bacillus grows in the infundibulum or upper third of the pilosebaceous follicle—i.e., the part lying between the opening of the sebaceous gland and the mouth of the follicle. In this portion, as Sabouraud[17] emphasises, there is a virtual space between the epithelial lining of the follicle and the hair, occupied by sebum and horny débris. (2) If the so-called "seborrhœic cocoon" be expressed from the pilosebaceous follicle of a seborrhœic person, squeezed flat on a slide, and suitably stained, myriads of acne bacilli will be seen obviously in a state of active growth. (3) As a result of infection of the follicles with this organism there may arise in certain situations the polymorphic lesions of the common acne juvenilis—comedones or "blackheads," acne papules, pustules, &c. Sabouraud, I think rightly, maintains that the true acne pustule is due to the acne bacillus, and not to a secondary invasion with a *Staphylococcus albus*, although staphylococcal lesions may be and often are present in acne. This view has been recently confirmed by Goldsmith's[18] work on the staphylococci in acne vulgaris.

The Staphylococci.

The *Staphylococcus pyogenes aureus* is not a normal habitant of the skin, a fact that is often not appreciated. Both Goldsmith and Ferguson Smith[19] have confirmed this, but once an active infection with this organism occurs, it is, so to speak, "sown" in the mouths of the pilosebaceous follicles, not only in the neighbourhood of the active lesions, but also in parts of the skin widely distant from them, and the patient becomes a "pyococcus-carrier"; the danger of such a carrier in connexion, for example, with epidemics of pemphigus neonatorum, is clearly shown by the recent work of Benians and Jones.[20]

With regard to the *Staphylococcus albus*, it is useless, I think, to attempt to differentiate the various strains that have been described. Cedercreutz[21] considers that all these are but modifications of the same organism, and, as Benians[22] says, "the habits of the *Staphylococcus albus* in its various forms seem to be anything from those of a harmless saprophyte to those of a definitely pyogenic organism. Culturally, it appears to vary from a greyish and translucent to one of a brilliant enamel white colour." Suffice it to say that the *Staphylococcus albus is* a normal habitant of the skin—saprophytic but potentially parasitic, like the pityrosporon and the acne bacillus. The natural position in the skin for staphylococci is the mouth of the pilosebaceous follicle, and for the most part staphylococcal lesions are primarily follicular.

Habitat of these Organisms.

The three organisms that I have just briefly described may be regarded as the normal flora of the human skin, at any rate under civilised conditions. Each has its own localisation or site of election in the skin, and each, as Sabouraud and Adamson have *pointed out, when it takes on active growth, excites* a special type of cell-response to invasion.

Thus the pityrosporon, like a ringworm fungus—e.g., the *Microsporon furfur*, grows in between the layers of the stratum corneum, which hypertrophies, and is shed in visible flakes or pellicules ("dandruff" or "scurf"), such exfoliation, no doubt, being an attempt to cast off the parasite; on the scalp and other hairy parts, the pityrosporon, like certain ringworm fungi, may excite little or no inflammatory response in the cutis, but on the glabrous skin both it and a ringworm fungus provoke definite clinical and histological signs of inflammation.

The acne bacillus flourishes in myriads in the infundibular portion of the pilosebaceous follicles, and there may, like the pityrosporon, provoke both a non-inflammatory and inflammatory defence-reaction—viz., the comedo and the acne pustule. The comedo is a cocoon-like body composed of concentric layers of horny cells, which enclose a mass of the bacilli and inspissated sebum; as Adamson says, it may be looked upon as a reaction upon the part of the horny cells to the invasion of the follicle by the acne bacillus, or, as Whitfield[23] puts it, the epithelium endeavours to deal with the bacillus in the way in which the epidermis always deals with foreign bodies—namely, by encysting it with horny cells. The true acne pustule represents the inflammatory defence-reaction to the bacillus, although it has commonly been held to result from secondary infection with a *Staphylococcus albus*. Sabouraud[24] has clearly shown that the acne bacillus alone is responsible, and he points out that the leucocytic reaction is denser than in staphylococcal infection, producing thick caseous pus, unlike the fluid creamy "laudable pus" of the latter.

Staphylococci are normally present in clean healthy skin at the ostium of the pilosebaceous follicle as isolated units, waiting their opportunity to germinate, multiply, and produce active inflammatory lesions, the simplest of which is a small pustule formed at the mouth of the follicle and surrounding the hair. The normal defence to staphylococcal infection is the polymorphonuclear leucocyte. I cannot here describe the different types of staphylococcal lesion in the skin; they have recently been dealt with by

Organism.	Habitat.	Defence-reaction.	Lesion.
Pityrosporon.	Stratum corneum.	Exfoliation of horny cells. Cuticular inflammation.	Pellicle or dandruff. Seborrhœide or seborrhœic dermatitis.
Acne bacillus.	Infundibulum of pilosebaceous follicle.	Proliferation of horny cells to enclose it. Dense leucocytic exudation.	Comedo. Acne pustule.
Staphylococcus.	Ostium of follicle.	Polymorphonuclear exudation.	Pustule. Boil. Sycosis, &c.

Sabouraud.[15] The essential points are that the natural habitat for staphylococci is the mouth of the follicle, that the majority of staphylococcal lesions are follicular, and that the formation of pus from polynuclear leucocytes is characteristic.

I may summarise what I have just said in the Table above.

THE SYMPTOMATOLOGY OF THE SEBORRHŒIC STATE.

Some *degree of seborrhœa and slight active infection* with its triad of organisms are so commonly seen that the entirely non-seborrhœic person, who remains so throughout life, would seem to be exceptional. It will be understood that in the following description I am referring to those in whom seborrhœic manifestations are severe enough to be noticeable, and, as a rule, to demand treatment. Now I think that clinically one can conveniently classify these persons into two types: to one belong the flushed, robust, active, and in later life plethoric sort; I call this the pure or simple seborrhœic type: to the other belong the pallid, thick-skinned, pigmented, hypotonic kind. The former are usually fair, the latter dark or mouse-coloured, but not necessarily so. There are certain differences, as regards their seborrhœic manifestations, between these two groups, and often, I believe, the chief underlying factors predisposing to their seborrhœa are not the same in the two cases.

I will now briefly summarise the symptoms of the seborrhœic state:—

Cutaneous Manifestations.

The normal skin, as exemplified by that of the perfectly trained athlete, or as seen in those who have undergone the "sun and air cure," is beautifully smooth, supple, and clear; the horny layer is thin and translucent, and is cast off in invisible flakes, the pilosebaceous orifices are hardly visible, and the secretion of sebum and sweat (except in heat, strong sunlight, and after exercise) is imperceptible; the hair is sleek but not greasy, and there is no evidence whatever in the skin of active bacterial growth.

Contrast this with the skin of the seborrhœic person; as a whole, it appears thickened, coarse, and dirty, particularly in dark-complexioned persons; the horny layer is improperly formed and hypertrophied; the pilosebaceous orifices are enlarged and patulous, and either exude visible droplets of oily sebum, or are filled with solid plugs—the so-called seborrhœic cocoons—containing countless acne bacilli; there is often visible hyperidrosis in certain situations; the scalp after puberty is greasy, covered with adherent dandruff, which swarms with the pityrosporon and the *Staphylococcus albus*, and the hair dank and lifeless. To this picture must be added the infective complications—the comedones, pustules, and nodules of acne, the various *forms of* seborrhœic dermatitis, the superficial pustules due to the *Staphylococcus albus*, the deeper folliculitis of sycosis and boils due to the *Staphylococcus aureus*. In middle life rosacea, which sooner or later becomes complicated by a superadded infection of the flushed area with the seborrhœic organisms, is common.

Mucous Membranes.

Mouth.—The appearances of the mucous membrane of the lips, mouth, and tongue vary according to the type of seborrhœic person. In the simple type the vermilion borders of *the lips* are usually bright red, and covered with a yellowish, superficial crust, which I call the "seborrhœic scum"; *the tongue* is firm and red, and the papillæ prominent; *gingivitis*, representing doubtless the same lowered resistance to infection that characterises the skin is common, and the earlier the onset of the seborrhœic state, the sooner does it occur. In the other type of seborrhœic person, the lips may be pale or bluish, the tongue pale and indented, and its papillæ hardly visible.

The Teeth.—Dental caries and simple gingivitis are, I consider, the rule, at any rate in the simple seborrhœic; on the other hand, true pyorrhœa alveolaris is not.

Nasopharynx.—Chronic nasopharyngeal catarrh, with frequent exacerbations, is almost invariably present in severe cases of the seborrhœic state. It was a striking symptom among those met with in France during the war. In chronic seborrhœics, with symptoms dating from childhood, this catarrh is usually associated with the adenoid facies and marked hypertrophy of the lymphoid tissue; on the other hand, *it may develop as an entirely new symptom* in conjunction with infection of the skin, in those who become seborrhœic as a result of adopting a sedentary existence in middle life.

The Digestive System.

Symptoms referable to disorders of the digestive system differ so widely in the two types of seborrhœic, that a detailed discussion of their significance would be futile. Genuine intestinal flatulence, distinct from aerophagy, is a common sympton, due, I believe, to fermentation of carbohydrate, since it is almost *always relieved by exclusion of soft carbohydrate* foods from the dietary. Observations on the secretion of HCl by the stomach are, so far as I am aware numerous only in cases of rosacea. Ryle and I[16] investigated a small number of patients—all women—and found complete or extreme hypochlorhydria in 58 per cent. In Brown's[17] 50 cases, the percentage was lower—30 per cent.—and Eastwood[18] found a low secretory curve in about half her cases. My impression is that in the simple type of seborrhœic, the gastric HCl is usually normal or excessive, whereas in the other type it is usually diminished.

The Urine.

Sabouraud[19] in 1902 stated that an examination of the urine of 83 men with actively progressing seborrhœic alopecia, but in apparent good health, showed three characteristics—hyperacidity, excess of chloride, and diminution of phosphate. During the war, while working with Semon on large numbers of cases with active seborrhœic infections, I was impressed by the apparently high urinary acidity.[20] In most cases large and in some enormous doses of alkali were required to render the urine alkaline. We were also struck by the beneficial effect of alkalis in large doses in the more acute cases. We expressed the opinion that the character of the military rations and the unavoidable lack of fresh fruit and vegetables were probably in part responsible both for this high urinary acidity, and for the prevalence of seborrhœic manifestations among the troops. The same increased acidity of the urine is also found among civilian patients with acute symptoms of the seborrhœic state, and I believe that a close inquiry along modern lines into this question provides a promising field for biochemical research. One interesting fact is that in certain cases the administration of alkali causes the urine for a while to become progressively more acid.

THE ÆTIOLOGY OF THE SEBORRHŒIC STATE.

In considering the ætiology of the seborrhœic state it must be insisted that an apparently excessive secretion of sebum does not necessarily constitute seborrhœa in the pathological sense. It is probable, as Whitfield[21] suggests, that the greasy skin of the healthy negro is a physiological protective response to intense sunlight. The secretion of sebum, like that of sweat, saliva, and tears, is under the control of the *autonomic nervous system. Whitfield has remarked on* the reflex localised seborrhœa of the forehead resulting from eyestrain, and a similar local secretion of sebum and sweat may be provoked by electrical stimulation of the skin, as is sometimes seen in the treatment of facial blemishes by electrolysis. Of greater interest is the seborrhœic facies that may be met with in *encephalitis lethargica.* This was noted by Colin[22] and Sarbo[23] in early or acute cases, and Krestin described it as a feature of chronic cases manifesting the Parkinsonian syndrome; it was commonly associated with sialorrhœa and occasionally with rhinorrhœa. Krestin[34] also noted it, sometimes with sialorrhœa, in cases of senile paralysis agitans. The explanation would seem to be that "these secretory disturbances may depend upon lesions in the neighbourhood of the third ventricle involving vegetative nerve centres."

When we come to consider the factors responsible for the seborrhœic state, as ordinarily met with, we are at once struck by their complexity, but, lest I confuse the issue by attempting to present a comprehensive survey, I would at the outset emphasise what I believe to be the real crux of the problem.

The skin is intimately concerned with fat metabolism. It lies in close contact with the chief fat depôt of the body, its horny layer is permeated with fat, and the sebaceous glands and even the sweat glands secrete it. I find myself in agreement with Darier,[35] Montgomery,[36] and Scholtz,[37] who hold that *the essential and obvious change in the seborrhœic state is an alteration in the secretion and composition of the cutaneous fat*, and it is clearly this modification that favours the parasitic growth of the saprophytes of the skin. When all the minor factors—heredity, age, sexual evolution, &c.—are considered, this one fundamental cause remains predominant. That some similar biochemical change occurs also in mucous membranes would seem probable, in view of their comparable lowered resistance to invasion by saprophytic organisms.

The Influence of Diet and Personal Hygiene.

If we agree that the seborrhœic state is an index of faulty metabolism as regards fat and fat-forming foods, it becomes evident that diet, or rather the correlation between diet and the expenditure of physical energy, is a factor of paramount importance. Granted that there is an inborn and often hereditary tendency to seborrhœic manifestations, nevertheless I believe that all of us are potential seborrhœics. This is suggested by the fact that those, who in their youth have lived athletic outdoor lives, often develop seborrhœa and its complications for the first time when they abandon their games, adopt a sedentary occupation, but continue to eat as much, perhaps more, than previously. The relationship of diet to seborrhœa has been well analysed by Montgomery; he considers in detail the various foodstuffs—sugars, starches, fats, and alcohol—excess of which is a potent predisposing factor. The question is complicated by the fact that excess is not the whole story; the rate of absorption, and probably the liability of certain foods to undergo bacterial fermentation, with fatty acid production, also come into play. Our knowledge, however, of the metabolism in the seborrhœic state is fragmentary and based almost entirely on clinical observations, some of which, it is true, are definite and constant enough to allow of conclusions being drawn, but a complete biochemical investigation of the whole problem is urgently needed, and would, I believe, throw light on much that is now obscure.

Fats.

Our knowledge of the influence of fats on seborrhœa is fairly precise. Kossmann, de Jong, Plate and Röhrmann, Buschke and Fränkel, have all shown that sometimes the sebaceous secretion may have the same chemical characteristics as the fat ingested. The experiments of Policard and Mlle. Tritchovitch[38] explain this and are of great interest.

They are based on the observation of Daddi that sudan-red and scarlet-red, if given with the food by mouth, produce vital staining of depôt fat and adipose tissue. Policard and Tritchovitch showed, however, that only the depôt fat is thus coloured—for example, that of the subcutaneous tissue and omentum, the composition of which depends very largely on that of the fat ingested. On the other hand, the essential fat of the various organs is not stained; in the normal liver, for example, there is found no trace of the dye. If the animal is starved the coloured fat disappears and with it the colouring matter.

These authors then showed that normally the cells of the sebaceous glands elaborate their fatty secretion from the fatty acids circulating in the blood; this, as Regaud and Favre have shown, is a process of true cellular activity. On the other hand, they are capable of fixing directly fatty particles that circulate in the blood, especially after digestion. This fat, unlike the normal sebaceous secretion, is coloured after ingestion of scarlet-red; it is only seen in the large "obese" glands of fat animals, never in normal glands. The fat of fixation is found extending to the periphery of the gland in close contact with the capillaries; the normal sebaceous fat is localised to the centre of the gland near the excretory part. It is thus seen that the normal function of the sebaceous glands is adipogenesis, the manufactured fat having a special composition of its own; under certain conditions—in animals after hyperalimentation, for example—they take on the function of adipopexy, in which case the fat taken up directly from the blood may have the characters of that ingested.

From these observations it is easy to understand how the normal sebaceous secretion may be altered either by the excessive intake of fat or fat-forming foods, or by the ingestion of special forms of fat. As I have said, the normal cholesterol fat of sebum is inimical to bacterial growth; but other fats are not, and it is doubtless when the composition of the sebum is changed by the adipopexic function of the sebaceous glands, that the active growth of the saprophytes of the skin are encouraged. This would explain the contention of Kenneth Wills that some cases of acne will yield to the omission of pig-fat from the dietary, and the observations of Whitfield that in some patients cheese will invariably provoke an outbreak of this eruption. As Montgomery points out, milk-fat is particularly liable to bacterial decomposition, hence the danger in seborrhœics of excess of cream or milk.

Apart from fats there is general agreement that excess of carbohydrate aggravates existing seborrhœic manifestations; a girl's complexion may be an index of the number of chocolates she has consumed the previous evening. It would seem that concentrated sweetstuffs and soft starchy foods, which cannot be properly masticated, particularly if cooked with milk, tend to ferment with the production of fatty acids and gas. Sabouraud[39] has emphasised the astonishing effect of merely excluding bread from the dietary of fat seborrhœic people, many of whom consume it mechanically in large quantities at meals which are otherwise adequate or excessive.

Alcohol.

That excess of alcohol promotes seborrhœa is a fact that he who frequents bars can see, but its mode of action is probably complex. It is a vasodilator, and through the ages has been recognised as a common cause of true rosacea, which is always accompanied by seborrhœa. I know no more striking clinical experiment than to observe the change that occurs in the complexion of a chronic alcoholic when he is persuaded or compelled to become a teetotaller. Apart from its vasodilator action alcohol is a carbohydrate and fat sparer, since it is so readily oxidised.

It is clear that the influence of diet in seborrhœa must be considered in relation to the mode of life. It is a question of oxidation. The best treatment for the seborrhœic state, apart from dietary restrictions, is a vigorous outdoor life with light clothing in a bracing sunny climate; it is the only one, in fact, that I have found of permanent benefit. Muscular exercise and deep breathing by which complete oxidation is ensured, the action of cool air in stimulating the thyroid-adrenal-sympathetic system, and thereby the metabolic rate, and the direct and indirect influence of sunlight on the skin—these are the important preventive measures. On the other hand, a sedentary life in overheated rooms, a dietary grossly disproportionate to the muscular energy expended, indulgence in alcohol, excessive clothing, and lack of personal cleanliness, are the chief predisposing factors.

In conclusion, the adjuvant factors may be briefly reviewed.

Heredity and Predisposition.

That there may be a hereditary and congenital predisposition to the seborrhœic state is, I think, beyond question. Seborrhœic families are common enough, and conversely certain families appear to be almost immune. I believe heredity to be an important *factor in the so-called seborrhœic alopecia*—the common baldness of men, or calvities.

Scholtz defines the seborrhœic diathesis as a congenital or hereditary tendency to present certain clinical skin manifestations *under the influence of* certain dietetic and metabolic factors, and it is unquestionably true that of two persons on approximately the same diet and living under the same conditions the one may become seborrhœic and the other not. At the same time the influence of environment and habits must be borne in mind when estimating the rôle of heredity and predisposition. Parents are apt to apply the same principles of diet and hygiene that their parents applied to them in bringing up their children. The Jews as a race are notoriously liable to seborrhœic manifestations and to diabetes; to what extent this tendency is hereditary or is dependent on their love of fatty and sweet foodstuffs, combined with a disinclination for physical exercise, is difficult to estimate.

Age and Sexual Evolution.

The various manifestations of the seborrhœic state follow in their evolution much the same stages as depicted in Shakespeare's seven ages of man. In infancy the true milk-crust betrays the future seborrhœic; the inevitable infection of its scalp from the parents or nurse with the pityrosporon takes root, and may cause the seborrhœic variety of infantile eczema. This infection persists as dry dandruff of the scalp till puberty, at which time the sebaceous glands awaken into activity. The scalp becomes greasy and covered with the so-called pityriasis steatoides; the micro-bacillus flourishes and gradually produces juvenile acne, which continues until the age of 25 or longer, and is often associated *with or succeeded by seborrhœic dermatitis.* At 18 or later begins calvities, which follows its relentless course, delayed, perhaps, but never arrested. In the third or fourth decade comes rosacea, and with it the so-called seborrhœic warts, which persist till death. These last, regarded by Darier as late nævi, must be distinguished from the true senile keratoses, picturesquely labelled by the French "fleurs de cimetière," thus implying their tendency to cancerous degeneration.

The Sexual Glands.

It is obvious that the evolution of the various complications of the seborrhœic state is closely connected with that of the sexual organs. The influence of puberty, of menstruation, and of the menopause can clearly be recognised.

The *growth of the hair and the activity of the* sebaceous glands are intimately related, and on the scalp the greater the latter, the less the former. That this relationship is connected with the endocrine glands concerned in sexual differentiation is certain, but its significance is obscure. Virility tends to loss of hair on the scalp with its increased luxuriance on the beard and body; feminism to a converse distribution. Sabouraud,[40] who has written so entertainingly on this subject, points out that the old satyrs are always depicted as bald on the head and hairy on the body, and the association of baldness, a large beard, and a hairy body was a common one when beards were the fashion. On the other hand, as Sabouraud's researches by proxy in the harems of the East reveal, a eunuch never develops the male type of baldness.

This influence of sex was illustrated in startling fashion by a case of suprarenal tumour in a female patient, which I had the opportunity of observing. There was the usual growth of beard and moustache, and cessation of menstruation, together with loss of hair on the scalp exactly resembling the ordinary male type of baldness. On removal of the tumour, normal menstruation began again, the hair on the face fell off, and a complete regrowth of that on the scalp took place. Unfortunately, recurrence of the malignant tumour was later apparent, and the former symptoms of virilism returned before death.

Intestinal Toxæmia.

I hesitate to employ this term—so simple in application, so difficult to define accurately. At the same time, as I have said, there is a type of seborrhœic person that for want of a better epithet I have labelled the "toxic" type, whose appearance is in marked contrast to that of the flushed, vigorous, "simple" seborrhœic. He is sallow and pigmented, his muscles are hypotonic, his tongue is flabby and furred, his breath foul, and the smell of his skin differs from that of the simple type. Invariably, I think, one finds a large quantity of indican in his urine, and not uncommonly a striking excess of urobilin. He improves out of all knowledge on a diet consisting largely of vegetables, fruits, crisp cereals, nuts, &c., simple laxatives such as rhubarb, and a vigorous out of door life. One girl, belonging to this type, of my acquaintance—a very severe and intractable case of acne—cured herself quickly by joining some cult which enjoins a diet as above, colon wash-outs, and regular breathing exercises.

One has to remember, however, that, as Hurst[41] pointed out long ago, many of the signs and symptoms of so-called intestinal toxæmia are the result of mechanical distension of the rectum by fæcal accumulations, and are at once relieved when these are removed. The well-known experiments of Donaldson[42] on healthy men, I think, prove this conclusively. He showed that deliberate abstention from defæcation for four days, or packing the rectum with cotton, were sufficient not only to produce such symptoms as headache, lassitude, furred tongue, foul breath, flatulence, &c., but also to cause a rise in the basal metabolic rate and of the blood-sugar, increased reaction times, and a diminished capacity for work. The symptoms were all promptly relieved when the rectum was emptied. Moreover, this voluntary constipation caused little or no increase in the urinary excretion of indican. It is probable that, as Mutch[43] suggests, it is in the small intestine—e.g., the lower end of the ileum, and, I think, in the cæcum, but not in the colon—that toxic substances may be produced and absorbed; and we may justifiably conclude that symptoms of so-called toxæmia may result either from mechanical rectal distension or from delay in, and the absorption of products of bacterial action from the small intestine. In the latter case the detoxicating function of the liver must be of importance.

There is clinical evidence to show that both simple constipation and genuine intestinal toxæmia may be factors in aggravating seborrhœic conditions such as acne, but the exact modus operandi is difficult to explain in either case.

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"METADYSENTERY,"

WITH REMARKS ON A CHRONIC TYPE.

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SOME years ago I suggested the term "metadysentery" to indicate various clinical types of colitis due to a group of bacilli which I called the metadysentery bacilli. These bacilli may be defined as follows: bacilli which similarly to the true dysentery bacilli (Shiga-Kruse, Flexner, Hiss-Russel, or dysentery-paradysentery bacilli) do not produce gas in any sugar but in contrast to them either clot milk and produce acidity in lactose-peptone-water or produce acidity in lactose-peptone-water without clotting milk. These bacilli were separated by Chalmers and myself (1919) into two groups, the genus Lankoides (milk clotted) and the genus Dysenteroides (milk not clotted); but at times a strain which appears at first not to clot milk may do so later on, and therefore in practice it is of advantage to combine the two groups into one under the term "metadysentery bacilli." It may be added that for this group Jacono has suggested the generic term "Castellanus."

Historical.

Some of the metadysentery bacilli have been known for years. *Bacillus ceylonensis* A and *B. ceylonensis* B were found by me in 1904 and 1905, their description being published in 1907. *B. gintottensis* I described in 1910; *B. madampensis* I isolated in 1910 and described in 1911; the first strain of *B. metadysentericus* was isolated in 1904, but was not named for some years. Chalmers and I created for these organisms two genera, Lankoides and Dysenteroides.

Nabarro has given much attention to this group of organisms; at one time he was inclined to identify them all with *B. coli anaerogenes* of Lembke. In a very interesting publication in the *Journal of Pathology and Bacteriology* in 1923 he says:—

> Lembke, in 1896, isolated from the excreta of dogs a coliform bacillus producing acid but not gas in glucose and lactose media, to which he gave the name *B. coli anaerogenes*. Between 1906 and 1912 Castellani isolated several varieties in Ceylon which he has named *B. ceylonensis*, *B. madampensis*, *B. bentotensis*. These organisms all agree in the property of fermenting sugars, &c., with the formation of acid alone, the difference between them being of a minor nature.

Nabarro further states that he first isolated *B. coli anaerogenes* in 1912, from a case of dysentery at the Wakefield Asylum. In 1921, during an investigation upon summer diarrhœa and other diarrhœal conditions in children, he isolated 30 strains of *B. coli anaerogenes* from 25 patients out of 107 investigated. It would appear, however, that the true *B. coli anaerogenes* produces acidity in great amount and very rapidly, and after repeated transplantations produces gas in certain carbohydrates.

Principal Types of Metadysentery Bacilli.

The following bacilli may be considered to belong to the group of metadysentery bacilli:—

(1) *Bacillus pyogenes fœtidus* Passet (1902). This and similar organisms, although belonging culturally and biochemically to the metadysentery group, do no seem to cause dysenteric symptoms or colitis symptoms. They were found in cases of abscesses. An interesting feature is that they are motile. (2) The bacilli found by me in certain cases of colitis and dysentery with or without fever, which I described with the names *Bacillus ceylonensis* A, *B. ceylonensis* B, *B. metadysentericus*. In addition to these bacilli, *B. gintottensis* and *B. madampensis* which do not seem to be pathogenic. (3) *Bacillus bentotensis* Castellani (1912). This bacillus was isolated by me in Ceylon in stools; it is motile, and with regard to this character is similar to *B. pyogenes fœtidus* from which, however, it differs with regard to biochemical reactions. (4) Several of the strains found by Duval in cases of infantile diarrhœa, in America, seem to me to belong to the metadysentery bacilli rather than the paradysentery group (Flexner). (5) Certain strains found by Nabarro, in England, in cases of infantile diarrhœa, although Nabarro, until recently identified them with *B. coli anaerogenes*. (6) The strains found in recent years by Sonne and others in certain cases of dysentery, although these may be identical with *B. ceylonensis* A, *B. ceylonensis* B, and *B. metadysentericus*.

I do not place among the metadysentery bacilli the *Bacillus coli anaerogenes* found by Lembke in dogs, as apparently after repeated transplantations it produces gas.

The pathogenic metadysentery bacilli may be separated into two principal types: (1) *B. ceylonensis* A type (including *B. metadysentericus*) and (2) *B. ceylonensis* B type. In the first type acidity in lactose-peptone-water is produced very slowly and may be almost absent, clotting of milk is slow or absent; indol negative or only a trace. In the second type production of acidity in lactose is rapid, clotting of milk fairly rapid, indol usually positive. Serologically, especially using my absorption method, several subgroups may be differentiated.

Bacteriological Description of the Various Species.

This has been given in a number of previous papers; among the recent ones I may mention one in the *American Journal of Tropical Medicine*, July, 1927, with the title, The Classification of Bacterial Dysenteries and of Dysentery Bacilli. There is therefore no need to enter into details, but the table showing the characters of the more important species may be found useful.

Clinical Syndromes: Chronic Metadysentery.

The clinical intestinal conditions in which organisms of the metadysentery group of bacilli have been isolated may be classified into: (*a*) *Acute*. With either dysenteric diarrhœa or simple diarrhœa. In certain cases fever may be present. (*b*) *Chronic*. Several types.

These organisms have also been found at times in obscure cases of fever in which intestinal symptoms may be very slight or lacking altogether, and paratyphoid has been suspected. I have under treatment at the present time one such case in London.

In this paper I propose to discuss again a chronic type characterised by recurrent attacks of simple

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diarrhœa with absence or only occasional presence of dysenteric symptoms. The stools during the attack are fluid, brownish or yellow, at times frothy; as a rule, they do not contain muco-pus or blood, but there are a number of exceptions. Each attack may begin suddenly with severe abdominal pain, or only abdominal discomfort may be felt; it lasts from a few hours to several days. In the intervals between the attacks, and the intervals may be very prolonged, the patient may feel fairly well, but as a rule complains at times of light abdominal discomfort and flatulence; he often feels run down, tired, nervy, and not inclined for work. These cases go on for years, a little better, a little worse; they consult many practitioners, and are generally told they are suffering from colitis, or intestinal intoxication, or intestinal subinfection; sometimes the diagnosis mucous colitis and abdominal neurasthenia is made. Not rarely atypical appendicitis is suspected and the patient is operated on. Similarly, atypical cholecystitis may be suspected. The patients try all sorts of treatment, Plombières douching being probably the most popular and next to it streptococcal vaccines and various so-called intestinal disinfectants. The result is generally unsatisfactory. Some of these patients have a wretched life and are a burden to themselves and their families.

TABLE SHOWING BIOCHEMICAL CHARACTERS OF CERTAIN BACILLI OF THE METADYSENTERY GROUP.

(Reactions After an Incubation Period of Three Weeks at 37° C.)

—	Motility.	Gram.	Gelatine.	Serum.	Litmus milk.	Lactose.	Glucose.	Lævulose.	Maltose.	Galactose.	Mannitol.	Dulcitol.	Saccharose.	Inulin.	Rhamnose.	Inositol.	Adonitol.	Arabinose.	Amygdalin.	Salicin.	Sorbitol.	Raffinose.	Dextrin.	Erythritol.	Glycerol.	Potato starch.	Indol.	Lead agar.	
B. ceylonensis A, 1907* (St. P.D.).	0	0	0	0	AG	0 or Avs	A	A	A	A	A	0	A	0	A	0	0	A	0	0	0	A	As	0	A	0	0	0	See Note 1.
Ditto, 1907* (St. Ceylon O).	0	0	0	0	AG	0	A	A	A	A	0 or A	0	0 or A	0	0 or A	0	0	A	0	0	0	A	Avs	0	0 or A	0	0	—	
Ditto, 1907* (St. Z).	0	0	0	0	AG	A	A	A	A	A	A	0	A	0	A	0	0	A	0	0	0	A	0	0	A	0	0	0	
Ditto, 1907* (Var. II., St. Sb.).	0	0	0	0	AG	As	A	A	A	A	A	0	0	0	A	0	0	A	0	0	0	0	A	0	0	—	0	—	
Ditto, 1907* (St. R.R.).	0	0	0	0	AG	A	A	A	A	A	A	A	0 or A	0	A	0	0	A	0	0	A	A	A	0	A	0 or A	+	0	See Note 2.
Ditto, 1907* (St. R.W.).	0	0	0	0	AG	As	A	A	A	A	A	A	0 or A	0	A	0	0	A	0	0	A	A	0	0	A	0 or A	+	0	
Ditto, 1907* (St. L.V.).	0	0	0	0	AG	A	A	A	A	A	A	A	A	0	A	0	0	A	0	0	A	A	A	0	A	A	+	0	
Ditto, 1907* (St. Ceylon O.).	0	0	0	0	AG	A	A	A	A	A	A	A	0 or A	0	A	0	0	A	0	0	A	A	A	0	A	A	+	0	
B. metadysentericus, 1904* (Var. A.).	0	0	0	0	A	A	A	A	A	As	A	0 or As	A	0	—	—	—	—	—	—	—	—	—	—	—	—	+ 0	—	See Note 3.
Ditto, 1904* (Var. A., St. Z.).	0	0	0	0	A	A	A	A	A	A	0 or A	0	A	0	A	0	0	A	0	0	0	A	0	0	0	0	+ 0	—	
Ditto, 1904* (Var. B., St. L.).	0	0	0	0	A	A	A	A	A	A	0 or As	0 or As	0 or As	0	0 or A	0	0	A	0	0	A	A	A	0	A	—	+	—	
Ditto, 1904* (Var. C.).	0	0	0	0	A Alk D	As	A	A	As	A	0 or Avs	0 or Avs	0 or Avs	—	—	—	—	—	—	—	—	—	—	—	—	—	0	—	
Ditto, 1904* (Var. D.).	0	0	0	0	Alk	As	A	A	A	A	A	A	A	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	
B. bentotensis, 1912* (St. O.).	+	0	0	0	A or Alk	A	A	A	A	A	0	0 or As	A	0	0	A	0	0	0	0 or As	0	0 or As	0	0	A	—	+	—	
Ditto, 1912* (St. L.).	+	0	0	0	AG	A	A	A	A	A	A	0	0	0	A	0	0	A	A	A	0	0	A	0	As	—	+	—	
B. madampensis, 1911* St. H.).	0	0	0	0	AG	A	A	A	A	A	A	0	As	0	A	0	0	A	0	0	Avs	A	A	0	A	0	+	0	
B. pyogenes fœtidus, 1902.†	+	0	0	0	AG	A	A	A	A	A	A	A	A	—	—	—	—	A	—	—	—	A	A	—	—	—	+	—	

* Castellani; † Passet. St., strain. 0 = negative, viz., absence of clotting in milk, absence of acidity and gas in sugar media (the medium may become alkaline). + = positive, viz., presence of clotting in milk, presence of acidity and gas in sugar media, &c. A = acid. AG = acid and gas. Alk = alkaline. — = reaction unknown. As = acid slightly. Avs = acid very slightly. D = decolorised.

Note 1.—Some strains of *Bacillus ceylonensis* A at first produce acid in glucose and lævulose only, lactose is not fermented or only very slowly; milk is clotted very slowly. Strains P.D., O., Z., are serologically identical. Strain Sb. differs serologically.

Note 2.—The four strains of *Bacillus ceylonensis* B are serologically identical; strains R.R. and O. produce acidity in lactose rapidly; strain R.W. very slowly.

Note 3.—Certain strains may clot milk after prolonged incubation.

Illustrative Cases.

CASE 1.—Mrs. A. for two years before being seen by me had been suffering at intervals from attacks of diarrhœa with severe abdominal pains, the stools being brownish or yellowish, at times somewhat frothy, never containing any blood. She came to consult me in June, 1926. A bacillus was isolated from the stools, with the characters of the bacilli of the metadysentery group—viz., produced no gas in any sugar, produced acidity in lactose, clotted milk slowly. The blood agglutinated the bacillus isolated from the stool up to a dilution of 1 in 100, and the laboratory strain of *B. ceylonensis* B up to a dilution of 1 in 120. The bacillus was not agglutinated by blood of normal individuals. A powerful Shiga serum (titre for Shiga, 1 : 1000) obtained from Burroughs Wellcome, agglutinated it only up to 1 in 20. The lady was admitted to a tropical nursing home and was kept at complete rest in bed and on fluid diet. A course of *ceylonensis* B vaccine (peptone-water cultures killed by the addition of carbolic ½ per cent.) was given in minute doses. She gradually got better, and up to the present day has not had any more attacks. The agglutination for the bacillus isolated from the stools rapidly decreased; it is now negative.

CASE 2.—Mrs. B., an Englishwoman, had an acute attack of diarrhœa, she thinks, with a little blood and mucus, but does not remember with certainty, 14 years ago in Rome. She did not go to see a doctor, and did not even go to bed; since then she has never been quite well. Very often she has had abdominal discomfort and flatulence; as a rule, however, no diarrhœa. She came to consult me in August, 1926, because she was passing through a period of reacutisation with diarrhœa, the stools being liquid, of a brownish colour. A bacillus was isolated from the stool with the following characteristics: slow clotting of milk, no production of gas in any sugar, acidity in glucose. I thought at first that lactose was negative, but after three weeks a slight amount of acid developed. Serologically, the organism was identical with a strain of *B. ceylonensis* A isolated in Ceylon. The bacillus isolated from the stool was agglutinated by the patient's blood in a very high dilution (1 in 320); the laboratory strain of *B. ceylonensis* A was agglutinated in a dilution of 1 in 160.

CASE 3.—Mrs. H. has been suffering from rather obscure abdominal symptoms for many years; abdominal discomfort, flatulency, attacks of simple diarrhœa followed by long periods of constipation; there was apparently at times slight tenderness in the right lower abdomen; appendicitis was suspected and an operation was performed. The appendix did not seem to be diseased. The lady came to consult me in August, 1926, merely complaining of vague abdominal discomfort and of always feeling tired and ill. The blood showed high agglutination (more than 1 : 160) both for *B. ceylonensis* A and for *B. ceylonensis* B, all strains; none for *B. madampensis*.

Three strains of metadysentery bacilli were isolated from stools; one was agglutinated by patient's blood and by *B. ceylonensis* B serum; the third strain was not agglutinated by either the patient's serum or *B. ceylonensis* A or *B. ceylonensis* B sera. The third organism appeared to be identical with *B. madampensis*. It seems, therefore, that in this case the condition was probably due to a mixed infection—*B. ceylonensis* B and *B. ceylonensis* A.

I am indebted to Sir William Simpson for carrying out the necessary inoculations in rabbits to obtain the specific sera.

I may quote two cases of colitis with fever described by me in 1907.

(1) An Australian medical man, 24 years of age, arrived at Colombo from China in April, 1905. A week before reaching Colombo he began to feel ill with lassitude, headaches, diarrhœa—10 to 15 motions daily with no mucus or blood—irregular low fever. The disease lasted two months. The diarrhœa was followed by a long period of constipation. The convalescence was very prolonged, the patient suffering repeatedly from attacks of nervous tachycardia. A bacillus was isolated which clotted milk and produced acidity, but no gas in many sugars; I gave a description of the bacillus and called it *B. ceylonensis* B. The original strain is still in my possession.

(2) A retired German officer. Strongly built man, 50 years of age. No previous disease of any kind. Began to feel ill with malaise while on board a German steamer during the voyage from Aden to Colombo; irregular rises of temperature; slight diarrhœa. He never felt ill enough to remain in his cabin. As there was a case of enteric on board, the same disease was suspected in this patient, and he was accordingly advised to land at Colombo. During the first three days after landing in Colombo he felt quite well and was getting ready to go up country when suddenly, in the afternoon, his temperature rose to 103·2° F. There was slight shivering, severe headache, diarrhœa becoming a prominent symptom, 12 liquid motions being passed in a few hours. I saw the patient in the evening; temperature 102·4°, pulse 78; no roseola or any other rash; examination of the chest negative; spleen not enlarged; the stools, which were liquid and yellowish, did not contain blood or muco-pus. The fever lasted 16 days longer and its course was very irregular. The pulse always remained slow. The spleen could never be palpated, and roseola spots never appeared. The diarrhœa lasted for three days, and the stools never contained blood. The analysis of the urine was negative. Except during the first four days the patient did not complain of headache or of any serious subjective symptom.

Treatment consisted in the exhibition of the usual intestinal antiseptics and in keeping the patient on liquid diet. From the stools an organism was isolated which clotted milk, slowly produced acidity in glucose, but not in lactose (readings taken on the seventh day). I called the bacillus *B. ceylonensis* A. After several transplantations it became capable later on of producing acidity in a number of sugars, and it may produce slight acidity in lactose after two or three weeks' incubation.

Diagnosis and Distribution.

Diagnosis is difficult; the bacteriological examination of the stools may be negative very many times before metadysentery organisms are found. In the chronic cases what I have found most helpful is testing the blood for agglutination for the principal varieties of the group. My routine procedure is to test the blood of every suspicious case for agglutination for *B. ceylonensis* B, *B. ceylonensis* A, and *B. metadysentericus*. When the agglutination is higher than 1 in 80, as a rule repeated bacteriological examinations of the stools will reveal sooner or later the presence of metadysentery organisms, although, as I have already stated, many examinations may have to be carried out before a successful one is obtained. The stool for examination must be absolutely fresh.

The colonies on MacConkey's agar plates are delicate and after a day or two may have a pinkish or reddish colour.

A very similar chronic clinical syndrome may be found caused by *E. histolytica*; very rarely by bacilli of the true dysenteric group (Shiga-Kruse, Flexner, and Hiss-Russel or dysentery-paradysentery group). Only repeated and thorough microscopical and bacteriological examinations will enable one to make a differential diagnosis.

The condition is a cosmopolitan one; I have studied cases in which the infection was apparently contracted in Ceylon, India, Italy, the Balkans, Spain, France, Germany, the United States, and this country.

Conclusion.

The term metadysentery may be used to indicate a group of colites due to the metadysentery bacilli—viz., bacilli which in contrast to the true dysentery bacilli (Shiga-Kruse, Flexner, Hiss-Russel, or dysentery-paradysentery bacilli) either clot milk and produce acidity in lactose-peptone-water, or clot milk without producing distinct acidity in lactose-peptone-water, or produce acidity in lactose-peptone-water without clotting milk. This group of bacilli includes *Bacillus ceylonensis* A, *B. ceylonensis* B, *B. metadysentericus*, and several others.

In this paper attention has again been called to a chronic type of colitis due to the above-mentioned bacilli which in my experience is far from rare. In this type true dysenteric symptoms with blood and muco-pus in the stool are usually, though not always, lacking. The patient feels tired, nervy, has no appetite, complains of flatulence with occasional attacks of simple diarrhœa followed at times by long periods of constipation. The diagnosis is based on the presence in the blood of specific agglutinins and on the repeated bacteriological examination of the stool.

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SOME POINTS IN THE DIAGNOSIS OF CARDIAC LESIONS IN CHILDREN.

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Children, like patients of all ages, are brought to the physician from time to time for an opinion on the soundness of their hearts. It may be that some symptom, referable at least in the mother's opinion to the heart, has made her anxious; it may be that doubts or aspersions have been cast on the heart in the course of a routine examination at school or elsewhere.

The problem presented is of the greatest possible importance, and it is extremely desirable to reach a definite conclusion and to give an unequivocal opinion. If the heart is the seat of active disease, absolute rest is the first requisite for recovery, and it is wrong that the child should be up and about. If the heart has some congenital or acquired structural defect but healthy musculature, the problem is to determine as nearly as may be its powers and limitations, to explain the situation to the parents, and to plan the child's days so that work, play, and happiness are as little interfered with as possible. If the heart whose healthiness has been called in question is, in reality, sound, the importance of pronouncing it to be so can scarcely be exaggerated. To play for imagined safety by describing a heart of whose condition one is in doubt as "weak," and counselling a vague carefulness, is, in reality, to run the very grave risk of fixing upon the child a lifelong burden of fear, spoiling its happiness and usefulness, and perhaps even of manufacturing a chronic invalid. If there is doubt, as sometimes there is bound to be, the condition should be pronounced doubtful and diagnosis suspended for a limited period until it can be established with certainty. The position once explained and accepted, an interim régime can be prescribed which may be allowed to err on the side of caution, but the necessity of establishing the diagnosis at the earliest possible moment must never be forgotten.

Thus, the problems of cardiology in childhood have a special importance and urgency; first, because the child's heart has far greater powers of recovery and adaptation than the adult's; and, secondly, because the child, more than the adult, is dependent on our judgment; what we say about the heart may have lifelong consequences, and it is our bounden duty to make sure of the truth before we speak.

Although the degenerations in muscle and vessels which complicate the problem after middle life are absent, the position of the heart in the chest is relatively variable and is easily affected by exocardial factors, murmurs of all kinds are commoner than at any other time of life, the heart and blood-vessels are especially sensitive to nervous influences, and the heart muscle, though immune from degenerations, is relatively susceptible to intoxications and inflammations. The liability of children to rheumatism makes it particularly necessary to consider whether any lesion which may be found is active or not.

Investigation of the Case.

No attempt will here be made to describe or classify the many conditions which may be met with. It is intended rather to indicate how investigation can best be carried out, and to discuss the relative value of various symptoms and signs in the child as compared with the adult. The methods of investigation which can be employed are history-taking, physical examination, efficiency tests and instrumental investigation by means of skiagram, electrocardiogram or otherwise—of which direct examination is, in these cases, the most valuable.

The *history* is of less value than in an adult with similar complaints, especially as the greater part of it cannot be obtained from the patient himself. It is important to consider the type of parent who is giving it, and so to form some opinion of the weight which may be attached to the story, and more especially of the kind of influences to which the child is subject at home. If the mother has been told already that the child has a "weak" heart, she should always be asked what, if anything, she noticed to be amiss before this time. In this way it is possible to disentangle the actual features from those which may have been suggested by previous questions or which an anxious parent imagines to be appropriate to the occasion.

Under *family history* inquiry should be made into rheumatism and rheumatic heart disease. A definite history of acute rheumatism, chorea, or valvular disease of the heart in a near relative should be given some weight, but it should be remembered that the expression "rheumatism" when used of adults connotes, in lay parlance, almost any kind of pain not having an obvious cause, and that some form of heart disease or heart failure overtakes many previously healthy people in the late years of their lives. It must also be remembered that acute rheumatism occurs often enough in a single member of a healthy family. It is useful as an aid in the assessment of symptoms to know whether the patient is an only child, the baby of the family, or even the only girl in a large family of boys. Any one of these states has power to produce, and still more to magnify, subjective or functional symptoms.

In the individual child *symptoms* may be many, few, or none, and their value is most difficult to assess. The relevant ones fall into two classes, those of conditions causing cardiac damage and those referable to such damage.

Of the first, the "rheumatic group" is, of course, by far the most important. A definite history of acute articular rheumatism or of chorea is of the utmost significance, and may rightly be allowed to colour our view of doubtful physical signs. A history of tonsillitis, especially if recurrent, and of scarlet fever is also important, but it is questionable policy to search by leading questions for the "minor manifestations" of rheumatic infection. A history of occasional aches and pains, of transient fever, sore-throats, or fidgetiness can be elicited in a large proportion of all children. Whether it emerges probably depends at least as much on the mentality of the mother and child and the outlook of the doctor as on any physical factor, and neither its presence nor its absence should be allowed much weight. A definite account of "growing pains" cannot be ignored, but should not be over-valued in estimating the state of the heart. The insidious type of mitral stenosis, which is suspected far more often than it is found, develops quite independently of any history of rheumatism.

Symptoms referable to the heart itself are fewer and less reliable in children than in adults, and considerable lesions, especially of the mitral valve, may exist without producing any noticeable general effect. In young adults dyspnœa on exertion and œdema of the feet are relatively early and constant symptoms of myocardial weakness; in children both are uncommon, and both, but especially the second, indicate an advanced and serious degree of cardiac insufficiency. The place of dyspnœa as an early symptom is, to some extent, taken by listlessness and disinclination for activity, which, in a child of previously energetic disposition, are somewhat suggestive of cardiac insufficiency. Cyanosis, except in congenital lesions, is also uncommon and of serious import; the same may be said of cough.

There have also to be considered symptoms which parents ascribe to the heart, though the medical man is less likely to do so. Such are præcordial pain, fainting, palpitation, and changes of colour. Of these, it may be said that though any or all of them *may* be due to heart trouble, this is their least common cause. An attempt must be made, however, to explain them and to assess their value, and in doing so, it is of the first importance to discover the circumstances in which the symptom occurred. A faint at the dentist's has a very different complexion from a faint after running upstairs, and, in general, it is true to say that unless brought on by exertion such symptoms do not reflect on the heart's efficiency, and by no means always even then. Thus it often happens that but little help is to be got from history and symptoms, however carefully investigated, and we must turn to the *examination* of the child.

This examination must be thorough and general, and on no account be limited to the heart alone. The child's general aspect is of some importance and assistance. The thin sallow child of poor physique, often with dilated pupils and brisk reflexes, is not a typical rheumatic subject, but is prone to vasomotor disturbances including "functional" murmurs, and also to subjective symptoms arising from introspection and anxiety. The resemblance of these children to one or other parent in both physical and mental make-up is often striking and materially assists diagnosis. If the mother has the same pasty, anxious, and debilitated appearance as the child, but no heart disease, we should be chary of blaming the child's heart for his ill-looks; an inheritance, mental outlook, and environment common to both are much more likely to be the cause.

A child under 5 is unlikely, and one under 3 very unlikely, to have rheumatic heart disease. The typical rheumatic subject is a well-grown, well-nourished, and pleasant-looking girl of 10 to 16 who, unless the infection is active or the heart seriously damaged, presents little appearance of ill-health. If the disease is appreciably active there is almost always some degree of pallor with general listlessness and apathy. The pallor of aortic incompetence and the cyanosis of congenital pulmonary stenosis, and (though much less) of severe mitral stenosis are well known, but there is no facies of minor mitral lesions or of slight myocardial insufficiency. Severe valvular lesions, acquired early in life, gravely impair nutrition and growth.

The condition of the tonsils and tonsillar glands should always be noted, and attention may then be turned to the heart itself. There can be no exception to the rule that every heart should be examined in the erect and recumbent positions, and to this may well be added examination in the left lateral position and after exercise.

Inspection in severe cases may show præcordial bulging, which occurs more readily in children than in adults, and it will generally show whether the heart is acting quietly or excitedly and give some information as to the position, mobility, and character of the apex-beat—information which will be extended and confirmed by palpation. It is not always recognised that the position of the apex-beat is not the same in children as in adults. Until the age of 5 it is generally in the fourth space, with each succeeding year more commonly in the fifth, where it is established by puberty. Not only is it higher than in adults, it is also further out. It is definitely outside the nipple line in the first four or five years of life, in it until the age of 10 and internal to it by 14. It is higher and nearer the middle line when the child is lying down than when he is erect. These variations are associated with the fact that the heart is more horizontal and is relatively larger in childhood than in adult life, and also with changes in the shape of the chest. The point which is chiefly to be noted is that an apex-beat in the nipple line in a child under 14 is not, in itself, evidence of cardiac enlargement or displacement.

Very valuable information about the character of the heart-beat and the presence or absence of hypertrophy is gained by palpation with the flat of the hand, and this should never be omitted. The size of the heart should be judged chiefly by percussion which, in children, with their relatively thin chest walls, gives clear-cut and convincing results. In auscultation, again owing to the thin chest wall, both normal and adventitious sounds are heard distinctly, and murmurs are often diffuse. Reduplication or splitting of either sound is common and of little importance. In young children the pulmonary second sound is distinctly louder than the aortic. This may persist as late as puberty, and in no way supports a tentative diagnosis of mitral disease. The so-called third heart sound deserves attention because it is apt to be mistaken for the mid-diastolic murmur of mitral stenosis. It is heard near the apex of the heart in quite a large proportion of children, and consists of a short sound, occurring in diastole rather longer after the first sound than a reduplication. It is said to be due to the sudden tension of the mitral valve in diastole and has no evil significance. It may be added that normal sounds, quiet, orderly, and of good tone, are strong presumptive evidence of the heart's integrity and should not be lightly disregarded.

Murmurs are responsible for more troubles and difficulties than all other cardiac signs and symptoms put together, and are to be heard in a large proportion of children at one time or another. They may be divided according to their significance into three groups: transient or accidental murmurs which are of no pathological significance, temporary or atonic murmurs due to a relaxation of the normal tone of the myocardium, and permanent or organic murmurs which may be congenital or acquired.

The first are very common, and are notably inconstant and variable. They are systolic in time, usually heard best at the apex or pulmonary base, are not transmitted or accompanied by thrills or by evidence of cardiac enlargement or insufficiency. They vary in loudness but can, as a rule, be distinguished without much difficulty. In cases of doubt, a second examination after an interval will often settle the question.

Atonic murmurs may occur in anæmia or in any toxic or infective state. They are soft blowing sounds, localised, or, at most, conducted for only a short distance. One of the commonest varieties is a systolic murmur, heard at the apex, and due to mitral incompetence. Only the course of events can show with certainty whether this incompetence is due to endocarditis or to a temporary yielding of the mitral orifice. If there is reason to suspect active or recent myocarditis or myocardial intoxication and if the murmur is soft, purely systolic, and not very widely conducted it is wise to assume that it is not due to endocarditis until it proves itself to be so by persisting when the myocardium has recovered beyond dispute. This may take time. Such murmurs may persist in spite of six or eight months' rest in bed, and then disappear completely with the return of full myocardial efficiency.

The classical signs of mitral stenosis—the rough crescendo presystolic bruit with its thrill and slapping first sound—occur only when the lesion is established. In a child the sign of developing stenosis is not a roughening of the first sound, but a mid-diastolic murmur, best heard and sometimes only heard after exercise. It must be searched for with care, and if it be found it is wise to confirm its presence by a second examination, having regard especially to its relation to exercise, before it is made the basis of a definite diagnosis. It must be remembered that a diagnosis of mitral stenosis carries with it weighty and serious implications as to permissible exercise and probable length of life. If it is overlooked when present the child's chance of acquiring compensation may be jeopardised; if it is wrongly diagnosed, a potentially happy and useful life may be changed to one of anxiety and invalidism.

The signs of aortic lesions in children are essentially the same as in adults. They are usually associated with mitral lesions, but are much less common. Pure stenosis is extremely rare. The diastolic murmur of incompetence is easily overlooked; it is soft, sometimes very soft, and is generally best heard to the left of the sternum rather than at the aortic base. A certain amount of incompetence may result simply from loss of muscle tone, but this is much less common than at the mitral valve. When it occurs, it is perhaps most frequently in association with a severe anæmia.

In many cases some form of exercise-tolerance test is necessary in order to gauge the functional efficiency of the heart. A standard exercise should be performed, the manner of its performance be noted, the pulse counted, and the heart examined as with adults, but the result in children must be weighed with caution. Not only is the "normal" pulse-rate far more variable in children than in adults, but it is also more readily disturbed by emotion or excitement. Many children exhibit a tachycardia whenever they are examined, no matter how well they know the doctor, and the acceleration of the pulse after exercise is often obviously due in part to the excitement of performing it and will persist while the feeling of excitement lasts, often for much longer than the standard one or two minutes. In such children the manner of performing the test, the child's colour, and the presence or absence of dyspnœa are the best indications of the heart's response to the effort, and none of these is infallible.

Serious disorders of rhythm are rare in children. Sinus arrhythmia—the rhythmic variation in gear with the respiratory movements—is normal and often marked; a few deep slow breaths should suffice to differentiate it from other forms. It disappears on exercise and in general myocardial infections and intoxications, and its return in these latter cases is a sign of myocardial convalescence. Premature contractions or "extrasystoles" can be identified by the combined use of a finger on the pulse and a stethoscope at the apex. Unless very frequent or elicited instead of abolished by exercise they are of little import. Other disorders of rhythm are, in children, decidedly rare.

In difficult cases, when, for example, the significance or insignificance of an unusual murmur has to be determined and clinical evidence is not conclusive, valuable help may be gained from X rays or the electrocardiograph, but in most cases all pertinent questions can be answered without them.

Summary and Conclusions.

An attempt has been made to indicate the main differences between child and adult cardiology, and to point out some of the problems peculiar to children and how they may be faced.

The diagnosis of fully developed lesions is, on the whole, easier in children than in adults and even prognosis is in some respects less difficult than it becomes after middle life, but the problem of the early developing lesion is at times one of great difficulty. To form an opinion on the state of the heart at the moment of examination may not be hard, but there will arise in the mind the question "is this heart the seat of active infection—is this slight abnormality the first sign of serious trouble?" To answer this question a thorough and general investigation of the child and his history will be necessary, and in some cases a period of observation while the diagnosis remains in doubt cannot be avoided. Such cases are, however, the exception and not the rule. In very many cases brought up for decision the diagnosis of "healthy heart in a healthy child" can be made with confidence. In another group the nature and degree of cardiac damage can be stated with reasonable certainty, present infection excluded, a suitable régime instituted, and a watch kept for any recurrence of active trouble. In doubtful cases the necessity for reaching a decision at the earliest possible moment should never be forgotten.

The insidious nature of the rheumatic infection and the variety of its manifestations has lately been emphasised and even advertised. Parents, teachers, and others responsible for the health of children take early and serious note of fidgetiness and limb pains (though perhaps less than they might of febricula and tonsillitis). The doctor, knowing well what damage rheumatic infection can do is tempted to an attitude of extreme caution. This is, from one point of view, amply justifiable, but it must be remembered that while childhood is the time when rheumatic infection does its worst, it is also the time when accidental and insignificant murmurs are commonest and the pulse-rate most variable and easily disturbed, and further, it is the time when character and mental outlook are being formed. Six months of rest in bed to recover from cardiac dilatation may prove to be soundly invested; six months of doubt and caution with restrictions of exercise and play in an atmosphere of anxiety are unlikely to stay the progress of an insidious carditis, but are well calculated to sow the seeds of a cardiac neurosis difficult or impossible to eradicate.

ROYAL LONDON OPHTHALMIC HOSPITAL.—The annual report of this institution, which is still commonly spoken of as "Moorfields Eye Hospital," although 30 years have elapsed since it was removed to the City-road, shows that last year closed with a credit balance, after an expenditure of £31,607. There were 2581 in-patients who stayed, on the average, 16 days and cost £6 10s. 8*d*. each; there were 45,000 new out-patients who cost 6s. 3*d*. each. Considerable extensions are now imperative, including enlargement of the out-patients' department, accommodation for private patients, and additional nursing staff, and extension of the medical school and laboratories.

THE RADIOGRAPHIC AND MICROSCOPIC APPEARANCE OF
INFECTION OF THE TEETH AND THE SURROUNDING TISSUES.

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THE introduction of X ray examinations has provided the clinician with an additional and very valuable eye as an aid to diagnosis and prognosis. To obtain the greatest value from such examinations the radiologist should act as one of a team. The interpretation of dental radiograms is not easy. There are so many factors causing distortion of the images—the curving of the film in the mouth and the angle of incidence of the beam of X rays on the film when it is being activated. Add to this the wide range of variations of the dental arches and palates of different individuals, and it will become obvious that only the most painstaking technique is likely to lead to satisfactory results. Here, almost more than in other branches of radiography, the slogan "Only the best is good enough" applies.

Tables, setting out the angles of incidence for the beam of X rays upon the film for the various teeth, must be inaccurate, considering the wide variations of individuals. This angle must depend also upon the tilt of the patient's head. Only by experience and practice then is it possible to produce accurate representation of the teeth and surrounding tissues upon the films. Fortunately, it is easily possible to obtain clarity of detail, for the film can be placed in very close apposition to the objects under examination and there is a minimal amount of extraneous matter to be traversed by the beam of X rays in its passage to the film. Only the interposition of the nose, in the case of the upper incisors, and of the malar bone in the case of the upper molars, materially obscures this clarity.

The production of radiograms of fine detail, then, enables minute variations from the normal or healthy to be quickly and surely recognised, and it was with the purpose of proving that the radiographic interpretation of these alterations was true that the investigations about to be described were carried out. The radiographic appearance of infected bone in osteomyelitis and tuberculous disease is established and proved. The changes which occur in the bones of the jaws when these are infected from the mouth are essentially the same, although in the vast majority of cases the process is much more chronic. Yet the fine detail of a dental radiogram renders the detection of even small localised patches of infected bone quite possible.

The alterations produced in the bone as the result of infection are three: 1. Thickening of the trabeculæ with concomitant reduction in size and shape of the intertrabecular spaces—i.e., sclerosis. 2. Rarefaction of the trabeculæ with the necessary enlargement of these spaces. 3. Destruction varying from the loss of a few of the bony trabeculæ to the production of macroscopic cavities in the bone.

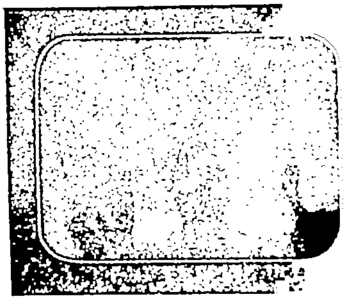
Sclerosis may be regarded, generally, as a defensive reaction of the bone to the advance of the infection. Rarefaction and destruction, then, will be regarded as a comparative lack of defensive power of the bone to the advance, due either to relative weakness of the tissues or to relative strength of invasion.

The investigations which were carried out to prove these points, although numerically weak, were valuable in that they were consistent with clinical evidence and with themselves, and they may stimulate others to carry on the experiments. There are eight cases. Small pieces of bone of the alveolar process were removed from around teeth, said to be infected upon X ray examination, by a small trephine of about three millimetres, mounted in the handpiece of a dental engine.

The preparation of the specimens was as follows. 1. Fixation in 40 per cent. formalin in physiological salt solution. 2. Fixation and decalcification in Bouin's fluid for two to three days. 3. Embedding in paraffin. 4. Cutting and mounting. 5. Staining with (*a*) hæmalum and eosin; (*b*) hæmalum, eosin, and saffron; (*c*) Gram's stain.

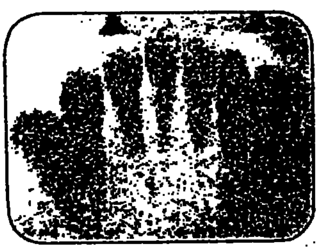
Specimen 1, taken from the dried skull of a dog, was decalcified with trichloracetic acid. The staining by hæmalum, eosin, and saffron brings out fibrous tissue more clearly. Gram's stain was used in the hope of demonstrating some micro-organisms in the deep bone. No attempt was made to produce cultures, for the technique of removing the bone was not sufficiently rigorous to exclude the possibility of contamination from the tissues of the mouth. All the cases were examined by dental radiograms before removal of the piece of bone.

FIG. 2.



Sclerosis around an infected cyst. The periodontal membrane is thickened and the lamina dura is absent. The trabecular network is replaced by compact sclerotic bone.

FIG. 3.



The lower incisors of a patient suffering from a "toxic" heart. The lamina dura is absent, the periodontal membrane is irregularly thickened, the trabeculæ are hazy, and tracks can be seen leading from the roots to the deeper bone.

Description of Specimens.

1. A fragment of bone, taken from the dried skull of a dog which had been the subject of marginal osteitis. Radiographically there is extensive loss of bone about the necks of the teeth. A mild sclerosis is noted around the apices of the roots. The radiograms are unnaturally clear owing to the lack of soft tissues. The site of the removal of the bone was at some distance from the margin. Under the microscope the bone tissue appears normal, except that, having been preserved dry, the marrow tissue is shrunk. Animals rarely show symptoms of deep bone infection.

2. A fragment taken from bone surrounding an infected cyst. Radiographically the bone is densely sclerosed, and the shadow of the lamina dura is lost in this sclerosis. The trabecular shadows are hazy, and the intertrabecular spaces are rounded (Fig. 2). Microscopically the bone trabeculæ are broader than usual. They show parallel striæ, as though fresh deposits of calcium salts had been laid down. These striations resemble the formations seen in tree trunks. The osteogenetic cells are normal, so that these lines of "secondary calcification" only accentuate the normal appearance. In the marrow there is abundance of fibrous tissue infiltrated with lymphocytes. Osteoclasts are numerous at the borders of the trabeculæ. In places they lie in little "niches" in these structures.

3. A fragment taken from around the lower incisors of a patient suffering from a "toxic" infection of the heart. Radiographically the summits of the interdental septa are destroyed, and there is little reactive sclerosis. The shadows of the lamina dura are indistinguishable, and the periodontal membrane shadows are irregularly thickened. The trabecular shadows are fine and hazy, and tracks are to be seen leading from the roots downward to the deeper bone (Fig. 3). The slides show a piece of bone with the periodontal membrane and a fragment of root. The trabeculæ show some rare deposits of "secondary calcification." The bone cells appear healthy, and are of average numbers. In the marrow the blood-vessels appear dilated and contain numerous polymorphonuclear leucocytes. These are situated against the walls of the vessels, and in places have traversed the walls and are lying in the surrounding tissue. At the borders of the trabeculæ the osteoclasts are numerous and in places are situated in "niches," apparently eaten into the bone. The cement and dentine of the tooth do not exhibit any pathological abnormality, and staining by Gram did not reveal any micro-organism.

4. A piece of bone taken from around the apex of an infected tooth. Radiographically the point of a broach, which had been passed through the apex, is seen. The trepanning was undertaken to remove this. At the apex is an area of "rarefaction," surrounded by dense hazy sclerosis. The shadow of the lamina dura is absent and the periodontal membrane is much thickened and irregular. The fragment of cement and dentine removed do not reveal any pathological change under the microscope. The bone is partly compact and partly cancellous. The trabeculæ do not show any "secondary calcification"; there is some increase of fibrous tissue in the marrow and also a slight general infiltration of lymphocytes. Osteoclasts, situated around the borders, are not numerous. In the periodontal membrane at the apex is an abundant accumulation of lymphocytes, and the limits of the bone are irregular. Staining by Gram was negative.

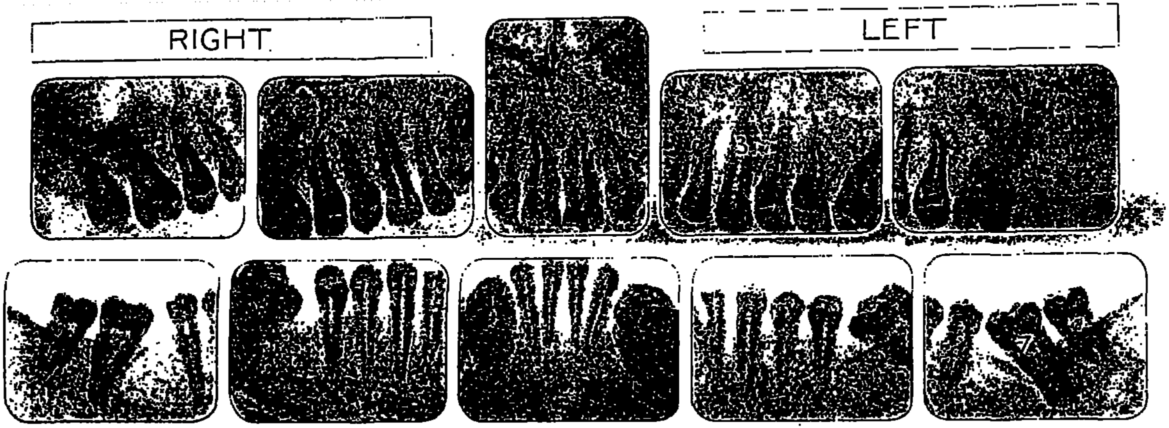
5. A fragment of bone removed during apicectomy. It was taken at a distance of about three millimetres from the apex. Around the apex the bone is sclerosed and hazy in the radiograms, and the intertrabecular spaces are rounded and diminished in size. There is little microscopical alteration in the bone cells, and the trabeculæ do not show any change. The periodontal membrane also is normal. In the slide stained by Gram, although no organisms were detected, there is a definite diffuse infiltration of lymphocytes in the bone-marrow. The slides were prepared from different areas of the specimen.

6. A fragment of bone taken from the edentulous jaw. The teeth had been removed two years previously. The trabecular shadows are thickened in places, but still hazy. A compact covering layer has not yet formed upon the surface of the alveolar process, an indication that healing is not yet complete. The bone cells are microscopically normal. The trabeculæ are thick, and lines of "secondary calcification" are well shown. The marrow tissue is invaded by excess of fibrous tissue. In places this is arranged in dense bundles. Where this tissue looks younger there is augmentation of the capillaries and a generalised infiltration of lymphocytes. At the borders of the trabeculæ the osteoclasts are in excess, and are often to be seen lying in little bays in the bone.

7. A fragment taken from the bone surrounding an infected cyst. The trabecular shadows are hazy and the limiting margin of the cyst ill-defined. Osteoblasts are numerous in the bone, in which are noted lines of "secondary calcification." In the marrow there is an increase of young fibrous tissue, and in places an infiltration of lymphocytes. Staining by Gram was negative.

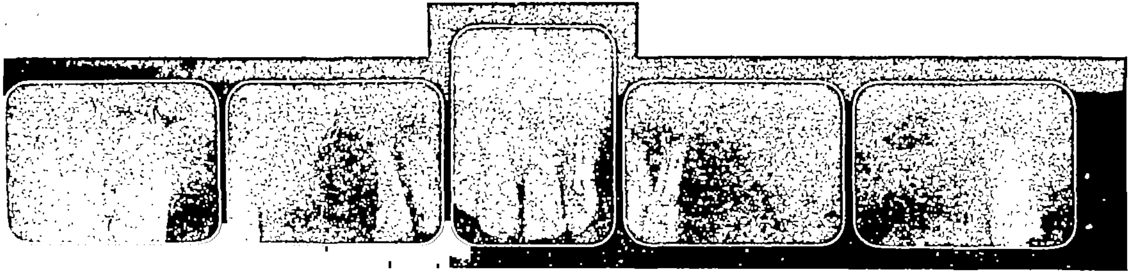
8. A fragment of bone taken with the tooth in extraction from a jaw the subject of osteitis deformans. In this series of radiograms (Fig. 4) the contrast with those of the normal bone is very striking (Fig. 1). The bone has lost its characteristic reticulate form and has acquired an appearance best described as that of ground glass. The roots of many of the teeth are exostosed, and the shadows of the lamina dura have disappeared. In spite of the bulbous roots, the teeth were easily removed by the dentist. The bone was soft and "springy" in consistence. Under the microscope the bone has a quite particular appearance. The trabeculæ are short, as if broken, and appear to have been invaded by medullary spaces. Some few lines of "secondary calcification" are still noted, and in places the trabeculæ are invaded and replaced by fibrous tissue, well shown by staining with saffron (Fig. 5.) The bone cells appear normal, but in the fibrous tissue the cells are shrivelled or lost. Normal marrow is completely absent and is replaced by large spaces, having a rounded and irregular cystic formation. The lining of these cysts is composed of fibrous tissue which in some parts is placed against the bone trabeculæ, while in other parts osteoclasts intervene. Where the bone is replaced or apparently being replaced by fibrous tissue osteoclasts are numerous, and are sometimes seen surrounded by this fibrous tissue, in which is a mild infiltration of lymphocytes. Coloration by Gram proved negative.

Some Notes on Case 8.—Aged 56, this patient came for routine examination of the teeth and jaws. Up till then



Complete survey. Each tooth is shown clearly at least once. There is some destruction of the summits of the interdental septa, particularly of the posterior teeth, with accompanying sclerosis. A small area of localised hazy sclerosis is to be seen at the apex of |3. There is well-marked hazy sclerosis also of the bone surrounding the roots of |7. Elsewhere the supporting bone is fair.

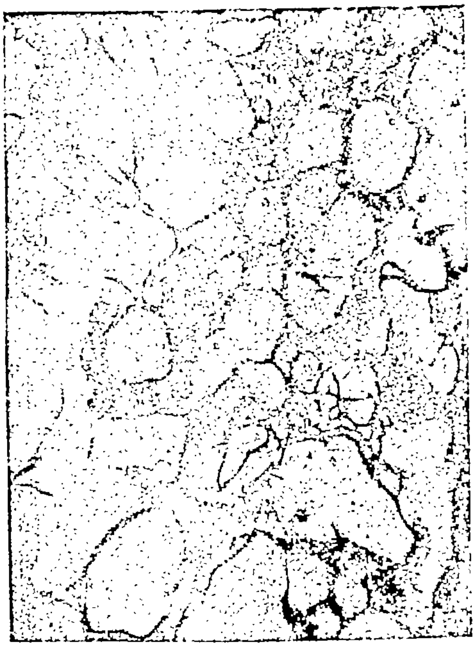
FIG. 4.



Radiograms from a jaw affected by osteitis deformans. The bony tissue looks like ground glass, the lamina dura is absent, and the periodontal membrane is irregularly thickened. The contrast is striking between this bone and that shown in Fig. 1.

there was no suspicion of osteitis deformans and the only clinical sign, albeit somewhat remote, that could be elicited was that her brother had remarked that she had become "bow-legged." Examination of the limbs by X rays did not reveal any curving of the bones, but there may have been slight alteration of the shape of the necks of the femora.

FIG 5.



Microphotograph of cancellous bone. × 90. The trabeculæ are irregular and the medullary spaces have undergone a cystic transformation.

The skiagram of the skull showed a suspicious thickening of the vault, but the change was not sufficient to warrant a diagnosis upon that alone.

The slide (Fig. 5) does not show all the characteristics of bone subject to this disease, perhaps because the change is very early, and also because the bone is infected.

In Specimen 1 there were no signs of inflammation in the bone, and the radiographic appearance was brilliantly clear. In Specimens 2, 4, 5, 6, and 7 there was lymphocytic infiltration of the marrow, excess of osteoclasts, and the delicate network of the bone had become more coarse and the trabeculæ thickened and hazy. Where the bone trabeculæ had become thickened the so-called lines of secondary calcification appeared. In Specimen 3 there was an osteoporosis. The bone trabeculæ are finer. The infiltration of the bone-marrow by polymorphonuclear leucocytes is an indication of a more acute inflammation. In Specimen 8 normal bone-marrow was absent. The bone trabeculæ were short and in certain sites replaced by fibrous tissue. In this case the lymphocytic infiltration warranted the removal of the teeth. The radiographic image of the alveolar bone in this disease has an appearance quite particular. It resembles that of ground glass.

Conclusions.

1. None of the slides revealed micro-organisms. Perhaps bacteriological culture would be necessary to establish their presence.

2. The osseous lesions are those that result from inflammation.

3. The radiographic appearance corresponding to the inflammatory lesions are: (*a*) Sclerosis, when the trabeculæ present the so-called lines of secondary calcification. (*b*) A haziness of the trabecular shadows when the microscopic examination revealed the signs of inflammation. (*c*) This inflammation is accompanied by sclerosis when the inflammation is chronic. On the contrary, when the inflammation is acute sclerosis is absent.

4. The histological and radiographic examinations correspond in general with the clinical findings.

5. The particular image of the bone in the dental radiograms of the case of osteitis deformans may permit of an earlier diagnosis of this malady.

CHORDOTOMY IN THE TREATMENT OF OSTEOARTHRITIS OF THE HIP.

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OSTEOARTHRITIS, particularly when it affects the hip-joint, is one of the classical diseases of old age, and it is often difficult to treat when palliative measures have failed and the patient is crippled with pain and deformity.

It is essentially a senile degeneration of the joints characterised by atrophy and eventual disappearance of the articular cartilage in the centre of the joint, with hypertrophy leading to the formation of osteophytic outgrowths at the periphery. It is therefore a true arthritis *deformans*, but unfortunately this term has been used to include other conditions besides osteoarthritis. As will be seen presently, the age of the patient is not the sole factor in determining this "senile" type of degeneration, and osteoarthritis, particularly of the monarticular traumatic variety, is often seen in comparatively young subjects. But most of the patients are at least middle-aged or elderly and, it may be remarked, unsuitable for drastic surgical operations upon the affected joints.

During life the joints are not passive pieces of mechanism, but living structures which react to use like other living tissues. Every functional use of a joint is in a sense an injury—that is, friction and pressure tend to wear away the opposed articular surfaces. This normal wear and tear is at once made good by the increased blood-supply and nutrition which always accompanies function in normal tissues; hence the balance between wear and repair is dependent upon an adequate vascular response to function. If for any reason the vascular response in a joint is deficient, so that the process of repair is not equal to the demands made upon it, the joint simply begins to wear out and the cartilage becomes worn away where the friction and pressure are greatest. But the products of degeneration act as irritants to living tissues, so that in addition to degeneration in the centre of the joint there is also irritation, which makes itself evident in hypertrophic changes at the periphery where the blood-supply is still abundant.

Thus the characteristic features of osteoarthritis are degeneration leading to atrophy, erosion, and eventual disappearance of the cartilage in the centre of the joint, and hypertrophy leading to the formation of osteophytes at the periphery.

In old people the vascular response to function is less efficient than in the young, and often the power of repair is insufficient to make up for the normal wear and tear in a joint, so that the joint begins to wear out. Osteoarthritis is then a polyarticular affection beginning more or less simultaneously in many joints, although usually some of the larger joints, such as the hips, shoulders, or knees, are most obviously affected first. Naturally, any condition which greatly increases the wear of a joint, such as over-use, excessive weight-bearing in the case of the lower extremities, or repeated injuries, may predispose to or initiate the onset of osteoarthritis. So also any condition which enfeebles the vascular response—for example, arterio-sclerosis, endarteritis, or other circulatory disorder—may do likewise.

It has already been remarked that "senile" degeneration is not necessarily confined to the aged, and that anything which permanently interferes with the blood-supply of a joint may bring about similar changes at a much earlier age. Thus injury sufficiently severe to produce lasting effects is a common cause of monarticular traumatic osteoarthritis.

Lastly, osteoarthritis may be superimposed upon other forms of chronic joint disease, such as rheumatoid arthritis, for precisely the same reason, and failure to recognise this sequence has led to endless confusion between these entirely different diseases. There is no evidence whatever that osteoarthritis properly so-called is due to any infective or toxic agency.

Treatment.

From the very nature of the disease it is obvious that there is no actual cure for osteoarthritis. Exacerbations of pain and stiffness may occur from time to time and subside with or without treatment. But the fundamental pathological changes in the joints are *permanent* and slowly progressive.

Treatment consists in (*a*) palliative measures for the relief of pain and stiffness, and (*b*) surgical operations also for the relief of pain, or less often for the correction of deformity. Palliative measures, comprising various forms of physiotherapy and hydrotherapy, all resolve themselves into different ways of producing an increase of the local blood-supply, and their effects usually last just so long as the treatment continues, or a little longer. Many cases of osteoarthritis have their teeth, tonsils, and appendices removed without benefit to their arthritis, while vaccine therapy, founded as it is upon an erroneous conception of the disease, is equally futile.

It would seem rational to take the body-weight off a painful hip-joint that is wearing out. But elderly patients, especially if they are fat and heavy, do not take kindly to a calliper splint, and the relief so obtained seldom compensates them for the added discomfort.

In the earlier stages of the disease, before there are marked osteophytic outgrowths, much of the pain and stiffness may be due to fibrous adhesions at the periphery of the joint, and in some such cases a great improvement may be secured for a time by forcible manipulation under an anæsthetic.

Operative Treatment.

When palliative measures have failed, and the patient is crippled with pain and deformity, operative treatment may be indicated despite the fact that many of these patients are poor subjects for surgical interference. Practically only two operations are performed nowadays for the relief of painful osteoarthritis of the hip—namely, arthrodesis or destruction of the joint, and arthroplasty or reconstruction of the joint.

It is generally agreed that arthrodesis is the surest way of relieving pain in the joint. As usually performed, it is a very severe operation, entailing disarticulation of the head of the femur, the removal of the articular cartilage from both the head and the acetabulum, the replacement of the head, and prolonged fixation of the limb in plaster afterwards. Even then it is by no means assured that bony ankylosis will follow, although the pain is usually relieved. The modification of arthrodesis described by Albee consists in removing approximately the upper one-third of the femoral head by a horizontal cut, leaving a flat surface which is then brought into contact with a corresponding flat surface cut with a chisel in the roof of the acetabulum. This operation looks very simple on paper—for example, in a flat skiagram—but most surgeons have found that it is impossible to bring the two cut surfaces into contact without either reducing the diameter of the head of the femur or considerably enlarging the acetabulum.

Arthroplasty or reconstruction of the hip, as it is now the fashion to call it, is an attempt to form a new joint which shall be reasonably painless and yet retain some useful movement. The classical operation of J. B. Murphy has not yet fulfilled the hopes which he and others entertained for it. The operation now usually performed consists essentially in excision of more or less of the head of the femur and transplantation of the great trochanter to a lower level on the shaft of the bone, so as to give greater leverage to the muscles attached to it. It is by no means a trivial operation in an elderly patient, and the results as regards both the relief of pain and the preservation of useful movement are uncertain.

The operation described by Robert Jones for producing pseudarthrosis at the hip without disarticulation of the head of the femur is seldom performed nowadays. It may give relief of pain, but at the cost of great instability. Excision of osteophytes from the periphery of an osteoarthritic joint (cheilotomy) is utterly useless; it does not relieve either pain or stiffness.

From the foregoing considerations it is clear that the accepted treatment of osteoarthritis of the hip is extremely *unsatisfactory, there being no middle* course between ineffective palliative treatment and drastic surgical operations for which the majority of the patients are entirely unsuited. This has induced me to approach the subject from an entirely different point of view—namely, the relief of pain regardless of its local origin.

Chordotomy.

Clinically, the dominant feature of osteoarthritis is pain. Pain drives these cases to the surgeon, and pain is almost the sole indication for drastic operations, such as arthrodesis or arthroplasty in this disease. If sensibility to pain is abolished in an osteoarthritic joint, the patient is not only relieved of his suffering immediately, but he is enabled to recover much of the mobility which hitherto has been prevented by pain and muscular spasm. Sensibility to pain can be completely and permanently abolished by section of the anterolateral (spinothalamic) tracts in the spinal cord at a level above the entrance of the nerve roots from the affected part. By this operation the temperature sense is also abolished, but that is a small inconvenience if the patient is warned not to burn himself accidentally afterwards. Tactile sensibility is not interfered with.

To those who are not familiar with spinal surgery it may appear that this is an operation at least as severe as those which have been considered above. But actually it is not so. The removal of at most two or three laminæ in the dorsal region of the spine can be done with hardly any hæmorrhage and with the minimum of shock, even in an elderly patient, while the section of the cord is not necessarily attended with any serious risk. As compared with operations like arthrodesis and reconstruction of the hip, chordotomy is far less disturbing to the patient, while the results hitherto have been remarkable.

1. Man, aged 60. Fell on left hip three years ago; was not laid up, and had no treatment except rubbing with liniment. Hip has been painful and getting progressively worse ever since. Walks with a pronounced limp. Left great trochanter somewhat raised and prominent. Flexion of left hip limited to 40 degrees; rotation and abduction absent. Constant pain. X rays show advanced osteoarthritis of left hip. Operation, April 18th, 1929: chordotomy. Right spinothalamic tract divided at level of fifth dorsal vertebra. Result: complete loss of sensibility to pain up to level of left costal margin. Movements of left hip much increased and quite painless. Discharged May 18th, walking well.

2. Man, aged 40. History of contracted hips following typhoid 27 years ago. Has scar of old abscess over right great trochanter; otherwise right hip is apparently normal. Complains of gradual onset of pain and stiffness in left hip for five years. Is now in constant pain. Walks with pronounced limp. Left hip palpably enlarged; all movements very much restricted and painful. X rays show chronic arthritis with gross enlargement of head of left femur and acetabulum. Operation June 11th, 1929: chordotomy. Right spinothalamic tract divided at level

of fifth dorsal vertebra. Result: complete loss of sensibility to pain up to left costal margin. Left hip can be manipulated vigorously without pain. Movements much freer. Discharged July 10th, walking well.

Conclusions.

A great many people are going about in more or less constant pain and disability from osteoarthritis of the hips and other joints of the lower extremities. After spending a considerable part of their lives and fortunes in seeking relief from palliative treatment many of them seek surgical advice on account of the continued pain and disability. The forms of surgical intervention hitherto available—namely, arthrodesis and arthroplasty—are far too severe for most elderly patients, and it is usual to advise operation in such cases only when the pain is intolerable and something must be done. Chordotomy affords a means of giving immediate, complete, and permanent relief from pain in these cases without interfering with the hips or other joints.

It is not suggested that chordotomy is a trivial operation which can be lightly undertaken in all cases. But it is a much less severe operation than either arthrodesis or arthroplasty, and since it accomplishes the same object—namely, the relief of pain—more surely and with less risk, I venture to think that it may become the operation of choice in some of these cases.

Clinical and Laboratory Notes.

THE RELATION OF CAROTIN TO VITAMIN A.

By Thomas Moore, D.Sc.

(*From the Medical Research Council's Nutritional Laboratory, Cambridge.*)

In an earlier paper[1] in The Lancet I supported the claim of Euler, Euler, and Hellstrom,[2] that the pigment carotin, even after many recrystallisations, possesses physiological action similar to that of vitamin A. Duliere, Morton and Drummond,[3] using a fat-free basal diet, subsequently failed to confirm this view, but further investigations by the writer[4] and by Collison, Hume, MacLean and Smith,[5] in both of which basal diets containing fat were used, furnished a weight of evidence in favour of the intense activity of the pigment, even when in the purest form obtainable.

Notwithstanding such high activity, it has been obvious to all investigators that carotin cannot possibly be identified with the familiar form of vitamin A found in cod-liver oil. To reconcile the common physiological action of substances so different, Euler and his colleagues have suggested that vitamin A activity may not be the special property of any individual molecule, but may be possessed by several molecules of the carotinoid type. The factor present in cod-liver oil, for example, may well be a carotinoid derived from marine algæ, or possibly a hydrocarotinoid. On seeking support for this hypothesis, however, Euler, Euler, and Karrer[6] have found that out of numerous substances investigated—only carotin and dihydro-α-crocetin (a polybasic acid obtained by the reduction of crocetin, a pigment of saffron) possess growth-promoting power.

The case of dihydro-α-crocetin is surprising, and its discussion may well be postponed until confirmatory evidence has been put forward. With regard to carotin and vitamin A, however, my preliminary experiments, recorded below, have indicated the possibility that the pigment may not independently exert the same action as the vitamin, but that it may act as a precursor capable of giving rise to the vitamin in vivo.

Euler, Euler, and Karrer[7] have claimed that when carotin is administered to rats above a certain level it is stored in the liver unchanged. An examination of the liver fats of rats which had received excess of carotin has led the writer to a different conclusion. Albino rats (litter mates), employed in an experiment to demonstrate the absence of vitamin D in carotin, were placed upon the Steenbock rachitogenic diet No. 2965,[7] and were given daily graded doses of a sample of carotin (M.P. 174° in air), which had been prepared from carrots and recrystallised five times from chloroform by the methyl-alcohol method. At the conclusion of the experiment, which lasted 36 days, the livers were minced, digested with 5 per cent. caustic potash, and extracted with ether. The liver fats were obtained by washing, drying, and evaporating the ethereal extracts, and were analysed for carotin and for vitamin A by colorimetric and spectroscopic methods. The data obtained are shown in the Table.

Rat No. Maximum weight.	Daily dose of carotin (mg.).	Total colorimetric units ingested by rat.		Total colorimetric units found in liver.		Total yellow units to be expected in liver if blue chromogen were carotin.
		Blue units in $SbCl_3$ reagent at 590 μμ.	Yellow units in $CHCl_3$.	Blue units in $SbCl_3$ reagent at 610-30 μμ	Yellow units in $CHCl_3$.	
♀ 1 (114 g.)	Nil	Nil	Nil	100	11	1100
♂ 2 (126 g.)	0·0001	0·6	6·6	100	10	1100
♂ 3 (143 g.)	0·001	6	66	100	10	1100
♂ 4 (150 g.)	0·01	60	660	200	11	2200
♂ 5 (132 g.)	0·1	600	6,600	250	14	2750
♂ 6 (140 g.)	0·75	1500	19,500	550	45	6050

Attention may first be directed to the striking case of rat No. 6, which received carotin at the high level of 0·75 mg. daily. Although this amount of pigment, if absorbed unchanged, would have been sufficient to render the whole rat intensely yellow, it is noteworthy that on autopsy the body fat was found to be as colourless as that of control animals. Even in the liver fat only feeble yellow pigmentation was observed, but on the other hand an unusually intense reaction was given with the antimony trichloride reagent. Since the absorption band observed spectroscopically in the blue solution was situated at 610-630 μμ (characteristic of vitamin A) and not at 590 μμ (characteristic of carotin), strong evidence was afforded that a proportion of the pigment had been transformed in vivo to vitamin A.

This possibility is supported by the other results obtained. The colorimetric units adopted represent those amounts of material which when dissolved in a cube of 1 cm. side of either chloroform or the antimony trichloride reagent would produce colorations equivalent in depth to 1·0 Lovibond unit (yellow or blue respectively), when viewed through the cube. 1 mg. of carotin under these conditions contains 1800 yellow or 165 blue units. It will be seen at once that in the case of Nos. 2 and 3, to which carotin was administered at less than the minimal physiological dosage, no opportunity for storage was afforded, and the blue unit contents of the livers of these rats did not rise above the level of the negative control rat No. 1. In the case of all three rats (Nos. 4, 5, and 6), which received carotin in excess of the minimal dose, decidedly higher values in blue units were observed, but no appreciable increases in yellow units, such as must inevitably have accompanied the storage of carotin, were observed. This evidence, considered in conjunction with spectroscopic data, makes it plain that the high values in blue units shown in these cases were due to vitamin A.

The above experiments indicate clearly that carotin does not appear unchanged in the liver of the rat in more than minute traces, even when large excess of the pigment is ingested. A strong temptation must exist to connect the disappearance of the pigment with the formation of the vitamin. This important question is being put to test in more extensive experiments in which it is hoped that dangers due to irregularities in storage, or complications arising through the conservation of the rat's original store of vitamin by the preferential use of the added carotin, &c., may be ruled out. For the present justification must exist to suspect all estimations of carotin which are based purely on data obtained by the use of the antimony trichloride reagent without the support of spectroscopic data and estimations of yellow pigmentation.

Conclusion.

The ingestion of excess of carotin by the albino rat leads to no increase of the pigment in the liver, but to a great intensification of the colour reaction for vitamin A.

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A CASE OF "POST-VACCINAL ENCEPHALITIS."

BY G. N. GROSE, M.R.C.S. ENG.,
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THE following is an account of a fatal case of encephalitis following vaccination recently admitted to St. George's Hospital:—

The patient, a boy of 14, passed the medical examination for the Post Office service in June of this year. He was vaccinated for the first time on July 30th; Government calf lymph was used but no other person was vaccinated at the same time. Four insertions were made, three of which "took well." His doctor examined him on August 8th and found the vaccination to be pursuing its normal course. The boy's father says that on the 9th he complained of headache and was constipated. Stiff neck and pain in the chest on deep respiration followed and continued for two days. On the 12th the headache was much worse. He became drowsy and this drowsiness increased till his admission to St. George's Hospital the same evening.

On admission the temperature was 103·4° F., the pulse-rate 104, and the respiration-rate 30. The boy was flushed and the whole body surface felt hot and dry. He was very drowsy and made no attempt to understand or answer questions. He opened his eyes from time to time, groaned faintly, rolled his head from side to side, and appeared to resent examination. There was no head retraction but definite stiffness was present in the neck muscles and erector spinæ. The pupils were equal in size, partly dilated, and reacted briskly to light. The fundi appeared normal but the discs were slightly inflamed.

The upper limbs were held in an attitude of flexion with occasional spasmodic movements and muscular twitchings. Both limbs were spastic and all tendon reflexes were greatly exaggerated. *The lower limbs were flaccid*, the right more than the left. Tendon reflexes were only feebly present. Plantar responses on both sides were equivocal. Kernig's sign was present on both sides. The abdomen was retracted and slightly resistant. Reflexes were present. There was no bladder distension and neither liver nor spleen was palpable. The heart was slightly dilated and a soft blowing systolic murmur was audible all over the præcordium. Nothing abnormal was detected in the lungs.

Vaccination marks were present on the left upper arm and appeared to be normal; of these three had "taken" and were surrounded by some petechial hæmorrhages.

The cerebro-spinal fluid on admission was *under moderate pressure* and clear. Dr. E. L. Hunt's report on it was as follows: "Colourless fluid; marked excess of cells in centrifugalised deposit, polymorphs about 80 to 90 per cent. No organisms found; globulin—no excess; albumin—excess, opaque cloud; sugar—well-marked reduction, about normal = 0·085 per cent."

Course of the Illness.—On August 13th drowsiness had advanced to coma. Pupils were still equal and active and there was no squint. Fine fibrillary twitchings were visible from time to time in both masseter muscles. There was complete flaccid paralysis of the right leg. In the left leg only the knee-jerk could be elicited and on attempting to obtain a plantar reflex the whole limb was drawn up slowly. The abdominal reflexes were present only in the upper right quadrant. The cremasteric reflex was absent. The bladder was distended and there was slight incontinence of urine. Urine drawn off by catheter contained nothing abnormal. The temperature rose to 106·5° F. at night and the respiration-rate to 36. There were no physical signs in the lungs. The resting blood-sugar was 0·188 per cent., and the blood-urea 0·037 per cent.

At a second lumbar puncture the fluid was found to be under less pressure than previously. Dr. R. B. Hervey Wyatt reported that it was "slightly tinted and blood-stained fluid. Sugar present in normal amount; globulin—faint haze; albumin—slight excess. Excess of cells—chiefly polymorphs; many lymphocytes also present; no organisms seen."

On August 14th the coma was deeper. The temperature fell during the day from 106° to 103°. The patient had incontinence of fæces but not of urine. There was complete flaccid paralysis of both lower limbs and the upper limbs were less spastic. Pupils were still equal and reacted to light but were smaller; there was no squint. The neck muscles and erector spinæ were less stiff. A hard, red swelling, size of a tangerine orange, appeared over the left sacro-iliac joint. Several erythematous patches were also present on other parts of the body. No hæmorrhages were seen in the buccal mucous membrane or fundi. Considerable œdema of the prepuce appeared. Respirations became slow and sighing at night.

At a third lumbar puncture the fluid was under greater pressure than on August 12th and more deeply blood-stained. Dr. Hunt reported: "Fluid contains a little *macroscopic* blood. After centrifuging the fluid the supernatant fluid has a distinct faint yellow colour. Centrifugalised deposit—mostly blood; the leucocytes present do not seem more numerous than would be accounted for by the blood present; the percentage of lymphocytes is rather high. No organisms found. Sugar—present, about normal; globulin—no excess; albumin—excess, opaque cloud. Urea = 0·06 per cent. No growths were obtained on any of the cultures made from the specimens of cerebro-spinal fluid.

On August 15th the boy was considerably weaker. Urine obtained by catheter contained a trace of albumin and blood. The pupils were contracted and fixed. The fourth lumbar puncture yielded only 1 c.cm. of blood-stained fluid not under pressure. A swab taken from the vaccination marks yielded no growth on culture. Blood culture was negative.

The boy grew rapidly weaker and died in the afternoon.

Post-mortem Appearances.—The body was examined 10 hours after death. Heart: some dilatation of both auricles; otherwise healthy. Lungs: a few petechial hæmorrhages under the visceral pleura on the left side and some degree of congestion at the bases of both lungs. Liver: slightly congested; otherwise healthy. Spleen: larger than normal and congested but soft. Kidneys healthy. Bladder distended with urine.

There was no flattening of the surface of the brain but all the vessels were intensely congested. On section the cut surface was at once covered with minute globules of blood oozing from the congested vessels. No hæmorrhages were apparent to the naked eye and there was no apparent increase of fluid in the ventricles. There was no meningitis. Sections of the pons, cortex, and basal ganglia are being prepared for microscopical examination.

I wish to express my thanks to Dr. C. B. Levick for permission to publish these notes, and to Dr. Hunt and Dr. Hervey Wyatt for their reports on the cerebro-spinal fluid.

A CASE OF
INTUSSUSCEPTION CAUSED BY POLYPI
IN A YOUNG ADULT.

BY DONALD W. STUART, M.R.C.S. ENG.,
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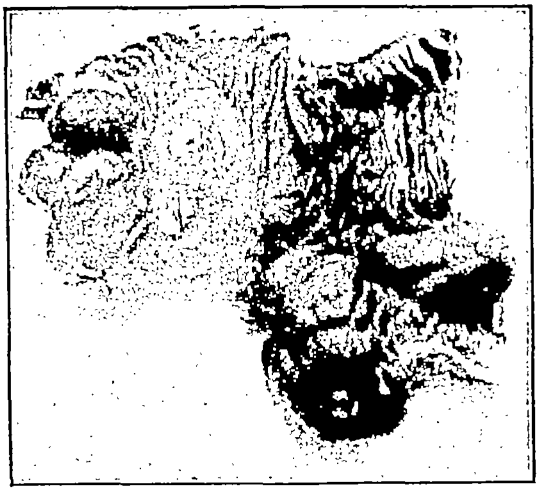
THE following case seems worthy of publication.

A girl, aged 15½, was admitted to the Cardiff Royal Infirmary on July 1st, 1929. On the same morning she had been seized with a sharp pain in the right side. During the course of the day she retched several times, but only vomited once; her bowels had been open on the previous day and she had never passed blood per rectum. She did not appear obviously ill. A definite, large, tender mass was palpable in the region of the umbilicus, and appeared to be of the consistency of intestine. There were no urinary symptoms or any undue emptiness in the right iliac fossa.

At operation by Mr. Harries the same evening a large ileo-ileal intussusception was found, and was reduced with great difficulty. Soft polypoid masses were felt within the lumen of the ileum. On opening the gut polypoid masses, like bunches of grapes, were seen springing from the wall and partially blocking the lumen; they extended along the wall for several inches, and the apex of the intussusception was opposite one of these masses. The photograph illustrates their appearance. As it was found impossible to remove the masses separately, about five inches of ileum was resected and the divided ends brought together with an end-to-end anastomosis. The patient made an uninterrupted recovery.



Polypoid masses springing from the wall of the ileum.

Microscopically, the protruding masses were shown to consist of fat lying in the muscular wall under the mucous membrane, and each had the appearance of an epiploic appendix projecting inwards.

It is quite common to get enlarged lymphoid follicles in an ileo-ileal intussusception, but very unusual to see an intussusception caused by polypoid masses.

I am indebted to Mr. D. J. Harries for permission to publish this case.

THE SURGICAL SIGNIFICANCE OF THE NERVUS SPINOSUS.

BY E. CAREW-SHAW, M.R.C.S. ENG.,
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THE nervus spinosus is so cavalierly treated in the standard anatomical and surgical text-books that it is not generally believed to possess the slightest surgical significance, yet it is an important path of referred pain—that reaction of a nerve to an abnormal stimulus. In this case the nerve is the mandibular division of the trigeminal, the abnormal stimulus is generally pressure and the result is pain over the area of supply of the nervus spinosus accompanied by tinnitus.

Anatomically the n. spinosus arises from the trunk of the third division of the trigeminal, and leaves the skull in company with the parent trunk through the foramen ovale. In this part of its course it is closely adherent to the periosteum at the base of the skull, and so usually escapes the notice of the dissector. It then re-enters the cranial cavity by way of the foramen spinosum with the middle meningeal artery, runs beneath the dura to the petro-squamal suture, and so enters the mastoid antrum, which it supplies, also sending twigs to the additus and posterior portion of the middle ear.

CASE 1.—A woman, aged 30, gave the following history. Three years ago there was pain and tenderness over the left ear which gradually increased in severity. Temperature 101° F., pulse-rate 120. Mastoiditis was diagnosed and treated by operation. The pain subsided for a few days after operation, only to reappear with marked vigour, and this time the right ear was also implicated. A sea voyage was tried, but there was no improvement. The patient's general condition deteriorated owing to the loss of sleep caused by the otalgia and tinnitus. On examination both drums were in perfect condition of colour, tension, and lack of scarring. The hearing showed the normal range of acuity. Behind the left ear was a well-healed mastoid scar. The nose, accessory sinuses, and throat were all normal and the teeth appeared to be in perfect condition. On X ray examination, however, bilateral impacted wisdom teeth were clearly visible. Further X ray plates showed that the roots of the impacted teeth were encroaching on the inferior dental canal. The two wisdoms were removed, also the first molars on both sides, because they exhibited signs of pressure necrosis; this gave almost instant relief from the pain and tinnitus.

CASE 2.—A nun, aged 32, had suffered from unilateral otalgia and tinnitus for six months. The symptoms were insidious in onset and though becoming steadily worse never interfered with sleep. The patient ascribed her troubles to a fall. On examination, the nose, throat, and ears were found to be quite healthy, but on the side of the painful ear an impacted wisdom tooth could be made out projecting a little above the gum margin. This was confirmed by X rays. The tooth and the one against which it was impacted—again because of pressure necrosis—were removed. This entirely cured all subjective symptoms.

CASE 3.—A woman of 29 gave a history of bilateral otalgia and tinnitus for nearly two years. Though there were occasional remissions, there were always exacerbations of pain at menstruation. Examination revealed nothing abnormal in the nose, nasopharynx, fauces, mouth, or larynx. Large painful glands could be palpated on either side of the neck. I regret to state that no radiographic examination was carried out because the patient, who was a dental student, assured me that she had had her mouth X rayed recently as she was worried about the condition of two crowned teeth, but that the plates showed nothing unusual. A blood count showed a leucocytosis of 16,000 with many immature polymorphonuclear leucocytes, but a very thorough medical examination failed to reveal signs of tuberculosis or other chronic disease. After two months the glands in the neck were no longer palpable, but the otalgia became steadily worse and with fewer remissions. The patient was again examined; this time a wisdom tooth could just be made out erupting slightly through the gum on the left side, but the X ray plates on which I now insisted showed that the tooth was impacted and also that a similar condition was present on the other side. The teeth were removed and the tinnitus immediately subsided, but the otalgia took nearly five weeks to disappear completely.

These three cases are selected from eight of their kind, and they all illustrate clearly how forgetfulness of the existence of this nerve might easily cause embarrassment or worse. I should mention that *each patient showed a rise of temperature to about* 100° F. with each exacerbation of pain.

OVERSEAS NURSING ASSOCIATION.—The annual report of this Association comes down to March 31st last. Its object is to supply trained nurses for hospital and private work in the Colonies and Dependencies, and among other British communities abroad. Its total income was £1144, of which £718 represented fees in respect of the cost of selecting 171 nurses for Colonial Governments and certain institutions. The number of nurses employed during the year was 840, an increase of 115. For the first time a nurse has been appointed for the Leper Settlement in Cyprus; she has charge of 98 Greeks and Turks.

HOSPITAL FOR SICK CHILDREN.—Last year, the annual report records, there were 6950 in-patients who cost £6 5s. 8*d*. each; new out-patients (6*s*. 10*d*. each) numbered 28,786. The board of management is still considering the urgent problem of reconstruction. Although the site of the Foundling Hospital is available it cannot be bought for lack of means, and unless those means are supplied, it is stated that the hospital will have to be rebuilt on the present disadvantageous site in Great Ormond-street. Since the institution was established in 1852, more than a million children have been treated.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 337.)

SECTION OF SURGERY.

DIVERTICULITIS.

Opening Address.

WITH Prof. E. D. TELFORD, the President, in the chair, a discussion on Diverticulitis was opened by Dr. E. I. SPRIGGS (Ruthin). He began by reviewing the history of diverticulitis, and said that Graser in 1808 was apparently the first to suggest that inflammation of the peritoneum about the sigmoid colon was due to diverticula. With the advent of X rays further light was shed on the condition, and early stages of the disease detected; it appeared that there was a stage in the bowel in which diverticula were present but not inflamed. Afterwards O. A. Marxer detected a still earlier stage, so that three stages in the progress of the disease were now recognised: (1) the pre-diverticula stage; (2) the stage of formed diverticula; and (3) the stage of inflamed diverticula, or diverticulitis. In the first stage the affected bowel lost its normal segmentation and presented a more rigid outline due to pathological changes in the bowel wall. The second stage—i.e., of formed diverticula—was often discovered by radiological examination, and in 1000 such examinations at Ruthin Castle it was found in 10 per cent. As regards microscopic features, the muscular wall of the bowel might or might not cover the pouch. The ætiology of diverticulitis was not yet fully understood, but the incidence in middle age pointed to the pouches being acquired and not congenital. They might be simple pulsion pouches, but Dr. Spriggs thought the main feature was probably that of inflammation, for they were found associated with infective foci in other parts of the body. Constipation, he said, was probably not the cause, for the disease was commoner in men than in women, and there was no abnormal constipation in the series. Aperients were more likely to be harmful, by producing liquid fæces which by bacterial or chemical action damaged the bowel wall.

The clinical features might be classified as follows: (1) discomfort round the navel, or more especially in the left iliac fossa; (2) flatulence and a feeling of distension, often with constipation, irregularity of the bowels, diarrhœa, or a sense of incomplete evacuation. These symptoms might have intermissions of several weeks or longer. In some cases the bladder was implicated, with painful and frequent micturition. A sausage-shaped tumour was sometimes felt in the left iliac fossa. Rectal hæmorrhage was rare. The pathological features were those of chronic inflammation of the pelvic colon arising from one or more diverticula and spreading to the peritoneal coat. Later on abscesses might form in the inflamed area, and, in time, chronic inflammation might lead to a scirrhous narrowing of the bowel wall.

The main points in the diagnosis were the long history and the well-being of the patient in the interval of the symptoms. The absence of bleeding and mucus was against malignant disease, although both might occur in diverticulitis. Radiographic examination was the most positive aid to diagnosis, but it was a mistake to diagnose diverticulitis on the ground that some diverticula were seen, or to miss the condition because the affected piece of bowel was not thrown into profile. When there was a narrowing without the characteristic appearance of diverticulitis, the presence of near-by diverticula made it probable that the case was one of diverticulitis, though the possibility of cancer being also present was not excluded. Obstruction might develop in diverticulitis either from inflamed mucosal folds, this form of obstruction rapidly yielding to douching and warm oil enemas, or from fibrous constriction of the bowel wall. Douching might give relief in this as in the former.

The treatment of diverticulosis consisted in keeping the alimentary canal as clean as possible; any source of sepsis must be removed. Diet should be simple and regular with a good deal of fruit and vegetables and little meat. Dr. Spriggs used a freshly treated culture of *Bacillus acidophilus* in sterile milk. Paraffin was also given to ensure that the motions were soft. He did not believe in aperients except in special cases. The colon was to be washed out with normal saline solution every other day for a time; in some cases it was necessary to do this permanently. The above regulations, with a sufficiency of exercise and rest, together with abstinence from alcohol, was all that was necessary as a rule. Often by such treatment the disease could be arrested, or its progress at least greatly retarded, the pouches emptying their contents more rapidly after treatment. Operation might be needed for an accident such as the perforation of a pouch, also for complications such as an abscess or a fistula, and in some cases where obstruction had supervened. In a number of cases the disease was much localised, and some of them were favourable for excision.

Dr. Spriggs concluded his paper by saying that diverticulosis was a complaint that could be controlled if recognised early, but became dangerous if allowed to take its course unchecked. It was necessary, therefore, to be familiar with the early stages.

Dr. Mayo's Views.

Dr. WILLIAM J. MAYO (Rochester, U.S.A.) ascribed the first account of diverticulitis to Habershon in 1857. There were, Dr. Mayo said, two types of diverticula of the colon, the acquired and the true. In the former the mucous membrane of the intestine pouched through small openings at weak points of the bowel wall. This type was concerned in diverticulosis, in contra-distinction to true diverticula of the congenital type, in which all the intestinal coats covered the sac. Records at the Mayo Clinic, compiled from both radiographic and post-mortem evidence, suggested that more than 5 per cent. of persons over forty years of age had diverticulosis. A study of the relative incidence of diverticulosis in men and women showed 64 per cent. males and 36 per cent. females. As constipation was more common in women these figures seemed to show that this was not an important factor in causation. With rare exceptions diverticulitis was confined to the sigmoid. Cases might be classified into four groups: (1) Self-limiting diverticulitis in which there might be the formation of a tumour which disappeared in the course of a few weeks. (2) Diverticulitis and peridiverticulitis with abscess formation resulting in various fistulæ. (3) Diverticulitis complicated by an obstruction of the bowel. In acute cases this was due to infection and œdema, in chronic cases to hyperplasia and adhesions. (4) Carcinoma developing on a diverticulum. In such cases carcinoma might develop as a result of infection and irritation in diverticula, and this last group might comprise those cases in which colostomy had been performed many years previously, the patient eventually dying of carcinoma. The distinction between diverticulosis and carcinoma of the sigmoid could usually be demonstrated by radiological methods.

In acute cases, said Dr. Mayo, surgical treatment should usually be tentative; he had operated in 20·2 per cent. of diverticulitis cases. If there was abscess formation the pus should be evacuated and if more radical treatment appeared to be necessary it could be postponed. If acute obstruction resulted, colostomy should be performed, and at a subsequent operation the stenosed portion of the sigmoid and the colostomy opening might be excised simultaneously or cæcostomy might be done instead, with radical operation later if necessary. In other cases colostomy might be resorted to for temporary relief, the opening being closed later if the lumen of the colon spontaneously became patent. Other operative procedures were for the cure of fistulæ.

Discussing the origin of acquired diverticula, Dr. Mayo pointed out that the sigmoid colon, being of relatively recent development, had not achieved the stability of the primitive small intestine. It would be interesting to know whether diverticulitis was as common in the rice- and fish-eating countries as in potato- and red meat-eating countries, the latter articles of food tending to produce a large fæcal mass and a large amount of bacterial action. There was also a possibility that spasticity of the colon predisposed to the development of diverticulitis, whilst there might be sympathetic nerve derangement due to decreased sympathetic control of the bowel.

Medical and Surgical Treatment.

Prof. W. H. Maxwell Telling (Leeds) said he had published an account of his first case in 1908, and resummarised the known facts in 1917. He had originally made two mistakes: first, when he failed to invent the word diverticulosis to differentiate symptomless cases; and, secondly, when he said that the treatment of the condition could be summarised in the word surgery. He now believed in treating the case medically as long as possible unless there were complications, and he thought the prognosis not too gloomy. For treatment he recommended: (1) administration of liquid paraffin to keep the fæcal mass soft; (2) weekly lavage of the bowel by saline purges; (3) an ordinary diet, eliminating as far as possible indigestible things such as nuts, and also, preferably, potatoes; (4) the avoidance of any strenuous abdominal exercises so as to reduce the risk of perforation; and (5) the postponement of surgical intervention until absolutely necessary.

Mr. J. P. Lockhart-Mummery (London) disagreed with the statement of Dr. Spriggs that diverticula were formed as a result of pre-existing inflammation; he believed that the formation of diverticula was the first stage and that the inflammatory condition was secondary to their formation. Probably diverticula started as pulsion-herniæ of the mucous membrane of the colon, and secondary inflammation might take place at almost any stage in their development. Predisposing to their development, it seemed probable that there was degeneration of the bowel wall from age and unnatural conditions of bowel function. He distinguished two different types of diverticulitis: (1) a type in which the colon wall became inflamed over a wide area at an early stage of the pouches, this being the type in which obstruction occurred and could only be treated by resection of the damaged gut or colostomy; (2) a type in which the diverticula developed without the accompanying inflammation, such cases being rightly called diverticulosis. Inflammation might eventually occur in one or more of the diverticula and might result in abscess formation or peritonitis.

Diverticulitis was a disease of the wealthy classes. The diagnosis depended ultimately on radiography or discovery during laparotomy. The disease could, however, be diagnosed with considerable accuracy through the clinical picture, the chief symptoms being pain and tenderness of the left iliac fossa with slight rise of temperature. In women the affected portion of the colon might cause symptoms suggesting disease of the left Fallopian tube, and in men vesical symptoms. The early stages of diverticulitis could be successfully treated medically, and diverticulosis was a condition calling for no surgical interference; but once the inflammatory mischief was well established the condition was progressive, and although the condition might be kept in check for a considerable period serious results might occur quite suddenly. The best results of surgery were seen when the diseased area was confined to a short length of bowel and resection was performed. In many cases resection was impossible and colostomy the only procedure available. Colostomy was necessary when an abscess is perforated, either externally or into the bladder. In some cases the patient might be saved a colostomy by freeing the bladder and wrapping it carefully in omentum. Those cases in which septic sinuses had formed were very difficult to treat even when free drainage was established.

Mr. Lockhart-Mummery concluded by saying that he thought the association between diverticulitis and carcinoma of the colon was probably accidental in most cases, though possibly, through the pressure in the colon, a carcinomatous stricture might lead to the formation of diverticula.

Mr. Seymour Barling (Birmingham) said that, to the surgeon, diverticulitis most often presented itself as a local abscess, peritonitis, or intestinal obstruction, and treatment must be prompt and simple. Later on the problem of the underlying disease could be considered. It must be borne in mind, first, that the disease lay dormant, or progress was very slow and could be checked by suitable medical treatment; and, secondly, that the technical difficulties might make operation formidable. Nevertheless, in selected cases resection could be undertaken. From a chance observation of a case during a laparotomy he had noted that there was a stage at which the bowel wall was inflamed and irritable, when spasm could easily arise and cause the mucosa to protrude; and these two factors of inflammation and spasm appeared to be the essential underlying cause of the fully developed condition. He had never met with carcinoma developing on diverticulitis, but in two of his cases he had seen a stalked papillomatous growth associated with diverticulitis, and he did not regard the association as wholly a coincidence.

Mr. Garnett Wright (Manchester) called attention to emergencies such as free perforation into the peritoneum and fistulæ between colon and bladder due to inflammation in a single diverticulum. He gave a short account of a case he had operated on for acute intestinal obstruction, a colostomy being performed which was later closed because the inflammatory trouble in the colon had subsided, leaving a patent bowel.

Prof. D. P. D. Wilkie (Edinburgh) thought that a distinction should be drawn between diverticulosis and diverticulitis, the former being relatively common and unassociated with symptoms of ill-health. Surgeons might be consulted for: (1) Development of acute symptoms which generally subsided without operation. Occasionally immediate operation was necessary for diffuse or localised suppurative peritonitis showing that a perforation had occurred. (2) Intestinal obstruction for which a colostomy might be required. (3) A group in which the main features were a chronic toxæmia and in which coincident cholecystitis was often found, and probably represented a secondary infection. In these cases, owing to the poor operative risk, expectant lines of treatment were indicated. In a few cases resection was desirable. It should be done only after preliminary colostomy to allow the subsidence of inflammatory mischief; the bowel should then be resected with the colostomy.

Mr. T. P. Kilner showed a series of slides illustrating reconstructive surgery. First series showed methods of Thiersch grafting with pressure.

SECTION OF DISEASES OF CHILDREN.

CHRONIC DYSPEPSIA IN CHILDREN OF SCHOOL AGE.

With Dr. E. A. Saunders in the chair, a discussion on this subject was introduced by Prof. F. S. Langmead (London), who said that the term chronic dyspepsia in children was used to connote a group of symptoms varying in degree and in proportion, which together formed a common clinical picture. The picture presented was that of a dull and listless child, with a poor appetite and a coated tongue. There might be vague abdominal pains; the general nutrition was impaired and the stools irregular. Slight nocturnal fever, disturbed sleep, and psychical symptoms might also be present. In comparison with adult dyspepsia the difference lay chiefly in the relative infrequency of organic lesions in children. It was doubtful if it was justifiable to regard the so-called intestinal dyspepsia of children as a disorder apart from dyspepsia in adults.

Ætiology of Intestinal Dyspepsia.

Analysis of the symptoms showed that they fell into three groups—abdominal, constitutional, and psychical. The whole position of toxæmia—arising in that home of lost causes, the intestinal tract—was thorny and contentious; but neither toxæmia nor acidosis needed to be invoked to explain defective nutrition in a child with chronic digestive disorder.

(1) *Dietetic Causes.*—Food, said Dr. Langmead, played an important part. Some cases were associated with continued overfeeding; others with meals so frequent or irregular that appetite was absent. A child would always take its food if there was appetite, and there was no surer way to court dyspepsia than to eat when it was absent. Other common errors were giving cod-liver oil, &c., before meals, giving food at or near bed-time, food-bolting, and a diet containing excess of "roughage." Too much stress should not be laid upon the ætiological significance of any undigested particles found in the fæces. The relative excess of one of the elementary food factors was apt to be less considered in children of school age than in infants, but there was no doubt that faults in dieting were often committed along these lines. This was specially noticeable in the case of fat dyspepsia. The fermentation which arose from carbohydrate excess often led to the passage of frequent mucus-containing stools. There was also a group of cases which arose from protein sensitisation, producing nausea and vomiting very soon after the taking of food. Inquiry in such cases might elicit that the vomiting was always after a particular article of food—e.g., fish, eggs, apples,—and their omission would bring the attacks of vomiting to an end. The part played by vitamin deficiency in children of school age was doubtful. A cause which should always be considered was defective mastication.

(2) *The Rôle of Infection.*—To correlate the symptoms and course of the digestive disorder with the infection was not possible; nor could it be claimed with certainty that the departure from the usual intestinal flora was primary and provocative and not merely secondary and incidental. The production of the toxæmia was a difficult question and one worthy of discussion. It had often been shown that indicanuria was no guide to intestinal putrefaction, and probably stasis and putrefaction were not sources of intoxication so long as the mucosa was healthy. Focal sepsis, teeth, tonsils, adenoids, &c., did appear to play an influential part in some instances, but chronic appendicitis was probably not an important cause in many children.

(3) *Hepatic Dyspepsia.*—The cases which Dr. Langmead had been accustomed to call "hepatic" were those in which fats were badly borne, in which there were from time to time bouts of toxæmia, with pale greasy stools, slight jaundice, and sometimes a palpable liver. Defective functioning of the liver might, however, be a factor in many of the cases and might be related to toxic symptoms. The use of bile-salts certainly increased the power of these children to deal with fats. The changes found in the liver in fatal cases of cyclical vomiting seemed definitely to inculpate this viscus.

(4) *The Rôle of the Nervous System.*—Here the question that arose was whether the nervous symptoms were the result or the cause of the intestinal symptoms, or whether both were due to some antecedent cause. Dr. Langmead's view was that in most cases the nervous symptoms were secondary to the intestinal disorder.

In conclusion, he suggested that there was no fundamental difference between intestinal dyspepsia in children and many examples of dyspepsia in adults, and no reason for regarding it as a disease apart, with an individual ætiology.

Discussion.

Dr. HAZEL CHODAK GREGORY (London) was of opinion that the theory that the greater part of childish dyspepsia was due to hyperchlorhydria was based on a fallacy. With regard to the appendix it was doubtful if any inflammation or other abnormality of it was a common cause of intestinal indigestion. Among the organic lesions causing symptoms of dyspepsia tuberculous infection of the mesenteric glands was fairly common during school life, though the symptoms were by no means clearly defined. The present tendency to diagnose every case of dyspepsia in which there appeared to be a difficulty with fats, as one of acidosis was being overdone. A fat-free diet might suit for a week or so, but was quite inadequate for ordinary requirements. The common types of dyspepsia in childhood Dr. Gregory considered to be functional; they were sometimes hepatic, sometimes pancreatic, and sometimes enteric, but the system chiefly involved was the nervous system.

Mr. HERBERT RAYNER (Manchester) said that surgeons only saw those cases due to some tangible organic disease and these formed a very small class. The common organic lesions encountered in childhood were appendicitis, tuberculous mesenteric or retroperitoneal glands, tuberculous peritonitis, and a motley collection such as chronic intussusception, tuberculous ulcers of ileum, and Meckel's diverticulum. Gastric and duodenal ulcers were very rare indeed. Appendicitis as a cause of dyspepsia should not be overlooked, though as a rule the symptoms differed in many respects from those encountered in the adult. Three types of appendicitis could be recognised in childhood: (1) Cases with no previous history of any abdominal disorder. (2) Cases with a history of recurrent attacks of pain in the stomach over several years, but not recognisable as attacks of acute appendicitis; this was the commonest type. (3) Cases where the history indicated that the child had had mild attacks of appendicitis lasting from two to four days and recovering without operation. Tuberculous glands, said Mr. Rayner, were not so important from a surgical point of view, but there were some cases which it was impossible to distinguish from acute appendicitis.

Mr. T. S. IRWIN (Belfast) confined his remarks to the dyspepsia associated with duodenal ulcer, and gave details of four cases that had occurred in his own practice. His conclusions were (1) that duodenal ulcer did occur occasionally at school age; (2) that symptoms of a similar nature going back to school age were to be found in adults suffering from ulcer; (3) that even during school age some cases of actual perforation had been found; and (4) that vomiting was a much more frequent symptom in children than in adults.

Prof. C. W. VINING (Leeds) thought many dyspeptic symptoms were due to dietetic deficiencies. Protein deficiency and vitamin deficiency probably occurred in a large number of children. Good feeding and a generous diet were important prophylactic agents.

Dr. CATHERINE CHISHOLM (Manchester) had found that in over 3500 girls attending a secondary school in only 4·5 per cent. were gastro-intestinal symptoms present of sufficient severity to cause absence from school. It did not appear, therefore, that school stress, &c., played any part in the production of dyspepsia in children of school age, but defective hygiene was undoubtedly very important.

SECTION OF OPHTHALMOLOGY.

FOCAL SEPSIS AND DISEASES OF THE EYE.

Mr. J. GRAY CLEGG (Manchester) the President, opened the proceedings by brief reference to some former ophthalmic surgeons of Manchester: Benjamin Gibson, one of the most famous oculists of his day, who published in 1811 his treatise on the formation of an artificial pupil; David Little, a most skilful operator; Mules, whose name was associated with his operation for evisceration; and Hill Griffith, the first to recognise cellular deposit on the back of the cornea in choroiditis.

Mr. A. F. MACCALLAN (London) opened a discussion on toxic absorption due to focal septic lesions, and its effects in the production of eye diseases. He claimed that British ophthalmology was leading in the study of this subject, and acknowledged his indebtedness especially to the work of Mr. William Lang. The more usual sites of such focal sepsis were the mouth in adults and the tonsils in children. Less common sites were the appendix, colon, or duodenum, the gall-bladder, the female pelvic organs, and the deep urethra and vesiculæ seminales in the male. Any chronic focus of sepsis might set up ocular change—e.g., a septic focus in an old amputation stump. He disagreed entirely with the view expressed elsewhere, that dental sepsis did not cause ocular disease. In a suspected case it was important to obtain really good radiograms of the whole mouth. Edentulous areas should be radiographed, for buried stumps, or unerupted teeth might be found. The frequency of apical abscess was not yet realised by the medical profession. Pain might be absent, and the radiogram might furnish the only evidence. Pyorrhœa was, in his experience, a less common cause of ocular disease than apical abscess. Tartar on the teeth might also provide the focus of absorption. Crowned teeth were specially subject to the formation of apical abscesses. The resistance factor was extremely important; many people with septic foci had good powers of resistance, and so escaped ocular manifestations. The eye might be infected by three paths: (1) direct extension, from open dental sepsis, tonsils, nasal mucous membrane, or accessory nasal sinuses; (2) lymphatic absorption; (3) deglutition and absorption from the alimentary canal. Among the results of direct extension were blepharitis, acute and chronic tarsal cysts, some forms of conjunctivitis, phlyctenular conjunctivitis, episcleritis, corneal ulcer, dacryocystitis, and orbital cellulitis. Meibomian cysts were, in his experience, almost invariably associated with dental sepsis, in private as well as in hospital patients. Phlyctenular conjunctivitis in children was usually associated with enlarged tonsils. The treatment of ulceration of the cornea had been immensely improved in his hospital clinics since the recognition of the frequency of associated causative focal sepsis; almost every case showed the obvious presence of open dental sepsis, from which there was a constant flow of pyogenic organisms to the conjunctival sac. In acute ulceration of the cornea dental treatment must be prompt and adequate, within 24 hours, if it was to be effective.

Dendritic ulcer, in Mr. MacCallan's opinion, was peculiarly apt to be associated with dental sepsis. Dacryocystitis was, he believed, often caused by it, and required surgical intervention—since removal of the dental septic focus alone would not suffice. In these conditions, toxic absorption by the lymphatics was more commonly the cause than direct extension. Iritis, on the other hand, might result from either open or closed dental sepsis, or from tonsillitis or other forms of focal sepsis. Cyclitis, with or without iritis, usually had a similar origin. Early discovery and elimination of the septic focus was of great importance. More than one septic focus might be present. Hyperæmia of the retina at the macula, without other fundus changes, was very often present when toxic products had got into the circulation; degeneration followed if the toxæmia persisted. Vitreous opacities were always accompanied by long-standing focal sepsis. Cataract had been produced experimentally by certain toxic conditions; toxins in the blood might so affect the ciliary body as to cause alteration in the aqueous, leading in turn to damage to the epithelium of the lens capsule, allowing the entrance of substances causing cataract. He believed that long-continued focal sepsis (usually dental) was the most important cause of cataract. It was therefore of great importance to detect early slight opacities in the periphery of the lens, and search for the focus of septic absorption, and to eliminate the cause of the cataract. Progressive myopia in children was, in his experience, always associated with enlarged and septic tonsils, and primary glaucoma he had found in numerous cases to be associated with a fulminating focus of sepsis. Lastly, the effect of focal sepsis on intraocular operations was very marked—a fact which should be remembered not only as regards adults undergoing operation for cataract or glaucoma, but also in children with septic tonsils who required operation for lamellar cataract, &c. In conclusion, the speaker said that though he had not dealt with the subject exhaustively, the opinions he had expressed were based on personal experience.

Discussion.

Dr. A. F. **Hurst** (London) laid stress on the need for a definite system of investigation, for which team-work was necessary. He thought the term "stomatologist" more accurate than "dentist." It should be remembered that probably every dead tooth was a source of infection. It seemed absurd to send edentulous cases to a dentist; but it had been found in a number of such cases that there were areas of rarefying osteitis. It was essential to have really good radiograms of the sinuses, and then expert examination by a rhinologist, for an antrum might be full of pus without any localising symptoms. He had never found ocular infections in association with duodenal ulcer. In connexion with achlorhydria it should be remembered that hydrochloric acid had not only a digestive function, but was also an important antiseptic. In its absence one would expect to find increased sepsis in the intestine. Bacteriological examination of the fæces was helpful if some definitely pathogenic organism was found—e.g., of dysentery—which ought not to be there. Leucorrhœa was of far more importance in this connexion than the average gynæcologist realised. When due to cervicitis it might be of great significance. It was important to realise that the cervix could be sterilised by diathermy. He had seen cases of arthritis cured by diathermy to the cervix—rather than to the joints. It was very useful and a great safeguard in some cases to have a vaccine prepared from the source of infection—e.g., in the mouth—and give some doses of this before offending teeth were extracted.

Mr. E. **Musgrave Woodman** (Birmingham) referred especially to the sphenoidal and ethmoidal sinuses as possible sources of septic absorption, and called attention to the close proximity of the optic nerve. X rays showed very little of the condition of these sinuses. Methods of investigation at present available were inadequate. These sinuses lay in the position of greatest danger not only to the eye, but to the body. He submitted that there was still a case for further investigation into this area. The technique devised by Dr. P. Watson-Williams was accurate for the sphenoidal sinus, but not so satisfactory for the investigation of the ethmoidal cells.

Dr. **Arnold Renshaw** (Manchester) brought forward figures embodying the results of examinations of 1269 cases of infective eye disease in the pathological department of the Manchester Royal Eye Hospital. Of these, 682 were syphilitic and 587 non-syphilitic. In 170 of these cases elaborate systematic examination had been made including the Wassermann reaction, the Pirquet test (human and bovine), temperature reactions after injection of tuberculin, renal efficiency, glucose tolerance, and estimates of blood calcium. Of these 170 cases, syphilis was found in 41, tuberculosis in 47, tuberculosis with complications in 55, and other causes of infection in 20. Further analysis of the sources of infection (other than tubercle and syphilis) gave the following results: nose 44 cases, tonsils 38, teeth 24, ears 3, urine 6, cervix uteri 6, fæces 2, urethra (male) 2. In his experience, cases of tuberculosis affecting the eye did fairly well if treated with the proper tuberculin. Many of the cases were due to the bovine strain. Incorrect dosage might aggravate such cases. In people with oral infection teeth should never be removed till a vaccine had been prepared.

Mr. E. E. **Maddox** (Bournemouth) pointed out that dental sepsis, present in a patient with ocular disease, was not necessarily the causative factor. He referred to the interesting analogy in the structure of teeth and eyes—the enamel corresponding to the lens, the dentine to the sclera. Dental sepsis should not be regarded as a special entity; it was only a local expression of a general condition. Even a detached retina might sometimes be absolutely cured by the removal of septic teeth. He had had such a case in a young woman of 18 with double detachment of the retina. He attached importance to the least sign of rocking of a tooth when examining for suspicious teeth. Nearly all cataracts were due to focal sepsis somewhere

Mr. E. J. PRIMROSE (Glasgow) supported the views advocated by the opener of the discussion. He had had special experience of syphilitic diseases of the eye. In these cases antisyphilitic treatment was not all that was necessary. Other conditions often called for treatment at the same time—possibly some factor that had caused a latent syphilitic infection to become active or was hindering recovery. Or there might be a hypothyroid condition present, and recovery would be delayed till this was remedied.

Mr. W. B. INGLIS POLLOCK (Glasgow) urged the importance of examining the teeth before operation for glaucoma or cataract. He had seen three cases in which impacted unerupted teeth had been the cause of ocular trouble. It was advisable to remove a blind eye that might be a possible source of septic infection of the other eye. In private practice the expense of such elaborate investigations as had been described was a difficulty.

Dr. PATRICK WATSON-WILLIAMS (Bristol) said that in this matter ophthalmology was in advance of other sections of the profession. Only by all-round survey could one get to the bottom of these cases. He had suggested formerly the analogy between detachment of the retina and an infective pleurisy. He wished to emphasise the important factor of tissue defence. Defence failed at times owing to constant reinfection.

Mr. A. W. ORMOND (London) said that bacterial infection acted by chemical means; colloid chemistry was still in its infancy. Mr. Maddox's case of detached retina had interested him particularly. He had a similar case, in which cervicitis seemed to be the probable source of septic absorption. Dendritic ulcer had not seemed, in his experience, to be due to dental sepsis.

Mr. H. L. G. LEASK (Glasgow) referred to the fact that some rhinologists were more conservative than others. In his experience the ophthalmologist got more valuable help from those of the more daring temper.

Mr. T. AUBREY JONES (Stoke) called attention to McDonagh's work. He had had some very interesting results from using his treatment.

Mr. T. O. GRAVES (Birmingham) also referred to non-specific protein therapy—by T.A.B. vaccine. For example, where some chronic headache remained after a sinus affection this treatment stirred up an acute reaction, and the chronic headache disappeared.

Mr. N. BISHOP HARMAN (London) called attention to the curious fact that 75 per cent. of the phlyctenular lesions in children were located in the lower outer quadrant of the eye. In intractable cases of phlyctenular lesions it was remarkable how often removal of the tonsils effected a cure. In regard to detached retina, his experience confirmed the view that in some cases it was associated with dental sepsis.

Mr. MACCALLAN, in replying to the discussion, said, in regard to dendritic ulcer, there had, in his experience, recently been some focus of sepsis in all cases. In the removal of septic teeth caution was called for. Removal of a number of such teeth at one sitting sometimes had a bad effect. Such patients should be treated as cases of major operations were, they should have a general anæsthetic and go to bed for ten days. By this method untoward results could be avoided. As to vaccine treatment, he was not quite in agreement with Dr. Hurst. In cases of retinal thrombosis, he regarded vaccine treatment as likely to be specially dangerous. In cases of detached retina he now always looked for a focus of sepsis, and rarely used operative treatment for the detachment; the ætiology was probably similar to that of infective pleurisy. In ascertaining the presence of any dead teeth, the electrical testing of their vitality by the dentist was perhaps of more importance than a good radiogram. Before operating for cataract he would always remove a blind shrunken eyeball if present. He quite agreed with Mr. Primrose that it was important in syphilitic cases to look for other foci of sepsis.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

PLACENTA PRÆVIA.

AT a meeting of this Section, with Dr. C. E. DOUGLAS in the chair, a paper on

The Symptoms and Diagnosis of Placenta Prævia

was read by Dr. BETHEL SOLOMONS (Dublin). The terms "unavoidable hæmorrhage" and "placenta prævia" were used, he said, only when bleeding in the last three months of pregnancy was caused by the separation of a placenta situated either wholly or in part in the lower uterine segment. When speaking of the varieties of location he referred to placenta prævia as (1) central or total; (2) partial, where internal os was partially covered; and (3) lateral, where the edge could be felt just above the internal os in the lower segment. Use of the term "marginal" should be discontinued. As regards ætiology, he thought there must be some fault in the endometrium. He had several times curetted the uterus two months after the occurrence of placenta prævia, and had found evidence of either a true endometritis or else a hyperplastic condition of the uterine mucosa; he suggested that curettage was indicated two months after delivery in order to avoid a similar complication in future pregnancies. The dangers of placenta prævia, as shown by world statistics, were great for the mother and very great for the child. The mother might die from collapse following hæmorrhage, whilst sepsis might later develop owing to the low position of the placenta and the exsanguinated condition of the patient. Menorrhagia, the tendency to abort, and sterility were also sequelæ to be borne in mind. The records of the Rotunda Hospital showed 320 cases of placenta prævia with 10 deaths among 60,180 delivered; with improved technique in diagnosis and treatment Dr. Solomons was able to report a series of 55 cases without a death. Most of the babies were premature and only 12 were born alive. Placenta prævia should be suspected in pregnancy by the history of hæmorrhages at various times from the fourth month onwards. The first symptom to which attention was drawn was fresh hæmorrhage accompanied by clots. A very important point in diagnosis was that the bleeding was extremely insidious in its onset. There was no concomitant pain. Two pints of submammary saline should be given immediately after the hæmorrhage, and every practitioner should carry the apparatus and material for doing this. At the Rotunda Hospital the stock saline solution was made by boiling two teaspoonfuls of salt in a pint of water; when the solution was to be used one pint of boiling water was added. This gave the correct strength, and approximately the correct temperature (100° F.). After injecting fluid the abdomen should be examined. The uterus would be found soft and painless, with the presenting part high up and unfixed, and a uterine souffle would be heard in the hypogastrium. A vaginal examination should always be made and carried out with elaborate asepsis. The cervix would be found closed, and there would be bogginess in one or all of the fornices. If the os was open the placenta itself would be felt. The urine should be examined in all cases and would probably be found normal. In conclusion, Dr. Solomons pointed out that the prognosis depended on diagnostic ability and choice of therapeutic technique.

Treatment.

Dr. F. H. LACEY (Manchester) said that in face of a history of slight hæmorrhage at the sixth or seventh month, followed by perhaps another within several weeks, it was often hard to decide whether to temporise in the hope that the child might have a favourable chance. Since the child in these cases was usually born prematurely even when there had been no intervention, and the proportion of stillbirths was very high, the treatment adopted should be that which gave the best maternal results. If there was a history of severe hæmorrhage or of recurring slight hæmorrhages the uterus should be evacuated when the mother was in good condition. At St. Mary's Hospitals, Manchester, during the last ten years there had been 562 cases, of which 19·2 per cent. were primiparæ; the multiparæ had had an average of 4·9 children. The methods of treatment adopted were: (1) rupture of membranes in 125 cases, with a maternal mortality of 2·3 per cent. and 45 per cent. of stillbirths; (2) delivery by natural forces in 76 cases, with a maternal mortality of 2·0 per cent. and 30 per cent. of stillbirths; (3) version in 273 cases, with a maternal mortality of 7·6 per cent. and 81 per cent. of stillbirths; (4) breech delivery in 21 cases, with no maternal deaths; (5) Cæsarean section in 33 cases; (6) induction of labour in 15 cases, with no maternal deaths and 70 per cent. of stillbirths; (7) application of vulsellum forceps with weight (Willett's method modified) in 11 cases, with no maternal deaths and 27 per cent. of stillbirths. Dr. Lacey pleaded for more frequent Cæsarean section for placenta prævia at or near full term when the os was closed with a centrally placed placenta in an elderly primipara. In conclusion, he pointed out that of the 562 cases 28 had ended fatally. Fifteen per cent. had been treated at home for hæmorrhage and were very weak when admitted to hospital; this showed how important it was that every woman suffering from hæmorrhage during pregnancy, however slight, should be admitted immediately to a nursing home or hospital where she could be under constant supervision.

Discussion.

Prof. G. E. ESSEN-MOLLER (Lund, Sweden) was called upon to open the general discussion. He said that in placenta prævia the ratio of risk to the child was considerably greater than that for the mother, and he thought that in treatment maternal benefit should be aimed at. He agreed with the plea for the increased use and adoption of Cæsarean section for this condition.

Dr. J. W. RIDDEL (Plymouth) did not see why a simple issue should be complicated. Version gave the worst results and Cæsarean section was the operation of choice near full term.

Mr. L. C. RIVETT (London) agreed with the nomenclature of Dr. Solomons, and thought that the term "marginal placenta prævia" should be dropped. Discussing the differential diagnosis, Mr. Rivett pointed out that with accidental hæmorrhage the bleeding was continuous, whilst in placenta prævia there were repeated "shows" with periods of no bleeding in between. He thought that most cases delivered themselves with the aid of some simple procedure such as rupture of the membranes or the application of Willett's forceps; for the other cases he advised Cæsarean section. What was most important, however, was to avoid delay, for this was fatal.

Dr. A. L. MUDALIAR (Madras) considered that the degree of dilatation of the cervix should be stated in describing a case of central placenta prævia. The only sure way of diagnosing the condition was to feel placental tissue; in cases of high placenta prævia, although the placenta was not actually palpable, a peculiar gritty sensation could be made out if the finger were passed up through the cervix between the uterine wall and membranes. In the treatment Dr. Mudaliar considered small doses of pituitrin useful. Cæsarean section should not be done too frequently, and must only be considered when the child was alive and when there was a reasonable chance of its surviving. The mother could be saved by simpler methods.

Dr. J. P. HEDLEY (London) did not approve of the routine adoption of Cæsarean section for placenta prævia in young women. He pointed out that the patient had to be constantly watched and was in constant fear throughout subsequent pregnancies.

Prof. R. W. JOHNSTONE (Edinburgh) said that the importance of the diagnosis prompted the Edinburgh school to examine all patients thoroughly per vaginam; they did not hesitate to resort to anæsthesia and pass the finger up into the uterus to feel for placenta. No one should temporise with placenta prævia; treatment must be immediate.

Dr. GIBBON FITZGIBBON (Dublin) thought that although Cæsarean section had a place in treatment, statistics tended rather to over-rate its utility. He referred to over 200 cases treated in the Rotunda Hospital under his Mastership in which version was employed with a very low maternal mortality. Dr. FitzGibbon thought that treatment should follow vaginal examination. There was no great urgency in all cases, and it was better to delay examination until treatment could be undertaken.

Dr. GILBERT STRACHAN (Cardiff) maintained that in many cases of placenta prævia there was a great deal of shock. He agreed that immediate saline infusion was desirable.

Dr. R. S. STATHAM (Bristol) protested against the use of submammary saline; he had lately seen two cases of sloughing of the breasts as a result of it, and he now used the flanks for saline infusion. Hot vaginal douches were pernicious. The cases should be dealt with where and when the hæmorrhage occurred, and version therefore had a useful place in treatment. He used Willett's forceps and had found de Ribes's bag of value in cases where there was a good deal of shock and the recovery of the patient had to be waited for.

Miss MARGARET BASDEN (London) said she had employed vaginal plugging with gauze soaked in Bonney's paint after rupturing the membranes; this treatment, however, had been followed by superficial ulceration of the vagina and subsequent stenosis necessitating a plastic operation. She thought that the results were good as far as the mother was concerned. She employed Cæsarean section in bad cases.

Prof. W. BLAIR BELL (Liverpool) said it was impossible to adopt uniform treatment for every case. He thought the terms "placenta prævia centralis" (p.p.c.) and "placenta prævia partialis" (p.p.p.) should be employed, the former to include all cases in which there was encroachment of the maternal os by the placenta. In certain cases Cæsarean section was the only proper treatment—e.g., with central placenta prævia in a primigravida with undilated cervix and a viable child. Of the other cases a considerable percentage could be treated by Cæsarean section. While in cases of doubt the mother's life should be the first consideration, that of the infant could often be saved without extra maternal risk. He had had two cases of post-partum hæmorrhage after Cæsarean section for placenta prævia, and suggested that this accident might be avoided by the use of pituitrin and ergotin. It should be remembered that many cases, especially where the cervix was not involved, terminated normally.

Dr. W. R. ADDIS (Manchester) said that if treatment was to be carried out at home simple methods should be devised, and any attempt at increasing the number of instruments which the general practitioner had to carry was to be deprecated. He favoured either version or rupture of the membranes, together with administration of pituitrin.

Prof. DANIEL DOUGAL (Manchester) thought that "safety first for the mother" should be the obstetrician's motto when treating placenta prævia. The high fœtal mortality was due to (1) prematurity, and (2) separation of part of the placenta, and these should be considered carefully before any new form of treatment was introduced with the idea of saving the child. *Willett's forceps ought to be employed* more often. Prof. Dougal thought that the indications for Cæsarean section in cases of placenta prævia were definite and limited. It should be done only when there were chances of getting a live child.

Dr. H. L. H. GREER (Belfast) agreed with those who advocated caution before performing Cæsarean section. He always did an external version as a preliminary to bringing down a leg in cases of placenta prævia, so that the foot was over the internal os.

Sir EWEN MACLEAN (Cardiff) thought early version with slow extraction was the ideal. It was his own practice to exhaust all methods of treatment before resorting to Cæsarean section, and he asked whether the Cæsarean scar might not possibly be an ætiological factor for placenta prævia. He had one case of death from post-partum hæmorrhage following a Cæsarean section for placenta prævia. He agreed with Prof. Blair Bell about considering the child's life in deciding upon any form of treatment.

Dr. E. A. GERRARD (Manchester) urged that therapeutic methods favourable to the child should be preferred so long as the safety of the mother was not prejudiced. The partial type of placenta prævia seemed to offer most scope for improved methods. A form of treatment which involved little interference with the child and one which was nearest to the normal course of labour should prove the most satisfactory. These conditions, in his opinion, were fulfilled by Willett's method of rupturing the membranes and applying traction to the child's head by means of a forceps attached to the scalp.

The CHAIRMAN regretted that no general practitioner had spoken. He had been in practice for 47 years and had met with only nine cases of placenta prævia.

Reviews and Notices of Books.

SCIENCE AND PERSONALITY.

By WILLIAM BROWN, M.A., M.D. Oxf., D.Sc. Lond. With a foreword by Sir OLIVER LODGE. London: Humphrey Milford, Oxford University Press. 1929. Pp. 258. 12*s.* 6*d.*

IN a brief foreword Sir Oliver Lodge remarks with some surprise the versatility of the author, particularly his mathematical equipment. But Dr. William Brown has always shown in his writings the catholicity of his mind, and in addition a certain yearning for the religious and the philosophical. Unfortunately, his desire to be fair to psychology and yet keep intact his and other people's religious aspirations leads to a timidity in both acceptance and criticism. This is unfortunate in a writer who, in addition to wishing to keep abreast of advances in psychopathology, attempts to give philosophical sanction to his standpoint. One has always been led to believe that the best philosophers were, in their search for truth, dignified and logically uncompromising. It is this intellectual asceticism and austerity which is lacking in Dr. Brown's latest collection of essays. He covers the whole field of the sciences from mathematics to the normative studies of ethics and æsthetics; rightly so, since his thesis is that man's highest pursuits are the Good, the True, and the Beautiful. But in all fields he has left us vague as to what his point of view really is. He expresses very honestly his doubts about Freudian psychopathology, and makes pregnant remarks throughout his inquiry. That done, the more positive side is stated in somewhat cloudy philosophical announcements which are zealous rather than logically convincing. In this volume the author confesses a more than passing interest in the phenomena of psychical research. No psychologist has the right to ignore or to sneer at these phenomena; they call for calm and dispassionate inquiry. Dr. Brown is impressed by the data of so-called telepathic and mediumistic experiences. He gives us a sample which, however, more mundane explanations might suffice to elucidate. We should welcome from Dr. Brown an exposition of these phenomena by methods of research on the lines of his now classical work on the Essentials of Mental Measurement.

SYNOPSIS OF MIDWIFERY AND GYNÆCOLOGY.

Fourth edition. By ALECK W. BOURNE, B.A., M.B., B.Ch. Camb., F.R.C.S. Eng., Senior Obstetric Surgeon, Queen Charlotte's Hospital, London; Obstetric Surgeon to Out-patients, St. Mary's Hospital. *Bristol*: John Wright and Sons, Ltd. 1929. Pp. 434. 15*s.*

THE fourth edition of this book has been revised and brought up to date by the inclusion of such new matter as has been accepted as a permanent addition to our knowledge of obstetrics and gynæcology; it serves admirably as a supplement to and a substitute for the ordinary text-books for the purpose of revision before examination. One section only, in our view, deserves criticism, that on abdominal palpation. On page 26, when abdominal examination during pregnancy is described, two "grips" are advised. The next time that abdominal palpation is mentioned is in connexion with the diagnosis of occipito-posterior positions (page 93), when three "grips" are mentioned. On page 99 four "grips" are enjoined for diagnosis of face presentations and a similar number for breech on page 106, while little indication is given as to what the third and fourth grips are. This is of no moment to the experienced graduate, who sooner or later invents a method of palpation of his own, but is liable to confuse the beginners who use the book. Moreover, examiners in practical work are liable to demand precise and accurate knowledge of this important method of diagnosis. We question whether the method described on page 26, of attempting to push the head downwards and backwards into the pelvic brim by abdominal palpation alone, is really of much value, and in inexperienced hands it may well create a false sense of security. A fuller account might have been given of the modern views on the origin of pelvic endometriomata.

We know of no synopsis which better serves the purpose for which it is intended, and the book deserves the popularity it has attained.

LES OTITES MOYENNES.

By GEORGES PORTMANN, Professor to the Oto-Rhino-Laryngological Clinic in the University of Bordeaux; and KARL KISTLER, of Zurich, formerly *Assistant* in the Clinic. Paris: Masson et Cie. 1929. Pp. 212. Fr.70.

THE classifications of affections of the middle ear, for long purely empirical, has been put on a scientific basis by the pathological work of F. von Bezold and his pupils, F. Siebermann and A. Scheibe. But, although 30 years have elapsed since the publication of the first and only edition of von Bezold's treatise on diseases of the ear, the authors affirm that only a faint echo of his work is to be perceived in the literature of French otologists, and this book has been written to fill this gap. For the sake of accurate terminology, in this book the expressions "catarrh" and "catarrhal" have been avoided, since though they should denote inflammation of a mucous membrane, they are often used to designate very different affections. The termination "itis" expresses the idea of an inflammatory process, and therefore the expression cicatricial otitis, for a condition which is not such a process but rather the result of one, is ruled out. Again, otorrhœa is not the name of a disease, but of a symptom. These may seem small points, but the authors consider accurate nomenclature important as an aid to the classification of our conception of diseases of the ear, which is the chief aim of their work. The term "tubal obstruction" is here used to define the class of case often described as "acute catarrhal otitis," but distinguished from true inflammation of the middle ear by the absence of pain and the complete return of hearing after inflation; "tubal obstruction with exudation" takes the place of "chronic exudative middle-ear catarrh"; and chronic dry or adhesive catarrh is classified either as "tubal obstruction with persistent retraction of atrophied drum-membrane," or as a sequel of "recurrent simple otitis," or of "necrosing acute otitis." The book is written in a concise, almost tabular form, but contains much interesting matter. In regard to chronic suppurative otitis, a distinction is made between simple and cholesteatomatous; the former, which constitutes between 60 and 70 per cent. of all cases of suppuration, is characterised by a central perforation and a non-fœtid discharge, the latter by a marginal epitympanic perforation and a fœtid discharge.

The authors do not admit the conception that chronic suppuration depends on osseous lesions, since all the true bony lesions are consecutive to cholesteatoma; in support of their view they point out that all cases of death due to chronic suppurative middle-ear disease have shown an epitympanic perforation, and have been complicated by cholesteatoma and, that over a period of years in the Central European countries they have been unable to discover a single death due to chronic middle-ear suppuration with a central tympanic perforation. This last statement is supported by statistics collected by Bezold, Siebermann, and Scheibe, which show 11,105 cases of "simple" chronic suppuration with tympanic perforation and no death, contrasted with 4281 cases of "cholesteatomatous" chronic suppuration with epitympanic perforation and 78 deaths.

The book is profusely illustrated by microphotographs, some from the authors' collection and some from those of colleagues, among whom we notice Mr. J. G. Fraser of Edinburgh. These are beautifully reproduced, and add greatly to the value of the work, which is of importance to general physicians as well as to otologists.

Kolle and Wassermann's Bacteriology.

Handbuch der pathologen Mikroorganismen. Third edition. Edited by W. Kolle, R. Krass, and P. Uhlenhuth. Lieferung 18. Band V. S. 525–1036. Berlin: Gustav Fischer and Urban and Schwarzenberg. 1928. M.38.

This standard text-book on pathogenic bacteria needs no introduction, since it has been in international use as one of the works of reference for many years. The authors of this section have made no attempt to adopt any of the new nomenclatures of bacteria, such as that adopted by the American Society of Bacteriologists, but have been content to follow the time-honoured terminology. The volume opens with an account of the immunological aspects of *B. diphtheriæ*, by Prof. E. Wernicke and Prof. H. Schmidt. The work has been brought up to date by the inclusion of modern studies on the Schick test and on toxin-antitoxin mixtures. The description of serum sickness following the inoculation of antidiphtheritic serum is, however, confined to one short paragraph.

Prof. H. A. Gins devotes eight pages to a consideration of the *Bacillus fusiformis*. He recognises three different forms: the fusobacterium of Plant-Vincent, the fusobacterium nucleatum, and the fusobacterium polymorphum. Brief mention only is made of the interesting question of the symbiosis of this group of organisms with the spirochætes, a subject on which a good deal has been written lately in connexion with broncho-pulmonary spirochætosis, pulmonary abscess, and gangrene, but probably this subject receives notice elsewhere in this many volumed work. The rest of this section, containing some 400 pages, is given up to a consideration of the tubercle bacillus in its many aspects. Seven professors (B. Möllers, H. Selter, W. Blumenberg, E. Löwenstein, R. Kraus, W. Zwick, and S. Witte) are responsible for this part of the work, and they have discharged their responsibility with success. The pages are packed with information culled from reliable sources. Searching for observations on questions specially prominent at the present time, we find a useful summary of the so-called filtrable virus form of *B. tuberculosis;* the existence of these Möllers considers still sub judice. De Witt and Long's recent work on the chemistry of tuberculosis seems to have escaped notice in the chapters on the chemistry of the bacillus. In dealing with the different types of tubercle bacillus occurring in man and animals the exceptional figures given for Edinburgh by John Fraser are tabulated separately from those quoted from other authorities. It would be interesting to get confirmation of these results by another research under post-war conditions. L. Cobbett's book, the "Causes of Tuberculosis," which gives so much valuable information on tuberculosis in man and animals is not mentioned; being a war-time publication it has not received in continental countries the publicity it deserves. A. S. Griffith's work on the atypical forms of tubercle bacilli found in lupus is dealt with fairly fully. There is also a long and careful analysis of the work of the Calmette school on the B.C.G. culture of tubercle bacillus and its use as a vaccine. Prof. Kraus comes to the conclusion that when inoculated into animals this strain is capable of producing a benign infection with non-progressive lesions which tend to heal, that the strain is therefore analogous to "virus fixe," and that it is capable of being used as a prophylactic vaccine under adequate control.

Other modern developments in bacteriology are critically and sanely considered in this comprehensive work; the broad historical basis on which it is compiled and the successful efforts made to keep it up to date maintain its title to a proud position among works of reference.

The Newer Knowledge of Bacteriology and Immunology. Edited by Edwin O. Jordan and I. S. Falk. London: Cambridge University Press; Chicago: University of Chicago Press. 1928. Pp. 1196. 50s.

Adequate praise may appear exaggerated here. There are over a thousand pages and 82 contributors, and the general standard of the articles is high. Each forms a summary of contemporary knowledge, with a very full list of references. Certainly no bacteriologist can afford to overlook this work, which is sure to save him a great deal of labour in analysing the literature of many outstanding problems. Many of these papers present synopses of matters too new to have become the subject of monographs. Such are the articles on toxins and the estimation of their strength, on the use of human serum from convalescent patients in prophylaxis and treatment, and the isolation of substances with immune properties. The articles on the spirochætes and the bacteriophage are also memorable, and several papers are included on the bacteriology of dairy-farming. We regret that workers other than American are insufficiently represented—through no fault of the editors we are assured.

St. John Ambulance Brigade.—In the report for 1928, which has just been issued, Major-General Sir Percival Wilkinson, the Chief Commissioner of the Brigade, states that 317,671 cases of accident and sudden illness were dealt with, in addition to many thousands of unrecorded cases. During the year there was an increase of 104 divisions, with a personnel of 3662. The strength of the Brigade is now 1684 divisions and 51,631 persons, of whom 13,409 are women; there are, in addition, 202 cadet divisions. There was a large increase in the calls upon the service, and the 106 ambulances traversed more than 271,000 miles. Sir Percival Wilkinson adds: "The desire to join our ranks is reaching all grades of society, all ages, and all professions."

THE LANCET.

LONDON: SATURDAY, AUGUST 24, 1929.

DERMATOLOGY AND GENERAL MEDICINE.

Views upon the functions of the skin and their importance in general medicine have changed a good deal of late years. From being regarded as a protective covering having little relation to vital internal processes, we have come to appreciate the close and intimate associations of the skin with biological activities hitherto held to be but little connected with it. In many ways we have reverted to the opinions of the old-time physicians who laid great stress upon the normal functioning of the skin, and we have been able to elucidate some of the mechanisms by which the benefits of this functioning may be brought about. Thus we have come to realise, for example, the remarkable interdependence of cutaneous activity with that of the vegetative nervous system, and to learn that the powerful influence of season and climate upon health and well-being acquires some explanation through this association. In the Lettsomian lectures, whose publication commences in this issue, Dr. H. W. Barber discusses aspects of this important question which have already received attention. It has been shown by Cramer and others that an influential governor of the activity of the thyroid-adrenal apparatus is found in the heat-regulating function of the skin; moreover, the effective stimulus to this system is change of temperature rather than the exact level at which the temperature is set; variations in climate and rate of movement of air effect more than constancy of heat or cold or the degree of moisture present. Of all climatic factors influencing the human organism the rate of air movement and the intensity of the solar radiation are perhaps the most important. The former, by leading to increased cooling of the body, provokes an increased activity of the thyroid and adrenal, and produces a more rapid oxidation and higher gaseous exchange. Light clothes and a non-stagnant atmosphere are thus important adjuncts to treatment, a point which Jakowenko [1] has lately emphasised in a study of the stimulating effect of sun and air baths at health resorts upon metabolism. It is possible, as recent work has shown,[2] that cooling itself may lead to the formation of a histamine-like substance in the skin—such as Sir Thomas Lewis has shown to be formed after vessel injury—upon which the general effects of cold are mainly dependent. The liberation of an "H-substance"—according to Lewis's brilliant researches—is in the nature of a defence mechanism, being a normal response of the skin tissues upon which reactive hyperæmia, inflammatory changes, anaphylaxis, and similar processes largely hang. Prof. Fröhlich's work, too, has shown the importance of seasonal variations upon the permeability of vessel walls, and the condition known as chilblains is probably an abnormal response of some such defensive process to undue chilling.

The action of sunlight, and especially of the ultra-violet rays of sunlight, is as yet far from fully explained. Their effect is mainly upon the skin, for they do not act deeply, and the problem is intimately bound up with that of epidermal pigmentation. That they lead to a formation of vitamin D in the skin layers is probable, and that their effect is in some way connected with the sympathetic nervous system and the adrenal bodies is undoubted. A chemical hormone is suggested as the medium by which such connexion is effected, and extracts of pigmented skin are said to be both pressor and mydriatic, which points to adrenalin or some similar substance being concerned. Irradiation of the skin, however, while causing increased pigmentation, tends to lower sympathetic tone, though in therapeutic doses ultra-violet light has little effect upon blood pressure, pulse-rate, or basal metabolic rate (Fries and Topper).[3] There are, moreover, important constitutional factors also involved, a point in the study of skin diseases which Dr. Barber emphasises opportunely. In no branch of medicine are constitutional variations in individuals more clearly illustrated than in the investigation of skin responses to irritants or infections. The blonde subject with soft pale skin who blisters readily on exposure to sunlight has long been known to be less resistant to tuberculosis than the brunette who pigments readily in the sun and in whom tuberculosis, if contracted at all, tends to run a more benign course. An immense number of skin tests have been devised with the object of determining such constitutional variations in skin responses, and to such variations much of the incidence of skin diseases is due. Dr. Barber exemplifies such factors by the case of three common external infecting agents of the skin, the pityrosporon, the acne bacillus, and the staphylococcus. He has done great service in pointing out afresh the importance of the seborrhœic "diathesis," or as he has termed it, the "status seborrhœicus," and has drawn a striking picture of the two types of this "diathesis," worthy of the study of all physicians. He holds with others that its essential change is an alteration in the secretion and composition of the cutaneous fat.

Such a conception must clearly have significant and practical bearing upon treatment, and we must look further than the purely local lesions in such conditions as are under discussion. Thus changes in the endocrine glands (particularly, as Sabouraud insists, in the sex glands), in the digestive organs, and in the excretory organs should be looked for in the examination of such cases. The possibility of intestinal toxæmia as a factor is also suggested by Dr. Barber, and in this connexion it is interesting to recall that Lloyd Arnold [4] has lately shown that the bacterial flora of the small intestine may be altered by both diet and climatic changes. Clearly both can be of the utmost importance in the treatment of skin disease. The former by perhaps affecting the nature of the cutaneous fat not only through changes in its quantity but also in its quality, the latter by its influence upon the endocrine glands and the vegetative nervous system. The relationship of fat metabolism to intestinal auto-intoxication and to cutaneous manifestations is one which, as Dr. Barber suggests, may well repay more complete biochemical investigation. The rare conditions of acanthosis nigricans, which occurs in association with malignant disease of the peritoneum and bowel, and of xanthoma, which is invariably associated with greatly increased cholesterol content in the blood, are of interest in this connexion. It is not only, however, with regard to the sebaceous glands that we should pay attention to dirt, climate, and "diathesis." The same wide view of skin disorders must be taken in other conditions besides those of the "seborrhœic state." Eczema and urticaria are, of course, two notable examples in which general principles can never be subordinated to local measures; hyperhidrosis, pruritus, alopecia areata, von Recklinghausen's disease, to mention but a few, show also the importance of nervous factors in ætiology. It is, in fact, not only in ætiology but also in diagnosis and treatment that close study of the skin may reward the general physician, and ever more must a close study of the body as a whole repay the dermatologist.

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[1] Jakowenko, W. A.: Amer. Jour. Hyg., July, 1929, p. 105.

[2] Horton, B. T., and Horton, G. E.: Amer. Jour. Med. Sci., August, 1929, p. 191.

[3] Fries, M. E., and Topper, A.: Amer. Jour. Dis. Child., 1927, xxxiv., 160.

[4] Arnold, Lloyd: Amer. Jour. Hyg., 1928, viii., 604.

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THE SIGNIFICANCE OF CAROTIN.

Carotin and closely associated lipochrome pigments are widely distributed throughout the world of living organisms, but nothing has been definitely known of any physiological function which they perform in either plants or animals. It seems impossible that they are of no advantage to the plant body, where they are made, but their presence in animals might, of course, be due to their passive ingestion in food.

The frequent association of carotin with substances rich in vitamin A was early noticed and was followed up by J. C. Drummond and by H. Steenbock, and with various collaborators. Steenbock found the association in plant tissues to be very close. Yellow maize, for instance, was well supplied with vitamin A, whereas white maize was not; whilst in the varieties with intermediate shades of colouring the vitamin A value was found to be proportional to the depth of yellowness. In the case of animal fats, however, the parallelism is less exact, and it appears to break down altogether where the liver oils are concerned, although these oils also contain unidentified lipochromes. Carotin itself was actually fed to rats as a source of vitamin A by Drummond (1919, 1920, 1925), by M. Stephenson (1920), and by Steenbock (1921). The two former got negative results, but Steenbock, using recrystallised carotin of constant melting-point, found that it promoted growth in rats on a deficient diet. All these observations, however, except that of Drummond in 1925, were carried out at a time when the fat-soluble vitamins A and D were not differentiated and all tests of substances for vitamin A which were performed in that period are now regarded as unreliable. Drummond's observation of 1925 is not open to this criticism, and has stood in the literature as the chief evidence that vitamin A cannot be supplied in the diet as carotin. This year he has repeated his experiments,[1] and again obtained a negative result, using a highly purified carotin of melting-point 184·9° C. Three other sets of workers, however, report results different from his, but corresponding with one another's. Euler, Karrer and co-workers, Thomas Moore, and Smedley-MacLean, Hume and co-workers, have all found that vitamin A is adequately supplied to a rat on a deficient diet by a daily dose of 0·01–0·005 mg. of recrystallised carotin. The last-named group found even 0·003 mg. to be a sufficient dose of a carotin of melting-point 178° C. and of iodine value 330, and also that the minimal dose decreased with the increasing purity of the preparation. It is true that the melting-point of some of the carotin used by Drummond was higher than that of any used by the other workers, and the truth may simply be that he is working with the pure substance, whilst the others are employing a contaminated carotin in which the contamination represents vitamin A. The situation would then be very like what happened in the case of ergosterol, the parent substance of vitamin D, which proved to be a contamination of cholesterol. On the other hand, something very much more fundamental may be at stake, and it may be that when the cause of the discrepancy between Drummond's result and those of the other workers is explained, our understanding of the chemical nature of vitamin A may be much advanced; though even if pure carotin is found in certain circumstances to supply vitamin A, some additional explanation is needed to include the means by which the vitamin is supplied in liver oils. A contribution by Mr. Moore on p. 380 of our present issue probably brings this explanation a step nearer. In the circumstances of his experiment, the consumption of carotin in large excess by two albino rats did not lead to any considerable increase of pigment in the liver, but was followed by great intensification of the antimony trichloride colour reaction for vitamin A, also in the liver. The observation suggests rather forcibly that the large consumption of carotin had in some way contributed to the formation of a reserve of vitamin A. A further observation of great interest is recorded by Euler and Karrer, but awaits confirmation. They have tested several other lipochrome pigments and their derivatives as sources of vitamin A; most of these were negative, but one, dihydro-α-crocetin, is reported to be active for rats in a daily dose of 0·015 mg.

The problem from the point of view of the colour test for vitamin A was discussed in our columns on August 3rd by Mr. Moore, who pointed out how the intrusion of carotin concentrates, rich in vitamin A, has vitiated the reliability of the antimony trichloride colour test for vitamin A; for such preparations of vitamin A of plant origin a biological test with rats is the only criterion, but the colour test is still held to be valid in the case of liver oils. Should it prove that carotin can in certain circumstances supply vitamin A, another series of researches, which hitherto have somewhat baffled interpretation, would receive an explanation. F. P. Underhill and co-workers,[2] and J. Goldberger and co-workers,[3] last year both described a condition called "black-tongue" in dogs, which is produced on certain diets. Goldberger's syndrome is cured with yeast and seems to represent pellagra in the dog. Underhill's syndrome is not cured with yeast, but with butter, pig's liver, eggs, carrot, and recrystallised carotin. The condition is said not to have been cured with cod-liver oil, and on this ground, and because it is curable with pure carotin, the possibility that it is due wholly or partially to a vitamin A deficiency is dismissed. The diet used appears incomplete in other ways, but on the whole, in view of the list of curative substances, and in the light of the new evidence about carotin, the suggestion that this form of black-tongue is due to vitamin A deficiency certainly deserves reconsideration.

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[1] Dulière, W. L., Morton, R. A., and Drummond, J. C.: Chem. and Ind., 1929, xlviii., 518.

[2] Underhill, F. P., and Mendel, L. B.: Amer. Jour. Physiol., 1928, lxxxiii., 589.

[3] Goldberger J., and others: United States Pub. Health Rep., 1928, xliii., 1385.

CARDIO-AORTIC SYPHILIS.

BOTH the difficulty in diagnosis and the disappointing results of antisyphilitic treatment in cardio-aortic syphilis were referred to by those who took part in the discussion on this subject at the meeting of the British Medical Association, a report of which appeared on p. 330 of our last issue. There is a general consensus of opinion that the common cardiovascular syphilitic lesion is an aortitis. This often gives rise to no symptoms whatsoever, and is only discovered post mortem in a patient who has died of some other disease. Sometimes, however, the aortitis leads to aneurysm of the aorta—perhaps the most distinctive of the syphilitic lesions, since it is so rarely due to other causes. Sometimes the process involves the root of the aorta producing incompetence of the aortic valves, or leading to partial obstruction of the orifices of the coronary arteries with its sequel angina. Aortic incompetence is, however, also a common result of rheumatic infection, though it is then generally associated with mitral stenosis. Similarly coronary arterial disease may be a part of the general degenerative process accompanying senescence, and the resulting ischæmic fibrosis is of a similar nature to that produced by syphilis. Age, therefore, is an important consideration in the diagnosis. Rheumatic heart disease is essentially an affection of youth, while atheromatous changes appear late in life. Syphilitic heart lesions, on the other hand, generally become manifest between the ages of 35 and 50, and the sudden appearance of anginal symptoms or the discovery of aortic regurgitation, in a previously healthy subject, in middle life, should at once arouse suspicions of a possible syphilitic ætiology. The Wassermann reaction is less helpful in diagnosis than the casual observer might anticipate. As several speakers pointed out, symptoms of heart disease plus a positive Wassermann are by no means conclusive of cardio-aortic syphilis, and still less does a negative Wassermann exonerate syphilis as the causal factor. The symptoms of cardiovascular involvement do not generally make their appearance for 15 years or more after the primary infection. But, once they have appeared, the progress of the disease is often rapid, and it is unusual for the patient to live for more than two or three years after the condition is first diagnosed. By thorough antisyphilitic treatment of the primary infection we may hope to prevent the development of cardiovascular lesions; but when once those lesions can be recognised, neither arsenic, mercury, nor iodides will give more than a temporary relief. The treatment then becomes that of heart failure, and antisyphilitic remedies are a secondary consideration.

It is possible that the future may have in store new developments in the clinical outlook on cardiac syphilis. WARTHIN has been able to demonstrate the presence of spirochætes in the heart muscle of a series of patients who died suddenly after a brief period of ill-health—generally less than 48 hours. These cases he regards as examples of malignant exacerbation of latent syphilis. He has also demonstrated certain more chronic lesions of the heart muscle which he believes to be pathognomonic of syphilis, and is of the opinion that syphilitic myocarditis is a much more common condition than is generally believed. At the present time there is no link between these pathological findings and the clinical manifestations, but the evidence is sufficiently definite to suggest that it may become necessary to modify our present view of cardiovascular syphilis as being essentially an aortitis.

RAY LANKESTER.

SIR EDWIN RAY LANKESTER, whose death at an advanced age occurred last week, was the most widely known man of science in England, and among not only his acquaintances but his intimate friends he could count a large number of medical men of every sort of different standing or specialty in the profession. By family ties this was made probable, for he was the eldest son of Dr. EDWIN LANKESTER who succeeded the founder of THE LANCET as medical coroner for Central Middlesex, while his brother is a well-known physician, and his own training, after a boy's acquaintance with classics, was purely on scientific lines. Thus it was natural that LANKESTER should appreciate, instinctively or logically, the aims of medicine, and medicine owes him a debt in many directions. He was the leading zoologist in this country, and we do not know who has a better claim than LANKESTER to be considered the leading zoologist of the world. Not only was his equipment perfect but he had a genius for communicating his knowledge. As lecturer and author alike, his clear arrangement of material and his logical methods of expression introduced to a varied public those scientific aspects of biology which were exactly needed for a comprehension of the large outlook of medicine; and his immediate pupils, who benefited alike by his genius and his friendship, became themselves agents for spreading still further the doctrines of progressive biology. Through them, as through his own great personality, LANKESTER can be considered a pioneer along many different lines of medical thought and work—lines which would never have been laid down had it not been for the constructive genius and power of logical coördination which suggested them.

Annotations.

"Ne quid nimis."

INFANT MORTALITY.

AT the end of the week there was issued from the Ministry of Health a Report on Infant Mortality,[1] constituting the English contribution to an international inquiry which has been instituted by the League of Nations. In accordance with a general plan the English inquiry takes the shape of an investigation in certain parts of Staffordshire and in Sunderland where infant mortality is relatively high, and in Oxfordshire and Croydon where it is relatively low. The primary object of the inquiry was to ascertain the causes of infant mortality in these centres during 1927 and 1928, and previous investigators of the subject will have the satisfaction of knowing that the general findings of the inquiry support views which are already held, little having been elicited that was at variance with English experience.

Throughout the Report the subjects of infant mortality in these districts are considered under two heads—namely, (1) stillbirths and deaths during the first six months of life (neonatal deaths), and (2) deaths from postnatal causes—and the main part of the Report is taken up by an analysis of the principal causes of these two groups of deaths in the four selected localities. The analysis is accompanied by statistical notes from Dr. Peter McKinlay upon such points as *mortality in relation to the order of birth* in the family, the birth-rate in relation to the social status and housing conditions of the family, and the mortality in relation to those conditions, and in relation to the age of the mother, and the well-being or indigence of the family. The general findings of the Report are confirmatory of previous experience in respect of all the circumstances adduced. Thus first pregnancies are found to be attended with a higher death-rate than is met with in the immediately subsequent group of births, but the latest children born have, on the whole, the highest mortality-rate. Clinical experience would have anticipated this, as it would also have anticipated the conclusion that bad housing and overcrowding are definitely prejudicial to infant life, although neonatal cases are much less closely associated with a dense population than are the deaths from postnatal causes. There is a fairly clear dividing line between the causes of stillbirths and neonatal deaths on the one hand and deaths after the first month of life on the other. Out of 1083 deaths investigated in the selected districts, 774 were either born dead or died during the first month of life, prematurity and obstetric difficulties, including ante-partum hæmorrhage, accounting for the figures; while in the second group of older infants we find respiratory diseases and gastro-intestinal diseases, many of which have an infective origin, to constitute the main scourges of infancy.

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[1] International Inquiry, Health Organisation of the League of Nations (English Section). Report by Dame Janet Campbell, M.D. With Statistical Notes by P. L. McKinlay, M.D.

The manner in which the investigation has been conducted makes the Report a valuable document for reference; new facts or new doctrines it may not contain, but it forms a good example for local investigation with regard to a subject which every health authority of the country must keep prominently before their own and public attention. The first concrete suggestions of the Report are that general sanitary environment, and particularly housing, requires improvement, and that there should be established throughout the country a maternity service for mothers whose circumstances call for such aid, the service to include adequate attendance at childbirth and hospital provision for abnormal cases, or where domestic environment calls for it. Other suggestions are, and naturally are, that home-visiting and welfare centres should be developed, that a domicilary nursing service should be instituted, and that domiciliary medical attendance under the National Health Insurance service should be extended and hospital accommodation for infants increased. At the close of the document appear the following far-reaching and valuable pieces of advice—namely, that further scientific investigation of infant hygiene should be conducted together with training of medical students in the subject, and that the public generally should be educated in the importance of securing suitable provision for maternal and child welfare. Dame Janet Campbell's words which close the Report allow that little elucidated or suggested in it will be new to students of this question, but describe the paramount value of the investigation as lying in the more exact definition and emphasis of certain known but not always fully recognised facts and in the clearer light which it throws upon conditions under which many babies now live and die. She would have us not rest content with thinking that the present machinery for supervising infant health and welfare is relatively complete and satisfactory, for "much yet remains to be done before it can be said with truth that the pregnant woman and the young infant are receiving all the support and all the assistance due to them from the community if the children of the nation are to multiply and prosper." Every social worker will be in agreement here.

NERVES IN CANCERS.

THE most fundamental character of tumours is their functional isolation from the harmonious corporation of the body in which they live; they live for themselves alone. Correlated with this isolation is the traditional fact that they have no blood-vessels or nerves of their own; we call it a "fact" because there is still no reason to doubt that in a broad general way it is true. The more we know of tumours, however, the more we realise that they grade into normal tissues, structurally and functionally, and some of them reproduce something of the physiological action as well as the histological structure of the organs from which they spring. We might therefore expect that in some instances tumours might be found to have some blood-supply and some nerves of their own, not to the normal extent but imitating it in greater or less degree. That secondary tumours may excite a new growth of vessels out of proportion to the connective tissue reaction has been known for some time. A few observers have claimed that they may do the same with nerves, and Prof. H. Oertel, of Montreal, has lately published [1] the results of a long search in human tumours by the new silver methods. He shows beyond much doubt that nerves can be found in a good many new growths, and from their intimate disposition in relation to the neoplastic cells he seems to have made out a fair case for his belief that they are in functional relationship to the tumour tissue, supplying the parenchyma as well as the vessels and connective tissue. By the nature of the case anatomical evidence by itself can hardly be quite convincing, but his descriptions and illustrations merit careful study. Negative findings are of little importance; knowing the lawlessness of tumours in general we should hardly expect that all of them would have nerves, and that most have no nerves is no great argument against the thesis that some possess them.

PNEUMOCONIOSIS.

THE list of pneumoconioses, as every student knows, begins with anthracosis, a term applied to a pulmonary fibrosis affecting the workers in coal mines and, more loosely, to the pigmentation of the lungs of town dwellers as commonly revealed at autopsies. The researches of André Jousset[2] who has made a careful pathological and chemical study of the pigment found in the lungs of both town dwellers and coal miners, indicate that the use of the word anthracosis in either connexion is incorrect. He maintains that what has been assumed to be carbon is in reality a residue of black oxide of iron, "not physiological dirt but pathological dross." The black oxide may be the legacy of hæmolysis following stasis, in which case yellow pigment is produced, or of infection and inflammation which whether acute or chronic results in a deposit of black pigment. The mixture of the two pigments commonly found points to their community of origin. The large detached alveolar cells, often described as "dust cells," according to Dr. Jousset do not contain infected particles of inhaled carbon or other foreign matter, but pigments representing different degrees of oxidation of iron derived from hæmoglobin. When tuberculosis has been found in the "anthracotic" lung, it has been assumed that the tubercle bacillus has found a suitable nidus in tissues which have undergone fibrosis due to the irritation of inhaled carbon. But carbon is not a pulmonary irritant and the examination of the sputa of miners made at intervals after they have left the mine shows how rapidly the lungs clear themselves of coal dust. The source of the pulmonary pigment must be found elsewhere. Dr. Jousset points out that pulmonary tuberculosis is always accompanied by a deposit of melanin which impregnates even the smallest tubercles and is especially well seen in the environment of cavities. Thus the pigment, in these cases as in other congestive and hæmorrhagic states of the lung, is the result and not the precursor of disease. The French miner, as such, is neither more nor less liable to consumption than other workers. But mining is not simply a matter of digging for coal, operations in many of the French coal mines include rock-drilling, and in work of this type inhalation of siliceous dust is possible. It has been found that workers at the rock-face are specially liable to pulmonary complaints. An analysis of the lungs of miners who had died as the result of accident showed a comparatively high percentage of silica and iron. Silicosis, sclerosis, and pigmentation would thus seem to be three stages in the development of "miners' lung."

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[1] Jour. of Path. and Bact., 1929, xxxii., 557.

[2] Rapports de l'anthracose et de la tuberculose pulmonaire, Rev. de la Tuberculose, 3e Série, 1928, ix., 884.

If too much attention has been paid to anthracosis as a possible source of disease, too little has been paid to other occupational causes of pulmonary fibrosis. Attention has recently been directed to the grave results which may follow the inhalation of asbestos dust in factories for the carding and spinning of this substance.[3] Asbestos fibre contains a relatively high percentage of silica and this differs from carbon in having an intensely irritant action upon the mucous membrane of the bronchial tree. Pulmonary asbestosis, when once established gives rise to an intense dyspnœa which precludes the patient from the slightest exertion, may be accompanied by extreme cachexia and often leads to an early death from broncho-pneumonia. If the student must omit anthracosis from the head of his list of pneumoconioses asbestosis should be substituted for it, at any rate, till more vigorous action on the part of those charged with the supervision of factories and the control of occupational diseases has reduced the incidence of this disease.

EXPERIMENTAL ELECTRIC SHOCK.

A COUPLE of years ago we commented[4] on a paper in which Dr. R. W. Ian Urquhart, of the University of Toronto, described experiments on the effect of strong alternating currents on the nervous system of animals. He showed then that when an alternating current of suitable strength was passed through the base of the brain, the nerve centres were paralysed or blocked in such a way that the respiratory, vagal, and conjunctival reflexes were inhibited. Provided that there was no charring, these reflexes returned after a time if efficient artificial respiration was kept up. In collaboration with Dr. E. Clark Noble, Dr. Urquhart now records[5] further observations on this condition, which he terms a-c block, to distinguish it from the anelectrotonus produced by a direct current. Shocks were administered to the cardinal centres of the brain and spinal cord and to the sciatic nerve of rabbits. In the experiments on the brain, one of the vagus nerves was isolated and severed at the level of the cricoid cartilage and arranged so that the central end could be stimulated by weak induction shocks. The occipito-atloid membrane was exposed, and a special button electrode applied to it. A point electrode was inserted high up the nose. The current, which was applied as soon as the animal was enough recovered from the anæsthetic to give a conjunctival reflex, varied from 1200 to 1850 milliampères, and was passed for two seconds. Artificial respiration was begun as soon as possible after the current was broken, and it was found that normal respiration returned at varying intervals up to three and a half minutes, the pupillary reflex and vagal response reappearing decidedly later, always within a few seconds of each other. The relative shortness of the block was presumably due to the immediate commencement of artificial respiration. Further tests of no little clinical importance showed that if resuscitation was delayed for two and a half to three minutes, the animal rarely recovered; that no advantage was gained by the use of pure oxygen or of oxygen and carbon dioxide mixtures, and that the chance of recovery was not increased by injections of adrenalin. Currents of varying frequency all produced much the same results. Tests were also made on ten rabbits to determine the truth or error of the current belief that shock patients sometimes relapse after spontaneous breathing has been re-established. Two of the animals were found dead next morning, but the other eight were apparently quite unharmed. Since the cause of death could not be ascertained, the authors regard the experiment as inconclusive. The attempts to demonstrate block in the spinal cord met with many technical difficulties, but it was established that a current of 750 ma., applied for two seconds, produced a block lasting five minutes in a decerebrate cat. In the sciatic nerve of the rabbit the smallest current that would produce block was 2 ma., applied for two seconds. The block was confined to the length of nerve through which current was passed, and did not spread as in anelectrotonus. Its duration varied directly with the strength of the current, and after a certain limit recovery did not occur.

These experiments bear out still further the importance of starting artificial respiration immediately after an electric shock. They show that whereas it is possible to save life and health by immediate first-aid, a delay even of a couple of minutes may mean the loss of the patient. This fact should be impressed on the minds of all electrical workers.

THE ANXIOUS LITTLE TACHYPHAGE.

New York is said to possess an organisation known as the Three-hours-for-lunch Club, which was devised to combat the evil influence of the quick-lunch counter. The "anxious little tachyphage," a type of dyspeptic admirably described by Dr. Paul Michon,[1] would certainly not be eligible for membership until he had radically revised his habits. Live with him for a day, says Dr. Michon, and his digestive troubles will be more easily understood. He wakes in the morning with a tight feeling in his epigastrium at the thought of what is before him, lies in bed too long thinking about his troubles, hurriedly gets through his dressing, toys with his dull breakfast, and rushes off to the office. At every delay on the journey the epigastric discomfort reminds him of its presence, and a morning spent in telephoning, interviewing, and correspondence harasses him still further. Home to lunch with the telephone too close to his table, he bolts his food, drains his glass at one gulp, and throughout the meal crumbles bread and chews at it nervously. Then to the office again, he throws himself once more into the press of business, and ends the working day with a hurried dinner so as to rush off to a theatre or reception. This sort of thing continues year after year, its victim constantly denying the possibility of anything going wrong with his health, until quite suddenly the suggestion of an ulcer or growth in his stomach brings the "tachyphage," a little more anxious than usual, to the physician. Unless he is lucky enough to meet someone who really understands the sort of life he leads he may quite well be sent away with merely an alkaline powder and some pious hopes about his diet. Dr. Michon insists on the essentially psychopathic nature of the malady and prescribes his treatment under three headings. First, there is the direct treatment of the stomach, and this is to be reduced to a minimum. Alkalis are definitely forbidden, and all that is allowed is a powder of animal charcoal or of kaolin before the main meal of the day. Secondly, there is the treatment of the "tachyphagia"; instructions for this must be written. Regular hours for meals and a generous allowance of time for each meal are important, while papers, messages, and the telephone must be banished during its progress. At the meal itself solids must be chewed and not bolted, and liquids taken in small portions throughout, while a definite and reasonable ration of bread should be selected beforehand and not exceeded. Thirdly, the general anxious state must be dealt with by what some people may call psychotherapy and others common sense. Walking without hurry should be substituted as far as possible for other modes of transport, while moderation in all work and the various forms of pleasure-seeking must be tactfully counselled. Medicaments to curb the activities of the sympathetic nervous system, such as belladonna, may be administered before meals, and especial attention should be directed to securing regular hours of sleep, for which purpose sedatives such as valerian and the bromides are recommended. This is all very well, a critic may say, but how is one to tell that this sort of treatment is all that is required, and how many times will a real case of gastric ulcer or of malignant disease give much the same sort of vague story as this other type of case? Dr. Michon does not despise radiological assistance, but he thinks the diagnosis pretty evident from the patient's appearance and behaviour. Look at this man, he says, still young, who comes to consult you for gastric trouble. His rapidly roaming eye looks first at one corner of your consulting room, then at another, now stares you straight in the face, now is off on another tour of inspection. His restless face looks as if the worst is about to happen, and in a brief and nervous way he describes his symptoms, none of which really suggest the idea of an organic lesion. Such, he holds, and with good reason, is the clinical picture of the "anxious little tachyphage"—a figure who is becoming increasingly common in these islands. Possibly the best way to combat this occupational disease would be to invite the Three-hours-for-lunch Club to start a mission in England.

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[3] Pulmonary Asbestosis. By W. Burton Wood. Tubercle, 1929, x., 353.

[4] THE LANCET, 1927, ii., 1001.

[5] Jour. Indust. Hyg., 1929, xi., 151.

[1] Presse Méd., July 20th, p. 952.

HEALTH AT THE JAMBOREE.

THE organisation of the Boy Scouts' World Jamboree at Arrowe Park, Birkenhead, nowhere showed to better advantage than in the medical department. The hospital, which was in charge of the Medical Commissioner, Lieut.-Colonel J. C. Holdich Leicester, consisted of nine marquees and six bell tents. Four of the marquees were wards, each holding 16 beds. Another was divided into two parts, one-third of its space being used as a dispensary and the rest as an emergency operating theatre. A sixth marquee, similarly divided, served as a dental clinic and an out-patient department. The remaining three were used respectively as an office, a store, and a dining-tent for the staff. One of the bell tents was a store-room for patients' clothing and the other five were isolation wards. A small portable plant supplied the hospital with electric light, and all the units were linked by telephone. Cooking was all done out-of-doors under a corrugated iron roof. The Cheshire Girl Guides Association supplied the entire nursing and executive staff, whilst Colonel Leicester was assisted in his medical work by three local practitioners and a number of local honorary consultants. The dental clinic was under the supervision of Mr. H. H. Tomlinson, who was assisted by a staff of six dentists.

More than 30,000 scouts attended the camp, and it is surprising that in the three weeks only 321 had to be admitted to hospital. Of these, 52 were evacuated to local hospitals as being likely to need attention for more than a few days; this figure included nine cases of infectious disease sent to Birkenhead Fever Hospital. All the rest returned to their units relieved or cured. Tonsillitis accounted for 70 cases, and the next commonest types of ailment for which admission was necessary were cuts, stings, or bruises (39 cases). These were closely followed by chills, malaria, and malaise (28 cases), and pyrexia (26 cases). There were 21 fractures and dislocations, 14 sprains, 15 cases of constipation and colic, and 14 of other stomach troubles. Considering the mud and damp in which the camp has lived, the proportion of respiratory disorders was low; there were 11 cases of asthma, bronchitis, and catarrh, 8 of "influenza," and 7 of pneumonia and pleurisy. Coughs and colds might have been expected to number more than 80, while rheumatism accounted for only 3 admissions. Twenty operations were performed for the reduction of fractures and repair of other injuries. The out-patients' department was attended by 1229 boys, 271 of whom had cuts and wounds (68 septic), and 125 had boils. Scalds, burns, sunburns, and abrasions accounted for 108 more. Naturally the greatest number of in-patients were English: 160. French followed with 47, and Scottish 12, Welsh 12, Irish 11, and American 9, came next. A really remarkable absence of epidemic disease and of serious illness in such a large concourse was very largely due to the efficient hygienic precautions taken by the Assistant Camp Chief (Health), Major M. B. Ritchie, ably seconded by the Hygiene Commissioner, Dr. Richard Wyse. The stagnant pools in the woodland areas were freed from infestation and the water-supply was carefully planned. The latrines were adequate in number and suitably placed, and an expert staff saw to their emptying and cleansing. The camp was patrolled by members of the St. John Ambulance Brigade and the British Red Cross Society, and whenever possible the boys were medically examined before coming to camp. There is a first-aid post under medical supervision at the rest camp organised at Earl's Court for scouts who wish to stay in London before or after the Jamboree. Here, again, local hospitals are coöperating cordially. The organisers and medical staff are to be congratulated on the success of their work, which may well form a model for future encampments of the same kind.

THE TREATMENT OF ENURESIS IN CHILDREN.

THE psychological causation of nocturnal enuresis in children is much emphasised nowadays, and many writers discredit all forms of treatment by medicaments, diet, restriction of fluid, or the various forms of surgical intervention. Two recent papers illustrate possible methods of approach along the lines of what is called psychiatry. Dr. R. C. Hamill[1] holds the view that enuresis is a conduct disorder and can be perfectly well stopped when the child so desires. He explains to both child and mother that the only reason why the bed is wet is that the child prefers a wet bed to getting up, and once the child admits this and assumes responsibility for its conduct a cure is effected. In Dr. Hamill's opinion any other suggestion will only be detrimental to the child's interests; to accuse the tonsils, prepuce, hereditary influences, and so on will merely furnish the child with excuses for its ill-behaviour. With a young child the mother must quietly assume that nothing short of a dry bed every night can possibly be expected from her offspring, and with an older one, who can understand Dr. Hamill's ingenious explanation of conscious control during sleep, a few talks at the psychiatric clinic will usually complete the cure. Out of 80 cases thus treated 40 were entirely rid of the habit, and of the other 40 some were improved, some not improved but still under treatment, and some had been lost sight of. Dr. Hamill claims that this treatment is "specific," and Dr. I. S. Wile makes a similar confident claim of great success for two methods of treating enuresis which he brings forward.[2] Dr. Wile says that for cases of enuresis in institutions the method of personal approach to each child is quite impossible, so in the first of his two methods a "group approach" was employed. In this scheme the inmates of the institution—the Hebrew Orphan Asylum in New York City—were divided into teams, and the object of the campaign was explained separately to the boys and girls. Each team elected a captain, and each week the percentage of dryness was calculated for the various teams so as to foster the competition spirit. The method employed by the teams was left to their discretion, but the usual plan was to wake up the offending members or to encourage the weaker members to greater efforts by means which are not stated but can be imagined. When a member of one of these enuretic teams had remained dry for four weeks he or she was allowed to enter a regular dormitory. This scheme worked very well over a year, and for the second year the boys and girls were allowed to carry on without the interference of the "psycho-pediatrician" with equally satisfactory results. The second plan which Dr. Wile employed was to wake all male enuretics at 9 P.M., 12 midnight, 2 A.M., and 5 A.M., *the child being made to get up* and visit the closet. The percentage of cures in this group was somewhere in the neighbourhood of 30 to 40 per cent., while by the "team" method the results seemed slightly lower, although their assessment was more difficult. Dr. Hamill claims for his plan of putting the responsibility on the child that it greatly aids in the development of character, by encouraging the inhibition of impulses without conscious effort, while Dr. Wile says that the cured children in his series "reflect their new power in personality and in physical health, together with some intangible immeasurable advantages along the line of better emotional stability, greater intellectual application, and finer social balance." Such claims have never been made for the old-fashioned belladonna method, but the percentage of cures obtained was probably very much about the same.

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[1] Jour. Amer. Med. Assoc., July 27th, p. 254.

[2] Med. Times, August, 1929, p. 223.

THE IMMUNISING DOSE OF VACCINIA.

THE Rolleston Committee on Vaccination, in their report to the Ministry of Health last year, pointed out that definite experiments do not seem to have been made "to determine the minimal dose sufficient to give rise constantly in the human being to the characteristic vesicular manifestation and to immunity lasting for a reasonable time." In the light of their suggestion that "experimental observations be made to ascertain if it is feasible to increase the dilution of vaccine lymph beyond the present degree without impairing its efficiency," it is interesting to note some results obtained by Dr. Peter Clearkin,[1] of Tanganyika, in an investigation of vaccinal immunity in monkeys. He used a variolous strain obtained from a case of small-pox in 1920. Its virulence was maintained by alternate passage from calf to animal, and the titre was ascertained by the intradermal injection of 0·1 c.cm. of serial dilutions on the shaved abdomen of the monkey. The highest dilution causing vesiculation was taken as the titre, and the minimal infective dose was calculated from it. The immunity of the monkeys was tested, from 14 to 28 days later, by insertions of serial dilutions of a fresh, very active vaccine. The number of monkeys used was not large and the estimation of the minimal infective dose in this way is rough, but the experiments showed that very small quantities of vaccinia virus protect against enormous doses. The immunity given by 60 minimal doses was as strong as that given by 20,000, and protected against 50,000 minimal infective doses. In another experiment, *two minimal infective doses protected against* 100,000. Dr. Clearkin thinks that these results form a useful guide in the vaccination of human beings, since the dermal reactions of the monkey are very much the same as those of man. He points out, however, that the whole problem *of anti-variolous* immunisation is bound up with the production of a stable vaccinia virus.

OPHTHALMOSCOPIC SIGNS IN HEART DISEASE.

A PAPER by Wallan M. Yater and Henry P. Wagener, of the Mayo Institute[2] analyses the post-mortem findings in 137 cases of heart disease, in which the fundi had been examined ophthalmoscopically during life. The cases were classified first according to species of heart disease and secondly according to character of the changes observed in the fundus. The writers conclude that ophthalmoscopic examination yields negative results in heart disease unless this is due to or associated with hypertension, coronary sclerosis, or subacute bacterial endocarditis. Of the 137 cases, 8 had subacute bacterial endocarditis, death being due to septicæmia in all cases. Embolic lesions were noted in 2 cases. Thirty-two patients were classified under the heading of hypertension; of these, 25 died of cardiac decompensation with or without uræmia, 4 of hemiplegia, 2 after operations, and 1 after an accident. All but one out of the 32 showed sclerosis of the retinal arteries of "hypertension type"; by this the authors mean generalised constriction of the calibre of the arteries with exaggeration of the arterial reflex stripe, irregularities in the lumen of the arteries, and arterio-venous compression. In addition to these changes, 17 showed retinitis—i.e., scattered cotton-wool patches and hæmorrhages and œdema of the retina, occasionally even œdema of the disk. In three other cases there were hæmorrhages not severe enough to come under the term retinitis. In this series, therefore, very nearly all those cases of heart disease which were dependent on high blood pressure alone showed retinal changes. Among 25 cases in which coronary sclerosis was found, 19 deaths had been due to causes purely cardiac and six followed operations. In many of these cases, and also in 11 cases of mixed type, high blood pressure was present and fundus changes had been recorded. These changes were often merely indicative of what the authors term senile arterio-sclerosis—that is, only *an alteration in the light reflex, difficult to diagnose* without any marked constriction of the retinal veins or alterations in the calibre of the arteries. Leaving these mild cases aside, the investigation showed that out of the 137 cases under review 52 had been diagnosed as having retinal arterio-sclerosis of the more severe or unmistakable type with or without retinitis. Even more interesting is the observation, already recorded, that, in the 32 cases in which hypertension was the only cause of cardiac disease discovered, typical retinal changes had been present in 31.

DIABETIC COMA.

Dr. E. P. Joslin[1] *does well to point out that* although seven years have now passed since the discovery of insulin, diabetic coma goes on taking its toll. It is, as he says, high time that deaths from this cause became very rare, and the simple outline of treatment which he sets out would go far towards achieving this if it were generally carried out. The treatment of the emergency of coma should, he says, take precedence over everything else and as soon as the diagnosis has been made insulin should be injected subcutaneously every half hour in doses of from 10–40 units or more until returning consciousness, normal respiration, and decreasing glycosuria show that recovery is beginning. To meet dehydration, a quart of normal saline should be injected subcutaneously at once, because in coma it is dangerous *to trust to retention* and absorption of liquids by the mouth or rectum. Intravenous injections are satisfactory if given slowly to avoid distension of the heart. The circulation, he suggests, may be stimulated by caffeine sodiobenzoate in doses of grs. 7½ given if necessary four-hourly. The stomach should be gently washed out so that liquids will be retained, and fluid containing about 50 g. of carbohydrate should *be given in the first 24 hours.* A gradual return to simpler articles of regular diet may then be made, the dose of insulin being regulated by frequent urinary tests, at first every two hours and later every four or six hours. The dose of insulin should be 15 units for a red reaction with Benedict's solution, 10 for a yellow, and 5 for a green, and no insulin is required if the urine is sugar-free.

Prevention, however, *is better than treatment* and the patient must be taught to avoid coma. He must never omit insulin, in Joslin's opinion, so long as there is sugar in his urine, and irrespective of the diet he is taking he must increase the dose if he has fever or an infection. This is an aspect of the subject lately treated of by Dr. R. Boulin,[2] who places infection in the first rank of causes predisposing to coma. The more impressive conditions such as pneumonia and gangrene are, of course, not likely to be overlooked, but sore-throats, influenza, boils, and small infected ulcers have an importance to the diabetic which is out of all proportion to their apparent gravity. Coma in a chronic diabetic accompanied by any of the above conditions does not react easily to insulin and the prognosis is correspondingly grave. Next to infection emphasis should be laid on fatigue, both physical and mental, whilst shock from trivial injuries, and intoxication by alcohol or anæsthetics are other important precipitants of coma. Error in the diabetic régime is another and better recognised factor, and in this connexion Boulin mentions especially excess of animal proteins. In some diabetics, he says, too much meat is a far greater danger than too much fat. Surgical intervention is an obvious risk; this should not, however, mean that its aid is withheld or even postponed, but only that due precautions are observed. Starvation he regards as a valuable weapon in the treatment of precomatose conditions. The argument that because in the normal subject it produces slight acidosis it is therefore likely to increase the acidosis of diabetes, he dismisses as unjustified by facts; many authorities have consistently used complete starvation to reduce acidosis and have found it quick and reliable. As regards diagnosis he lays stress on the gradual onset of mental and physical feebleness passing progressively into loss of consciousness. Coma never comes on unless there are large amounts of sugar, and acetone as shown by the ferric chloride test, in the urine; but it is impossible by urinary examination alone to estimate the degree of acidosis, for this will depend upon the extent to which the kidneys allow these bodies to pass. Other and well-known signs of coma are loss of appetite, diarrhœa, vomiting, and abdominal pain, whilst the association of slow and ample inspiration and forceful expiration with a smell of acetone in the breath is, of course, conspicuous evidence of its commencement.

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[1] Brit. Jour. Exper. Path., August, 1929, p. 237.
[2] Amer. Jour. Med. Sci., July, 1929, p. 105.

[1] Jour. Amer. Med. Assoc., 1929, xciii., 33.

THE TRANSFUSION OF IMMUNISED BLOOD.

WE may reasonably look on serotherapy as being still in its infancy. At birth it was the idol of all beholders; then it seemed to lose weight and popularity; and now once more it shows signs of being a credit to the family. Notable advances have been made of late years, for example, in the therapeutic use of convalescent serum in quite a number of diseases, such as poliomyelitis and measles. But obviously there are many difficulties in the way of getting suitable and sufficient serum from convalescent patients and the method has many limitations. The main effort is therefore concentrated on attempts to produce blood or serum with strongly antipathogenic properties. Theoretically, it should be possible to render whole human blood more potent in this respect than any animal serum, but in practice it has not proved very easy to do so. In applying the method to the treatment of acute illnesses most of those working along these lines have of necessity utilised non-specific transfusions, the donor of the blood being actively "immunised" by injection of an indifferent "antigen" such as nucleic acid or a stock vaccine. It is customary to take the blood within 24 hours—usually about six to eight hours after the inoculation—and give it at once to the patient. In less acute conditions there is, of course, time in which to try more specific immunisation of the donor, a procedure which ought to be free from risk if it is done carefully. Thus in treating enteric fever J. Clemens[3] gave injections of typhoid vaccine to the donors until the agglutination-titre of the serum had reached a high value, and carried out transfusion of blood to the patient without any danger or disadvantage to the donor. Greater difficulty is likely to arise with streptococcal infections in which immunisation is attempted by means of autogenous vaccines, and Clemens preferred to use blood taken from people who had recovered from septic wounds or erysipelas, seldom employing any preliminary inoculations to raise their immunity. The choice of donor depended on study of the bacterial flora of secretions from the wound and of organisms obtained from the patients' blood, and in the few cases he describes it appears that proven streptococcal septicæmia which had shown no improvement after frequent injections of streptococcal serum and other treatment were completely cured. It is to be regretted that fuller details of these cases are not recorded, but so far as they go they support the view that immunisation of a donor by autogenous streptococcal vaccines as a preliminary to blood transfusion might be carried out in such a way as to prove useful in such conditions as subacute malignant endocarditis. Some of the work done in this country has indicated that a similar course of treatment may prove of value in conditions of chronic toxæmia such as are sometimes present in rheumatoid arthritis or ulcerative colitis. With highly virulent organisms the process of immunisation is likely to take a considerable time, but in good hands it should certainly not be dangerous. In spite of the practical and theoretical obstacles which begin to crop up as soon as the subject is closely examined there are undoubted possibilities in this line of treatment, and it is not too much to hope that some of them may soon be realised.

SPECIAL GLASS IN SCHOOL WINDOWS.

OPINION still differs about the value of having school-room windows made of glass which is pervious to ultra-violet rays. We know that ordinary glass cuts off most of these rays, including those of shortest wave-length which are said to be peculiarly beneficial to health; we also know that specially prepared glass will let such rays through; further, we may take it as proved that exposure to these short rays is often beneficial to weakly children. Here, then, is evidently a prima facie case for practical experiment, and such an experiment has now been made. In 1925 a test undertaken in a Smethwick school showed striking benefit to the health and nutrition of children who had their lessons in a class-room with windows of vita-glass, which is perhaps the best-known variety of special window glass of the kind under consideration. These results got a good deal of publicity, but it was felt that the small number of children (30) and the lack of adequate controls made their reliability doubtful. Therefore last year, at the instance of the Board of Education, a thorough investigation was made in which a large group of children (240 in all) was kept under more elaborate observation. In his annual report Dr. Paul, the school medical officer for Smethwick, records the method and results of this research. Two classes were selected in each of three different schools, great care being taken to ensure that each pair contained children of the same average age, 5½, 8½, and 10½ respectively, of the same social status, and with similar school curriculum and environment. In each group one class was kept in a room with special windows, and for over a year from May, 1927, careful records were kept of the children's height and weight, and of their hæmoglobin index by von Fleischel's method, whilst educational tests were also systematically conducted. From the tables showing the figures at the beginning and end of the experiment, which are set out in the report, it appears that growth was in no way greater in the vita-glass classes than among the controls, whilst the educational tests had inconclusive results, the most favourable figures being spread fairly evenly over both sets of classes. The average attendances were also no better in the vita-glass classes. On the other hand, the hæmoglobin content figures were consistently better in the vita-glass classes, the average increase for them being nearly 13, whereas in the control classes it was only about 7½. Critics familiar with the technique of von Fleischel's method might suggest that this difference is not significant, but in view of the scientific and judicial way in which the research was carried out, these figures must be taken to mean a real difference in favour of the special glass. On the whole, however, it is impossible to deny that the benefit to the school-children from the vita-glass windows was very slight, the reason probably being that children sitting upright in a class-room with their clothes on have very little of their skin exposed to the light. When, as in special establishments, they can be recumbent and unclothed with the light falling on them from above, the benefit is generally accepted as considerable, and the effect would doubtless also be more marked in places where there is clear air and much sunshine. The daily average of sunshine at Smethwick was only 2 hours 45 minutes, and for two hours (noon to 2 P.M.) of the sunniest part of the day the children were not in school. These factors would more or less hold good for English schools in general, and considering that vita-glass tends to lose its special penetrability with time and is a good deal more expensive than ordinary glass, it scarcely seems sound policy to reglaze all class-rooms. Certainly it would be undesirable to do so if such a step were thought a satisfactory alternative to the establishment of adequate open-air schools where sunlight can act under much more favourable conditions and in company with many other healthful influences.

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[2] Rev. de Méd., 1929, No. 4, p. 431.

[3] Med. Klin., 1929, xxvi., 1021.

A NEW VACCINATION ORDER.

THE Minister of Health has adopted the four first recommendations of the Committee appointed by his predecessor in 1926 to consider, inter alia, "the practical methods which are available in the light of modern knowledge to remove any risks which may result from vaccination." An Order issued this week gives effect to the change of policy, and an account of its provisions will be found on p. 411 of our present issue. It instructs public vaccinators to make single insertions of lymph instead of the four which were previously required; multiple insertions will be available for those who wish to gain maximal immunity at one operation. As a corollary to the smaller dosage the rule is altered by which the Ministry did not allow revaccination, by public vaccinators, below the age of 10. Revaccination will be encouraged at the age of entering school (5 to 7 years), and again on leaving (14 to 16). In a covering letter to local authorities the Minister emphasises the importance of primary vaccination in infancy. Recognising that "post-vaccinal nervous disease" has occurred mainly in children of school age or in adolescents who have never been vaccinated, he expresses the opinion that in the present state of knowledge, and so long as the small-pox prevalent in this country retains its mild character, it is not generally expedient to press for the vaccination of such persons unless they have been directly exposed to infection. The new Order makes no reference to the use of less potent lymph.

DRY LUMBAR PUNCTURE.

THE difficulties occasionally encountered in securing a sample of cerebro-spinal fluid, although the needle has been correctly passed, are examined by Dr. H. Carter in a short note contributed to the annual report of the Metropolitan Asylums Board for 1928 (p. 280). In the first place, he points out, the fluid may be pathologically thick or may be liable to clot in the needle. Secondly, there may for some reason be low local intrathecal fluid pressure. Neither of these explanations admits of much discussion. A third possible impediment—namely, lateral displacement of the theca by the needle—is set aside by Dr. Carter as improbable in view of the strong lateral and anterior attachment of the theca by the nerve roots and the common ligaments respectively. The fourth obstacle to drawing off fluid is usually described as the presence of nerve roots floating against the needle, but here again he finds the suggestion unacceptable, because the constituents of the cauda equina lack mobility. The fifth and newly recognized impediment, which he describes in the present note, is an abnormal persistence of three considerable masses of firm subarachnoid connective tissue in the theca. The chief masses are lateral and the small one is in the middle line. By the presence of these masses in the theca the cavity from which fluid is usually obtained may be reduced to one-third of its normal width. A needle is apt to be thrust into one of the lateral masses, and Dr. Carter suggests that in cases where "dry" lumbar puncture can be attributed to this cause the needle should be withdrawn and redirected so that it passes into the theca, not exactly in the middle line, but not far from it. The large lateral and small mesial masses should thus be avoided. The dissections on which the note is based were made on children, but it is possible that the abnormally persistent subarachnoid fibrous tissue may be found in a certain proportion of adults.

ON Tuesday evening, August 20th, the following bulletin was issued from Buckingham Palace:—

> The progress of His Majesty the King towards restoration of health continues. The wound is steadily diminishing in size, and is healing satisfactorily. His Majesty has derived benefit from breathing and other physical exercises. Both bodily and mental activity are now undertaken without undue fatigue. The King will be able to leave London for Sandringham in a few days.

This bulletin, which is the first to appear since July 3rd, was signed by Sir Stanley Hewett, Sir Hugh Rigby, and Lord Dawson.

MORE than 700 people have enrolled as members of the Thirteenth International Ophthalmological Congress which is to be held at Amsterdam and The Hague from Sept. 5th to 13th, and nearly 250 communications covering the branches of ophthalmology have been promised. The principal subjects of discussion will be the ætiology and non-operative treatment of glaucoma; the geographical distribution of, and international social campaign against, trachoma; and the diagnosis of suprasellar tumours. Committees will present reports on the examination of visual acuity, perimetry, the notation of the cylinder axis, the examination of light sense, the standardisation of the visual examination of railwaymen and others, and ophthalmological education. The representative of England on the International Ophthalmological Council is Mr. Leslie Paton, whilst the secretary is Dr. E. Marx, of Holland.

WE have to record the death of Dr. Fletcher Beach, consulting physician to the West End Hospital for Nervous Diseases, and at one time medical superintendent of Darenth Asylum, on August 18th, in his eighty-fifth year.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—The annual conference of this Association, which was held in London at the end of last April, was described in our columns on May 4th (p. 921 et seq.). A complete report of the proceedings has now been issued and can be obtained from the Central Association for Mental Welfare, 24, Buckingham Palace-road, London, S.W., price 3s. 6d. The conference met under the presidency of Sir Leslie Scott, M.P., and was attended by a large number of people specially interested in mental welfare and the effect of the Local Government Act, 1929, on the work of local authorities under the Mental Deficiency Acts. Among the papers read was one on the report of the special investigation carried out on behalf of the joint committee of the Board of Education and the Board of Control, contributed by Dr. A. F. Tredgold, and an address on the recommendations of that committee was given by Dr. R. H. Crowley, senior medical officer to the Board of Education.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLI.—CHOLECYSTOGRAPHY.

THE object of cholecystography is to render the contents of the gall-bladder opaque to X rays so that its anatomical characteristics and physiological reactions may be studied. The normal gall-bladder is constantly receiving or discharging bile, and if a series of cholecystograms are taken at appropriate times this filling and emptying can be made visible.

Mechanism of the Test.

Broadly speaking, the mechanism of the test is as follows: A halogen compound, the one most frequently used being sodium tetraiodophenolphthalein, generally known as "the dye," is introduced into the body intravenously or by the mouth, according to the technique adopted. It is carried by the blood to the liver, through which it passes, leaving by way of the bile. In the gall-bladder the bile containing the dye is concentrated and so rendered opaque to X rays, and then after an interval is discharged down the common bile-duct. For a successful cholecystogram it is necessary to have (1) adequate absorption of the dye, (2) a permeable liver, (3) a patent cystic duct, (4) a gall-bladder able to concentrate its contents, (5) a patent common bile-duct. Full details of technique are given in recent medical text-books. Once a satisfactory technique has been arrived at, it should be scrupulously followed; in this way only is it possible to reduce mistakes to a minimum. At Ruthin Castle we get good results with a preparation known as keraphen (tetraiodophthalophenon), which has the advantage of producing small reactions. It is given orally and is not unpleasant to take.

A preliminary screening should never be omitted. With cholecystography a normal gall-bladder gives a shadow (see below), while a pathological one, into which no dye enters, may not be visible. As is well known some diseased gall-bladders also give a shadow at an ordinary screening, and if a little dye does enter such a gall-bladder during cholecystography, the shadow of the gall-bladder itself, reinforced by this small amount of dye, may give a total shadow closely resembling that seen in a normal cholecystogram.

Cholecystography gives anatomical information as to the shape, size, position, capacity, and mobility of the gall-bladder, but it is mainly a test of function and herein lies its greatest use. Pathological changes must be inferred for the most part from the disordered function and, with the important exception of stone, cannot be directly shown in the way that is possible with an opaque meal in ulcer or growth of the bowel. Even when stones are present the gall-bladder may empty and fill normally.

THE NORMAL GALL-BLADDER.

The shadow begins to appear about four hours after intravenous and 12 to 15 hours after oral administration. It gradually becomes denser and after reaching a maximum fades, shrinking at the same time. This reduction in size and density is greater after a meal is taken, especially one containing much fat. (Figs. 1 and 2.) The shadow as a rule is gone 20–24 hours after its first appearance. Such a sequence proves that the ducts from liver to gall-bladder are patent, that the gall-bladder wall is flexible and that its mucosa is healthy, and finally that the way is clear from gall-bladder to duodenum.

Anatomical Variations.

Shape and size.—The normal shadow has a smooth outline and is pear-shaped, oval or sometimes almost globular. Its size varies greatly and is much influenced by the time of the last meal.

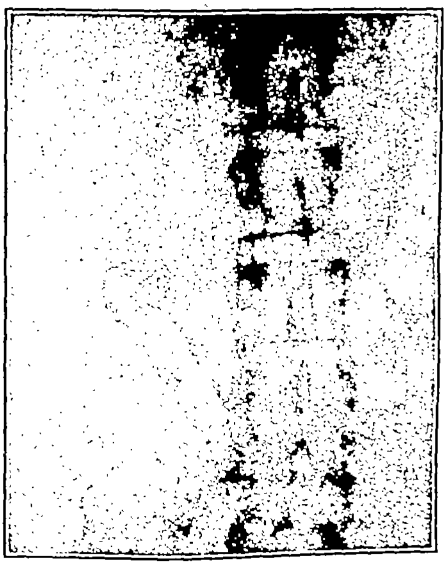
Position and mobility.—The position of the normal gall-bladder is also variable, as it may lie anywhere between the right costal margin and the right lumbar region, with almost as great a lateral swing. A range of three inches has been seen between the positions of the gall-bladder in the same patient standing and lying. This variability of position must be borne in mind, since a normally filling gall-bladder may lie in such a way as to be masked by the spine, or so that the tip of a transverse process may lie behind it and be mistaken for a stone within its lumen. The movement of the gall-bladder in various positions can be used in the differential diagnosis of opacities lying within the organ itself from those without. The anatomy of the gall-bladder also varies with the type of individual. The shadow is broader, placed higher, and moves more with respiration in those of massive build, heavy bony framework, short wide deep thorax, wide costal angle, and good bowel tone and position. In addition to general mobility within the abdomen, the range of movement in relation to neighbouring viscera is important. Here the radiologist is of great assistance by taking views from different angles, rotating or changing the orientation of patient to tube, and by the giving of a small barium meal when the gall-bladder is visible.

There are then wide variations of the normal gall-bladder, but for the most part they may be disregarded if a good shadow is obtained conforming to the emptying and filling changes noted above.

Significant Changes in the Normal Shadow.

The presence of a stone within the lumen may cause an abnormal outline and will be separately considered later. The hour-glass or biloculated gall-bladder, which is particularly liable to stone formation, may be congenital in origin or due to disease, such as adhesions, the presence of a large diverticulum, a tumour in the wall or pressure from without. My belief is that it is seldom congenital, and I would urge that a second cholecystogram should be taken before deciding that a gall-bladder is of the hour-glass type, for I have seen a bilocular shadow appear normal at a second examination. Double gall-bladders, gall-bladder diverticula, rudimentary gall-bladders, and those in which the fundus is bent up

FIG. 1.

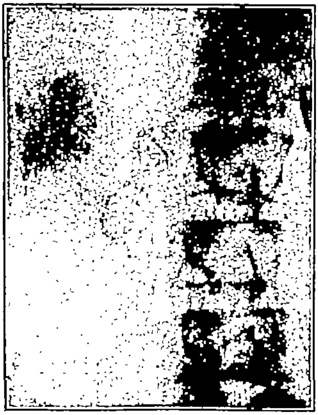


Normal shadow (oral cholecystography) filling stage.

so as to resemble a "Phrygian cap" are so rare as almost to rank as curiosities.

The normal gall-bladder should be more or less mobile, and one which does not show a fair range of movement should be regarded with suspicion, especially if highly placed, near the twelfth rib.

FIG. 2.



Normal shadow (oral cholecystography) after fat-containing meal.

A mottled shadow is generally due to stones, though it may be produced by gas in a superimposed duodenum or colon or by papillomata in the gall-bladder. When intestinal gas is present it is not confined to the gall-bladder region, and the shape of the bowel containing it can generally be made out. Multiple papillomata are rare; gritty stones lying free in the gall-bladder will change their position and arrangement with change of posture. If the stones contain enough calcium to render either periphery or centre opaque, the diagnosis is made more certain. A single stone adherent to the wall of the gall-bladder may cause an irregularity in the gall-bladder outline and be confused with an adhesion, a papilloma, or a lipoma

PATHOLOGICAL CONDITIONS.

From the standpoint of function the chief cholecystographic signs are the absence of a shadow of the gall-bladder, a faint shadow, the delayed appearance of shadow, and persistence of shadow. Of these the first two are the most important.

Absence of Shadow.

The absence of any shadow is the surest sign of a diseased gall-bladder. There may, however, even with a normal gall-bladder, be no shadow in extensive liver disease, catarrhal jaundice, acute abdominal conditions leading to temporary enlargement or œdema of the liver, and, as a rule, in the later months of pregnancy.

With these exceptions a failure to fill the gall-bladder may be regarded as due to (1) blocked cystic duct, stone being the most usual cause though growth and stricture are possibilities; (2) cholecystic disease so severe as to impair the concentrating power of the gall-bladder by destruction of mucous membrane or to fill it with calculi, mucus or inspissated bile: (3) blocked common duct due to stone or malignancy. In a series of 244 cases where no shadow appeared, which later came to operation, B. R. Kirklin[1] found a diseased gall-bladder with stones in 165, a diseased gall-bladder in 58, slight changes in the gall-bladder in 10, and a normal gall-bladder in 11, giving a total error of about 5 per cent. This raises the important and still unsettled point as to what constitutes a "diseased gall-bladder." The radiologist judges by cholecystography, which is a functional test, the surgeon by inspection and palpation, and the pathologist by the microscopic appearance of the organ. (The physician often has the unenviable task of trying to reconcile the opinions of his colleagues.)

If the 11 cases referred to above as normal gall-bladders had been removed it is more than probable that the pathologist would have supported the radiologist. I have seen a surgeon pass as normal a gall-bladder which had been condemned by the radiologist, and it was only when a "second look" was insisted on that the stones were detected which had been shown by cholecystography and were delivered when the organ was removed and opened. At present there are unfortunately no criteria applicable to all cases to indicate which is the gall-bladder whose removal will benefit the patient.

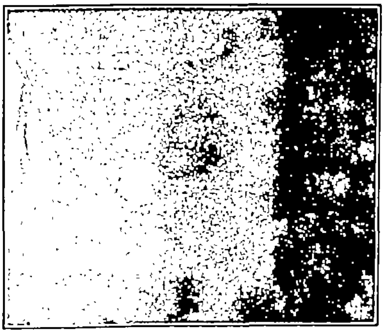
Faint Shadow. (Fig. 3.)

E. A. Graham, to whom the method of cholecystography is largely due, states of a faint shadow[2]—

> "This is but a degree of gall-bladder deficiency of which non-visualisation is the complete expression. . . . Ability to gauge the density of the gall-bladder image can only be gained by experience and observation. . . . There is no absolute scale of cholecystographic opacity because of the numerous variables that have their effect."

It is obvious that these "variables" should be reduced as far as possible by adhering closely to the chosen technique. The causes of faint shadow are those outlined above, operating to a less degree or more intermittently. As is to be expected, the degree of accuracy is not so great as with "no shadow." In Kirklin's series of 141 cases of faint shadow, 81 showed stones, 40 a diseased gall-bladder, 4 slight changes in the gall-bladder, and 16 a normal gall-bladder, an error of about 11 per cent. Even this degree of error shows greater accuracy than is possible by other means of investigation, particularly when it is remembered that "faint shadow" occurs for

FIG. 3.



Faint shadow (oral cholecystography). Two negative shadows in gall-bladder (confirmed as stones at operation).

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[1] B. R. Kirklin: Boston Med. and Surg. Jour., Feb. 9th, 1928, p. 1481.

[2] Diseases of the Gall-bladder and Bile-ducts. By E. A. Graham, W. H. Cole, G. H. Copher, and S. Moore. London, 1929.

the most part in the clinically suspicious or doubtful cases.

Other Variations.

Little is known about certain other variations from the normal seen in cholecystography. The late appearance of the shadow would be expected to follow delayed excretion of dye due to liver changes or a partial obstruction within the intra-hepatic duct system. In the gall-bladder itself a slow concentration owing to local disease would produce the same result. Even then should a shadow of normal density finally develop one should hesitate before diagnosing disease. When the shadow persists beyond the normal time the gall-bladder is rarely at fault, and other causes are to be sought, such as over-long abstention from food or reabsorption of the dye from the bowel.

Can a Diseased Gall-bladder give a Normal Shadow?

Here again we are faced with the unanswered question of what constitutes a diseased gall-bladder. In 121 cases which gave a negative response—i.e., normal shadow—Kirklin found at operation 4 cases of diseased gall-bladder with stone, 26 of a diseased gall-bladder, and 7 with slight changes in the gall-bladder, an error of about 30 per cent. He is supported by other observers, but Graham believes that "normal cholecystographic behaviour eliminates the biliary tract as the offender." My own experience is against such a definite statement. It is certain that the same gall-bladder may give a different response at different times owing to the presence of some temporary local condition at one examination. A repetition of the test is therefore advised in all doubtful cases. A professor of physiology was once asked as to what should be done when doctors differed. His reply was, "Call in more doctors." What, then, is to be done when doubt arises on the interpretation of a cholecystogram? Whether doubtful or not, it must take its place in a proper perspective with other data. Cholecystography is a test of function which may be capable of translation into terms of disease, but it cannot be allowed to replace the inferences drawn from a careful clinical examination. For example, recently in a case under our care, a bilocular gall-bladder filled and emptied normally. Operation was, however, advised on the history, when the suspected stone was found and removed, with cessation of symptoms. The history must be carefully taken and if necessary checked. This is instanced by the case of a jaundiced patient who denied all pain or even discomfort in the right upper quadrant of the abdomen. Despite this, surgery was advised, since stone was suspected. It was not till his operation, when 80 stones were found, that information was available from relatives of attacks of pain severe enough to require morphia.

Even when cholecystography indicates a diseased gall-bladder the case should be considered as a whole before treatment is decided upon. Cholecystitis is probably caused by a blood-borne infection, and there is a great possibility of disease elsewhere when the gall-bladder is involved. For this reason cholecystography should not be undertaken as a single line of investigation without due consideration of other organs. Thus, a man who showed a poorly-filling gall-bladder with multiple stones has been enabled to resume his work in comfort by clearing up a colitis which was evidently the main cause of his previous disability.

Summary.

In the presence of stone or gross gall-bladder disease cholecystography gives its most accurate results. It follows, then, that absence of shadow is the most reliable of purely cholecystographic signs and faint shadow comes next. In every instance the case must be considered as a whole before diagnosis and again before treatment. Cholecystography was devised as a test of function, and whilst it is a good servant may prove a bad master.

JOHN H. ANDERSON, C.M.G., O.B.E., M.D. Melb.,
Physician, Ruthin Castle.

Special Articles.

TREATMENT OF GENERAL PARALYSIS OF THE INSANE.

RESULTS OF MALARIAL THERAPY.

FROM the time when general paralysis was first recognised as a clinical entity the diagnosis has been regarded as almost equivalent to a sentence of death within four years. The recognition of its relationship with the *Spirochæta pallida* raised hopes doomed to early disappointment, for antisyphilitic remedies failed to give good results, and until Prof. Wagner-Jauregg introduced the malarial treatment no known form of therapy offered any prospect even of remission, much less of cure.

The Board of Control lost no time in starting an extensive test of the new remedy; they urged the superintendents of their institutions to try malarial therapy and instituted an inquiry into the results as soon as sufficient time had elapsed. The report of this inquiry is now available [1] in a form which constitutes a complete brochure on the subject of general paralysis. The history of the subject is outlined by Sir Hubert Bond in his preface, while Surgeon Rear-Admiral Meagher supplies an account of the work carried out in this country and in the various continental centres.

The Discovery of General Paralysis.

The historical introduction is a summary of Prof. G. M. Robertson's presidential address to the Royal Medico-Psychological Association in 1923. T. Claye Shaw has claimed that Shakespeare portrays a case of general paralysis in Achilles ("Troilus and Cressida," II., iii.), but the first account in medical literature was given in 1798 by John Haslam. The recognition as a clinical entity of what we call general paralysis is due to A. L. J. Bayle, who published his thesis in 1822 at the age of 23. During the two closing decades of last century the connexion of paralysis with syphilis was debated, but Sir Frederick Mott's appointment as pathologist to the London County Mental Hospitals marked an epoch in the history of the subject. His monumental volume, "Syphilis of the Nervous System," was published in 1910. The "parasyphilitic" doctrine was abandoned when Noguchi and Moore found the living spirochæte in the brain in 1913, and Mott was the first to admit that his hypothesis must give place to one which regarded general paralysis as "parenchymatous syphilis."

Malarial Treatment in this Country.

Dr. R. M. Clark, of Whittingham (Lancs), was the first English medical superintendent to induce malaria in general paralytic subjects; the date of the experiment was July 21st, 1922. In 1923 the City of London (Dartford), Rainhill, Hanwell, Bexley, Springfield (Middlesex), Claybury, Cardiff, Winwick, Chartham, Cane Hill, and Scalebor Park mental hospitals also adopted the treatment. Early in 1924 the Board of Control, assisted by Colonel S. P. James, I.M.S., of the Ministry of Health, issued a circular letter to all the institutions under their care, urging them to investigate the new remedy. Infected blood was supplied by Whittingham to other hospitals, and a mosquito centre was started at Horton. Statistics of all cases have been collected on an approved form from the outset, and Rear-Admiral Meagher, as well as collating these records, has personally visited as many of the discharged patients as possible.

To secure figures for comparison the report first reviews the fate of general paralytics in the 55 hospitals where malarial treatment has not been introduced. After correction, the total number of cases admitted during the year 1923 was found to be 624. Of these, 560 (90 per cent.) were dead at the end of 1927, while 52 (8 per cent.) were still in hospital, and 12 (2 per cent.) were living at home. All but two of those still in hospital were in the last stages of the disease. The 12 outside an institution were visited, and all were found to be mentally abnormal. One was bedridden, dirty, deluded, and incoherent; three were childishly dependent and demented; one suffered from "neurasthenia," and another from varied subjective disabilities; one had done a little work but was always ill; one did a little supervised work, and two females were able to do a little housework in their own homes. None was capable of normal occupation. This series suggests very strongly that complete recovery must be extremely rare, and that the "natural remissions," to which improvement under malaria is sometimes ascribed, are of very brief duration and poor quality.

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[1] General Paralysis and its Treatment by Induced Malaria. Report by Surgeon Rear-Admiral E. T. Meagher, R.N. (Retd.) H.M. Stationery Office. 1929. Pp. 87. 2s.

A similar investigation of the cases admitted during 1924 shows parallel results; 88 per cent. were dead, and 284 out of 549 (51·7 per cent.) had died within a year of admission. Nineteen out of every 20 general paralytics, once certified, *remain in hospital until they die.* Complete remission lasting as long as 12 months is most rare.

Results of Malarial Therapy.

Of 152 cases treated by malaria in 1923, no fewer than 36 were living at home, and 45 in hospital, while 71 had died by the end of 1927; thus 53 per cent. were alive, as against 10 per cent. of untreated cases. Of those still in hospital 7 had improved both mentally and physically, 7 mentally only, 5 physically only but without mental regression, while 18 had degenerated mentally. Six of the discharged cases could not be traced, but the others were visited, and 17 of them were at work earning wages, 3 were capable of work but unemployed, 3 females were successfully managing their homes, 2 were able to do odd jobs, and 5 only showed signs of dementia or degeneration. None was confined to bed or to the house. A similar series for 1924 showed that of 286 cases treated 120 were dead at the end of 1927, while 94 were in hospital (50 improved both mentally and physically, 4 mentally only, 16 improved physically without mental regression, and 24 degenerated mentally). Thirty-nine of the patients at home were earning wages, while 5 were temporarily out of work; 10 were performing their usual household duties, 4 did part-time work, and 4 were unemployed for physical reasons. Five only showed progressive degeneration, and none was confined to bed.

These figures have been compiled with the utmost regard for accuracy and may be accepted without hesitation. The report goes on to consider the possible fallacies introduced by diagnosis and selection of cases. There is, however, no disparity in accuracy of diagnosis between the treated and the untreated groups, so that the comparison stands, and any selection of cases seems to have erred rather on the side of liberality than of exclusiveness. The unavoidable conclusion is that patients treated by malaria have longer lives and lead a more desirable *existence than untreated cases. If they eventually* die their bedridden stage is shorter, and the nursing staffs declare unhesitatingly in favour of malarial therapy. Of the 108 discharged cases visited, 77 were found following their previous employments, which included surveying, shorthand typing, motor-driving, shopkeeping, mill work, and farming. Naturally, they had passed through a grave illness from which some permanent damage might be expected, but many of them were able to do laborious work and live reasonably normal lives among their relatives and neighbours. The impression received from a second group was that treatment had retarded rather than eliminated the disease; their horizon seemed a little limited, and their mentality a little dull, but their friends denied any increasing childishness. When marital life had been resumed the relationship seemed to be normal and the children healthy.

Cases treated during 1925, 1926, and 1927 are reviewed, and, *although too recent to justify conclusions*, they bear out those for 1923 and 1924. Of a total of 1597 cases treated in the five years, 33·9 per cent. are dead, 40·8 per cent. in hospital, and 25·3 per cent. alive at home.

Precautions and Conclusions.

The prognosis in untreated cases would justify a grave risk in treatment; the report discusses the deaths which have followed inoculation and which may be ascribed to malaria, and points out that the period of treatment is a perilous time requiring careful nursing and control by quinine. Once the patient has survived the fever the chances are good. It is not yet possible to state definitely which method of inducing malaria is the better. Relapses are frequent (about 50 per cent.) after mosquito bite, but rare after malarial blood (2 per cent.), but they usually remit spontaneously. Wagner-Jauregg has eliminated malarial deaths by careful preliminary cardiac treatment and quinine control, and his technique may prove equally successful if introduced here. The earlier malaria is given the more favourable is the outlook, and the report emphasises the urgent need for earlier diagnosis and earlier treatment. For the best results discharged cases must be followed up and supplemental treatment supplied. With these qualifications the malarial treatment can unquestionably be accepted as a therapy of proved value and great hope. To quote the report: "In applying malaria to general paralysis, Wagner-Jauregg has found a key that moves the lock."

MEDICINE AND THE LAW.

The Liability to Give Evidence.

THE liability of a medical witness to give evidence in the county court, and the limited remuneration which he may expect for so doing, were emphasised in the Bath county court last week when his honour Judge Gwynne-James inflicted a fine of two guineas upon a practitioner who had failed to answer a subpœna to attend the court and produce the medical record of one of his patients. The judge remarked that in two recent cases he had become aware of the existence of misunderstanding upon the subject. On each occasion a medical practitioner had refused to give evidence on behalf of a patient unless paid a special fee; in one instance the special fee demanded was 20 guineas, in the other a smaller amount. Such demands, said the judge, are of no avail and cannot be enforced. If a litigant desires the presence in court of a medical or other witness, all he need do is to serve him with a subpœna together with proper conduct money. The conduct money represents the travelling expenses, if any, to and from the court; "in the case of an ordinary medical witness" there is "an extra payment of one guinea which may, in an exceptional case, be increased not beyond five guineas." When this step has been taken, the witness is obliged to appear in court and obey his subpœna. He can demand no special fee, and, if he fails to appear, he is liable for contempt of court to a fine and imprisonment.

With this statement of the law, from one of the most senior and experienced of our county court judges, there is no quarrel. The medical practitioner has his duties to perform towards the administration of justice like any other citizen, though to hang about a county court all day long may cause him inconvenience, annoyance, and definite financial loss. The position is governed by Order LIII. of the County Court Rules and the official scales of fees which, within a certain not very liberal maximum, vary with the importance of the case and the discretion of the registrar or judge. If the witness fails to attend, or, being in court, refuses to give evidence, he may be called upon to show cause why a fine should not be imposed upon him, and may then be fined if his explanation is inadequate. Possibly, if his absence was due to a summons in emergency to save life, the judge would accept it; in the recent case at Bath the absent witness had no definite reason to give; all he could say was that he had never had a subpœna before, did not appreciate what it meant, took the opinion of a friend, and absented himself. The judge accepted this frank statement as mere want of thought rather than deliberate affront to the court. As is explained in "The Conduct of Medical Practice," in criminal cases, a witness who disobeys a subpœna is liable to arrest and imprisonment. In civil cases he may be fined, and also conceivably he may be made liable in damages if the litigant can show that the case was lost for lack of the evidence which the absent witness would have given. Attendance in court, in fact, is an unfortunate necessity, and the practitioner who seeks to avoid it must foresee the possibility of litigation and do his best to stand aside at the beginning—a course which his patient's interests do not always permit. As "The Conduct of Medical Practice" points out, it is sometimes possible to make a bargain beforehand with the party concerned and thus to stipulate for a special fee; if so, this is best done before disclosing any report or memorandum of the nature of the evidence that the witness will give; for, once the litigant knows what the witness will say, he can serve his subpœna and procure the attendance in the ordinary way. It remains only to add that more and more work is constantly being placed on the shoulders of the county court judges, and that attendance in the county court may become a more frequent duty for professional witnesses. The main justification of the county court as a tribunal is—next to its speed of decision—its cheapness. It follows that county court proceedings will seldom permit the payment of substantial fees.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Amalgamation of Medical Associations.

THE annual meetings of the Hartmann-Bund and of the Ärzte-Vereinsbund were held this year in Essen. The result of these meetings was that the by-laws of both associations were amended with a view to the closer coöperation of the two associations. The Hartmann-Bund was founded some 20 years ago by the late Dr. Hartmann, of Leipzig, on the model of a trade-union, and was at first in opposition to the old established Ärzte-Vereinsbund, which was said to be not sufficiently energetic in the struggle with the sick clubs. By and by, however, the competition between both associations ceased, and notwithstanding their difference in organisation the work was divided between them; the Hartmann-Bund looked after the economic interests of the profession, whilst the Ärzte-Vereinsbund dealt with general questions such as medical ethics, medical study, and hospital questions. At the Essen meeting a thorough reorganisation was effected. While Leipzig continues to be the seat of the Hartmann-Bund, the provision that the committee must consist exclusively of Leipzig medical men is repealed as being no longer in accordance with the extension of the work of the Hartmann-Bund. It has been arranged that the president of this organisation shall ex-officio sit on the board of the Ärzte-Vereinsbund and vice versa. The situation has been still more simplified by the election of Dr. Stauder, of Nuremberg, as president of both associations. A resolution was passed against the trade tax being extended to the medical profession and against a wider application of compulsory sickness and invalidity insurance. Dr. Hellpach proposed that State insurance should be compulsory for persons earning less than 3000 M. a year, and voluntary for those earning 3000 to 6000 M., while people earning more than 6000 M. should be excluded from State insurance. Finally, the hospital question was discussed. It was stated that the number of hospital beds has increased by 71 per cent. since 1913, notwithstanding the decrease of the population by the loss of German territory after the war. In cases of illness the public more and more prefer hospital treatment to home treatment; nevertheless, private hospitals, the majority of which belong to religious corporations, cannot be maintained owing to their cost, and must be taken over by the municipalities where they are supported by public means. A motion was adopted that the appointments of hospital physicians or surgeons should not be influenced by the politics of the candidates.

Dietary Treatment of Tuberculosis.

The Berlin Medical Society lately discussed a new treatment of external tuberculosis devised by a medical man, Dr. Gerson, of Bielefeld, Westphalia. The discussion was introduced by Prof. Sauerbruch, who said that in his clinic in Munich, where he was professor of surgery until his recent appointment to the chair of surgery at Berlin University, he had made experiments on the influence of diet on the healing of wounds and of external tuberculosis. By chance he heard of a Bielefeld medical man curing tuberculosis by a special diet, and thereupon he sent his assistant, Dr. Hermannsdörfer, to that city to study the method. Dr. Hermannsdörfer, in his paper read before the Medical Society, said that the new diet was based on the following facts. Experiments on animals had proved that a protein diet reduced susceptibility to infectious diseases, whilst carbohydrates favoured tuberculosis. The liability of the body to infectious diseases depended on the amount of water in the tissues, and the limitation of kitchen salt made the tissues drier. By administration of vitamins the liability to infectious diseases could be decreased. Dr. Hermannsdörfer therefore prescribed for tuberculous patients protein and fat with a small amount of carbohydrates, and replaced kitchen salt by a salt which Dr. Gerson called mineralogen, consisting of potassium and magnesium. He further prescribed much salad and vegetables in a raw state; the quantity of grilled and boiled meat was limited. The cost of such food was 50 per cent. higher than that of the ordinary hospital diet, but the results were extraordinary. Tuberculous lesions of the bones and joints and fistulæ healed; in lupus healing was obtained within a few weeks or months, and the results were permanent, even when the diet had been discontinued. As regards tuberculosis of the lungs, a definite judgment cannot yet be given, but it is reported that Dr. Rollier has introduced the above diet in his well-known sanatorium in Leysin, Switzerland. Dr. Bommer, of Giessen University, stated that the method had been applied in the University Clinic in 200 cases of lupus with excellent success. A great sanatorium is to be opened in Wilhelmshöhe, near Cassel, for the treatment of tuberculosis according to Dr. Gerson's method and under his direction.

Country Practice in Eastern Prussia.

A correspondent to the *Berliner Ärzte-Correspondenz* gives an interesting description of the position of country practitioners in Eastern Prussia, the part of Germany beyond the Polish Corridor. Eastern Prussia is the most lonely region of Germany, the population consisting for the greater part of peasants and large landowners. Cities are rare, and a town of 30,000 inhabitants is regarded as an important city. The railway lines are few and far between, and sometimes many miles from the doctor's residence, and the traffic is small. After the war, when many newly qualified medical men returned to Germany, there was a great movement towards the country, as the towns at that time were already overcrowded with medical men. This movement has now completely stopped and many country practitioners try to go to the towns. There are several reasons: first, the *deficiency of dwellings. The country medical man* has no chances of diversion outside his home, and when his surroundings are not pleasant he tries to get away as soon as possible. In some places where the local authority has provided for adequate residence for the medical man and has let it to him at moderate prices, the result is that those posts were much sought after. Another reason is that in Eastern Prussia the income of the country practitioner is too small, a practice of 6000 M. being, as a rule, the maximum income. In some particularly lonely places, where no medical man would voluntarily settle, the Treasury has given an extra allowance of 3000 M. for a resident doctor, but this sum is too small to attract medical men because private and club practice in those deserted places is quite insignificant. A medical man who, as an exception, earns as much as 10,000 M., is not in a position to have holidays, a locum tenent for a month costing 1000 M. A motor-car, which is indispensable owing to the great distances, may be purchased by the instalment plan, but as a rule the medical man has not the means to buy another car when the old one is worn out. In Königsberg, the capital of Eastern Prussia, the local group of the Hartmann-Bund has appealed to the Königsberg medical men not yet admitted to club practice to settle in country places, but there has been no response to that appeal.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The International Physiological Congress.

THE International Physiological Congress is meeting from August 19th to 23rd for the first time on American soil. This is the thirteenth of these gatherings, of which the first was held at Basle in 1880, as the outcome of suggestions which found expression at the International Medical Congress in London in 1881. Since the war meetings have been held at Paris in 1920, at Edinburgh in 1923 (when German physiologists once more attended), and in Stockholm in 1926. The meeting this summer is to be held at the Harvard Medical School under the presidency of Dr. William H. Howell, director of the School of Hygiene of Johns Hopkins University.

Effects of Carbon Monoxide in Low Concentration.

When the Holland tunnel was being built in New York it became necessary to find out how much carbon monoxide is permissible in tunnel air. The research done at that time[1] has become a standard in this country for ventilating engineering, but it took account of tunnel ventilation rather from the point of view of the driver of an automobile exposed for a relatively short time than of the worker—e.g., traffic policeman or repair shop employee—who may be exposed for several hours, and members of the U.S. Public Health Service now describe[2] an investigation of effects on this latter class of worker. Exposures were made in a special chamber from four to seven hours daily over a period of 68 days to gasoline engine exhaust gas so adjusted that the mixture breathed contained at the will of the experimenters 2, 3, or 4 parts of carbon monoxide per 10,000 parts of air. Six men were subjects of the experiments. Exposure to 2 parts carbon monoxide per 10,000 air gave distinct frontal headaches in from 3½ to 4 hours in about half the exposures. No occipital headaches resulted from exposure to this concentration. In a concentration of 3 parts per 10,000 of air frontal headaches appeared sooner (2½ to 3 hours), and a few cases of occipital headache and of vertigo occurred after three hours. This concentration produced 20 per cent. carboxyhæmoglobin in the blood in 2½ to 3½ hours, and 30 per cent. in 4 to 5½ hours, depending on the subject and whether he was at rest or exercise. *At the higher concentration of 4 parts* per 10,000 parts of air the above effects were more rapidly induced. At the end of 3½ to 4 hours more than 90 per cent. of exposures resulted in frontal headaches. In general, frontal headaches appeared when the hæmoglobin was about 20 per cent. saturated. A few distinct occipital headaches accompanied by vertigo developed at 23 to 28 per cent. saturation. When the subject was breathing uncontaminated air, saturation of hæmoglobin was reduced from 35 per cent. to 5 per cent. in five hours. Inhalation of oxygen greatly increased the speed of desaturation—from 35 per cent. to less than 10 per cent. in 30 minutes. There were no apparent signs that the health of the test subjects was adversely affected by the experiments. Hæmoglobin was usually increased pari passu with an increase in the red cell count. The leucocytes were unaffected. Apart from the occasional appearance of sugar nothing abnormal was found in the urine. Significant results were not obtained by psychological tests, possibly because so few men were under observation.

Medicinal Whisky.

Although there has been a slight decrease in the average amount of liquor prescribed by each physician the number of doctors prescribing alcohol continues to show a steady increase, having risen from 48,097 on June 30th, 1927, to 69,045 on the same date this year. The amount of whisky prescribed and consumed for medicinal purposes has been somewhat over 6,000,000 gallons in the last four years. There remain some 9,000,000 gallons mostly distilled before 1917. This stock, being sufficient only for four or five more years, the Prohibition Commissioner has authorised the manufacture next year of 2,000,000 gallons of medicinal liquor to replenish the supply.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

Relative Intelligence of the Sexes.

Dr. Petrescu lately read a paper before the Pedagogic Society, giving the results of 15 years' observation *in the schools of Bucharest. He has found that* intelligence is about equal in the two sexes in the earliest school years. The subsequent increase in mental power is considerably more rapid among the girls, so that at the end of the school period the results of intelligence tests are all in favour of the female sex. His conclusion is that the female intellect develops more rapidly than the male, and in this he agrees with the experience of de Körösy in Hungary. But he points out that as the great work of human progress has been accomplished by males, it is fair to assume that there is an early turning point at which the intellectual activity of women is arrested.

The Katzenstein Method of Testing the Heart.

In a communication recently presented to the Medical Society of Jassy Dr. Constantinescu spoke of *Katzenstein's* method of determining the functional power of the heart—a method which holds to be of especial service before surgical operation. It is based on the observation in animals that ligature of the larger arteries results in an increased cardiac activity which is characterised by higher blood pressure without any change in the pulse-rate. This condition does not disappear until the collateral circulation is fully established after a period of several weeks. In practice the test is performed as follows. The patient lies down, and when he is quite quiet the pulse-rate and blood pressure are determined. Both iliac and femoral arteries are then compressed, and the pressure is kept up for two to five minutes, changes in blood pressure and pulse-rate at the end of that time being carefully noted. With a healthy heart acting normally there is a rise of from 5 to 15 mm. of mercury in the blood pressure, while the pulse-rate remains the same or is slightly diminished. With a hypertrophied heart a rise of from 15 to 40 mm. is observed, and the pulse remains the same or is increased. With slight cardiac insufficiency the blood pressure does not rise, and the pulse-rate is unchanged or increased; whilst a marked insufficiency shows itself by a reduction of blood pressure and an increase in the pulse-rate. The method has the advantage of being simply and easily applied, but it is necessary to guard against excitement which might affect the result.

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[1] Ventilation of Vehicular Tunnels. U.S. Bureau of Mines, 1927.

[2] Effect of Repeated Daily Exposure of Several Hours to Small Amounts of Automobile Exhaust Gas. Public Health Bulletin, No. 186. 1929.

Multiple Arterial Thrombi.

In a recent paper in *Praxis Medici* Dr. I. Sturza criticises the common diagnosis of embolism where occlusion of large vessels and sudden death occur in patients suffering from mitral lesions. He is inclined to view the process as thrombotic, on the ground that the large masses found on the vessels are often altogether out of proportion to the small and delicate excrescences upon the diseased valves. Even if thrombi are present in the left auricle, their smooth surface argues against the possibility of embolism. In a case recently under his observation the abdominal aorta from 10 cm. above the bifurcation, together with the left and right femorals, the superior mesenteric, the left renal, splenic, right pulmonary, left inferior thyroid and left carotid arteries were found filled with clot. The immediate cause of death was occlusion of the mesenteric artery, and though the patient died half an hour after the accident, the intestines were already the seat of a hæmorrhagic infarction and peritonitis was beginning. The autopsy was performed four hours after death. To decide the question of thrombosis or embolism, the walls of the affected vessels were examined microscopically and intense inflammation was discovered in them, probably set up by the entrance of bacteria into the vasa vasorum, incident to a recurring endocarditis. On this explanation, he holds, it is not difficult to understand that a thrombosis may set in as suddenly and with the same signs as an embolism. The number of vessels occluded is often surprising, but the patients may have relatively few symptoms.

Public Health Services.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.†
Bootle ..	11,807	10,613	3,631	14,578	22·4
Leeds ..	75,150	—*	21,817	77,569	32·7
Stockport ..	15,227	13,447	5,458	12,388	23·63
Margate ..	3,337	2,944	1,152	1,376	15·7
Ilford ..	14,910	—*	5,910	9,795	28·6

* Not given. † Excluding dental defects and uncleanliness.

Bootle.

Dr. F. T. H. Wood, of Bootle, calls attention to the progress and expansion of the school work made possible by the increasing interest and coöperation of parents and teachers. Special inspections have risen from 4790 to 5280, largely owing to the attendances at the rheumatism clinic established early in the year; over 60 per cent. of the sources of reference at the special inspections were direct requests from the parents. Dr. Wood stresses the value of the attendance of parents at the routine inspections. He believes that the education of parents in sound nutrition and domestic care, the improvement of facilities for the drying of clothing of children arriving wet at school, the provision of dry dwellings, and prompt early attention to chills and illness such as tonsillitis will all play an important part in the conquest of rheumatism. He notes that 84 per cent. of all the skin diseases were due to conditions closely associated with uncleanliness and that nearly 3000 school days were lost by exclusion indirectly due to the same cause; the annual cost to the ratepayers of the inspection and treatment of uncleanliness in school-children was at least £300. He is convinced that the source of infection of all habitually verminous children is the home and not the school, and that if further progress is to be made it must be through education of the parent. On the subject of dental treatment he holds that the surprising difference in the conditions of the children's teeth and in the number of consents given for treatment among schools of similar standing can only be explained by the varying degrees of interest and enthusiasm shown by teachers, who are also urged to devote attention to the prevention of flat-foot, which mostly begins in later childhood. He draws attention to the importance in this connexion of (1) avoidance of muscular fatigue in the growing child and provision for ample sleep; (2) supervised training of the whole muscular system, especially that of the legs; (3) ordering a proper type of boot, which should be so fashioned that the inner side of the boot is kept straight and the end of the boot opposite the big toe; and (4) teaching the child to walk and stand with feet kept parallel and not pointed outwards. In walking the child should rise on the balls of the toes with each foot in succession.

Dr. A. G. Williamson, the assistant medical officer, analyses 111 of the first cases of rheumatism seen at the clinic. He states that no new features have come to light. The great majority of the cases started between the ages of 5–12, and that as the heart was so often affected in insidious and unsuspected cases the value of the clinic was emphasised. The spread of scalp ringworm was also inquired into, and in the 18 cases closely investigated the infection was not of school origin—a feature that is in harmony with the keynote of Dr. Wood's report, that the most important influence on the child is to be found in the home.

Leeds.

Dr. A. Wear notes the changes in the 20 years since the first report on the school medical work was issued; the work in general has increased in extent and efficiency, while the special work has come to include orthopædic treatment with massage and artificial sunlight, X rays, clinics for ear, nose and throat, eyes and skin, and searching ascertainment, registration, and administrative action for exceptional children. The clinic work began in one top room with one nurse (Miss Webster), who to-day superintends the school nursing service of Leeds (covering nearly 320,000 patients every year), of which she was once the sole representative. Owing to the indefatigable work of the nurses, with the help of the teachers, the presence of lice and nits, almost inevitably found in these early days, has become "distinctly rare." There is now a generally improved physique and more careful dental and general cleanliness, and the establishment of a health conscience, particularly among the girls, is becoming noticeable. On the value of fresh air in elementary schools Dr. Wear is emphatic. He cites two otherwise similar schools; one with better ventilation had a percentage of 6·5 cases of infectious illness, another less well ventilated had a percentage of 13·7. It is surprising that the report contains no direct reference to the lack of an open-air school. This lack is the more striking because the percentage of defects found is unusually high (32·7 per cent.) which reflects both thorough medical inspection and adverse local conditions. There may be some local factor which explains this omission, nowadays very rare. Provision seems to be made for all exceptional children apart from the delicate and pre-tuberculous class, and it is especially this class which benefits so much from prophylactic treatment. There are special schools for the physically and mentally defective, for the blind and the deaf, and there is a nursery school. For anæmia, rickets, malnutrition, and tuberculous conditions artificial sunlight treatment has been available since June, 1927, and recently these facilities have been improved. Dr. Wear comments on the low earning capacity of the ex-pupils of the special mental deficiency schools, and thinks that more attention should be given to manual training, and he also suggests that a larger proportion of scholars might be allowed to leave school for *suitable* employment after reaching the age of 14. But would not, however, this system defeat its own object? The child leaving at 14 usually gets into a blind alley job from which he is turned away at 16 when his employer is faced with payments under the Insurance Act. He is then workless, untrained, and unsocialised, and for the defective lad the moral and social outlooks are deplorable. If this possibility were borne in mind in the interpretation of the phrase suitable employment this danger might be avoided, but the number of children finding permanent work would be small. Improvement is to be hoped for along the other lines indicated in this report—better manual (semi-vocational) training continued until 16 years of age, and close coöperation with the employment exchanges.

Despite the immense amount of routine work time has been found for some special inquiries, and for propaganda in the best sense of that word—including the award of prizes for the child with the best cared-for teeth and for the best essays on the subject.

Stockport.

Dr. N. Gebbie draws attention to the fact that in Stockport, as elsewhere, the number of children found to be suffering from defects at the very beginning of their school life is still unduly high, and suggests that it is to a more complete supervision of the infant and the toddler by means of an extended maternity and child welfare service that we must look for improvement. This conclusion is not altered by the circumstance that the percentage of defects at later ages does not differ greatly from that of the entrants, for many defects may persist and others are revealed—e.g., errors of refraction—as school life progresses. But the care of the toddler is not so much in the province of the infant welfare centre as in that of nursery schools, the universal and adequate provision of which is an ideal not yet likely to be attained. They do not exist in Stockport, and it is not indicated in the report how far the facilities of the school clinics are made use of for infants below school age. A considerable extension of the dental work has been made possible by the appointment of an additional dentist in August, 1928. There have been inspections in 20 schools, compared with six in the previous year. Steps have also been taken to reduce the number of casual cases, though six sessions per week out of 24 are reserved for treatment of urgent necessitous cases. A complete orthopædic scheme has not yet been established, but good work is being done by means of a special arrangement with the Stockport Infirmary, and the interest taken in the welfare of the crippled children by Mr. E. S. Brentnall, the hon. orthopædic surgeon of the infirmary. The facilities provided include massage, exercises, and artificial sunlight treatment. Some beds are allotted at the infirmary to school-children, and cases are also sent to the Shropshire Orthopædic Hospital at Oswestry. It has been decided to provide an open-air school at Woodbank, where there is an ideal site, with accommodation on modern lines for approximately 100 children. Three class-rooms of the open-air type are in use in a temporary building at Flyde Lodge High School. A voluntary organisation known as the "George Fearn Trust," aided by a grant of £150 from the local authority, maintains 15 beds at the Ormerod Convalescent Home at St. Anne's-on-the Sea. There is no organiser of physical training, but in the elementary schools this training is given by teachers who have paid special attention to the subject, and in the secondary schools for girls remedial exercises when required are discussed by the visiting doctor with the drill instructor. Owing to the prolonged illness of the specialist teacher the class for stammering children could not be held. It is evident that the work in Stockport, as far as the facilities allow, has been thoroughly carried out.

Margate.

Margate is one of those smaller places where practically all the general work is done by one person. Dr. Cowan McCombe has to turn his mind from large engineering questions like main water-supply to smaller ones like the cure of blepharitis or the giving of an anæsthetic, and constantly has new duties to face such as the care of rheumatic children and the licensing of nursing homes. He has help in the special branches of dental, aural, and ophthalmic work, and his burden is lightened by the nurse (there is apparently only one full-time nurse) and by the sanitary inspectors. He has also the coöperation of the attendance officer and the teachers, to all of whom he gives especial thanks. It is perhaps because Dr. McCombe is known so well personally that the percentage of parents attending the medical inspections is unusually high—nearly 80 per cent. Another feature of a small area with good local interest is the large share taken by voluntary bodies; the provision of meals for necessitous cases is carried out independently of the authority, and the occupation class for the ineducable mentally defective was run privately. The risk attached to such voluntary service was made obvious when the lady responsible for this class was unable to continue and it had to be dropped at least temporarily. This is the more unfortunate because there is no home for mentally defective children in Kent, and it is almost impossible to get institution treatment for them. Another disadvantage of areas of this size is the impossibility of establishing any local special schools; use has to be made of joint or borrowed accommodation. The education authority has recently coöperated with the county council in the orthopædic scheme. The clinic is held at Broadstairs, where an orthopædic surgeon attends twice a month and a trained nurse weekly. Hospital accommodation is provided in suitable cases and surgical appliances are supplied for out-patients when necessary. There are 65 delicate children who would benefit from an open-air school, but this, unfortunately, does not exist.

Ilford.

Dr. A. H. G. Burton, whose school medical report was again one of the earliest to appear, shows clearly what has been done in Ilford and what extensions of activity are essential. The authority has established an adequate and well-planned open-air school to which 90 children have already been admitted. It is designed to allow the maximum amount of sunlight and air into the class-room, the whole of which can be opened on the south side by folding doors. Arrangements have been made for the conveyance of those who live in outlying parts of the borough. The next step forward will be the establishment of an orthopædic scheme, which is not a very easy matter owing to the position and size of Ilford. Coöperation with the Essex County Council has been considered, but the nearest centre is at Romford which is too far for Ilford children to attend. The nearest hospital at which there is an orthopædic surgeon is in London. The authority would therefore need (1) to make arrangements for in-patient orthopædic treatment in London; (2) to appoint an orthopædic surgeon whose salary would be some 80 guineas a year if he attended fortnightly; and (3) to establish and fit up clinics for massage and remedial exercises with a whole-time trained masseuse at a salary of £200. At present valuable remedial exercises are being carried out for postural defects and slight deformities by Mr. F. T. Roberts, the supervisor of physical training, whose interesting report is here included. Extended facilities for dentistry are much needed. The present scope of the work is very limited, and the low percentage of acceptances (45·9 per cent.) should be raised when the appointment of a second dentist makes it possible to undertake educational propaganda among the parents and children.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 10TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 114 (last week 129); scarlet fever, 1482 (last week 1776); diphtheria, 741; enteric fever, 80; pneumonia, 612; puerperal fever, 28; puerperal pyrexia, 81; cerebrospinal fever, 8; acute poliomyelitis, 16; acute polio-encephalitis, 2; encephalitis lethargica, 14; continued fever, 1; dysentery, 10; and ophthalmia neonatorum, 81. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on August 13th–14th was as follows: Small-pox, 132 under treatment, 5 under observation (last week 134 and 9 respectively); scarlet fever, 1326; diphtheria, 1491; enteric fever, 18; measles, 330; whooping-cough, 276; puerperal fever, 27 (plus 13 babies); encephalitis lethargica, 123; and "other diseases," 23. At St. Margaret's Hospital there were 12 babies (plus six mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 3 (1) from enteric fever, 28 (5) from measles, 1 (0) from scarlet fever, 25 (6) from whooping-cough, 33 (6) from diphtheria, 60 (5) from diarrhœa and enteritis under two years, and 15 (4) from influenza. The figures in parentheses are those for London itself.

Of the deaths from measles 5 were reported from Liverpool and 5 from Bradford; those from diarrhœa and enteritis included 6 each from Manchester and Liverpool, 5 each from Birmingham and Sunderland, 4 each from Hull and Stoke-on-Trent, and 3 each from Leeds and Newcastle-on-Tyne.

The number of stillbirths notified during the week was 305 (corresponding to a rate of 49 per 1000 total births), including 59 in London.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—From Sept. 9th to 14th the Brompton Hospital will hold an all-day course in diseases of chest. Facilities will be given for attending the practice of the various departments of the hospital, and instruction will be by lecture and demonstration. Under Dr. Eric Pritchard's direction there will be a course at the Infants Hospital from Sept. 9th to 22nd. This is designed mainly for those engaged in infant welfare work, and visits will be paid to centres other than the hospital. From Sept. 10th to Oct. 5th a course of lecture-demonstrations in psychological medicine will be given at the Bethlem Royal Hospital on Tuesday and Saturday mornings. An intensive course in medicine, surgery, and the specialties for men only will be given at the Westminster Hospital from Sept. 16th to 28th, from 10.30 A.M. until 5.30 P.M. daily. The Prince of Wales's Hospital and the North Middlesex Hospital will hold a course in gastro-enterology from both medical and surgical aspects from Sept. 30th to Oct. 4th. The Metropolitan Hospital will hold its first course under the auspices of the Fellowship, in medicine, surgery, and the specialties, from Oct. 21st to Nov. 2nd. A second evening course for the M.R.C.P. examination from Oct. 15th to Dec. 6th. Further information and syllabuses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Obituary.

WILLIAM EWART, M.D. CAMB., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO ST. GEORGE'S HOSPITAL.

WE announced last week the death, on Sunday, August 11th, in his 81st year of Dr. William Ewart. This will have come as no surprise to those who knew him, since for several years he had been in a very precarious state of health; but in spite of his increasing general weakness and his painful lameness he remained until the end a familiar figure in the Athenæum, and a regular attendant at the Comitia of the Royal College of Physicians of London.

DR. WILLIAM EWART.

[Photograph by Elliott and Fry.

William Ewart was the son of an English father and Xenie Guillet, a French lady, and he was educated partly in England and partly at the University of Paris, where he obtained the diploma of Bac. ès Lettres. He joined the medical school of St. George's Hospital in 1869, and as a student saw service with the French army in the Franco-German war. He obtained the diplomas of the English Colleges in due course, becoming house physician to the hospital in 1873. In the following year he took the diploma of M. R. C. P. Lond., and in 1875 was elected house physician to Addenbrooke's Hospital, Cambridge, at the same time gaining at Gonville and Caius a scientific scholarship. In 1876 he graduated in the first class of the Natural Science Tripos, and proceeded to the degree of M.B., which he obtained in 1877. After some post-graduate work in Berlin he returned to St. George's Hospital as curator of the museum, lecturer on physiology, and demonstrator of physiological chemistry, was appointed pathologist to the hospital in 1879, and in 1882 was elected assistant physician. He had previously taken to the M.D. Camb., and been elected F.R.C.P.

Ewart's connexion with St. George's Hospital was a long and honourable one. He was assistant physician for seven years, during which time he was assiduous in the conduct of out-patient practice, and an informative if whimsical demonstrator of the varied clinical material which came under his eye. Many students of St. George's will remember Ewart's demonstrations, for they formed a curious difference from anything like stereotyped teaching in their rapid deductions and explanations and their alternate brevity and diffuseness. Patients, also, were often disconcerted by his methods of cross-examination—he was not really trying to convict them of inaccuracy, but his questions were often oddly worded, while he seemed impatient at the delay or confusion in the replies brought about by his own use of words. But those who attended the out-patient department regularly under Ewart's direction learned much clinical medicine. In 1888 he was elected full physician to the Hospital, and discharged his duties with regularity and enthusiasm, although again his teaching was of an individual character that often appeared unpractical to his pupils. While assistant physician to St. George's Hospital he had also been assistant physician to the Brompton Hospital for Consumption and Diseases of the Chest, and this post, in accordance with a rule that seemed prevalent at the Hospital at that date, he was asked to resign upon election as full physician to St. George's. Ewart had been a very energetic pathologist at Brompton, and acquired a great deal of knowledge concerning phthisis, where he had been in touch with much modern work, so that it was natural that in his wards at St. George's he should be particularly interested in pulmonary cases. His physical examination of such patients was minute and laborious, and many of his clinical clerks must have been hard put to it to recognise the various signs of stationary, active, and new mischief which he would detect. He was constantly on the look-out for rare cases, and it sometimes seemed as though his high scientific equipment as a student betrayed him into associating with elaborate chemical or physical reactions circumstances which could be explained in more ordinary fashion.

Especially did Ewart's work at Brompton, although of no long duration, influence his literary interests. His most important literary work was entitled Pulmonary Cavities, and was an expansion of the Goulstonian Lectures on the subject which were delivered in 1882 before the Royal College of Physicians of London. In the course of an elaborate explanation of the methods, as he saw them, by which nature endeavours to heal pulmonary cavities, he referred in great detail to the anatomical changes which bring about the formation, collapse, contraction, and healing of these lesions, and the knowledge of the subject which he displayed—alike of the post-mortem findings and the literature—was recognised at once as remarkably intimate and well documented. He pursued the subject later in a volume upon the anatomy and nomenclature of the bronchi and pulmonary blood-vessels, while the articles on bronchitis and bronchiectasis, which he contributed to Allbutt and Rolleston's System, again revealed his deep interest in the structure of the lung. A second side of Ewart's activities was due to his experience gained at Brompton, for the influence on the tuberculous subject of climatic conditions led him to study climatology in a practical manner, and to write notes on the climatic features of various centres at home and abroad at a time when such information was badly needed.

Ewart's connexion with the Royal College of Physicians of London was a long and intimate one. Elected a Fellow in 1881, at the time of his death he was fourth or fifth on the roll of seniority. He delivered the Goulstonian Lectures in 1882, as has already been said, acted as an examiner for two separate periods of three years—1885 to 1888, and 1894 to 1898, and was a member of the Council from 1901 to 1903. To the end of his life he was a devoted servant of the Corporation, and a very regular attendant at the Comitia, where he will be sadly missed.

In practice, apart from his hospital work, William Ewart did not possess the qualities that appealed to the public, nor was he able to render the prompt and straightforward assistance to family practitioners that they and their patients expected at consultations. And thus it came about that William Ewart, with great scientific qualities and personal characteristics that endeared him to many, made no headway at all as a consultant physician.

WE have to record that Dr. JAMES DOUGLAS WRIGHT, of Wembley Park, has died suddenly at Chichester from pneumonia in his forty-fifth year. Born at Coatbridge, he was educated at the Anderson College and St. Mungo's College, Glasgow, where he qualified with the Scottish conjoint diploma in 1912. Throughout the late war he served in France, holding a captain's commission in the Royal Army Medical Corps. A period of post-graduate study at Glasgow followed, and in 1921 he became a Fellow of the Royal Faculty of Physicians and Surgeons. As a practitioner in Wembley Park he was not very widely known, but his considerable skill as a physician was appreciated, and colleagues with whom he was intimate found that they were wise in turning to him for advice when in difficulties. His kindness to his patients was reflected in their loyalty to him and his death will be much regretted. Dr. Wright was unmarried.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. T. B. Shaw relinquishes his post as Professor of Hygiene and Director of Medical Studies at the Naval Medical School, Greenwich, on appointment to Chatham Hospital. Surg. Capt. J. S. Dudding succeeds Surg. Capt. Shaw.

Surg. Lt. A. A. Pomfret to be Surg. Lt.-Comdr.

The following appointments have been notified:—Surg. Capts. A. R. Schofield and C. T. Baxter to *Vivid;* and L. M. Morris to *Victory*, for R.N. Hospl., Haslar. Surg. Lts. W. R. S. Panckridge to *Nelson;* and J. L. Malone to *Alecto*

ROYAL ARMY MEDICAL CORPS.

Capts. J. M. Savoge and G. K. Fulton to be Majs.

The undermentioned Lts. (on prob.) are confirmed in their rank: J. C. Gilroy, W. A. R. Ross, D. Blewitt, R. G. G. Robertson, V. C. Verbi, W. H. Scriven, J. Crosley, H. E. Knott, and M. J. Malley.

TERRITORIAL ARMY.

Capt. D. R. Jones to be Maj.

Lts. D. G. Coutts and G. A. MacDonald to be Capts.

F. W. A. Warren and N. Harkness to be Lts.

E. G. C. Darke and C. R. Croft (late Offrs. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lts.

Capt. J. B. McGovern resigns his commn. and retains his rank.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. C. Rundle having attained the age limit relinquishes his commn. and retains his rank.

Maj. W. J. Gray having attained the age limit retires and retains his rank, with permission to wear the prescribed uniform.

Capt. (Bt. Maj.) G. Patton and Capt. F. W. Begg having attained the age limit relinquish their commns. and retain their rank.

ROYAL AIR FORCE.

Major R. H. Bebb (Army Dental Corps) is granted a temporary commission as a Squadron Leader (Dental) on attachment to the R.A.F.

Flight Lt. A. B. H. Cole (Capt. Army Dental Corps) relinquishes his temporary commission on return to Army duty.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Majs. P. E. Barber (retd.), G. H. H. Waylen, W. George, and A. H. Fullerton, and upon Capt. J. B. McGovern (retd.).

COLONIAL MEDICAL SERVICES.

Dr. P. S. Selwyn Clarke, from the West African Medical Staff, has been made Assistant Director of Sanitary Service, Gold Coast. The following appointments have been made: Dr. A. G. Badenoch, Dr. G. I. H. Braine, and Dr. R. C. Burgess, Medical Officers, Federated Malay States; Dr. B. A. S. Russell, Lady Medical Officer, Gold Coast; Dr. H. S. Begbie, Assistant Medical Officer of Health, Hong-Kong, and Dr. W. D. Forrest, Medical Officer, Hong-Kong; Dr. R. M. Dowdeswell, Dr. M. A. W. Roberts, and Dr. H. C. Trowell, Medical Officers, Kenya; Captain N. L. Joynt, Medical Officer, Virgin Islands, Leeward Islands; Dr. S. Kramer, Assistant Colonial Surgeon, St. Helena; Dr. E. K. Tratman, Professor of Dental Surgery, College of Medicine, Singapore; and Dr. D. C. McE. Macpherson, Medical Officer, Gilbert and Ellice Islands, Western Pacific. Dr. C. R. Adgie and Dr. S. A. Maclean have been appointed Medical Officers on the West African Medical Staff.

Correspondence.

"Audi alteram partem."

MEDICAL WORK AT THE SCOUTS' JAMBOREE.

To the Editor of THE LANCET.

SIR,—I think that the profession in general would like to know about the important part which many of its members played in the World Jamboree at Birkenhead. From home or overseas, some 70 doctors were in camp. They represented almost every branch of the profession—consultants, practitioners, medical officers of health, the services, teaching staffs, research, specialists, and students. Many are high in the Scout movement, many are actively associated in furthering its aims; some not desiring a "busman's holiday" were to be found in important non-medical appointments at the Jamboree, and were always ready to give their professional services when required; while others, non-Scouters, stood in to lend a hand in hospital or aid-post out of sheer goodness of heart. Years did not signify; among all, there was joy in their actions and the spirit of youth on their faces. It is delightfully refreshing to see eminent medical men in the boyish and rational dress of shirts and shorts. Medical necks and medical knees take on a fine shade of tan. And the spirit of comradeship and friendliness that sprang up was perfectly splendid. A medical Scouters' dinner was held, at which almost 50 were present. The Chief Scout received the members of the health organisation (hygiene and medical staffs) on the last day of the Jamboree and expressed his great appreciation of the work they had done for Scouting.

It is fine to see so many members of our profession imbued with the spirit of scouting. For myself, it was a unique privilege to observe how magnificently they carry into practice the Scout doctrine of service to others.—I am, Sir, yours faithfully,

M. B. H. RITCHIE,

Major, Royal Army Medical Corps; Assistant Jamboree Camp Chief (Health), World Jamboree, 1929.
Military Hospital, Colchester, August 19th, 1929.

*** *An annotation on medical work at the camp appears on p. 396.*—ED. L.

THE TREATMENT OF HÆMORRHOIDS.

To the Editor of THE LANCET.

MY DEAR DOCTOR,—I highly esteem your magazine, THE LANCET, and am thoroughly grateful for space accorded the review of my book, "The Modern Treatment of Hæmorrhoids." It grieves me, however, to see my book misquoted in great length in the aforesaid review. May I ask you, therefore, to allow me the privilege of correcting these errors and misquotations and of making one or two remarks pertinent to the matter discussed in this review?

First, I am quoted as "still preferring a 20 per cent. solution of cresylic acid, glycerine and water." The fact of the matter is that I have never preferred nor advocated a 20 per cent. solution of this substance. What I *have* recommended and what I *do* use is a 10 per cent. solution. Since the trend of popular opinion is toward the weaker strength in injection treatment solutions, I feel that my book may be misjudged by the aforementioned statement that I prefer the 20 per cent. solution.

Secondly, I am quoted as recommending the use of a suction pump for the diagnosis of hæmorrhoids, when, in fact, my book discusses at some length the possibility of harmful effects upon the patient incident to its use and emphasised the fact that clinical judgment in the matter may be distorted by its employment. I trust you will permit me to quote my concluding sentence in this respect. I say, "We are thus liable to do the patient the injustice of ascribing to him a pathological condition, hæmorrhoids, when, in fact, what is observed as merely a normal physical response to a physical state of negative pressure." From this it must be very evident that I regard the method just as obsolete as your revewing authority does. I am, therefore, loathe to be classed among those that recommend it. Unfortunately the review does place me in that category.

Two other points that I think will bear mention are that the reviewing editor in chiding me for the lack of "facts about recurrence-rate" overlooks the fact that I have devoted one entire chapter of nine full pages to a discussion of the very subject concerning whose omission he is so deeply grieved. Finally, he deplores the lack of metric recommendation as to the dosage to be employed in the injection treatment. The instructions I do give are such as require observation during the administration of the treatment. I do believe these to be far more reliable and definite than any mathematical formula. If the good doctor will exclude all the variable factors which individuals present, will standardise the size of hæmorrhoids, their composition and consistency, and, moreover, will standardise the reaction of the tissues to the solutions we use in injection, then I will be in a position to make a specific mathematical formula which will resolve the injection treatment of hæmorrhoids into a simple process of turning a crank.

I trust you will be so good as to give as much space to this partial refutation of the review of my book as you gave to the original review. I assure you this will be greatly appreciated.

Most cordially yours,

New York, July 22nd, 1929. J. F. MONTAGUE.

*** We much regret the error as to the strength of the solution of cresylic acid. In reviewing the first edition of the work we recorded the strength of the solution correctly. With regard to the use of the suction pump, lest readers should put our reviewer's interpretation on the passages referred to, would it not be as well to much curtail in future editions reference to this technique: a lengthy and illustrative description of a measure may surely be read as a recommendation? With regard to the recurrence-rate, the statements require more detailed support in the form of definite facts, while the practitioner would certainly be much helped by information about average doses and usual limits of dosage.—ED. L.

THE ANGLO-FRENCH LIBRARY OF MEDICAL AND BIOLOGICAL SCIENCE.

To the Editor of THE LANCET.

SIR,—The kindly notice in this week's LANCET of Sir William Hamer's "Epidemiology, Old and New" (1928) emboldens me to draw attention to a project that has hitherto escaped comment. This book, and Sir Humphry Rolleston's "Aspects of Age, Life and Disease," are the first contributions, by English authors, to a series of monographs, by French, British, and American writers of distinction, that will be known as the Anglo-French Library of Medical and Biological Science. The original feature of this collection of books is that *each* volume will be published in London in English and in Paris in French. Thus, translations of the books written by Sir William and Sir Humphry are actually on the point of publication in Paris, whilst one of Prof. Achard's, "L'œdème brightique" (ready in Paris) is now in the hands of the printer in London. That a French and an English publishing house should have collaborated to this end, in the manner found possible by Messrs. Doin and Messrs. Kegan Paul and Co., is, in itself, gratifying to all those who desire to forward the exchange of ideas between members of the medical profession in the two countries. I confess to being jealous that the reception accorded to the plan in England should not be less generous than that reported to me by my co-editor, Prof. Cruchet, of Bordeaux.—I am, Sir, yours faithfully,

F. G. CROOKSHANK.

Wimpole-street, W., August 17th, 1929.

THE NEW VACCINATION ORDER.

THE new Vaccination Order, framed on the Report[1] of the committee (the Rolleston Committee) appointed in conjunction with the Medical Research Council, was issued by the Ministry of Health at the beginning of the week, together with a circular addressed to boards of guardians.

THE STATEMENT OF THE MINISTER OF HEALTH.

The Vaccination Orders will be amended especially to give effect to the following recommendations of the Rolleston Report, which will be found on p. 201 of that document:—

(1) In place of the officially advocated four insertions a trial be made of vaccination and revaccination in one insertion with a minimum of trauma, and that multiple scarification and (or) cross-hatching be deprecated.

(2) Primary vaccination be performed in infancy, between the ages of 2 and 6 months as at present, and revaccination be offered at the time when a child enters school (5 to 7 years), and again on leaving (14 to 16 years).

(3) Vaccination in multiple insertions be available for such persons as desire to obtain the maximum protection against small-pox obtainable at one operation.

(4) In public vaccination parents be informed that if, in consequence of vaccination, a child requires medical attention, it is the duty of the public vaccinator concerned to provide such attention without cost to the parents.

The Minister has issued a new Order to boards of guardians dealing with these points, with a detailed explanation of certain paragraphs in the Order, contained in the first schedule which gives the official instructions to public vaccinators. Thus stress is laid upon the recommendation numbered (3) above, ensuring that where the parent or guardian of a child desires maximum protection the number of insertions may be increased up to four.

Post-vaccinal Nervous Disease.

Of post-vaccinal nervous disease, concerning which the Rolleston Report stated that though the manifestation might be extremely rare their occurrence must be of serious import, the Minister of Health says: "Post-vaccinal nervous disease, both in this country and abroad, has occurred mainly in children of school age or adolescents who had never previously been vaccinated, and that this fact emphasises the desirability of securing the successful vaccination of infants. Where this has not been attained the question which arises is whether it is advisable to vaccinate children of school age or adolescents. The Minister is of opinion that, in the present state of knowledge, and so long as the small-pox prevalent in this country retains its present mild character, it is not generally expedient to press for the vaccination of persons of these ages who have not previously been vaccinated, unless they have been in personal contact with a case of small-pox or directly exposed to small-pox infection."

THE VACCINATION ORDER, 1929.

After the preamble, according to form setting out references to existing vaccination orders, the new Order sets out an amendment of paragraph 0, Form A, in the schedule to the Order of 1924 which ensures after-inspection by the public vaccinator both of any vaccination performed by himself or a medical practitioner to give the necessary certificate of successful operation. Where he is himself the operator he is to render any subsequent treatment required. A further paragraph sets out that revaccination, which is stated to be desirable at the ages of 5 and 14, will be performed free of cost on application to the public vaccinator.

Instructions to Vaccinators under Contract: the First Schedule.

(1) Except so far as any immediate danger of small-pox may require, the public vaccinator must vaccinate only subjects who are in good health. As regards infants, he must ascertain that there is not any febrile state, nor any irritation of the bowels, nor any unhealthy state of the skin, especially no chafing or eczema behind the ears, or in the groin, or elsewhere in folds of skin. He must not, except of necessity, vaccinate in cases where there has been recent exposure to the infection of diseases such as measles, scarlatina, or diphtheria, nor where erysipelas is prevailing in or about the place of residence.

(2) *If it be necessary to postpone vaccination on medical* grounds a certificate to that effect must be given by the public vaccinator in the form prescribed by the Minister of Health or to the like effect—

(*a*) If in his opinion the child is not in a fit and proper state to be vaccinated; or

(*b*) If in his opinion the child cannot be safely vaccinated on account of the condition of the house in which it resides or because there is or has been a recent prevalence of infectious disease in the district; and in any such case the public vaccinator is required forthwith to give notice of such certificate to the medical officer of health of the district in the Form P. set out in the Fifth Schedule to this Order,[2] or to the like effect.

(3) All public vaccinations are to be performed with glycerinated calf lymph or with such other lymph as may be issued by the Minister of Health. If the parent or other person having the custody of the child requires that it shall be vaccinated with lymph issued by the Minister of Health, the vaccination must be performed with such lymph.

(4) The public vaccinator must keep such record of the lymph he uses for vaccination as will enable him always to identify the origin of the lymph used in each operation. He must not employ lymph supplied by any person who does not keep an exact record of its source.

(5) The public vaccinator must keep in good condition the lancets or other instruments which he uses for vaccinating, and he must not use them for any other purpose whatever. When vaccinating he must have with him the means of sterilising and cleansing his instruments. He must cleanse and sterilise his instruments immediately before and after performing each vaccination. When once he has unsealed a tube of lymph he must never attempt to keep any part of its contents for the purpose of vaccination on a future occasion. In no circumstances whatever should the mouth be applied directly to the tube in which the lymph is contained for the purpose of expelling the lymph. In the case of ordinary capillary tubes an artificial blower may be properly used for this purpose.

(6) Vaccination should at every stage be carried out with aseptic precautions. These should include: First, the thorough cleansing of the surface of the skin before vaccination; secondly, the invariable use of sterilised instruments; and thirdly, the effective protection of the vaccinated surface against extraneous infection both on the performance of the operation and on inspection of the results.

Advice should always be given to the person having the custody of the child as to the necessity of effective protection of the vaccinated surface until the scabs have fallen and the arm has healed.

(7) In all ordinary cases of vaccination or revaccination, the public vaccinator should vaccinate in one insertion preferably by a single linear incision or scratch not more than a quarter of an inch long merely through the epidermis. This incision should be made in the long axis of the limb. The lymph may be applied to the cleansed skin and the incision made through it, or the lymph may be applied to the incision immediately after the latter has been made. The lymph may be gently rubbed into the scratch with the side of the needle or lancet. In cases in which the public vaccinator or the vaccinee (or the parent or other person having custody of a child vaccinee) desires to obtain additional protection at one operation (i.e., where the maximum protection against small-pox is desired, or where the circumstances make it especially desirable to avoid risk of failure), the public vaccinator may, if he considers it necessary, increase the number of such insertions. The number of insertions should not exceed four, and they should be placed so as to avoid coalescence of the resulting vesicles. The aim of the public vaccinator should be to produce successful vaccination with the minimum of injury to the tissues. In no circumstances should the vaccinated area be cross-scarified or cross-hatched.

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[1] Cmd. 3148, H.M. Stationery Office. 1s.

[2] i.e., The Vaccination Order, 1898.

Opportunity should be taken by the public vaccinator to recommend that, in view of single-insertion vaccination, revaccination is advisable at an earlier period than if more insertions had been made than one.

(8) The public vaccinator must enter all cases in his register on the day when he vaccinates them, together with all particulars required in the register up to and including the column headed "Initials of person performing the vaccination." The results of the vaccination are to be entered in the register upon the day of inspection and attested by the initials (in column No. 13) of the person who makes the inspection. In cases of successful *primary* vaccination the public vaccinator must record the number of separate normal vaccine vesicles or groups of vesicles which have been produced. In cases of *revaccination* he must register as "successful" only those cases in which either vesicles, normal or modified, or papules surrounded by areolæ, have resulted.

When any operation (whether vaccination or revaccination) has to be repeated owing to want of success in the first instance it should be entered as a fresh case in the register.

The new Order comes into force on Oct 1st, 1929.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The Council of the College are prepared to receive applications for the office of Milroy Lecturer for 1931 on State Medicine and Public Health. Particulars will be found in our advertisement columns.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: *Examination in Canada.*—A Primary Examination in Anatomy and Physiology for the Fellowship of the College was held at Toronto on August 6th and the following days, this being the first occasion on which this examination has been held out of England. The examination was conducted by Profs. William Wright, W. E. Le Gros Clark, C. Lovatt Evans, and John Mellanby, who were sent out from England for the express purpose, with Profs. J. P. McMurrich and C. H. Best, of Toronto University, as assessors. Sir Holburt Waring also attended as visitor on behalf of the College. Twenty-three candidates presented themselves for examination and nine were successful. The Canadian Medical Association was responsible for the arrangement, and much of the success of this new departure was due to Dr. Alexander Primrose, Dean of the Medical Faculty of the University of Toronto, and Dr. T. C. Routley, General Secretary of the Association, who took an active part in bringing about this attempt to offer to Canadian medical practitioners greater facilities for obtaining the F.R.C.S. Eng. There is a strong desire in Canada for closer association between the medical profession in the Dominion and in this country, and much interest has been taken in Canada and the United States in the undertaking. The examiners were received by the Governor-General at Quebec, and by the Prime Minister at Ottawa, who expressed sympathetic interest in their mission. The Final Examinations for the Fellowship will be conducted only in England, but the opportunity of passing the Primary Examination in Canada should make two visits to this country unnecessary, and so, it is hoped, bring the F.R.C.S. Eng. within the reach of a larger number of Canadians than has hitherto been the case.

INSTITUTE OF HYGIENE.—On August 16th a luncheon was held on the premises at 28, Portland-place, London, W., to celebrate the granting of a Royal Charter of incorporation to this Institute which was founded in 1903. In the absence of Sir Thomas Oliver, the President, the chair was taken by Prof. J. W. H. Eyre, a Vice-President, who spoke of the work done over a long period in persuading manufacturers to provide unsophisticated food and drink and good clothing, and in trying to improve conditions of life generally. Prof. Bostock Hill, in proposing the toast of the Institute, referred to the work of the National Health Week Committee over which he had presided for 18 years. Dr. Harry Campbell responded to the toast; Dr. Andrew Balfour proposed the health of the Chairman; Mr. A. L. Peterson spoke of the value of the Institute from the point of view of the manufacturer; and Mr. Seymour Harding, the Secretary, responded to the toast of his health.

DEGREES AND DIPLOMAS IN PUBLIC HEALTH.—The Royal Institute of Public Health has issued a booklet describing the course of instruction which it offers to candidates for these degrees and diplomas. It may be had from the Secretary of the Institute, 37, Russell-square, London, W.C. 1.

UNIVERSITY OF MELBOURNE.—Dr. R. Marshall Allan, M.C., has been appointed professor of obstetrics in the University. At one time Assistant Master of the Rotunda Hospital, Dublin, he has been director of obstetric research at Melbourne University for the past two years. He is a graduate of Edinburgh University and a Fellow of the Edinburgh Royal College of Surgeons.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The following awards have been made for 1929–1930: A University Scholarship to John Bishop Harman, of St. John's College, Cambridge; Entrance Science Scholarships to C. J. Cobbe and to S. H. Alavi and R. H. R. Belsey; and a William Tite Scholarship to H. R. B. Norman.

GIFT FOR VETERINARY RESEARCH.—The Government of New South Wales has accepted a gift of £20,000 from Mr. F. D. McMaster for the erection of an animal health laboratory by the Scientific and Industrial Research Department.

THANK-OFFERING FUND.—The Fund being raised to commemorate the recovery of the King now stands at about £400,000. Of this sum £187,000 is contributed to the National Radium Fund, whilst the remainder, which is received by King Edward's Hospital Fund for London, includes amounts which have been ear-marked for individual hospitals.

Appointments.

DAVIES, L. M., M.D., B.Ch. Oxf., D.P.H., has been appointed Medical Officer of Health, Devon.

MACDONALD, E. K., M.D., B.S. Lond., Medical Officer of Health, Barnsley.

WEAVER, A. E. REMMETT, M.D., Ch.B. Birm., D.P.H., Medical Officer of Health for the Weston-super-Mare Urban district.

Certifying Surgeons under the Factory and Workshop Acts: PICKELS, J. A., M.B., B.S. Lond. (Uffculm District, Devon), and SARAFIAN, D. H., L.R.C.P. Lond., M.R.C.S. (Chipping Sodbury, Gloucester).

Vacancies.

For further information refer to the advertisement columns.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham City Education Committee.—Asst. School M.O. £600.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £200.

Bristol Royal Infirmary.—H.P. to Cancer Research Dept. At rate of £60.

Chester Royal Infirmary.—H.S., &c. £120.

Coventry and Warwickshire Hospital.—Hon. Anæsthetist.

Evelina Hospital for Children, Southwark, S.E.—H.S. £120.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. At rate of £100.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Great Yarmouth General Hospital.—Sen. H.S. £150. Also Secretary £300.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P's. Each at rate of £150.

Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.

Hull Royal Infirmary.—Cas. H.S. Also Asst. H.P. Each at rate of £130.

Kidderminster and District General Hospital.—H.S. £150.

Kingston-upon-Hull, City and County of.—M.O.H. £1500.

King's Lynn, West Norfolk and Lynn Hospital.—Sen. and Jun. H.S.'s. £150 and £100 respectively.

Lanarkshire Joint Committee on Venereal Diseases.—Venereal Diseases O. £750.

Leicester Royal Infirmary.—H.S.'s, H.P. Also Cas. O. Each at rate of £125.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Liverpool University.—Lecturer in Pathology. £600.

Liverpool and District Hospital for Diseases of Heart.—H.P. At rate of 50 guineas.

London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Lowestoft and North Suffolk Hospital.—H.S. £150.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Aural H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. Each at rate of £150.

Manchester Royal Children's Hospital, Pendlebury.—Res. M.O. At rate of £125.

Mount Vernon Hospital, Northwood, Middlesex.—H.S. At rate of £200.

Nottingham General Hospital.—H.P. Also Asst. Res. Cas. O. Each at rate of £150.

Oswestry, Shropshire Orthopaedic Hospital and Agnes Hunt Surgical Home.—H.S. £200.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Anaesthetist.

Rotherham Hospital.—H.P. £180.

Royal College of Physicians.—Milroy Lecturer for 1931.

Royal National Orthopaedic Hospital, 243, Great Portland-street, W.—H.S. also H.S. for Country Branch, Stanmore. Each at rate of £150.

Royal Northern Hospital, Islington Tuberculosis Dispensary, Holloway, N.—Tuberculosis Officer. £750.

St. Marylebone Hospital, Ladbroke-grove, W.—3rd Asst. M.O. £300.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent-garden, W.C.—H.S. At rate of £75.

St. Vincent's Orthopaedic Hospital, Eastcote, Middlesex.—Res. M.O. At rate of £150.

Scarborough Hospital and Dispensary.—Two H.S.'s Each at rate of £120.

Sheffield City.—Asst. Tuberculosis Officer. £600.

Sheffield Royal Infirmary.—Jun. Aural and Ophth. H.S. At rate of £80. Also Clin. Asst. for Ophth. Dept.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Tipton Urban District Council.—M.O.H., &c. £800.

Torquay, Torbay Hospital.—Hon. P. Also H.P. £175.

Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.

Watford, Herts Peace Memorial Hospital.—Res. M.O. At rate of £150.

Weir Hospital, Grove-road, Balham, S.W.—Sen. and Jun. Res. M.O.'s. £200 and £150 respectively.

Weston-Super-Mare General Hospital.—H.S. £130.

Worcester General Infirmary.—Sen. and Jun. Res. M.O.'s. £180 and £120 respectively.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Freshford (Somerset).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, for the Districts of the Eastbourne and Hastings County Courts (Circuit No. 50). Applications for the post should reach the Private Secretary, Home Office, not later than Sept. 4th.

Births, Marriages, and Deaths.

BIRTHS.

JAIDKA.—On August 8th, at "Newcroft," Eastfield, Peterborough, the wife of K. C. Jaidka, F.R.C.S.E., of a daughter.

SCOTT.—On August 7th, at Fletcher House, Tottenham, N., the wife of Dr. J. A. A. P. Scott, of a daughter.

MARRIAGES.

BELLAMY—MCGREGOR.—On July 30th, at St. Bartholomew's the Great, E.C.1, William Albert Bellamy, M.R.C.S., L.R.C.P., to Elsie, youngest daughter of the late C. M. McGregor and Mrs. McGregor, of Plumstead.

DAUKES—BIGGS.—On August 10th, at the Presbyterian Church of England, Hove, Lieut. H. W. Daukes, R.A.M.C., to Olive Margaret, eldest daughter of Mr. and Mrs. Owen O. Biggs, of Sackville-gardens, Hove.

RUSSELL—BREW.—On August 12th, at St. Augustine's Church, Penarth, Arthur Victor Russell, M.B., to Mary Violet, eldest daughter of Dr. and Mrs. Richard W. Brew, of Penarth, South Wales.

DEATHS.

BEACH.—On August 18th, at De Crespigny-park, Denmark Hill, Fletcher Beach, M.B. Lond., F.R.C.P., M.R.C.S., L.S.A., aged 81.

BUCKLEY.—On August 8th, at Clopton Manor, Kettering, Northants, Thomas William Buckley, M.D. Durh., M.R.C.S. Eng., J.P., Major, late R.A.M.C., aged 70 years.

SPENCE.—On August 12th, in a London nursing home, John Buchan Spence, M.B., aged 73.

WHITE.—On August 7th, suddenly, at Juan les Pins, Herbert White, M.R.C.S., L.R.C.P., late Surgeon Lieut. Com., R.N., in his 46th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ARTIFICIAL CREAM: A PROSECUTION.

THE Artificial Cream Act, passed last May and taking effect at the beginning of June, was a measure pressed forward rather in the interests of agriculture than of public health. It is, nevertheless, worth while to note that the first prosecution under the Act occurred at Marlborough-street police station on August 13th when the Ferns Pure Milk and Cream Company was fined sums amounting to £10 2s. with £7 costs for a breach of the statute.

The Act defines "cream" as "that portion of natural milk rich in milk fat which has been separated by skimming or otherwise," and "artificial cream" as "an article of food resembling cream and containing no ingredient which is not derived from milk except water or any ingredient or material which by virtue of the proviso to Subsection (2) of the Food and Drugs (Adulteration) Act, 1928, may lawfully be contained in an article sold as cream." The statute makes it an offence to sell or offer for sale for human consumption under a description or designation including the word "cream" any substance purporting to be cream or artificial cream within the statutory definition unless (*a*) the substance is cream as defined in the Act, or (*b*) where the substance is artificial cream as defined in the Act, the word "cream" is immediately preceded by the word "artificial." The defendant company said its artificial cream was made out of the constituents of dairy cream and nothing else. A Government analysis stated that it was reconstituted cream with a low fat content. It was two-thirds the price of ordinary cream. There had been some misunderstanding about the label. The magistrate, who remarked that the very name of the company was misleading, said that the Act was no good unless it was enforced. The label, even when affixed to the carton, was misleading; there was nothing about artificial cream until the receptacle was turned round, and then the words were upside down. The artificiality of the substance ought not to be concealed but should be more prominent than anything else.

The prosecution was undertaken by the National Farmers' Union, but it may be noted that the Act casts upon the local food and drugs authorities the duty of enforcing its provisions. All premises where artificial cream is manufactured, sold or exposed for sale for human consumption must be registered with the local authority unless already registered under other provisions. The public will doubtless appreciate the opportunity of distinguishing a natural from a synthetic article of food.

ATOPHAN ADMINISTERED BY INUNCTION.

IN many European schools it is becoming fashionable to give drugs by the skin. Alimentary disturbances, both immediate and remote, may thereby be avoided, and apart from comfort and consequences it is naturally an advantage to avoid the chance that the remedy will disintegrate in the stomach. Many drugs damage the liver when given by mouth, and it is claimed that this trouble is largely obviated by using the cutaneous route. The difficulty of absorption is, of course, often great. Volatile bodies, for instance, are not nearly so readily absorbed by the skin as by the lungs or alimentary tract. Alkaloids, again, are very uncertain in their penetration, whatever the vehicle, and aqueous solutions of non-volatile drugs hardly pass through the skin at all. But a good many drugs mixed with oil, fat, or alcohol—in short, anything capable of mixture with, or permeation through, the extracutaneous film of grease and the cutaneous fat—seem to be absorbed consistently and rapidly. This has led Prof. H. Kionka,[1] of Jena, to try inunction as a means of administering atophan, a trade preparation of phenyl-cinchoninic acid, which has come in for a certain amount of criticism on account of its toxic action on the liver in certain cases. Like other quinoline carbonic derivatives, atophan is said to have the curious power of reducing the ability of the renal tubules to reabsorb urates. When they are taken by mouth a considerable increase in the urinary excretion of all the urates is seen. The body tissues and the articular structures in particular are depleted of uric acid and the clinical amelioration of gout may be brought about. Kionka gave the drug to rabbits in two different forms, the first being an ointment composed of vaseline and olive oil as the vehicle; and the second a commercial preparation called Doloresum-tophiment, in which the atophan exists as an amino compound and the vehicle is a soap fat. The efficacy of the commercial preparation was found to be double that of the crude ointment as measured by the quantitative urinary excretion of uric acid. This heightened activity is attributed to the soap fat basis.

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[1] Fort. d. Ther., 1929, v. 173.

It will be remembered that the question of the toxicity of phenyl-cinchoninic acid was fully discussed in our own columns not long ago by Dr. Geoffrey Evans and Dr. A. W. Spence.[2]

BIRTH CONTROL.

AT the Population Conference at Geneva in September, 1927, a body was formed called the International Medical Group for the Investigation of Birth Control. The second annual issue[3] of their report, which is now obtainable, contains contributions from six different countries, those from Great Britain and the United States being the longest. The papers are for the most part written according to a common plan, the headings of which are: Statistical investigations, research work of a relevant kind, information about the general temper of the country towards birth control, and "miscellaneous remarks."

The section most likely to prove interesting to English medical readers is the one which concerns Great Britain, written by Dr. C. P. Blacker. In this article an attempt is made to summarise what is known statistically of the value of different contraceptive methods. These are found to be less effective than is generally assumed. The data analysed are those of certain birth control clinics. Among patients with whom the clinics maintain touch, the various methods taught are found in one way or another to be unsatisfactory by a percentage that ranges from 9 per cent. (Walworth) to 24 per cent. (North Kensington). Among patients with whom the clinic fails to maintain contact, a small number of whom were visited in their homes by a social worker of the North Kensington Clinic, the percentage is higher. In the United States the method which is thought the most reliable, and which is most usually taught, is a combination of pessary and spermaticidal jelly. The follow-up system that prevails in the American clinic, whose figures are analysed, is very thorough. It is interesting, therefore, to note that for this combination of methods, as taught in America, the "failure rate" is only 5 per cent. It is acknowledged that the figures on which the British percentages are based are inadequate. A satisfactory system of keeping case records has only been evolved after much experience and thought, and the early records from which the percentages have been extracted are both incomplete and unsatisfactory. Even so, however, the figures give cause for disquietude. Nevertheless the report as a whole is encouraging in that it foreshadows the possibility of great improvement in contraceptive technique as a result of certain research now in progress.

The report attempts to appraise impartially the value of contraceptive methods in use in different countries, and to summarise medical information about birth control as it becomes known in different countries. In view of the great sociological importance of contraception it is possible that future reports may have considerable influence both at home and abroad.

ULTRA-VIOLET RAYS IN OPHTHALMOLOGY.

THE positive and negative indications for the use of ultra-violet rays in diseases of the eye are defined in a recent paper by Mr. W. S. Duke-Elder.[4] Tuberculous iridocyclitis, he says, is especially suitable for general light treatment combined with tuberculin, and another disease in which its value is very great is phlyctenular keratoconjunctivitis. In chronic cases, especially when general light baths are used in association with local application of light, the disease can almost invariably be overcome, although corneal opacities once formed may be permanent. The more important part of Mr. Duke-Elder's paper concerns the local application of ultra-violet rays, for which he has devised a special ophthalmic radiation lamp. Many inflammatory and degenerative affections of the anterior segment of the eye are amenable to this treatment, but it is essential that it should be undertaken only by specially skilled hands, since an error in the focusing might easily cause permanent injury to the lens. For this reason it is only suitable for diseases of the cornea, iris, sclera, and conjunctiva. Pathogenic micro-organisms are killed, also the superficial cells of damaged corneal epithelium, and an intense vascular reaction floods the diseased cornea with bactericidal influences. Almost any kind of corneal ulcer, including hypopyon ulcer, responds well to the treatment. In mild affections the usual therapeutic methods may be sufficient without exposure to ultra-violet rays, but in severe and recurrent cases it is invaluable. The method is also indicated in sclero-keratitis and in some conjunctival affections, which fail to improve under ordinary measures; among these Mr. Duke-Elder includes trachoma but not spring catarrh. For applying the rays to the upper conjunctival fornix he has devised a special form of application to be used with his lamp.

HOLIDAYS FOR FACTORY GIRLS.

To the Editor of THE LANCET.

SIR,—You have on many other occasions shown your sympathy with factory girls in need of a holiday, and have earned their sincere gratitude by allowing us to appeal through your columns to the generosity of your readers. May we again, in circumstances of urgency, invoke your friendly aid? In heat such as we have experienced lately in our crowded towns, one longs more than ever for a dip in the sea or for a breath of air on the hills; for meals out of doors, lunch in a bathing suit on the sands, a picnic tea under the shade of the trees. Whatever indeed the weather may be, one looks forward throughout the year to the summer holiday, for many the only appreciable holiday, in the hope that it will bring respite and rest and renewal of health.

Some of your readers will know of hopes for a holiday frustrated, of plans long made brought to nought at the last moment. Those who have not been so unfortunate can at least imagine the bitter disappointment caused by the loss of a holiady long due. Such a disappointment will assuredly fall to many tired workers in factories this summer unless your readers, to whose generosity we appeal, are able to come to the rescue. Many factory girls who have done their best to make some provision for a holiday by putting aside their pence throughout the year, are waiting to go away; but the funds which seek to supplement their savings are exhausted. We ask your readers to replenish them.

The help thus given is accepted with lasting gratitude. It blesses those who give and those who take. Many letters, written by the girls in a spirit of deep thankfulness and describing the varied delights of a change of air and scene, testify eloquently to this. Quotations from such letters may be seen in the report of the fund. The fund helps chiefly the poorest class of factory workers. It helps those who, being often the main support of their families, are quite unable in this matter adequately to help themselves. They need this summer holiday, and one has only to see them before and after it to realise what wonders such a holiday can work.

Subscriptions and donations will be thankfully received and acknowledged by the hon. treasurer, Mrs. Slater, or Miss Canney, 75, Lamb's Conduit-street, London, W.C. 1.

We are, Sir, yours faithfully,

(Signed) ALBERTA SANDWICH,
KATHERINE ATHOLL,
A. F. LONDON,
W. PETT RIDGE,
ANNE SLATER (Hon. Treas.).
J. FREDK. GREEN (Chairman).

75, Lamb's Conduit-street, London, W.C. 1,
August 16th, 1929.

A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—Reference an article in your issue of August 10th headed "An Ingenious Truss," describing an apparatus manufactured by the Uterpress Co., and named by them the "Colquhoun" truss, I should be glad if you will publish this, which is to the effect that I have no interest in the name, manufacture, or sale of the truss mentioned.

I am, Sir, yours faithfully,
GIDEON COLQUHOUN, F.R.C.S.

44, Brook-street, W., August 20th, 1929.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE.—Last year 1464 in-patients were treated at the hospital itself, at the Convalescent Home at East Finchley, and at Lonsdale House, Clapham, the branch for disabled sailors and soldiers. The cost of maintenance was £39,177, which exceeded the income by £4795. The board are anxious for the preservation of Queen-square House Garden, since the amenities of the hospital would be seriously affected if it were built over.

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[2] THE LANCET, 1929, i., 704.

[3] Obtainable from the Hon. Mrs. Marjorie Farrer, 41B, Clanricarde-gardens, London, W. Price 6d.

[4] Brit. Jour. Actinother. and Physiother., July, 1929, p. 82.

STUDENTS' GUIDE—SESSION 1929-1930.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

POWERS, DUTIES, AND CONSTITUTION.

THE General Council of Medical Education and Registration of the United Kingdom is, first, a registering body: no person, even though his qualifications have been obtained by examination, is a *legally qualified* medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that medical education reaches an efficient minimum standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner convicted of felony or misdemeanour or adjudged guilty of professional misconduct. Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council consists of 38 members, of whom all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. The Crown members need not be medical men and one layman now sits on the Council. Three members are appointed for dental business by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom.

THE EDUCATIONAL CURRICULUM.

Professional Education.—The course of professional study after registration as a student occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

Regulations as to Registration of Medical Students.

Before registration as a student every candidate should produce evidence that (*a*) he has attained the age of 17 years; (*b*) that he has passed a recognised examination in general education; and (*c*) that, *in addition thereto*, he has passed, or obtained exemption from, an examination, theoretical and practical, in elementary physics and elementary chemistry conducted or recognised by a licensing body. The minimum standard of General Education required is that of University Matriculation or entrance examination in the Faculties of Arts or Pure Science. In other Faculties the examination must be of the standard prescribed in Regulation 2 below.

An approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may admit a student to the professional examination in elementary biology upon registration as a medical student.

The candidate commencing medical study should apply to the registrar of the division of Great Britain and Ireland in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Council; and should produce proof that he, or she, has fulfilled the first three conditions.

The Maintenance of the Register of Medical Students.

1. The Education Committee prepares and issues from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the Council.

2. The Council has recognised the undernoted university examinations which are conducted in Great Britain and admit to the Faculties of Arts or Pure Science, or to other Faculties, subject to the conditions specified below:—

Oxford University, Responsions; Cambridge University, The Previous Examination. The Matriculation Examinations of the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Victoria of Manchester, Sheffield and Wales, and the Entrance or Preliminary Examination of the Universities of Scotland.

The condition prescribed by the Council in Faculties other than Arts or Pure Science is that:—

The certificate shall bear evidence that the candidate has passed in the Matriculation or Entrance standard, in the following subjects, viz.: (a) English. (b) Mathematics, Elementary. (c) A language other than English. (d) A fourth subject, as defined in the regulations of the particular Examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science; Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose of matriculation or entrance.

3. Subject to the condition prescribed above (Section 2), the Council will recognise those of the examinations conducted by recognised authorities in Great Britain which are accepted by any one or more of the above-named Universities as equivalent (under prescribed conditions as to "credits" or "grades"), for purposes of Entrance or Matriculation, to an Examination named in the preceding list (Section 2). Such Examinations are:—

Bristol University: Higher School Certificate Examination; School Certificate Examination. Cambridge Local Examinations Syndicate: Higher School Certificate Examination; *School Certificate Examination. Central Welsh Examination* Board: Higher Certificate Examination; School Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: Higher School Certificate Examination; General School Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

4. The Council will continue to recognise certain Examinations conducted by Educational Bodies, other than those (mentioned in Section 3) whose Examinations are accepted by any one or more of the Universities of Great Britain. Recognition will not be extended under this Section to any Examination unless the Council is satisfied (*a*) that in scope and standard it is equivalent to a recognised Matriculation or Entrance Examination of a University of Great Britain, (*b*) that it fulfils the condition prescribed by the Council (Section 2), and (*c*) that the Examination has been completed at not more than two sittings. Such Examinations are:—

The College of Preceptors (England): Senior Certificate. The Educational Institute of Scotland: Preliminary Medical Certificate.

5. Subject to the prescribed condition (Section 2), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, and the Matriculation or Entrance Examinations of the National University of Ireland, the Queen's University of Belfast, the Irish Royal Colleges of Physicians and Surgeons; and also the Leaving Certificate of the Department of Education of the Irish Free State, the Senior Grade Leaving

Certificate of the Ministry of Education of Northern Ireland, and all examinations accepted by any one or more of the Universities of Great Britain or Ireland, as equivalent, for purposes of entrance or matriculation, to the above-named University Examinations.

6. Subject to the prescribed condition (Section 2), the Council will recognise all Examinations of Colonial or Foreign Universities which are accepted by any one or more of the Universities of Great Britain as equivalent, for purposes of entrance or matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

7. The Council will recognise the Final Examinations for Degrees in Arts or Science of any University of Great Britain or Ireland or of the British Dominions.

8. The registration of medical students shall be placed under the charge of the Branch Registrars.

9. Each of the Branch Registrars shall keep a register of medical students.

10. The Branch Registrar shall enter the student's name and particulars in the Students Register, and give him a certificate of such registration.

11. Each of the Branch Registrars shall supply to the several licensing bodies, medical schools, and hospitals, in that part of Great Britain or Ireland of which he is Registrar, blank forms of application for the registration of medical students.

12. A copy of the Medical Students Register prepared by each of the Branch Registrars shall be transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who will distribute the list to the licensing bodies, medical schools, and hospitals.

All applications for special exceptions to the foregoing regulations as to registration shall be addressed to the Registrar of the General Council, and shall be decided by authority of the Education Committee, who shall report thereon to the Council.

The Medical Schools and Colleges.

The Universities, including their Colleges and Medical Schools, and Schools of Medicine at which Medical Study may be commenced in the United Kingdom are set out seriatim in the following pages.

MEDICAL REGISTRATION IN IRELAND.

The problem of medical registration in the Irish Free State, which gave rise to some anxiety a short while back, has been satisfactorily settled. By agreement between the Governments of Great Britain, of the Irish Free State, and of Northern Ireland — since confirmed by legislature at Westminster and Dublin—the powers and duties of the General Council of Medical Registration and Education are to continue as heretofore in respect of qualifying bodies in the Irish Free State, and of medical practitioners qualified in the Irish Free State. Side by side with this a Medical Council has been set up in the Irish Free State with the duty of establishing and controlling a Register for the Irish Free State. Practitioners whose names are on the General Register, and persons who pass a qualifying examination in the Irish Free State, will be registered on the Irish Free State Register on payment of the prescribed fee. The Irish Free State Medical Council have, over those whose names are on the Irish Free State Register, the same disciplinary powers as are possessed by the General Council over those whose names are on the General Register. To possess the privileges of a qualified practitioner in the Irish Free State it is necessary to be registered in the Irish Free State Register.

The net result of the change in the law as regards the practitioner qualifying in the Irish Free State in the future is that: (1) If he intends to practise only in the Irish Free State he need only register in the Irish Free State Register; (2) if he intends to practise in Great Britain he will register in the General Register; and (3) if he is in doubt where he will practise he will register in both Registers. He will, as he registers in one Register, or in both Registers, put himself under the disciplinary control of the one Council or of both Councils. No practical inconvenience is caused, and practitioners qualified in the Irish Free State in future will not find themselves deprived of any of the privileges or rights enjoyed by their predecessors.

THE DENTAL BOARD OF THE UNITED KINGDOM.

Anyone who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available, and, unless registered in the Dentists Register, no dental work, under the additional Benefit Scheme of the National Health Insurance Act can be undertaken.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The chairman is appointed by the Privy Council. Other members of the Board are appointed by the Minister of Health, the Scottish Board of Health, the Governor-General of Northern Ireland, the General Medical Council (3), Direct Vote of the qualified dentists practising in England and Wales, Scotland, and Ireland (3), Direct Representatives by registered dentists not being qualified dentists (2).

Registration of Dental Students.

The General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923, provide that the registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and be subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence either at a recognised dental hospital or school, or by pupilage with a registered dental practitioner.

Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in dental mechanics. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school. Two years' *bona-fide* apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study. When a student can show evidence of regular pupilage in dental mechanics to a registered dental practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations.

THE OFFICES.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council. 44, Hallam-street, Portland-place, London, W. 1, The offices of the Dental Board are adjoining.

A memorandum on the procedure to be adopted by those who desire to enter the profession of medicine, with notes on costs and prospects, and a similar Memorandum in regard to Dentistry, may be obtained on payment of 1s. each.

THE

MEDICAL EXAMINING BODIES

AND

SCHOOLS OF THE UNITED KINGDOM.

A GUIDE TO THE FACILITIES FOR OBTAINING THE VARIOUS MEDICAL DEGREES AND OTHER QUALIFICATIONS FOR THE BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

UNIVERSITY OF OXFORD.

THERE are two degrees in Medicine, *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health** and *Ophthalmology*. The examinations are open to men and women alike.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science; Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The first B.M. examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing *First B.M. Examination*, the candidate can, on producing certificates, present himself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology; but cannot, unless he is already a registered medical practitioner, enter for examination in Medicine, Surgery and Midwifery until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First B.M. Examination. He must pass in Medicine, Surgery and Midwifery at one and the same time.

Before admission to the Examinations in Pathology and Bacteriology, and Materia Medica and Pharmacology, of the *Second B.M. Examination*, the student must produce certificates of having attended courses of instruction including practical work in Pathology, Bacteriology, Post-mortem Clerking, Pharmacology, and Pharmacy, either in Oxford or in a recognised Medical School. Before admission to the remainder of the second B.M. Examination, he must produce a number of other certificates, including certificates of having acted as Clinical Clerk and Dresser, each for six months in the Wards, of instruction in Midwifery and of attendance on Labours, of instruction in Infectious Diseases and in Ophthalmology, of proficiency in Vaccination and in the administration of Anæsthetics, and of three academic years of hospital practice.

The degree of Bachelor of Surgery (B.Ch.) is granted with that of B.M. after passing the above examinations.

The degree of Doctor of Medicine (D.M.) is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by the examiners for the B.M. degree whose subjects are dealt with therein and by Professors in the Faculty of Medicine. The degree of Master of Surgery (M.Ch.) is granted after examination to Bachelors of Surgery who have entered upon their twenty-first term, and who are members of the surgical staff of a recognised hospital, or have acted as dresser or house surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £800. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Schorstein Research Fellowship of the value of £200 a year, tenable for two years, is offered in alternate years. Candidates must be graduates of the University, under 35 years of age, and must hold a registrable medical qualification. Their research must be carried out in one of the Medical Departments at Oxford. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects, Animal Physiology, Botany, Zoology. A George Herbert Hunt Travelling Scholarship of the value of about £100 is awarded every second year to enable a Bachelor of Medicine to undertake three months' study abroad. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year on the nomination of the Regius Professor of Medicine. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships varies, according to the Candidate's need, between £30 and £100 a year; the exhibitions vary in value from £30 to £100 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1929; from the Regius Professor of Medicine; from the Professors in the departments of medical science; and from the Dean of the Medical School, Oxford.

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—225 beds. Courses of instruction are given in connexion with the Oxford for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools in the United Kingdom.

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* Suspended until further notice.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Thursday following the second Monday in March and on the Thursday following the first Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the second Monday in November and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Antenatal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. Bachelors of Medicine who graduated before May, 1904, may obtain the B.S. by passing the Surgical part of the M.B., B.S.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the second Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis for approval and may be exempted from a part or from the whole of the written examination.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology, and Rhinology. A thesis may be submitted as for M.D.

Doctor of Philosophy.—A Degree of Ph.D. has been instituted in non-clinical subjects for External Students in the Faculty of Medicine. Candidates for this degree must hold, in a branch of study akin to that in which they propose to proceed to the Ph.D. Degree, the Degree of M.B., B.S., or B.D.S., or B.Pharm., or B.Sc.

Bachelor of Pharmacy.—The course extends over three years.

Full details of the prescribed curricula can be obtained free on application to the Academic Registrar, or for External Degrees from the External Registrar, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 at the Alexandra Hospital, Swanley. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electrotherapeutics and X Ray work. Whole-time Clinical Units under Professors of Medicine and Surgery have been established. A new Surgical Block of ten wards, with accommodation for 250 patients, and connected with a block of five new operation theatres is nearing completion, and will be ready for use about January 1930.

Ten house physicians and ten house surgeons are appointed annually, are provided with rooms and board, and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear, and a house surgeon for orthopædic surgery are appointed every six months, and are provided with rooms and board and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical outpatients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential College is attached to the hospital.

There are quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, and pathological chemistry. *The Medical College Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, morbid anatomy and histology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is complete. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histo*logy, and pharmacology.*

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[1] Of these schools that of the Royal Free Hospital is reserved for women; University College admits men and women to the whole course, the number of women being limited: King's College admits men and women to the intermediate subjects; the remainder admit men only.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. Facilities for research work are afforded in the Clinical Units and Laboratories of pathological and other departments.

Scholarships given in aid of Medical Study.—For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships in Science of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, Anatomy, and Pathology; (*c*) and (*d*) are awarded after examination in Mathematics, Latin or Greek or French or German, a second language or Chemistry or Physics; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology; (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, 10 guineas, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (*r*) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (*s*) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Information may be obtained on application to the Dean of the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Treatment.

In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Six House Physicians, six House Surgeons, two Obstetric and Gynæcological House Surgeons, and two House Surgeons to the Special Departments are appointed annually. The large proportion of resident appointments to the number of students makes it probable that a student of ordinary ability will be able to obtain one of these appointments.

The following appointments are open to students after they have held resident appointments: Resident Medical Officer, at a salary of £400 per annum; Registrar to the Medical, Surgical, Obstetrical and Ear, Nose, and Throat Departments, at £150 per annum.

By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk.

Final studies are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped laboratories has been established. Students receive their training in Preventive Medicine, Pathology, Bacteriology, and Biochemistry here, and are encouraged to undertake research. Special facilities are available for post-graduate research and study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital. Special demonstrations are arranged for Post-graduates.

One Epsom School Scholarship, two Oxford and Cambridge Scholarships, and one Scholarship in Anatomy and Physiology open to students of King's College, are offered for competition each year. In addition there are a number of Exhibitions.

The Museum contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, the Cuthbert Lockyer Collection.

The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, in a Students' Club. The Club, which is under the control of a committee of students, provides needful athletic recreation, and includes also a medical society.

Further information may be obtained on application to the Dean, Dr. F. H. Young.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 430 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. There are all the usual special clinical departments. One ward is set apart for Diseases Peculiar to Women, and there is a Maternity Ward of 11 beds. Children's beds are placed in the women's wards. There are two ophthalmic wards.

Twelve house physicians, 12 house surgeons, and 12 casualty officers are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £250 per annum each; Medical Officer to the Atkinson-Morley Convalescent Hospital, at £300 per annum; Medical Registrarship at £200 per annum, Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the posts (3) *of Junior Anæsthetists, each at £30.*

Entrance Scholarships and Endowed Prizes of a total value of £700 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third *year of* the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Scholarships and Prizes.—At this school five entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two William Brown Exhibitions, £120 and £80 respectively; (*c*) and (*d*) two University Entrance Scholarships, 90 guineas and £70 respectively; (*e*) Devitt-Pendlebury Scholarship, £50, Anatomy and Physiology, except in the case of (*c*), subject of examination for which is General Pathology.

This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to six in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*f*) Allingham Scholarship in Surgery for Students qualified not more than two years, £85; (*g*) and (*h*) two Brackenbury Prizes, one in Medicine and one in Surgery, £33 each, open to students of not more than five years' standing; (*i*) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (*j*) Pollock Prize, £23, Physiology, Physiological Chemistry, and Histology; (*k*) Clarke Prize, £5; (*l*) Thompson Medal, £9, Clinical Reports; (*m*) Brodie Prize, £8, Clinical Reports; (*n*) Webb Prize, open to perpetual pupils, £34, Bacteriology; (*o*) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Further information may be obtained from the Dean of the Medical School, Dr. A. Feiling.

GUY'S HOSPITAL, LONDON BRIDGE, S.E.1.—This hospital contains 646 beds. The whole of the medical school has been rebuilt within recent years. It provides ample accommodation, with modern equipment for all the non-clinical subjects of the medical curriculum.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynæcology, diseases of children, diseases of the nervous system, dermatology, otology, actinotherapeutics, anæsthetics, dentistry, orthopædics, vaccine, tuberculosis, genito-urinary and venereal diseases, Salomon's Welfare Centre (for Maternity and Children). Dresserships and clerkships in the various special departments are held by students in turn.

There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

House physicians, house surgeons, out-patient officers, assistant house surgeons, obstetric residents, house surgeons in the departments of ophthalmology, laryngology, and genito-urinary diseases, house physicians in the department for diseases of children, and clinical assistants are appointed from among recently qualified students according to merit.

Scholarships.—Six entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, *of the value of* £200, *to be awarded* alternately in Arts and Science (next award, June or July, 1930 in Science); (*b*) one Open Arts Scholarship of £100 for students under 19 years of age; candidates are required to take English and any two of the following subjects: Latin, Greek, French, German, and Mathematics; (*c*) one Open Junior Science scholarship for students under 20 years, £100; subjects, any three of the following: Inorganic Chemistry, Physics, Biology, and Mathematics; (*d*) a confined Junior Science scholarship of the value of £100 is offered for competition, annually in June or July, to candidates who have attended the Preliminary Science Classes at this School; (*e*) two open Senior Science scholarships: (1) a War Memorial scholarship of the value of £100, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students who have completed the curriculum for, or passed the examinations in, Anatomy and Physiology for a medical degree in any University of the British Empire, and who, during the nine months immediately preceding the Scholarship examination, have not entered as students in any Metropolitan Medical School other than Guy's; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry and Pharmacology, General Pathology.

Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 15 minutes from the hospital.

Further information, together with full particulars of Scholarships, and a booklet entitled "How to Enter the Medical Profession," will be sent post free on application to the Dean of the Medical School, Guy's Hospital, London, S.E. 1.

KING'S COLLEGE HOSPITAL.—The final subjects in the curriculum are taught at the Medical School of King's College Hospital, which is situated at Denmark Hill, S.E. 5.

The hospital has 400 beds, and provision will ultimately be made for 600. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physical Treatment, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry.

Appointments.—The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers, house physicians and house surgeons; resident anæsthetist; resident radiologist; bacteriologist; clinical pathologist; pathological, medical, surgical, and obstetrical registrarships. Sixteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Registrarships (those in connexion with King's College have already been enumerated).—Scholarships of the total value of £1145 are awarded annually. These include (*a*) Medical Entrance Scholarships—Science, £50; Anatomy and Physiology, £50; Pathology, £75; (*b*) two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the recommendation of the Regius Professors; (*c*) two Raymond Gooch Scholarships, £120 each, open to students of British Universities on certain conditions; (*d*) an Epsom College Scholarship, value £50 at least, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London; (*e*) two Seaman Scholarships, each £50 a year for a period not exceeding five years, restricted to the sons of clergymen of the Church of England; (*f*) Senior Scholarship (Clinical Studies), £40. The holders of the Warneford and Sambrooke Scholarships awarded by King's College are required to take the subjects of the preliminary and intermediate examinations at King's College, and the final subjects at King's College Hospital. Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital.

Prizes.—Tanner Prize, £10, Obstetrics and Diseases of Women; Todd Prizes, First £8 and medal, second £4, for Clinical Medicine; Burridge Prize, £4 4*s.*, Forensic Medicine; Jocelyn Almond Prize, £5 5*s.*, Diseases of Children; Wallis Prize, £10, History of Dentistry; 13 Class Prizes, £3 each.

The King's College Hospital Clubs and Societies Union consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. The athletic ground, over six acres in extent, is on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes"—a hall of residence for students belonging to the hospital.

The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, Dean; Mr. S. C. Ranner, Secretary of the Medical School.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in Mile End-road, and contains 839 beds. There are special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, and Pediatric, Orthopædic, Venereal, Radiological, Electro- and Physico-therapeutical and Inoculation Departments.

To each medical and surgical firm throughout the hospital there is attached a First Assistant, who is responsible for instructing the clerks or dressers of the firm in elementary medicine and surgery, and who assists the honorary members of the firm in the preparation of their demonstrations. In the department of Obstetrics and Gynæcology there are two assistants and two resident accoucheurs. Special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research are provided under the supervision of the staff.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. Special entries for medical and surgical practice can be made.

A Clinical Unit in Medicine, under the charge of a whole-time director, provides for the more elaborate methods of diagnosis and treatment, and takes a leading part in the initiation and coördination of medical research. The director has an assistant director, two assistants, and two house physicians.

Scholarships and Prizes.—The following is a list of the Scholarships and Prizes:—Entrance Scholarships: Price Scholarship £100, and one Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, (1) £100, Pathology; (2) £100, Human Anatomy and Physiology; two Open Scholarships, each of the value of £100, subjects, Human Morphology and Embryology, Physiology and Pharmacology, Biochemistry, Pathology, Bacteriology and Morbid Anatomy. Prizes: Buxton Prize, £40, subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; four Dressers' Prizes, amounting to £20, zeal, efficiency, and knowledge of Elementary Clinical Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; Treves Prize, £15, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, £14, Clinical Medicine and Pathology; T. A. M. Ross (Prox. Acc.) Prize, £10 10*s*., Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; and Liddle Prize, triennial, £120.

Medical Research Funds.—Funds to the value of over £113,000 permit of financial assistance being given to students and graduates engaged in Medical Research.

A laboratory for the manufacture of certain preparations of Radium has recently been endowed.

Two Residential Hostels are provided for students, and a hostel for 40 resident medical officers. The Union Athletic Ground, 13 acres, is within easy reach of the hospital.

Dean: Prof. William Wright.

ST. MARY'S HOSPITAL.—The Hospital and Medical School have on one side a poor district of 500,000 persons, and on the other side the residential districts of Kensington and Bayswater. The hospital contains 350 beds, and recent structural additions have added two new operating theatres. By a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals, the teaching facilities extend over 1000 beds. The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Clinical Units in Medicine and Surgery were established in 1920. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright. Certain Research Scholarships of *£200 each are awarded annually to students working* in the departments of the institute; and research beds have been instituted. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually. Numerous appointments are open to newly qualified members of the Medical School, including ten salaried posts with salaries varying *from £200 to £750 per annum. A special Post*-graduate course is held during the first week-end in October, and is open to all General Practitioners and other qualified men without fee.

Entrance Scholarships.—Two Entrance Scholarships of the value of £210 each are awarded annually, by nomination in July, the Geraldine Harmsworth Scholarship, £200, and one or more University Scholarships of £200 are awarded in July.

The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has *recently been added.*

For further information apply to the Dean of the Medical School.

MIDDLESEX HOSPITAL.—The hospital contains over 300 beds, with special wards for Cancer, Maternity and Gynæcological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electrotherapeutic department. The Cancer Hospital, containing *92 beds and Special Investigation* Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electrotherapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one senior resident anæsthetist, two junior resident anæsthetists, *and four resident officers to the special* departments. Ten registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

The Medical School, which includes the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, and the Barnato-Joel Laboratories, is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, for the Diplomas in Public Health, and the University of Cambridge Diploma in Radiology, for which two courses are held yearly. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 32 recognised Teachers, 10 Demonstrators, 4 Tutors. The Bland-Sutton Institute of Pathology and the Courtauld Institute of Biochemistry are completely equipped for routine hospital investigations, teaching and research work, and contains large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility.

Other features of interest are: the course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone, Prof. J. McIntosh, and Prof. W. B. Tuck. A primary F.R.C.S. course is held twice yearly, and also special classes to prepare students for the Intermediate Examinations of the Universities.

Scholarships and Prizes.—Two Entrance Scholarships, value £100 each, and two University Scholarships, value £90 and £60, are awarded annually in September. The successful candidates are required to become general students of the school. A Freer Lucas Scholarship is awarded annually on the nomination of the Headmaster of Epsom College. There are also two Broderip Scholarships, value £60 and £40 respectively; the Lyell Gold Medal and Scholarship, value £55 5*s.*; the John Murray Medal and Scholarship, value £25 (awarded every third year); the Freeman Scholarship, value £30; the Hetley Clinical Prize, value £25; the Leopold Hudson Prize, value 11 guineas; and the Second Year's Exhibition, value 10 guineas. There are also numerous class prizes.

The Students' Amalgamated Clubs include the following: Medical Society, Common Room Society, Musical Society, cricket, football, rowing, chess, lawn tennis, hockey, sailing, and fencing. There are a restaurant and a gymnasium in the school buildings, and large athletic grounds at N. Wembley, with new pavilion.

For further particulars apply to the Dean or the Secretary of the Medical School.

ST. THOMAS'S HOSPITAL.—This Hospital contains 644 beds. There are special departments for the treatment of women, children, diseases of the eye, ear, nose and throat, skin, teeth, and for orthopædics. Nervous and mental diseases are treated in special departments. An electrocardiograph has been installed for the investigation of diseases of the heart. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for Radiology, Electrotherapy, Phototherapy, Massage and Remedial Physical Exercises are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. A Clinical Unit in Medicine has been established.

All appointments in the hospital are open to students without extra fee. Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward and district, thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists.

The arrangements are made to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments.—A Resident Assistant Physician and a Resident Assistant Surgeon, salary £225 each per annum, and a Resident Anæsthetist, salary £200 per annum, are appointed annually. Two Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. A Pathological Registrar to the Department of Obstetrics and Gynæcology (at an annual salary of £250), an Ophthalmic Registrar (at an annual salary of £200), and an Orthopædic Registrar (unpaid) are appointed yearly. Two Senior Resident Casualty Officers (Medical and Surgical) are appointed yearly. *Eight Resident Casualty Officers and Anæsthetists* are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following: Anatomy, Physiology, Pathology, Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (*d*) Mead Medal, Medicine, Pathology and Hygiene; (*e*) Wainwright Prize, Medicine; (*f*) Toller Prize, Medicine; (*g*) Cheselden Medal, Surgery and Anatomy; (*h*) Clutton Memorial Medal in Clinical Surgery, biennial; (*i*) Beaney Scholarship, £50, biennially, Surgery and Surgical Pathology; (*j*) Solly Medal and Prize, biennial, Reports of Cases; (*k*) Sutton Sams Prize, biennial, Report of Cases; (*l*) Bristowe Medal, Pathology and Morbid Anatomy; (*m*) Hadden Prize, Pathology and Morbid Anatomy; (*n*) Grainger Testimonial Prize, £31 10*s.*, Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology; (*p*) School Council Research Scholarship, £250 per annum, tenable for two years; (*q*) John and Temple Research Fellowship, tenable for two years, £450, Children.

St. Thomas's House, the New Students' Club recently opened, comprises spacious dining-, smoking-, and reading-rooms, and accommodation for some 60 resident students. There is no occasion for students to leave the hospital premises during working hours.

Further information may be obtained from the Medical Secretary of the School, St. Thomas's Hospital.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—The final subjects in the curriculum are taught at the Medical School of the hospital, which has 526 beds, including 74 in the new obstetric hospital. The course of instruction is suitable for the examinations at the

Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. Clinical Units in Medicine, Surgery, and Obstetrics and Gynæcology are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. The department of otology, rhinology, and laryngology (the Royal Ear Hospital) has been provided with a separate building in Hunter-street, adjacent to the obstetric hospital. It contains 30 beds, including eight private wards for patients of limited means. The hospital is equipped with all modern appliances for investigation. The new buildings of the Obstetric Hospital of 74 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for *80 residents and students), the extension to the Nurses'* Home, and new research laboratories for the Medical School are now finished and in full occupation. Twelve women students are admitted annually.

Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Sixteen house physicians, ten house surgeons, ten obstetric assistants, four house surgeons to the Royal Ear Hospital (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. All house officers reside free in the hospital. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Medical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Ophthalmic Registrar, Registrar to the Royal Ear Hospital, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Skin and Venereal Diseases Departments, and House Anæsthetist.

Assistants to the Medical, Surgical, and Obstetric Units.—These salaried appointments, that have come into existence recently at the same time as the creation of the whole-time Chairs in Medicine, Surgery, and Obstetrics, are of great value to senior students who may desire to remain at Hospital after holding the ordinary resident appointments. They enable a man to continue clinical work and also to devote time to laboratory or other research, so as to fit himself for higher posts in the profession. The salaries range from £250 up to £800 a year, resident quarters being provided only for the chief assistant to the Obstetric Unit. The total number of such Assistantships varies from time to time, being generally about 12, and an aggregate sum of about £5000 annually is available for their salaries.

Scholarships and Prizes (those in connexion with University College have already been enumerated).—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions 112 guineas each, Anatomy or Physiology, or General Pathology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £150, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £75, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10s., Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

The *Museum of Pathological Anatomy* is open for study daily, and microscopic sections of most of the specimens have been prepared and are available for the use of students on application to the Curator. The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee. The Medical Library, open daily to every student of the School, contains about 20,000 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School, and the Athletic Ground at Perivale.

University College Hall, Ealing, is recognised by the authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge.

Full information can be obtained from the Dean of the School.

WESTMINSTER HOSPITAL.—The Hospital contains 218 beds, and has attached to it a Radium Clinic with 23 beds. There are separate departments for diseases of the eye, skin, teeth, ear, nose and throat, for orthopædic practice, for diseases of women, for diseases of children, for radiography, for venereal disease, and for massage, electrical and light treatment. The anatomical, pathological, and materia medica museums are open to all students of the School.

The entire teaching of the Hospital is devoted to the subjects of the Final Examinations. Arrangements are made for the tuition required for Preliminary and Intermediate subjects.

Appointments: Paid appointments as Medical, Surgical, and Obstetric Registrars, Casualty Officers, House Physicians, House Surgeons, Anæsthetist, &c., are available for students when they have passed their examinations.

Research: There are excellent opportunities for Research work in the recently endowed John Burford Carlill Laboratories. Grants to assist Research workers are made annually from the John Burford Carlill Endowment.

Fees: Annual fee, £40. An entrance fee of 10 guineas includes membership of the Sports Union Club with its various branches—i.e., football, cricket, tennis, boxing, and Guthrie Society. The Athletic Grounds are situated in Tooting and are reached in 20 minutes from the hospital.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £75 each. Summer Session: Two Scholarships in Anatomy and Physiology, £75 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Chadwick Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, £40, Chemistry; Rabbeth Scholarships open to First-year Students, one of £30 and one of £15; Class Examinations in the Preliminary Scientific Course.

Inquiries should be addressed to the Dean of the Medical School.

ROYAL FREE HOSPITAL, LONDON: SCHOOL OF MEDICINE FOR WOMEN.—The Royal Free Hospital contains 268 beds. The Hospital also has large Casualty and Out-patient Departments. A Children's Department, including 18 cots, an Orthopædic Department, and a Light Department have recently been added to the Hospital. Maternity Districts are attached to the Unit operating in the Gray's Inn-road and Essex-road areas. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital, Queen Square, South London Hospital, and Royal London Ophthalmic Hospital.

A Clinical Unit in Obstetrics has been established controlling 68 beds. Courses are arranged for the Primary Fellowship Examination of the College of Surgeons. The Eastman Dental Clinic, for which Mr. George Eastman, of Rochester, N.Y., has provided the building fund, is in course of erection and will provide a Dental School for women; at present the course for dental students is in conjunction with the Royal London Dental Hospital, Leicester-square.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers in the neighbourhood and the Warden can be consulted on the subject.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics.

Scholarships and Prizes. Among the larger of these awards are the following:—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years. (*d*) Bostock Scholarship, tenable for two or four years, £90 (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1931, £16. (*i*) John Byron Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies; application to the Secretary by March 31st next, £20. (*k*) Helen Prideaux Prize and Julia Ann H. Cock Prize, to be spent in assisting the newly qualified holder to further study, £60 each. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, open to all medical women, preferably coming from India, or going to work in India, (*m*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1931. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s*. a year, awarded in alternate years; next award in July, 1931. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1932. (*p*) Alfred Langton Scholarships, tenable two years, one awarded annually, £50 a year. (*q*) School Jubilee Bursary, tenable for three years, £50 a year. (*r*) Flora Murray Bursary, awarded every year to a fifth-year student, £50. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery.

The Students' Union arranges the social, athletic, and other clubs and societies. The School sports ground, consisting of 7½ acres of freehold land, is situated at Sudbury (easily reached from Euston Station).

Inquiries may be addressed to the Warden and Secretary of the Medical School, 8, Hunter-street, London, W.C.

UNIVERSITY OF DURHAM.

The University of Durham grants degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery and Master of Dental Surgery, the Diploma in Public Health, Diploma in Psychiatry, and a Licence in Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects of the Third Examination are—Pathology and Bacteriology, Materia Medica, Pharmacology and Pharmacy, Medical Jurisprudence, and Public Health. The subjects of the Fourth Examination are—Medicine, Clinical Medicine, Therapeutics, Surgery, Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Psychological Medicine, Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent at the University of Durham College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of

Bachelor of Medicine and Surgery of the University of Durham, and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the subjects of Medical Anatomy, Medical Pathology, and the Principles and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates must not be under 40 years of age and must have been in active practice for 15 years as registered medical practitioners. They must also produce certificates of moral character from three registered members of the medical profession. The fee is 50 guineas (including the degree fee), of which 20 guineas is retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 25 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology, and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad.

Candidates for any of the above degrees, diplomas, or licence must give at least 28 days' notice to the Secretary of Examinations, University of Durham College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before April 1st.

Scholarships and Prizes.—The following are awarded:—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £40 a year for three years (awarded every third year); Heath Entrance Scholarship (from Kepier Grammar School), £60 (renewable); Province of Durham Masonic (Entrance) Scholarship, £60 (renewable); Heath Scholarship for Surgery, £200, available every second year; Rutherford Morison Surgical Scholarship, £180, available every third year.

The following Scholarships are tenable for one year, namely:—Tulloch Scholarship for Elementary Biology and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology; Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarship for Surgery, £40; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £48 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for Psychological Medicine, £10; Sewell Memorial Prize and Silver Medal for Clinical Pathology.

For further information apply to the Dean of the College.

COLLEGE OF MEDICINE, Newcastle-upon-Tyne.—Hospital practice is carried out at the Royal Victoria Infirmary, a general hospital containing more than 550 beds, and there are facilities for the study of the various special subjects.

Practical midwifery can be studied at the Princess Mary Maternity Hospital, which contains 90 beds, with an annual indoor and outdoor attendance on 3000 cases.

The bacteriological laboratory is adjacent to Armstrong College.

A *Students' Union* has been erected and furnished at a cost of over £54,000, and is now in daily use. Special accommodation has been provided for women students.

NEWCASTLE-UPON-TYNE ROYAL VICTORIA INFIRMARY.—The Infirmary has 572 beds. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by specially appointed *Medical Tutors, Assistant Surgeons and Senior Assistant* in the Gynæcological Department, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, and Venereal Disease, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory in which all clinical bacteriological investigations are carried out with a view to treatment by vaccines and serums. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session *of 1929 opens on Oct. 2nd and the summer session* of 1930 on April 7th.

Applications for detailed information should be made to the Sub-Dean, Dr. Horsley Drummond, at the hospital.

Practical Midwifery is studied at the Princess Mary Maternity Hospital, a new building, excellently equipped, with 90 beds. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health.

Post-graduate Instruction.—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose, and Ear; Diseases of the Skin; Venereal Diseases; *Neurology*; Diseases of Children; Electrotherapeutics and Radiology; special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary, and also at the Princess Mary Maternity Hospital, for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees, including the subjects of Physics, Chemistry and Biology, extends over six years. The Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Physics, Chemistry, Biology, and Organic Chemistry; but at least three years must be spent in attendance upon classes in the University. The final year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof. Before commencing the study of Anatomy and Physiology examinations in Chemistry and Physics and Biology must be passed (First M.B., Ch.B., Parts I. and II.). All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. Second Examination.—Part I., Biology and Organic Chemistry; Part II., Anatomy and Physiology. Third Examination.—General Pathology and Bacteriology. Fourth Examinations (at the end of the fifth year).—Forensic Medicine and Toxicology; Public Health; and Materia Medica, Pharmacology and Therapeutics. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery and Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital three months, and mental hospital three months. Vaccination instruction must be taken and courses of Ophthalmology, Venereal and Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery. Distinctions may be awarded in the subjects (severally) of the Second, Third, Fourth, and Final, and First and Second-class Honours in the Final Examination.

Degrees of Doctor of Medicine and Master of Surgery. At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver, for the Ch.M., or, at the discretion of the examiners, in a special branch of Medicine or Surgery respectively. A thesis of exceptional merit may exempt from any part of these examinations, in which Honours may be awarded.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year candidates may carry on research elsewhere, under approved conditions, and on completing the course present a thesis and submit themselves for oral and possibly written examination.

Scholarships and Prizes.—The following are awarded:—Entrance Scholarships: (*a*) Frank Fletcher and Catherine Fletcher Scholarships of £100 per annum each, for five years. Two or more offered annually; open to men and women students under certain prescribed conditions as to residence, &c.; (*b*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*c*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*d*) Dental Scholarship of £46 17*s.* 6*d.*, Open Competitive Examination in subjects learned during apprenticeship; (*e*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland (available for year 1929–30); (*f*) two Ingleby Scholarships of £10 each, awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*g*), (*h*), (*i*), and (*j*) Four Queen's Scholarships of £10 10*s.* each. In the Second, Third, and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and whose work is sufficiently distinguished. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination and whose work is regarded as sufficiently distinguished. (*k*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*l*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "*Arthur Foxwell Memorial Medal*" (Gold Medal for Medicine) is awarded annually to the candidate taking the highest place in Clinical Medicine and passing the Final M.B., Ch.B. Examination in June; and the "Sampson Gamgee Memorial Medal" (Gold Medal for Surgery) is awarded annually to the best candidates passing Final M.B., Ch.B. Examination in June in Surgery provided that not less than 60 per cent. of marks is obtained (paper, oral, and clinical). The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in fourth and fifth years, open to all students.

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital, Queen's Hospital, Maternity Hospital, Children's Hospital, Mental Hospital, and Fevers Hospital, under the direction of the University Clinical Board. Appointments are open to students varying from £40 to £200 a year.

Post-graduate Instruction.—A "William Withering Lectureship" has been established. A course (or courses) of lectures is given annually for post-graduates on subjects chosen from year to year. In 1930 the Lectures will be given by Dr. W. E. Dixon. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers: The Lecturer for year 1930 is Sir John Bland-Sutton, Bart., LL.D., M.D., F.R.C.S. Post-graduate Courses of Clinical Demonstrations for General Practitioners are arranged annually (April to July) at the Birmingham General, Queen's, and Children's Hospitals.

QUEEN'S HOSPITAL.—330 beds. There is a close association of this Hospital with the University of Birmingham, and the University clinical teaching is conducted here, there being a wealth of excellent material. Ward rounds and out-patient clinic classes are held daily, and there are regular tutorial classes throughout the session. Post-graduate courses arranged by the University are conducted every year. There are special departments in Gynæcology, Diseases of the Eye, of the Ear, Nose and Throat, Dentistry, Radiography, Pathology, Bacteriology, Biochemistry, Physiotherapy, and Electrocardiography. There are also large Wards for Midwifery and Postnatal cases, a Nursery for instruction in Infant Welfare, an extensive Midwifery District, and residential facilities for students. There are 23 Resident Appointments (exclusive of Registrars) available each year for recently qualified students.

BIRMINGHAM GENERAL HOSPITAL.—406 beds. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, and Septic cases; special beds for Eye and Skin cases. Laboratories for Bacteriology, Biochemistry, Cancer Research, and Morbid Histology. Separate rooms adjoin *the medical and surgical wards for clinical* pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electrotherapy, Electrocardiographic investigation, and Venereal Diseases. Post-graduate classes in every branch of medicine and surgery. The Jaffray Branch Hospital contains 61 beds.

Birmingham and Midland Eye Hospital, Church-*street, Birmingham.*—*115 beds.* Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available. A limited number of Non-Resident Clinical Assistants' posts are open to qualified practitioners, particulars of which can be had on application to the General Superintendent. This Hospital has a very large Out-patient Department.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Matriculation.—Important alterations in regard to Matriculation requirements and to the First Year's course of study will come into operation in October, 1929. Particulars may be obtained on application to the Dean.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The subjects of the First Examination are: (1) Chemistry; (2) Biology (Zoology and Botany); (3) Physics; (4) Special Chemistry. The subjects of the Second Examination are (*a*) (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology); and (*b*) (3) Elementary Bacteriology, (4) Clinical Chemistry, (5) General Pathology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (*a*) (1) Special Pathology and Morbid Anatomy; (2) Forensic Medicine and Toxicology; (3) Public Health; (4) Pharmacology and General Therapeutics; (*b*) (5) Obstetrics and Diseases of Women; (6) Surgery, Systematic, Clinical, Operative and Practical, including Ophthalmology; (7) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may present themselves in Parts (*a*) and (*b*) separately, but candidates must have completed the fifth year of medical study before taking Part (*b*).

Degrees of Doctor of Medicine and Master of Surgery. No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees. Candidates for the degree of Doctor of Medicine are required (*a*) to present a thesis, acceptable to the Faculty, and certified to be the candidate's own work, together with (if the candidate desires) copies of published original papers upon Medical Science; (*b*) to present themselves for an *oral examination on the subject of the thesis.*

The University also awards a *Diploma in Medical Radiology and Electrology*—Part I., Physics: Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

Scholarships, Fellowships, and Prizes.—The following are awarded: (*a*) Robert Gee Entrance Scholarship (Men), annually, of £42 10*s.*, tenable for four years; (*b*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (*c*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination on results of Professional Examination in Anatomy, Physiology, Elementary Bacteriology, Clinical Chemistry, and General Pathology; (*d*) Derby Exhibition of £15, Competitive Examination in Clinical Surgery, and (*e*) Clinical School Exhibition of £15 in Clinical Medicine; (*f*) University Scholarship of £50 for one year, awarded on results of the Final (Part A) Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Biochemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100 for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £20; (*r*) Ridgway Research Scholarship (£100); numerous prizes and medals.

The Medical School.—All the laboratories and classrooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. There is also a separate building for Tropical Medicine. Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation.

Clinical Studies.—The Clinical School of the University consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals—the Eye and Ear Infirmary, the Hospital for Women (with the Samaritan Hospital), Liverpool Maternity Hospital, the Royal Liverpool Children's Hospital, and St. Paul's Eye Hospital. These hospitals contain in all a total of about 1445 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine, a Diploma in Public Health, and a Diploma in Bacteriology are awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation, and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination.

The First Examination: (1) Chemistry and Physics; (2) (*a*) Botany, (*b*) Zoology. Candidates must have attended during at least six months' courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, (*a*) Botany, (*b*) Zoology. The candidates sit for these parts separately. The Second Examination: (1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Bothparts must be passed simultaneously. The Third Examination: (1) Pharmacology and Materia Medica; (2) Pathology and Bacteriology. The Final Examination: (1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts: Part I., Forensic Medicine, Hygiene and Preventive Medicine; Part II., Medicine, Surgery, Obstetrics and Gynæcology (Systematic, Clinical, and Oral). Candidates must pass in all subjects of Part I. and of Part II. simultaneously. Candidates for the Second Part must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously obtained the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Degrees of B.Sc. and M.Sc.—The ordinary degree of B.Sc. in the Schools of Anatomy and Physiology may be obtained by students in Medicine who in their third year of study for the degree of M.B., Ch.B. complete the additional courses in these subjects prescribed for this degree. Candidates for the Honours degree of B.Sc. in Anatomy or Physiology, who are students in Medicine, are required to attend courses in advanced Anatomy and Physiology for four terms after passing the Second Examination for the degrees of M.B., Ch.B. Graduates in science may proceed to the degree of M.Sc. by presentation of an approved thesis.

Diplomas: 1. The following are available for candidates holding a registrable qualification in medicine, surgery, and midwifery; examinations are in two parts in each diploma and are written, oral and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination:—

(*a*) *Diploma in Psychological Medicine.*—Part-time course: extending over three University terms, two of which must be spent at the University. Six months' residence must be spent at a recognised Hospital for Mental Diseases.

(*b*) *Diploma in Public Health.*—The course extends over twelve calendar months at least: Part I. of the examination is held in June and October, and Part II. in March and October. Instruction for at least one of the parts must be taken out at the University. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice.

2. *In Veterinary State Medicine.*—Length of course, three University terms. Candidates must be members of the Royal College of Veterinary Surgeons.

3. *In Bacteriology.*—For candidates who have graduated either in science or medicine, or obtained other approved qualification. Length of course, one academic year. A satisfactory thesis on an approved subject must be presented.

Scholarships, Fellowships, and Prizes.—The following are offered in connexion with medical study at the Victoria University:—Scholarships: Dreschfeld Entrance (triennial), £20; John Russell Medical Entrance, £45; Sam Gamble Entrance for Women; Graduate Entrance (fees up to 160 guineas); two Dauntesey Medical Junior, £50 each; Dauntesey Medical Senior, £50; Professor Tom Jones Exhibition in Anatomy, £25; Dickenson Trust Scholarships in Anatomy and Pathology; Platt Physiological, £90; Graduate Research Scholarship, £70; Dickenson Trust Travelling Scholarships in Medicine and Surgery; Ashby Memorial in Diseases of Children (triennial), £100; John Henry Agnew in Diseases of Children, £120. Fellowships: Leech Research, £70; Professor Tom Jones, Surgical, £105; Morrison Watson in Anatomy, £150; Delépine in Preventive Medicine (biennial), £300; Worswick (Causes and Treatment of Rheumatoid Arthritis), £300; Zimmern Travelling Fellowship for Men, £175; Honorary Research Fellowships. Prizes: Sidney Renshaw in Physiology, £15; Wild Prize in Pharmacology, £10; Turner Medical, £20; Dumville Surgical, £15; Knight Prize in Psychological Medicine, £50; Graduate Prizes, £5 each. There are many general entrance scholarships, in addition to those already mentioned, open for competition, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories (now removed to special buildings close to the Royal Infirmary) ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica; new Pharmacological Laboratories have been added this year. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, mental hospitals, a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Post-graduate Studies.—Post-graduate Courses in the following subjects have been arranged for during 1929-30, in addition to those usually held at the various hospitals: 1. Whole-time intensive courses in (i.) Obstetrics, (ii.) Medicine and Surgery, (iii.) (*a*) Fractures, (*b*) Oto-Laryngology. 2. A Post-graduate Day. 3. Part-time courses in (i.) Diseases of the Eye, (ii.) Diseases of the Skin, (iii.) Bacteriology and Immunity. 4. Clinical Assistantships. Syllabuses and other information may be obtained on application to the Dean of the Medical School, Manchester University.

MANCHESTER ROYAL INFIRMARY.—The Manchester Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 608 patients (including 54 beds at the Central Branch). The medical side consists of four units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing and apparatus rooms, and its own class-room attached. All of these units are occupied. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; and (2) the Central Branch in the City, which has now accommodation for 54 patients. The Associated Hospitals thus contain 800 beds and are under the same management. Women students are admitted on the same terms as men.

Two Entrance Scholarships in Medicine of the value of £100 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

ROYAL MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and Lytham St. Anne's.—The hospital contains 190 beds and 80 in the Convalescent Home, Lytham St. Anne's. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electrotherapeutic Department, also an Artificial Sunlight Department. Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is an Orthopædic Department. Out-patients' day is on Tuesday at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

ANCOATS HOSPITAL, MANCHESTER (Founded 1828).—114 beds with a Convalescent Branch of 85 beds at Great Warford, Alderley Edge, Cheshire.

The hospital will be extended during the next two years by the addition of a new ward block, an operating theatre block, pathological department, physiotherapeutic department, and lecture theatre.

The medical division consists of three units served by consultative out-patient clinics. One unit includes a cardiological department; another devotes special attention to gastro-enterology; and the third to neurology. The surgical division comprises an orthopædic unit in which all the fractures and injuries of the hospital are treated; a unit devoted particularly to urology; a unit devoted to abdominal surgery; and an oto-laryngological unit. All units include out-patient clinics. A special clinic staffed by a team consisting of surgeons, pathologist, radiologist, and consultant in radium therapy has recently been created for the study and treatment of malignant disease. The demand on the surgical in-patient accommodation is great, 800 patients at the present time being on the waiting-list. Clinical teaching is given both to undergraduate and post-graduate students in all out-patient clinics, in the wards, and in the form of special lectures. The under-graduate teaching includes a University course in Orthopædic Surgery given in the Michaelmas term, and demonstrations on the examination of the ear, nose and throat. The hospital takes an important share in the University of Manchester Post-graduate scheme. A post-graduate "day," open to all practitioners without fee, is held on each Thursday in the University terms. During the session (1929-30) special intensive post-graduate courses will be given in the treatment of Fractures (Oct. 7th–11th), and in Oto-Laryngology (March 3rd–8th). Applications for entry to these courses should be made to the Dean of the Faculty of Medicine, University of Manchester.

There are six residents: a resident surgical officer, a resident medical officer, three house surgeons, and one house physician. These appointments are open both to men and women graduates, and are recognised by the University of London for the purposes of the M.D. and M.S. degrees. There are also four registrar appointments (part time): medical, orthopædic, surgical, and pathological. These are made annually, and are renewable up to a period of three years. General Superintendent and Secretary: Herbert J. Dafforne.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 73 beds. Out-patients are seen daily from 8.30 to 12 noon.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine. The courses and Degrees in the Faculty are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the

Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination. The First Examination consists of: Part I., Physics and Inorganic Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately. The Second Examination consists of: Part I., Organic Chemistry; Part II., Materia Medica and Practical Pharmacy; Part III., Anatomy, Physiology. Candidates will be allowed to pass any parts separately, but Part I. must be passed before Parts II. or III. The Final Examination consists of: Part I., Pharmacology, Pathology and Bacteriology; Part II., Medicine, Surgery, Obstetrics, Gynæcology, and Clinical Pathology; Part III., Forensic Medicine, Public Health, and Therapeutics. Part I. may be taken at the end of the second clinical year, and Parts II. and III. may be taken at the end of the third clinical year, but not before the completion of the fifth year of medical study. If taken separately Part II. may be passed before Part III.

Degree of Doctor of Medicine and Master of Surgery.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least two years' Hospital Practice or four years' other professional practice for the former, and one year has elapsed for the latter since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine may present a dissertation and, if the dissertation is considered to be of exceptional merit, will not be required to pass an examination. The first term commences on Oct. 1st. Prospectus can be obtained from the Academic Sub-Dean.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods, or post-graduate classes held by members of the clinical staff, may do so on application to the Clinical Sub-Dean, from whom particulars may be obtained.

Clinical Studies.—The clinical studies are pursued mainly at the LEEDS GENERAL INFIRMARY, which has accommodation for 630 in-patients, including 88 beds at branch hospitals in the country. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electrotherapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification. Further particulars concerning these, and the scholarships and prizes open to competition, may be obtained from the Dean of the Faculty of Medicine.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination. The subjects of the First Examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each. The Second Examination: The subjects are Anatomy and Physiology. Candidates must have completed the second year of professional study. The Third Examination: The subjects are Pathology, Pharmacology, Anatomy, and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study. The Final Examination: The subjects of the examination are: Part I., Forensic Medicine and Public Health; Part II., Medicine (including Mental Diseases and Diseases of Children), Surgery, Obstetrics (including Gynæcology). Candidates for Part I. must have completed the Michaelmas Term of the fifth year of professional study; candidates for Part II. must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B., Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy, Surgical Pathology and Bacteriology.

Scholarships and Prizes.—The following are awarded: Four Town Trustees scholarships, offered annually, each of the value of £50 per annum for three years. Medical: offered annually, covers cost of medical curriculum. Six Edgar Allen, offered annually, each of the value of £125 per annum for three years. Post-graduate: Frederick Clifford scholarship, value £50 per annum, tenable for two years. Mechanics' Institute scholarship, value £50 for one year, renewable for a second year. Town Trustees fellowship, value £75 for one year. Medals and Prizes: Kaye scholarship; Gold Medal in Clinical Medicine and Surgery; John Hall Gold Medal in Pathology; Holroyd Gold Medal in Anæsthetics; bronze medals. Particulars of all the above may be obtained from the Registrar.

The Medical School.—The Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain meals and refreshments at moderate prices. The University journal *The Arrows*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road; "Tapton Cliffe," Fulwood-road, and "Endcliffe University Hall," Endcliffe Vale-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained from the tutor for women students.

Stephenson Hall is a hall of residence for men students; particulars may be obtained from the Warden.

Clinical Studies.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes.

The Sheffield Royal Infirmary (500 beds) provides all the opportunities of a large general hospital with special departments for Skin and Ear. The Sheffield Royal Hospital, 320 beds, has special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. The two institutions are amalgamated for the purposes of clinical practice, medical, surgical, and special. There are special departments for the treatment of Diseases of the Eye, with wards assigned to them, at both hospitals, and excellent junior appointments. The Jessop Hospital for Diseases of Women, with 145 beds, has also a Maternity department, with about 900 in-patients per annum and about 250 out-patient cases attended. The Children's Hospital has 85 beds. Special courses on Fevers are held at the City Fever Hospitals (690 beds) and on Mental Diseases at the South Yorkshire Mental Hospital (1800 beds). Every facility is afforded in the various laboratories for the prosecution of advanced studies and research.

Post-graduate Courses.—Post-graduate courses of clinical instruction are held annually in the various hospitals connected with the School.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass, at Matriculation standard, an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, and entrance on the professional curriculum at the University, or an institution recognised as equivalent, of which three shall have been passed in the University, and two of these three subsequent to passing the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations. The First Examination: The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.) The Second Examination: The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). The Final Examination: The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine, and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may be taken together or separately. Forensic Medicine and Toxicology may be taken with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years' standing as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynæcology.

Clinical Studies.—The allied hospitals (Bristol Royal Infirmary and Bristol General Hospital) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High-frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital with 40 beds, and the Southmead Hospital with 556 beds, may be visited.

There are numerous salaried junior appointments for residents who are graduates.

Scholarships and Prizes.—The following are awarded: The Ashworth Hallett Scholarship, value £45, open to women only; two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s.*, for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14; Lady Haberfield Scholarship, value about 25 guineas.

Bristol City Senior Scholarships and those offered by the counties of Gloucestershire, Somerset, Wilts, and Devon, are tenable in the University. Some of the Fellowships awarded by the Colston Research Society for research in the University and the Beaverbrook Fellowship are allotted to the Faculty of Medicine.

Post-graduate Study.—Qualified medical practitioners may be appointed as clinical assistants for a period of one or more months. They may act as assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Demonstration courses with weekly lectures are held during May, June, and July.

All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, inter alia, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College of South Wales and Monmouthshire there.

Particulars can be obtained on application to the Registrar of the University of Wales, University Registrary, Cathays Park, Cardiff, or the Dean of the Faculty of Medicine, or to the Secretary, Welsh National School of Medicine, Newport-road, Cardiff. All classes are open to both men and women students.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England, and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

Students are required to pass a Preliminary Examination in General Education recognised by the Board, and a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board; a Pre-Medical Examination conducted by any of the Qualifying Bodies whose Degrees or Diplomas are registrable on the Medical Register; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, the Joint Matriculation Board of the Northern Universities, and the Central Welsh Board Higher Certificate. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education. The examination is partly written, partly oral, and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months. The fee for the examination is £3 3*s.*, for re-examination in Chemistry £2 2*s.*, and for re-examination in Physics £1 1*s.*

There are two Professional examinations called the *First* and *Final Examinations*. The courses of study for these examinations may be commenced before the Pre-Medical examination in Chemistry and Physics or some equivalent examination has been passed, provided that three terms of study are completed after the examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Biochemistry. Section II. Pharmacology, Practical Pharmacy, and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology, during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Biochemistry and Biophysics during five terms, courses of instruction in Pharmacology, Practical Pharmacy, and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s.*, for re-examination after rejection in Section I. £6 6*s.*, for re-examination after rejection in either part of Section I. £3 3*s.*, for re-examination after rejection in Section II. £3 3*s.* A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. Pathology (including Morbid Anatomy, Morbid Histology, and Clinical Pathology), and Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical, and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from *Section I.* The fee for admission to Section I. is £4 4*s.*; for admission to Section II., Part I., £10 10*s.*; Part II.,

£10 10*s.*; Part III., £6 6*s.*; and the re-examination fees are respectively £3 3*s.*, £6 6*s.*, £6 6*s.*, and £4 4*s.*

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First Examination of the Examining Board, may enter for a part of the Final Examination at the expiration of three years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First Examination may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, in Tropical Medicine and Hygiene, and in Laryngology and Otology. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, Colonial, or Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, London, W.C. 1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON:

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—The age for admission to this diploma, it will be noticed, has been changed from 25 to 23 years. The alteration in the by-law of the College is designed to enable men who have just finished house appointments to sit for an examination for which their recent clinical experience has exactly fitted them. The candidate must either have obtained the licence of the College, or a degree of Doctor or Bachelor of Medicine at a University which is registrable by the General Medical Council and is recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 10 guineas, which is reckoned as part of the fee for admission in the case of success.

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND:

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce, and include the examination of patients and the performance of operations on the dead body. The First Examination is held in June and December and the Second Examination in May and November.

The fees for examination are: First Examination, first admission 8 guineas, and for each readmission 5 guineas. Second Examination, each admission 12 guineas. The fee payable on admission to the Fellowship by Members is 10 guineas and by non-Members 30 guineas, in addition to examination fees.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First Professional Examinations of the English Conjoint Board in Anatomy and Physiology, or the equivalent examination in his University, on the production of certificates of attendance upon prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Pre-Medical and Primary examination is held quarterly. Part I. includes Chemistry, Chemical Physics; Practical Chemistry; Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months' Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine, Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments.

The course of study for the *Final examination* includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of three winter and three summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the office of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Three academic years (33 months) must elapse after a candidate has passed the examination in Anatomy and Physiology before he can complete the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations.

Master of Midwifery.—This diploma has now been instituted and the next examination will be on Monday, Nov. 18th, 1929. Candidates will be admitted to the examination who have been registered practitioners for at least one year, and who have held a resident appointment in an institution recognised by the Society for six months or more, and who for three months have attended an antenatal clinic and an infant welfare centre, also recognised by the Society. Until 1932 practitioners of ten years' standing may enter for the examination without further formality than the production of satisfactory evidence that they have made a special study of the subjects. The examination will be conducted by written papers and by clinical and oral tests.

The entrance fee for the examination is £10 10*s.* and a further fee, which at present is fixed at £10 10*s.*, will be paid before their admission to the Mastery, by those who have satisfied the examiners. Candidates for the examination must send in their certificates to the Secretary of the Society, Mr. Frank Haydon, who will supply any other information.

The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

PHARMACEUTICAL SOCIETY.

THE SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN is recognised by the University of London. The Society conducts examinations for registration as (*a*) Chemist and Druggist and (*b*) Pharmaceutical Chemist

Courses of Instruction are given for the examinations in conjunction with University College.

An Intercollegiate two years' course for the Final Examination for the degree of B.Pharm. of the University of London is also given in conjunction with University College. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates of approved Universities may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories; this degree may now be taken in Pharmacognosy or Pharmacy in the Faculty of Medicine. Further information may be obtained from the Dean, Prof. Greenish, 17, Bloomsbury-square, London.

METROPOLITAN CENTRES AFFORDING POST-GRADUATE FACILITIES.

Certain organisations and institutions provide for the needs of the medical student in his cirriculum and for the post-graduate student requiring special forms of instruction and opportunities for clinical observation. Many of the institutions are recognised by the English Conjoint Examining Board as a place of study for the fifth year of the curriculum.

Special Diplomas in public health, tropical, psychological, and ophthalmic medicine, medical radiology and electrology, laryngology, otology, and tuberculosis are now granted in proof of intensive work along the different lines indicated. Of these, the Diploma in Public Health, being regulated by the General Medical Council, is registrable. Appointments to and promotion in the various Services are largely dependent on the possession of a particular diploma, and each syllabus of the special courses available at the institutions which follow, either with or without association with the Fellowship of Medicine, is planned to afford the necessary instruction.

The Special Diplomas are dealt with fully on p. 469, where the Bethlem Royal Hospital, the Maudsley Hospital, and the Diploma in Psychological Medicine are referred to. Similarly the Hospitals of the Metropolitan Asylums Board provide post-graduate as well as under-graduate facilities, while the hospitals of the Seamen's Hospital Society both supply the instruction necessary for the Diploma in Tropical Medicine and Hygiene, and coöperate in the activities of the Fellowship of Medicine and Post-Graduate Medical Association.

HOSPITALS OF THE METROPOLITAN ASYLUMS BOARD.—These hospitals, of which there are 18 in the metropolis and the near vicinity, will shortly come under the administrative powers of the London County Council. The Board hold classes of instruction in fevers at all the infectious hospitals at which ordinary medical students attend, but the only hospital to which a class of instruction for the diploma in public health is attached is the North-Eastern Hospital. This course of lectures and demonstrations (three months) on clinical practice and in hospital administration is given at the North-Eastern Hospital, St. Ann's-road, Tottenham, N. 15, by the medical superintendent, on Mondays and Wednesdays at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning Thursday, Oct. 3rd, 1929. This course complies with the requirements of the revised D.P.H. regulations of the General Medical Council. Application for further information should be made to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, London, E.C. 4.

SEAMEN'S HOSPITAL SOCIETY.—The Society possesses seven establishments: the Dreadnought Hospital at Greenwich, 250 beds; the Albert Dock Hospital, E. 16, 53 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, W.C. 1, 56 beds; Tilbury Hospital, Tilbury Docks, Essex, 92 beds; Queen Alexandra Memorial Hospital, Marseilles, 60 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds; and the Angas Home, Cudham, 36 beds. Total, 627 beds. It has also a Dispensary in the East India Dock-road from which patients are transferred to the hospitals. Courses of operative surgery and surgical pathology are arranged by the London School of Clinical Medicine at the Dreadnought Hospital.

The clinical teaching of the London School of Hygiene and Tropical Medicine is given at the Society's Hospital for Tropical Diseases, Endsleigh-gardens, W.C. 1.

THE FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

Some 50 general and special London hospitals work in conjunction with this Association, which has its office at Room 28 in the House of the Royal Society of Medicine, 1, Wimpole-street, London, W. 1. Arrangements are made for courses in medicine and in surgery, occupying the whole or part of each day for periods of one to four weeks. Fees, £1 1*s.* to £7 7*s.* Special evening courses for the M.R.C.P. Examination are organised at intervals. Series of weekly (free) lectures (during the winter months) and clinical demonstrations in medicine and in surgery (except during August and September) are also arranged. Membership of the Fellowship is open to all qualified medical practitioners, the membership fee being 10*s.* per annum, which includes the subscription to the monthly *Post-Graduate Medical Journal.* Full information regarding the courses of study can be obtained from the Secretary.

GENERAL PRACTICE.

ROYAL NORTHERN GROUP OF HOSPITALS.—The Royal Northern Hospital, Holloway, London, N. 7, is the main institution of the Royal Northern Group of Hospitals, which includes the Royal Chest Hospital, City-road, E.C., Grovelands Hospital (Recovery Branch), Southgate, and the Reckitt Convalescent Home, Clacton-on-Sea. The total number of beds in the group is 400. Besides the honorary staff there are six anæsthetists, three pathologists, resident medical officer, resident house physician, three resident house surgeons, two resident casualty officers, and one resident obstetric surgeon. The large rectangular and circular wards, each of which contains 25 beds, the children's ward for children under 5 years of age, the observation wards in the new Casualty Department, the two operation theatres, and out-patient department are designed with a view of offering the greatest facilities for clinical work. The Special Departments include the following: Fracture, genito-urinary and neurological, physicotherapeutic, pathological (under a director of clinical pathology), tuberculosis, venereal diseases, and X ray (recently remodelled). Patients are removed to the Recovery Branch by ambulance a few days after operation. Demonstrations are given daily in the wards and out-patient departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office. A new maternity department has been opened, and the light department has been re-equipped.

Weekly lectures by members of the hon. medical and surgical staff are free to all medical practitioners. Special classes and demonstrations are being arranged for post-graduates. They include instruction in general medicine and surgery, and also lectures and demonstrations in special subjects at the Royal Northern and Royal Chest Hospitals.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynæcological, and children's wards, having 200 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are five resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are also held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Dr. S. C. Shanks, Secretary to the Medical Committee, 87, Harley-street, W. 1; or from Mr. T. H. C. Benians, F.R.C.S., Dean of the College, at the Hospital.

WEST LONDON HOSPITAL, Hammersmith, W.—This hospital has 220 beds. Attached to the hospital is the West London Post-Graduate College. The practice of the hospital is reserved exclusively for qualified men. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms. The hospital has a fully equipped pathological laboratory, at which instruction is given in elementary bacteriology. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Sir Henry Simson, at the Hospital. Secretary of the Post-Graduate College Mr. C. Cole, and of the Hospital Mr. H. A. Madge.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. (Established 1873; Incorporated 1917.)—The hospital contains 130 beds. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Monday, 1.15 P.M., Tuesday, 2.30 P.M., Wednesday, 9 A.M. and 1 P.M., Thursday, 8 A.M., Friday, 10 A.M. and 3 P.M., and Saturday, 9 A.M. New Out-patient Departments for special diseases have been opened: Neurology, Diseases of the Stomach and Disorders of Digestion, Diseases of Women, Genito-urinary Diseases, Diseases of the Rectum, and Dermatology.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—In-patient Department: Haverstock Hill, N.W.; Out-patient Department: Bayham-street, Camden Town (138 beds—viz., 109 free, 8 isolation and observation, &c., and 21 paying or contributory). Serves Hampstead and the populous districts of Kentish Town and Camden Town. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients' Department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital. Post-graduate work is in connexion with the Fellowship of Medicine.

QUEEN MARY'S HOSPITAL, Stratford.—This hospital has developed from the West Ham and Eastern General Hospital. It has 218 beds and ministers to a very poor public. Founded as a dispensary in 1861, and developing into a hospital in 1890, steady extensions have been made during this century. A Royal Charter was obtained in 1917, and the hospital has become a valuable charity with a full medical staff of physicians and surgeons, and specialists for gynæcology, obstetrics, ophthalmological surgery, radiology, and dental surgery. The Fellowship of Medicine and Post-Graduate Medical Association makes frequent use of the opportunities here offered.

Particulars may be obtained from Major Raphael Jackson, Secretary, Queen Mary's Hospital, Stratford, E. 15.

NEUROLOGY.

THE NATIONAL HOSPITAL, QUEEN-SQUARE, W.C.—The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October, and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuropathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist.

WEST END HOSPITAL FOR NERVOUS DISEASES.—This institution is recognised by the University of London as a school of instruction in Neurology for the M.D. degree, Branch III., and for the D.P.M. The Out-patient Department is in Welbeck-street, W.; the In-patient Department is at Gloucester-gate, Regent's Park, and contains 80 beds. Completely equipped with pathological and other special departments, the hospital offers every facility for instruction in Neurological subjects. In conjunction with the Bethlem Royal Hospital, it offers courses of instruction for the D.P.M. Additional series of clinical demonstrations, apart from the general practice of the hospital, are held regularly each session, and the hospital coöperates with the Fellowship of Medicine in the programmes of special post-graduate teaching organised by the Association. Appointments as Hon. Clinical Assistants in the Out-patient Department are open to registered medical practitioners. The Savill Memorial Prize (value £15) and Medal are offered biennially for competition among post-graduate students who have attended the practice of the hospital or any special course. Full particulars may be obtained from Dr. C. C. Worster-Drought, Dean, or J. P. Wetenhall, Secretary, 73, Welbeck-street, W.

HOSPITAL FOR EPILEPSY AND PARALYSIS, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. The out-patient department is open every week-day except Saturday at 2 P.M.

HEART AND LUNGS.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—The hospital contains 350 beds. The recent provision of 25 (surgical) beds in a special block has increased the total number up to 350 (approximately). The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital. Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The medical practice of the hospital is recognised by the English Conjoint Board and also by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students. During the month previous to each conjoint examination the teaching will be as far as possible for students about to enter for the final examination. The hospital practice is open to post-graduate students.

MOUNT VERNON HOSPITAL (INCORPORATED), Northwood; **CENTRAL OUT-PATIENT DEPARTMENT**, Fitzroy-square, W.—The hospital contains 150 beds, Medical and Surgical. Clinical Demonstrations are given by the visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards and in the out-patient department.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. 2.—Special Departments: Surgical, Laryngological, Radiological, Pathological, Electrocardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The in-patient staff visit generally in the afternoon; out-patients at 2 P.M. The post-graduate students are admitted on payment of fees which entitle them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, and a club room. Graduates desiring Assistantships in any department should apply to the head of the Special Department, Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney).

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, London, W. (founded 1857).—The practice of the hospital, both in the wards and out-patient department, is open daily to post-graduates and others. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the Cardiovascular system, and facilities exist for those requiring practical instruction in Electrocardiography, X Rays, and other graphic methods. Clinical Assistants in the Out-patient Department are appointed from time to time.

DISEASES OF WOMEN AND CHILDREN.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. 1. (contains 252 beds).—The practice is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to eight medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Clinical Clerks are appointed once a month. In the pathological department facilities are afforded to post-graduates for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology, and in Medical Biochemistry in the Pathological and Biochemical Laboratories. Courses of eight to ten Lecture-Demonstrations are given at weekly intervals twice a year in both subjects (Clinical Pathology and Bacteriology, and Biochemistry.) Time spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, as well as by the English Conjoint Board as part of the final curriculum. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL (formerly QUEEN CHARLOTTE'S LYING-IN HOSPITAL) AND MIDWIFERY TRAINING SCHOOL, Marylebone-road, N.W.—This hospital receives over 2300 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Antenatal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially trained. A Residential College provides accommodation for students and qualified practitioners (both men and women), and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council.

ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN, Waterloo Bridge-road, S.E.—This hospital, founded at the date indicated by its title, has recently undergone considerable extensions, and has now 130 beds, while the latest buildings include a nurses' home and a new operating theatre. It has a full staff of surgeons, physicians, and gynæcologists, and also special departments. A new orthopædic department is in use, and the physiotherapeutic and electrical department has recently been extended and re-equipped. There are facilities for post-graduates to attend the general and special clinics in medicine and surgery, including a genito-urinary clinic, a clinic for varicose veins, and the X ray department of gastro-intestinal diagnosis. Particulars of post-graduate courses, which are held from time to time, can be obtained from the Secretary or from the Fellowship of Medicine.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—138 beds and a large out-patient department; the home at Broadstairs has 50 beds. Private wards in the Nurses' Home, named after H.R.H. Princess Mary (Viscountess Lascelles), at 29, Tite-street, adjacent to the hospital. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is arranged between him and the child's parents. Application for admission should be made to the Secretary.

QUEEN'S HOSPITAL FOR CHILDREN (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, London, E. 2.—For the sick children of the poor under 14 years of age. 134 beds in London and 30 at the seaside branch, "Little Folks" Home, Bexhill.—Special departments in Ear, Nose, Throat, Skin and Eye, and Dentistry. Rheumatic Clinic in coöperation with L.C.C. schools weekly. A radiologist attends four times weekly. There are massage and light departments, and a special whooping-cough physician. The practice of the hospital is open to students by arrangement with the medical staff, and post-graduate instruction in children's diseases, lectures and demonstrations are given at times notified by the Fellowship of Medicine.

PADDINGTON GREEN CHILDREN'S HOSPITAL (42 beds).—This is a small hospital with a large out-patient department and a full staff, with eye, ear, skin, and dental departments. The facilities which it offers for observation of clinical practice are used by the Fellowship of Medicine.

HOSPITAL FOR WOMEN, Soho-square, W. (80 beds).—The teaching is available for post-graduates only, in limited numbers. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated is the London School of Gynæcology, comprising attendance in out-patient department, operating theatre, clinical lectures, and X ray treatment.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W. (70 beds).—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. Full particulars may be obtained from the Secretary to the Medical Committee at the hospital.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Glamis-road, Shadwell, E. (136 cots).—Clinical instruction is given by the physicians and surgeons to the hospital to students in the fifth year of the curriculum. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to the Secretary.

CHELSEA HOSPITAL FOR WOMEN, Arthur-street, Chelsea, S.W. 3.—This hospital has 100 beds, and a certain number are reserved for patients paying £5 5s. a week and small fees to the surgeons for operations. There is a convalescent home of 32 beds at St. Leonards. At a large out-patient department the patients are seen at a nominal payment.

THE EVELINA HOSPITAL, Southwark (76 cots), and THE BELGRAVE HOSPITAL (70 cots), Clapham-road, also give facilities for out-patient practice.

OPHTHALMOLOGY.

ROYAL LONDON OPHTHALMIC HOSPITAL (Moorfields, 1804-1899), City-road, E.C. (188 beds).—The attendance at Moorfields Eye Hospital is now very large. Operations are performed daily from 10 A.M. to 1 P.M., and four surgeons attend on each day. Students are admitted to the practice of the hospital, and special courses of instruction are given, which extend over a period of five months, by members of the Surgical Staff, beginning in October and March. The instruction and classes are arranged so as to meet the requirements for the various diplomas in Ophthalmology, both the preliminary examination in Anatomy, Physiology and Optics, and those subjects required in the second part. Students of the hospital are eligible as house surgeons or clinical and junior assistants; these are appointed every three months.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, Holborn, W.C. (85 beds, including 14 rooms for paying patients).—This hospital has recently removed from its original site at Charing Cross to much larger premises, well adapted for teaching purposes. The clinics are held in the afternoons from 1 P.M. Operations are performed daily in the theatre at 3 P.M. Lectures and practical classes in the various branches of Ophthalmology, including Operative Surgery, Bacteriology, and Pathology, are held during the winter and summer sessions at 5 P.M. The practice of the hospital is open to both men and women practitioners, and medical students. Post-graduate students at the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant (six appointments paid), and senior and junior clinical assistants.

ROYAL EYE HOSPITAL, St. George's-circus, Southwark, S.E.—There are 44 beds and 2 cots. Clinical instruction is given to students and post-graduates daily at 2.30 P.M., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Apparatus has been installed for the Microscopy of the Living Eye. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers.

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds, and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. This school is recognised as a teaching institution by the Universities of London and Oxford, as well as the English Conjoint Board. It receives a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. A Clinical Demonstration is held by members of the staff at the Central London Ophthalmic Hospital at 5 P.M. on the first Tuesday of every month. Students of medicine and doctors are admitted free.

GENITO-URINARY AND VENEREAL DISEASES.

LONDON LOCK HOSPITAL AND HOME. (Founded 1746.)—In the institution at Harrow-road, W., there are 202 beds. In the male department and out-patient department in Dean-street, Soho, W., there are 38 beds. Male and female patients are seen at 91, Dean-street, Oxford-street, W.1, at any time from 9 A.M. until 9 P.M. daily, including Sundays. Intravenous injections are given at every clinic. Irrigations for males are given daily from 8 A.M. to 9 P.M. Female patients and children are seen daily at 283, Harrow-road, Paddington, W.9, from 9 A.M. until 8 P.M. Irrigations for females are given at any time. The hospital is linked up with the Fellowship of Medicine; special courses of lectures are held in May and November each year, and application for tickets should be made direct to the Secretary of the Fellowship. Only a limited number of practitioners and students are permitted to attend the practice of the Female Lock Hospital, and application should be made to the Dean at the Male Lock Hospital, between the hours of 11 A.M. and 5 P.M., or to the Secretary at the Head office.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C.1. (Founded 1835.) (62 general beds and 10 private beds.)—For men and women. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Two fortnightly courses held during year in coöperation with the Fellowship of Medicine.

St. Peter's Hospital for Stone and other Urinary Diseases, Henrietta-street, Covent Garden. (Established 1860.) (30 beds for men and 2 beds for women and children).—The X ray department is diagnostic only. A loan of radium salts for research work was made by the British Empire Cancer Campaign in 1925. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Post-graduate Courses of Lectures are given from time to time, dates being advertised in the medical journals.

All Saints' Hospital for Genito-Urinary Diseases.—The in-patient department (30 beds) is at Finchley-road, and the terms of admission are free or by payment according to means. The out-patient department in the Vauxhall Bridge-road provides clinical instruction through the Fellowship of Medicine, in addition to which demonstrations in cystoscopy and other branches of genito-urinary work are available for all medical practitioners at the Out-patient Department on Wednesday, Thursday, and Saturday afternoons, at 1.30 P.M., without fee.

ORTHOPÆDICS.

Royal National Orthopædic Hospital, Great Portland-street, W. (450 beds.)—This institution is a good example of the fusion of small and scattered activities for the creation of an effective whole. The three orthopædic hospitals of the metropolis were combined for the formation of this central institution at the instance of the King's Hospital Fund, with the result that the grants from this Fund and the income from subscriptions can now be used to far better purpose and with economy. The hospital has also been approved by the Ministry of Health for the treatment of tuberculosis, the connexion between orthopædics and the therapeutics required in many forms of tuberculosis having become obvious. Country branch at Brockley Hill, Stanmore. (214 beds). Both branches of the hospital are residential schools for physically defective children, certified by the Board of Education. Post-graduate courses of 14 days each are held twice yearly.

EAR, NOSE, AND THROAT.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinic. Lectures each Friday at 4 P.M. An intensive Course of Lectures (especially suitable to D.L.O. students), with Operative Surgery Class, Peroral Endoscopy Class, and Pathology Class is given twice yearly—in May and October. Preparatory courses in Methods of Examination and Diagnosis at frequent intervals. Consultations on interesting cases take place on the fourth Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening clinics. New wing, with complete out-patient department and additional wards, was opened in August last.

Golden-square Throat, Nose and Ear Hospital (with which is amalgamated the London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 55,000. Minor operations are performed on Mondays, Wednesdays, and Fridays, at 9.30 A.M. New wards and in-patient operating theatres have been opened recently, and the hospital now contains 95 beds. Practitioners and medical students are admitted to the practice of the hospital, and clinical assistants are appointed periodically.

Metropolitan Ear, Nose, and Throat Hospital. (Founded 1838.)—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Clinical Assistants are appointed as vacancies occur.

SKIN.

London School of Dermatology, St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—In-patient Department (33 beds) at 262, Uxbridge-road, W. Out-patient Clinics are held daily at 2 and 6 P.M. (Saturdays 2 P.M. only), when demonstrations are given on the cases presenting themselves. The Chesterfield Lectures, constituting a systematic course in dermatology, are given on Tuesdays and Thursdays at 5 P.M., from October to March, by the hon. medical staff of St. John's Hospital and the physicians in charge of the Dermatological Departments of the London Teaching Hospitals. The lectures are free to those attending the practice of the hospital and to registered medical students. At the end of the course an examination is held for the Chesterfield Medal in Dermatology, and is open to those who have attended three-quarters of the lectures. The Electrical Department is open daily from 2 to 4 P.M., except on Wednesdays and Saturdays. Laboratory Courses in the Pathology and Bacteriology of the Skin can be arranged.

The London Skin Hospital (Fitzroy-square), and the Hospital for Diseases of the Skin (Blackfriars-road), admit students to their practice, which is among out-patients, daily at 2.30.

CENTRES OUTSIDE LONDON AFFORDING EDUCATIONAL FACILITIES.

Nearly every hospital of a general character in the country having more than 150 beds falls within this category, and certain of them have already been noticed in connexion with the universities to which their clinical practice is attached. The hospitals vary much in size and scope.

The following alphabetical list includes the provincial hospitals which are recognised by the English Conjoint Board for a part of the required training in medical and surgical practice through clerkships and dresserships.

Bath Royal United Hospital, Bath.—This hospital contains 212 beds, 72 of which are situated in Combe Park, Bath, and are for *paying patients* only, and possesses X Ray, Massage, Bacteriological Departments, a Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), at 5 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

Bedford County Hospital, Bedford.—This hospital has 124 beds, including 15 beds in the paying and 13 beds in the maternity wards, X Ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, nr. Woburn Sands. The hospital is approved by the University of London for the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary, Bradford.—This hospital contains 215 beds and, in addition, has 50 recovery beds at the Woodlands Convalescent Home, Rawdon. There are 4 Honorary Consulting Physicians, 1 Honorary Consulting Surgeon, 1 Honorary Consulting Laryngologist, 1 Honorary Consulting Gynæcologist, 1 Honorary Consulting Pathologist, and

1 Honorary Consulting Dental Surgeon. The Acting Staff consists of 4 Honorary Physicians, 4 Honorary Surgeons, 1 Honorary Radiologist, 1 Honorary Laryngologist, 1 Honorary Ophthalmic Surgeon, 1 Honorary Dental Surgeon, 1 Honorary Assistant Physician, 2 Honorary Assistant Surgeons, 1 Honorary Assistant Radiologist, 5 Anæsthetists, 1 Pathologist, 1 Physician in charge of Radium Therapy Department, 1 Resident Surgical Officer, 1 House Physician, and 4 House Surgeons. There are special clinics for Orthopædic cases, for Electrotherapeutic and Sunlight Treatment, and for Radium Therapy. A new hospital of 360 beds with a self-contained block for 70 paying patients is in construction. Secretary-Superintendent: Mr. J. J. Barron.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry (established 1840).—There are 307 beds available at the Main Hospital, and 40 beds at the Alcock Convalescent Hospital, Keresley (three and a half miles distance), which is used as an annexe. At the Main Hospital there are separate Medical, Surgical, Maternity, Children's and Accident Wards, also separate Ophthalmic Block complete with its own Theatre. There are separate departments for Clinics for Ear, Nose and Throat Diseases, X Ray, Electrical, and Sunlight Clinics, also V.D. Clinic. There is also an up-to-date Pathological Laboratory.

DERBYSHIRE ROYAL INFIRMARY, Derby.—This general hospital of 338 beds was rebuilt in 1892–94. In recent years there have been numerous alterations and additions to keep pace with modern requirements. The hospital is built on the pavilion system and provides, in addition to the usual Medical and Surgical blocks, a separate Ophthalmic block of 40 beds, a separate Children's block of 34 beds (Medical and Surgical), Gynæcological Wards, and an Ear, Throat, and Nose Department. There is a large and well-equipped Out-patient Department, also separate Orthopædic, X Ray, Electrical, Pathological, and Venereal Diseases Departments. The Honorary Visiting Staff consists of 2 Honorary Physicians, 3 Honorary Surgeons, 1 Honorary Ophthalmic Surgeon, 1 Honorary Gynæcologist, 1 Honorary Assistant, Physician, 1 Honorary Assistant Surgeon, 1 Honorary Assistant Ophthalmic Surgeon, 1 Honorary Pathologist, and 2 Honorary Surgeon Dentists. The salaried Medical Staff consists of a non-Resident Staff of 1 Surgeon-in-charge of X Ray and Electrical Departments, 1 Surgeon-in-charge of Venereal Diseases Department, 4 Anæsthetists, and a Resident Staff of 4 House Surgeons, 1 House Physician, and 1 Assistant House Surgeon and Casualty Officer. Registered Medical Students are admitted to witness the medical and surgical practice on payment of fees. Superintendent and Secretary: Mr. Walter Banks, F.C.I.S.

GLOUCESTERSHIRE ROYAL INFIRMARY AND EYE INSTITUTION, Gloucester.—This hospital has 145 beds. Secretary: F. J. Symons. An Electrical and Massage department has been established and Venereal Clinic opened. Also Ear, Nose, and Throat department, X Ray department, Ultra-violet Ray department, Orthopædic department, Dental department, and Pathological Laboratory.

HULL ROYAL INFIRMARY, Hull.—This hospital contains 272 beds, and since its establishment in 1782 has undergone steady additions and improvements, including up-to-date Ophthalmic, Radiological Nose, Throat and Ear, Dental, V.D., Violet Rays and Pathological Departments. Recent extensions include a new Operating Theatre, Nurses' Home, and extensions to the old X Ray, Electrical, and Out-patient Departments. Work is in progress on the erection of a new 500-bed hospital at Sutton-on-Hull. The Staff consists of 2 Consulting Physicians, 3 Consulting Surgeons, 2 Consulting Ophthalmic Surgeons, 3 Physicians, 4 Surgeons, 1 Ophthalmic Surgeon, 1 Aural Surgeon, 2 Radiologists, 1 Pathologist, 2 Assistant Physicians, 2 Assistant Surgeons, 1 Assistant Ophthalmic Surgeon, 1 Assistant Aural Surgeon, 1 Dental Surgeon, 1 Assistant Dental Surgeon, 4 Anæsthetists, 1 Officer-in-charge of V.D. Department. Resident Staff: 1 House Physician, 1 House Surgeon, 1 Assistant House Physician, 2 Assistant House Surgeons, 1 Assistant Surgeon to Special Departments, 1 Casualty Officer. An annexe at Withernsea has accommodation for 30 patients.

KENT AND CANTERBURY GENERAL HOSPITAL, Canterbury.—The hospital contains 120 beds. Pupils of the staff are admitted to the practice of the hospital. Operations daily. Special departments include Ophthalmic, Ear, Nose and Throat, Venereal, Orthopædic, Electrical, Actinotherapeutic, X Ray, and Bacteriological. Secretary: Mr. W. T. Southwood.

LEICESTER ROYAL INFIRMARY, Leicester.—At the General Infirmary there are 333 beds, and at the Children's Hospital in connexion, 70; venereal diseases, 17; total 420 beds. A reconstruction scheme has been carried out, and £250,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, two new wings, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Pathological Laboratories and post-mortem rooms were erected at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms, and now provides for 160 nurses and staff. An old central wing is being replaced by a new wing of three wards, and other structural improvements comprise reconstruction of the kitchens, new temporary ward of 30 beds, and a new venereal disease department. There are eleven resident salaried medical officers—viz., four house surgeons, two house physicians, three anæsthetists, and two dressers. Most of the posts are filled half-yearly and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. Students who seek resident Dresserships should apply to the House Governor and Secretary. A post-graduate course of lectures is arranged annually by the Leicester Medical Association, and also clinical classes are held for graduates preparing for M.D. and M.R.C.P.

NORFOLK AND NORWICH HOSPITAL, Norwich.—This hospital has at present 350 beds. There is a convalescent home with accommodation for 35 patients at Cromer. The Honorary Medical and Surgical Staff consist of 2 Consulting Physicians, 3 Consulting Surgeons, 1 Consulting Radiologist, 1 Consulting Ear, Nose and Throat Surgeon, 3 Physicians, 3 Surgeons, 1 Assistant Physician, 3 Assistant Surgeons, 1 Surgeon, Ear, Nose and Throat Department; 2 Ophthalmic Surgeons, 1 Radiologist, 1 Pathologist, and 2 Dental Surgeons. There are 3 Honorary Anæsthetists and Honorary Assistants to the Ear, Nose and Throat Department, the X Ray Department, Ophthalmic Department, and Cardio-Vascular Clinic. Other medical officers are: 1 Assistant Pathologist and 1 Assistant to the Venereal Diseases Department. The Resident Medical Staff consists of 1 House Physician, 3 House Surgeons, 1 House Surgeon to the Ear, Nose, Throat, and Eye Department, and 1 Casualty Officer. A private patients' home has recently been opened. Students are admitted to the practice of the Hospital for a fee of £5 5s. for six months. House Governor and Secretary: Mr. Frank Inch.

NORTHAMPTON GENERAL HOSPITAL, Northampton.—Two new wings were opened in 1904 and the old buildings entirely renovated and rearranged. In 1926 a new isolation block of 30 beds was opened. The number of beds is 230. There is an up-to-date Pathological Laboratory; also, X Ray and Therapeutic Department and V.D. Clinic. Two new operating theatres are being built.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., *M.B.*, *Ch.B.*, *M.D.*, and *Ch.M.* The degree of *Ch.B.* shall not be conferred on any person who does not at the same time obtain the degree of *M.B.*, and the degree of *M.B.* shall not be conferred on any person who does not at the same time obtain the degree of *Ch.B.* No one is admitted to the degrees who has not been engaged in study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course in Clinical and Practical Midwifery and have personally conducted 12 cases.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Three of the five years of medical study must be spent in the University of Edinburgh. The remaining two years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised for the purpose by the University Court.

Women are admitted to graduation in medicine under the same conditions as men.

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted.

Post-graduate Instruction.—The University takes part in the Courses given under the auspices of the Edinburgh Post-graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for approved candidates for the Degree of Ph.D.

In connexion with the University and Royal Colleges Post-graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-graduate Courses in Medicine.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars concerning these, as well as concerning the fees at different stages, can be obtained from the Dean of the Medical Faculty.

ROYAL INFIRMARY, Edinburgh.—1000 beds, including 42 cots for children. The clinical work of the Edinburgh student is done at the Royal Infirmary. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There is also a large and complete Radiological Department. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology.

The appointments are: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—120 beds, and fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given thrice throughout the year by the staff. Each course consists of 50 meetings and combines medicine and surgery. Post-graduate Courses of Lectures are held during the summer vacation. Full particulars with regard to teaching can be obtained from the Dean's office, University New Buildings, Edinburgh.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for outdoor patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Patients whose diseases require operations or extra care are accommodated in the house (10 beds). Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A Post-graduate Course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences in October. The class meets at 5 P.M. on Tuesdays and Fridays, and the instruction, which is practical, is supplemented by lantern demonstrations. Full particulars from the Secretary, 82, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: *M.B.* and *Ch.B.* (always conjointly), *M.D.* and *Ch.M.*; *B.Sc.* in Public Health; *D.Sc.* in Public Health; *B.Sc.* in Pharmacy; and *Ph.D.* in the Faculty of Medicine. A Diploma in Public Health (*D.P.H.*) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must attend a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), with Practical Chemistry, three terms; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and

Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine with nine months more of general hospital practice; the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects:. Ophthalmology, Diseases of the Ear, Diseases of the Throat and Nose, Venereal Diseases, Tuberculosis, Fevers, Vaccination. The final year consists of three intensive terms of study: one devoted to Midwifery and Diseases of Women, one to Surgery, and one to Medicine.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are granted to candidates, not under 24 years of age, who have previously obtained the double bachelorship on completing examinations, in Clinical Medicine for M.D. and in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M. The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College and must prosecute a course of special study or research for two or three years and given evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject matter of the thesis.

Post-graduate Medical Teaching is available under the auspices of Glasgow Post-Graduate Medical Association, which is representative of practically all the Teaching Institutions in Glasgow. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. There is a General Medical and Surgical Course during the last two weeks of August and the first two weeks of September. This is a whole-time course and includes most of the subjects of interest to the general practitioner. The forenoons are occupied with General Medicine and Surgical Diagnosis and Minor Surgery in the Royal Infirmary and in the Victoria Infirmary. In the afternoons special subjects are dealt with in some of the special hospitals or in the special departments of the general hospitals—two subjects each afternoon. On the four Saturday forenoons Tuberculosis and Infectious Fevers are demonstrated at Ruchill Fever Hospital. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from the Secretary of the Association, 9, Woodside-terrace, Glasgow.

There are many Bursaries, Scholarships, and Prizes in connexion with the Medical Course.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. New Lectureships in Materia Medica and Pathological Biochemistry were established recently, and this year a lectureship in Bacteriology has been founded. St. Mungo's College which embraces and continues the original Royal Infirmary Medical School, is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, over 800 beds. In addition to the large medical and surgical departments, there are special wards for diseases of women, of the throat, nose, and ear, skin, eye, burns, septic cases, and biochemical investigation. The wards are open to Women Students. Six house physicians and nine house surgeons, who board in the hospital free of charge, are appointed every six months; also five non-resident house physicians, eight non-resident house surgeons, and one non-resident dental house surgeon. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received, these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion and Massage Department, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during August and September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Biochemistry, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. Tutorial Classes for senior students are also held in August and September.

For information regarding fees and other particulars, application should be made to the Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital of 600 beds adjoins the University. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electrotherapeutics. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological and Bacteriological Departments the courses are both systematic and practical, and extend through the winter and following summer; these are likewise recognised by the University for graduation. In addition Post-graduate Courses are held. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. In the Clinical Laboratory students receive laboratory instruction from the lecturer on clinical methods. A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics. Secretary: J. Matheson Johnston, C.A.

VICTORIA INFIRMARY, 67, Carlton-place, Glasgow.—This institution, which has 380 beds, is the third of the extensive general hospitals in Glasgow to afford opportunity for clinical instruction to students. In addition to a full general staff there is a clinical research laboratory with pathologists and bacteriologists attached, radiological instructor, and a full assortment of specialists. The Bellahouston

Dispensary, also with a clinical staff, is conducted in connexion with the Victoria Infirmary. For further particulars of the clinical practice application should be made to the Secretary and Treasurer.

The Anderson College of Medicine, Dumbarton-road, Glasgow, W.1.—Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort *of students. Women students are admitted on the* same terms as men, and the Carnegie Trust extends its benefactions to students of the College. (Full particulars may be obtained from the Carnegie Trust Offices, Merchants' Hall, Edinburgh.)

Candidates for the L.D.S. can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty, Communications relating to the Preliminary Examination in General Education to be addressed to the Educational Institute Office, 47, Moray-place, Edinburgh; and relating to the Triple Qualification and to the Dental Qualification to be addressed to Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

Queen Margaret College (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curricula, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. The school of medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. The women students attend classes in the various University Buildings at Gilmorehill and Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine, and women are admitted to certain University bursaries and fellowships.

St. Mungo's College and Glasgow Royal Infirmary.—*The classes in St. Mungo's College* qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College.

Further particulars can be obtained from the Secretary of the Medical Faculty.

Royal Hospital for Sick Children, St. Vincent-street, Glasgow.—This institution consists of: (1) a hospital at Yorkhill containing 275 cots, built on an elevated and central site close to the University, and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a country branch at Drumchapel, Dumbartonshire, containing 80 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from infectious diseases. In 1928 there were 6402 patients treated in the wards, and the number of attendances of out-patients was 90,585. There are one professorship and four lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, one lectureship on Surgery and Orthopædics in Relation to Infancy and Childhood, one lectureship on Biochemistry in Relation to Infancy and Childhood, and one research lectureship on the Pathology of the Diseases of Infancy and Childhood. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition, special facilities are given for post-graduate study.

Full information may be obtained from the Medical Superintendent.

The Glasgow Royal Maternity and Women's Hospital, Rottenrow.—The average daily number of patients in the hospital is 140, and of the 4000 cases admitted to the wards per annum, over 60 per cent. are classified as abnormal. There are also about 3500 mothers attended per annum in their own homes. The work of the antenatal wards with their 40 beds is supplemented by large antenatal clinics where over 4000 new patients are seen in the course of the year. Splendidly equipped Research Laboratories were opened in 1926. The Visiting Staff of the hospital includes a Pædiatrician, who gives daily attendance. The practice of the hospital affords a wonderful field for post-graduate study and experience. In addition to the joint courses for post-graduates as organised by the Glasgow Post-Graduate Association, the resources of the hospital are always available for those who wish to make a special study of obstetrics. Inquiries should be addressed to the House Superintendent.

Royal Samaritan Hospital for Women, Glasgow. Increased to 160 beds by building extensions completed in 1927. It offers excellent facilities for clinical instruction in the diseases peculiar to women. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coördinating post-graduate medical teaching in all the hospitals. The Royal Samaritan Lectureship in Gynæcology is a University Lectureship associated with the hospital.

For further information, application may be made at the hospital, or to the Secretary, 200, St. Vincent-street, Glasgow.

Glasgow Lock Hospital, 41, Rottenrow, Glasgow. Contains 80 beds for the treatment of females suffering from Venereal Diseases. There is also a Labour Ward, and a well-equipped Dispensary for out-patient attendances. There is a Lecture Room and a Laboratory, equipped with modern appliances, where University classes on the subject are dealt with. Post-graduate classes are also held. Recently the hospital has been completely renovated and modernised. Full information from the Secretary and Treasurer, Mr. J. Neilson Gray, LL.B., 65, Bath-street, Glasgow.

Glasgow Ophthalmic Institution, 126, West Regent-street, and 131, Wellington-street (30 beds and six cots).—This institution is administered by the Royal Infirmary. Clinical and systematic courses of lectures for students during the winter and summer sessions. Operations on Wednesdays, Thursdays, and Fridays. Post-graduate classes and demonstrations are arranged during the summer. For information regarding fees and other particulars, application should be made to the Superintendent, Royal Infirmary.

Glasgow Eye Infirmary, Berkeley-street and Charlotte-street.—The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine, and by the Royal Colleges of Physicians and Surgeons of England for the Diploma in Ophthalmic Medicine and Surgery. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Post-graduate Classes are held. Secretary and Acting Treasurer, Mr. William M. Moore, 171, West Regent-street, Glasgow.

GLASGOW EAR, NOSE, AND THROAT HOSPITAL, 306, St. Vincent-street (52 beds).—At out-patient and indoor departments clinical instruction is given. A Research Department has now been installed. Post-graduate Courses are held during the year. Secretary: D. N. Mackay, 144, St. Vincent-street, Glasgow.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., *M.B.*, *Ch.B.*, *M.D.*, *Ch.M.*, a Diploma in Public Health, and Diploma in Dental Surgery (*L.D.S.*).

The extent and standard of the Preliminary Examination is determined by the Scottish Universities Entrance Board constituted under Ordinance No. 70 of the Scottish University Courts (General No. 3—Regulations as to Admission to the Scottish Universities for purposes of graduation), in accordance with the terms of that Ordinance. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities exempts. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz., Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Bacteriology, Practical Chemistry, Physics, Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere with not fewer than 80 patients, with a distinct staff of physicians and surgeons, and recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology, Venereal Diseases, Tuberculosis, and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica, Pathology and Bacteriology, Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

UNIVERSITY COLLEGE, DUNDEE.—The Medical School in St. Andrews University is carried on as follows. Part or whole of the medical curriculum of St. Andrews University must be taken here. Provision is made by St. Andrews University for instruction in the work of the first two years, including Anatomy and Physiology, in both St. Andrews and Dundee. The last three years of the curriculum must be taken in Dundee in University College, which is a constituent part of St. Andrews University.

ROYAL INFIRMARY, *Dundee (461 beds).—In addition* to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose, and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electrotherapeusis, and Electrocardiography. An extension providing for a new X Ray Department and Massage Department and for additional Operation Theatre accommodation has been opened recently, a new Maternity Department is being built at a cost of £32,000, and a new Dispensary at a cost of £25,000. Clinical teaching is given to male and female students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Universities and Boards of the United Kingdom. Ten Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., *M.D.*, *Ch.M.*, *M.B.*, and *Ch.B.* The Degree of Doctor of Philosophy (*Ph.D.*) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Candidates, before entering on the curriculum, must have passed the Preliminary Examination or hold a qualification recognised as exempting from such examination, have attained the age of 17, and have passed the Pre-registration Examination in Physics and Chemistry.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital, they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, Radiology, X Ray, Therapeutics and Electrical Treatment, and Clinical Chemistry, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis (in duplicate) has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis (in duplicate) must be presented for approval.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £45 per annum in value, most of them being tenable for three years. Scholarships: five Post-graduate Scholarships, value £36 to £100 per annum. Prizes and Medals: 15 Gold Medals and Prizes for proficiency in special departments.

ABERDEEN ROYAL INFIRMARY (800 beds).—The main clinical work of the students is done in the infirmary with its general and special facilities, including a Department of Clinical Chemistry.

ABERDEEN ROYAL MENTAL HOSPITAL.—This hospital contains about 900 beds. The class of Mental Diseases meets at the University of Aberdeen, and clinical instruction is given at the hospital during three months in summer. Physician-Superintendent, Dr. R. Dods Brown.

OTHER HOSPITALS.—Students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, Lying-in and Vaccine Institutions, and Ophthalmic Institution.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three bodies. This is the Scottish Conjoint Board.

The three bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities, as well as all the places which are recognised by the English and Irish Conjoint Boards.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, 2 terms; Elementary Organic Chemistry, one term; Anatomy, Practical Anatomy, 5 terms; Theoretical, including Biochemistry and Biophysics, 5 terms; Physiology, Materia Medica, 2 terms; Pathology (including Practical Pathology), 3 terms; Practice of Medicine, 2 terms; Clinical Medicine, 3 terms; Principles and Practice of Surgery, 2 terms; Clinical Surgery, 3 terms; Midwifery and Gynæcology, 2 terms; Diseases of Children one term; Medical Jurisprudence, one term; and Public Health, one term. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months' instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction, and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than nine months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for three months the practice of a public dispensary especially recognised by any of the above authorities, and three months' attendance at the out-patient department of a recognised general hospital. This attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: *Diseases and Injuries of the Eye*, three months; Insanity, three months; Infectious Diseases, three months; Gynæcology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Systematic and Practical Biology.

The *Second Examination* must be Written, Practical, and Oral, and consist of the following subjects:—(1) Anatomy and Embryology, and (2) Physiology, including Histology (if not included in Anatomy), Biochemistry, and Biophysics. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Third Examination* must be Written, Practical and Oral, and consist of the following subjects:—(1) Pathology, including Bacteriology and Morbid Anatomy, and (2) Pharmacology (Theoretical and Practical), including Pharmacological Chemistry, the Principles of Therapeutics, the methods of Treatment by Vaccines and Sera, and Prescription Writing. Candidates may be admitted to this Examination on production of the necessary certificates of curriculum.

The *Final Examination* must consist of the following subjects[1]:—(1) Medicine, including Therapeutics, Applied Anatomy and Physiology, and Clinical Pathology with Practical Medicine; (2) Surgery, including Applied Anatomy and Physiology, Clinical Pathology, with Practical Surgery; (3) Midwifery and Diseases of Women, Clinical Obstetrics and Gynæcology, with Practical Midwifery; and (4) Medical Jurisprudence and Public Health. Medicine, Surgery, and Midwifery must be taken together, and Medical Jurisprudence and Public Health, and not earlier than on the conclusion of five Winters and five Summers of Medical Study, provided that a period of 30 months has elapsed since passing the Second Professional Examination. The Schedule for the

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[1] Candidates at the Final Examination may be examined on Diseases of Children, Fevers, Tuberculosis, Insanity, Skin Diseases, *Diseases and Injuries of the Eye, Diseases of the Ear, Throat, and Nose*, Radiology, Venereal Diseases, Orthopædics, Vaccination, and Anæsthetics.

Final Examination must contain a summary of the entire Course of Study, and, properly attested or proved by Certificates, must be lodged with the Inspector, and the fee paid, *not later than one week before the examination.* At the same time there must be produced a Certificate to show that the Candidate is not less than 21 years of age. No Candidate can be exempted from examination on any subject of the *Final Examination* (with the exception of Medical Jurisprudence and Public Health) unless he has already passed in the subject at this Board.

In addition to the Written and Oral Examinations, all Candidates must be subjected to Clinical Examinations in Medicine, Surgery, and Midwifery and Gynæcology, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope and of other instruments, Clinical Chemistry, Surgical Appliances, Bandaging, Surface markings, Skiagrams, &c. The Oral Examination include the recognition of specimens. All Candidates for the Final Examination must complete the three portions (Medicine, Surgery, and Midwifery) within a period of 19 months.

There are four periods of examination annually.

The Registrar in Edinburgh is Dr. David Thomson, 49, George-square; and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom particulars of fees can be obtained.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES, Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that about 1000 students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards. Special courses of instruction for dental students are also included in the curriculum of this school. The practical classes and laboratories will open and the lectures commence on Oct. 1st. In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school. Post-graduate Courses are conducted in conjunction with the University. Further particulars regarding the school, also its calendar (price 6*d.*) may be had on application to the Dean of the School, Surgeons Hall, Edinburgh.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship.*

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or [illegible]ical jurisprudence.

F[illegible] the Fellows are elected from the

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The Royal College of Surgeons of Edinburgh admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The College grants a diploma of Fellowship after examination to the holders of British surgical degrees or diplomas and the holders of recognised degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire.

The Fellowship.—Candidates must be 25 years of age and in practice for at least two years. The examination is written and viva voce, and includes surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. Candidates are not allowed to appear for more than three times at the examinations. One month's notice of intention to appear for examination must be given by the candidate to the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held separately. The Licence is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate to the Faculty. In certain circumstances Fellows may be elected as a mark of distinction.

III.—IRELAND.

THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March, and in July. Courses in preparation for it may be taken in the School of Physic.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Botany, Zoology, Physics and Chemistry; Descriptive and Applied Anatomy; Histology, Physiology and Applied Physiology; Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Practice of Medicine; Surgery; Midwifery and Gynæcology. (2) Three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry; and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Hygiene and Jurisprudence, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year, and Part II. completed at the end of the fifth.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also submit a thesis and pass an Examination before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing, and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. The minimum time required for the complete course is nine months.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Scholarships and Prizes.—1. Medical and Surgical Travelling Prizes, £100, awarded in alternate years. 2. Bicentenary Memorial Prize, £30, awarded yearly, and given to the Travelling Prizeman. 3. Sir John Banks Prize and Medal. 4. Edward Hallaran Bennett Prize and Medal. 5. FitzPatrick Scholarship, awarded on results of Final Examination (interest on £1000). 6. Medical Scholarship, £20 per annum for two years, awarded in Chemistry, Physics, Botany, and Zoology. 7. Medical Scholarship in Anatomy and Physiology, £20 per annum for two years. 8. Henry Hutchinson Stewart Scholarships, one in Botany, Zoology, Chemistry and Physics, and another in Anatomy and Physiology, awarded annually and valued at £10 per annum for three years. 9. Henry Hutchinson Stewart Scholarship in Mental Diseases, awarded from time to time, £50 per annum for three years. 10. John Mallet Purser Medal, awarded annually in Physiology. 11. Daniel John Cunningham Medal and Prize, awarded annually in Anatomy. 12. Begley Studentship, £40 per annum for four years, awarded annually. 13. Kingsmill Jones Memorial Prize, awarded annually in Natural and Experimental Science, £15. 14. O'Sullivan Memorial Scholarship, £48 awarded annually for excellency of record in school.

Post-graduate Instruction.—Arrangements have been made, with the approval of the Board of Trinity College, for a post-graduate course of instruction at the School of Physic during the autumn from Monday, Sept. 16th, to Saturday, Oct. 5th. A limited number of members of the class can reside in college rooms and dine on commons. Women graduates can be accommodated at Trinity Hall.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.[1]

SIR PATRICK DUN'S HOSPITAL, Grand Canal-street, Dublin.—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Six Resident Pupils are appointed every six months. Twelve surgical Dressers and twelve Clinical Clerks are appointed each month. There are facilities for women students.

The practice of the hospital is open to all students, and the certificates are recognised by Dublin University, the National University and Royal Colleges of Surgeons of England, Ireland, and Scotland. It is an official "Treatment Centre" for venereal diseases.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

Further information will be supplied by the Hon. Secretary to the Medical Board.

ADELAIDE HOSPITAL, Peter-street, Dublin.—Two resident surgeons are elected half-yearly and four or more resident pupils every six months. At the termination of the session prizes in Clinical Medicine, in Surgery, in Gynæcology, and in Dermatology will be awarded.

Prizes.—Wallace Beatty Memorial bursaries are awarded at the commencement of the winter session. In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10 together with a silver medal, are awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from the Secretary of the Hospital.

MATER MISERICORDIÆ HOSPITAL, Dublin. (Under the care of the Sisters of Mercy.)—This Hospital, containing 410 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery is taught in the Special Wards and in the Dispensary. Surgical operations are performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents; a fully-equipped Biochemical Laboratory, a modern Electro-Massage Department, and Electrocardiograph room. Instruction is given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 18 resident pupils are elected annually. Dressers and Clinical Clerks are appointed regularly and certificates given for merit. Leonard Prizes will be offered for competition annually. Certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases. A Training School and a Home for Trained Nurses are connected with the Hospital, and Nurses who have passed a qualifying examination can be obtained on application to the Lady Superior.

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[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

Entries can be made with any of the physicians or surgeons, or with the Registrar, 31, Fitzwilliam-square. Detailed information may be obtained from the Secretary, Medical Board.

MERCER'S HOSPITAL.—This hospital contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the resident posts. There is a large dispensary for out-patients and a modern X ray department. An electrocardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. A gold medal is awarded annually to the best student. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements. A House Surgeon is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from members of the classes.

For further particulars apply to Dr. Leonard Abrahamson, Hon. Sec., Medical Board, 40, Fitzwilliam-place.

RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS (HOUSE OF INDUSTRY HOSPITALS), DUBLIN.—These hospitals contain 330 beds—130 for Surgical Cases, 80 for Medical Cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing with 42 beds, devoted mainly to throat, nose and ear and skin diseases. Two Resident Physicians and two Resident Surgeons are appointed each half year, in addition to a Resident Pathologist and a Resident Anæsthetist. Resident Clinical Clerks are appointed each quarter, and it has always been the aim of the Medical Board to ensure that each student spends at least six months in residence. Women students are eligible on the same terms as men. Ample facilities exist for post-graduate work in the various special departments, as well as in general medicine and surgery. Extensive alterations and improvements have recently been made in the X ray, Electrotherapeutic, and Electrocardiographic departments. For further information apply to Hon. Sec., Medical Board.

ROYAL CITY OF DUBLIN HOSPITAL.—158 beds and a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. There is a large nursery where special opportunities are afforded for the study of diseases of children, both medical and surgical. There are also special wards for ophthalmic, aural, and gynæcological cases; also a department for the Erlangen Treatment by Deep Therapy. There is a largely attended out-patient department, where students are allowed to attend accidents and dress cases under supervision. Six resident pupils are appointed every three months. A House Surgeon and a House Physician are appointed annually. For information apply to the Secretary.

DR. STEEVENS' HOSPITAL, Dublin (Kingsbridge).—250 beds, only 150 now in use. There is accommodation for 10 resident pupils, each of whom is provided with a separate bedroom, and board is supplied by the hospital at a reasonable rate. There is an Electric Massage Department, a "Sun-Ray" and Diathermy Department, and an X Ray Department. There are also two V.D. wards and a largely attended V.D. Treatment Centre. All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY.*

JERVIS-STREET HOSPITAL, Dublin.*

ROTUNDA HOSPITAL, Dublin.—This institution is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually and upwards of 1000 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year, and consists of daily clinical instruction in the maternity department and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. An antenatal dispensary is held three times weekly and all students are encouraged to attend. A special class in gynæcological examination and diagnosis is conducted by the Assistants to the Master. In addition there is a special class in operative obstetrics, limited in number. The pathological laboratory is under the supervision of a skilled pathologist, who gives special classes at intervals. There is a fully equipped X ray installation under the care of a competent radiologist. A ward has been opened for the treatment of infantile conditions, and is under the care of a pædiatrician, who gives instruction in the out-patient department, which is held daily. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M. and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The mess room and sleeping quarters have been decorated recently and reading rooms are provided. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6*s.*, months other than the first £4 4*s.*, three months £12 12*s.*, six months £21. Special gynæcological class £2 2*s.* per month. For further particulars apply to the Master, Dr. Bethel Solomons, F.R.C.P.I.

COOMBE LYING-IN HOSPITAL AND GUINNESS DISPENSARY FOR THE TREATMENT OF DISEASES PECULIAR TO WOMEN, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils, who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Women students can reside in the hospital. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

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* No returns.

NATIONAL MATERNITY HOSPITAL, Holles-street, Dublin.—Established 1894. The hospital consists of Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children and an antenatal and postnatal branch. Every facility is given for the carrying out of practical work. Undergraduate and post-graduate courses are arranged at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Clinical lectures are given daily and Oral lectures four times per week. The L.M. Diploma is given by special examination, which is held three times a year. Further particulars can be obtained from P. T. McArdle, Esq., M.B., the Master, or from the Secretary, Holles-street, Dublin.

ST. VINCENT'S HOSPITAL AND DISPENSARY, Dublin. —Established 1834. 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Ferrall gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the McArdle Memorial Prize, value £20. There are a large Extern Department and a new Pathological Laboratory. Hon. Secretary Medical Board, Wm. Doolin, M.B., F.R.C.S., 2, Fitzwilliam-square, Dublin.

NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students must pass a matriculation examination; the examination taking place in June and September in Dublin, and at certain local centres, includes five subjects, three of which must be Irish, English, and mathematics. All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—(1) Irish. (2) Latin. (3) Greek. (4) French. (5) German. (6) Italian. (7) Spanish. (8) Portuguese. (9) Welsh, *or any other modern language approved by* the Senate. (10) English. (11) Mathematics. (12) History. (13) Geography. (14) Applied Mathematics, or (15) Physics as an alternative. (16) Chemistry. (17) Botany. (18) Agricultural Science. (19) Commerce. (20) Music, and for women candidates only (21) Physiology and Hygiene. Students entering for degrees in Medicine or Dentistry, if not already registered by the General Medical Council, must take Irish, Latin, English, Mathematics, and a fifth subject.

The medical degrees granted are:—

M.B., B.Ch., B.A.O.; M.D., M.Ch., M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—*Matriculation.*—Almost all the students of the College are matriculated students of the National University of Ireland. The pre-registration examination in physics and chemistry is taken after matriculation either at the beginning of or during the winter session. The course is of five years' duration and dates from the passing of the pre-registration examination.

Degrees of M.B., B.Ch., and B.A.O.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination (Part I.) includes Pathology, Materia Medica, Pharmacology, and Therapeutics. Part II. (Third Examination), taken at the end of the Fourth Winter Session, includes Hygiene and Medical Jurisprudence.

The Final Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year after registration, when the curriculum has been completed. The degree of M.D. may be obtained either by examination or on published work.

A Post-graduate Summer Course is held each year, beginning about the middle of June. The D.P.H. Course extends over the year, beginning at the opening of the session.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—Students must have passed the Matriculation Examination of the University or some other recognised examination, and a preliminary examination recognised by the General Medical Council.

Medical Students who have passed the First Professional Examination of the Conjoint Boards of Ireland, England, or Scotland may be admitted to the rank of second-year students on making application to the Council. Similarly, students who have passed the Second Professional Examination of the same Boards may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may rank as fourth-year.

The school is provided with physiological, toxicological, pathological, and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are dissecting-rooms, well-appointed physical, chemical, and biological laboratories, a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs.

Residence of Students.—Students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, and register their addresses each session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Charitable Infirmary and County of Cork General Hospital, Cork North Charitable Infirmary and City of Cork General Hospital, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, Bon Secours, Fever, the District, and Ear, Eye, and Throat Hospitals.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, and in respect of the hospitals from the Secretaries.

UNIVERSITY COLLEGE, GALWAY: SCHOOL OF MEDICINE.—The College contains a well-lighted and ventilated dissecting-room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, varying in value from £30 to £60 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value from £30 to £40 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Tuberculosis Hospital and in the Galway Central and Fever Hospitals, containing on an average 350 patients.

CENTRAL HOSPITAL, GALWAY (300 beds).—In this completely renovated hospital, in addition to the Finer Surgical and Medical Departments, there are now Eye and Ear, Throat and Nose, Gynæcological and Obstetrical, Pathological, X Ray, Ultra-Violet Rays, and Electrical and Massage Departments. Students attend from University College, Galway. Medical and Surgical Clinics are held on alternate days during term. One Resident Physician and one Resident Surgeon are appointed every six months. Resident Students are admitted. The hospital is open to qualified medical men for post-graduate work.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission shall matriculate or fulfil such other test of fitness as may be prescribed by the Senate, or may be exempted from the matriculation examination by having passed similar examinations elsewhere. For information as to Scholarships and Prizes, inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has passed in the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The J. C. White laboratories, recently founded, are fully equipped for research in biochemistry and bacteriology. The Musgrave Pathological Laboratory.—In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the Corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, and the diagnosis of cases of infectious diseases. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum. Complete information can be obtained from the respective Secretaries.

ROYAL VICTORIA HOSPITAL, Belfast, 436 beds.—Students eligible for McGrath, McQuitty, Malcolm, Coulter Smyth and Elwood Scholarships aggregate annual value £185. Twelve House Surgeons and House Physicians. Thirty-six resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students, Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electrocardiography, *Dentistry*, *Radium Therapy*.

MATER INFIRMORUM HOSPITAL, Belfast.—This hospital contains 270 beds and is open at all hours for the reception of accidents and urgent cases. Clinical instruction is given daily by Physicians and Surgeons. Surgical operations are performed daily. The out-patient departments in Medicine and Surgery, also the special dispensaries for Gynæcology, Ear, Eye and Throat, Electrotherapeutics, Venereal Diseases are very largely attended and afford valuable opportunities to students for the study of those subjects. A House Physician and two House Surgeons are elected every six months. Resident pupils are admitted as the vacancies arise. Three Exhibitions and a Gold Medal are competed for annually in June. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom.

BELFAST INFIRMARY AND HOSPITAL (1600 beds).—Clinical courses are given quarterly, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application to the Hon. Sec. Visiting Medical Staff. Certificate of vaccination class recognised by Local Government Board. There is a department for Cancer with 32 beds, and X Ray and Bacteriological Departments.

THE BELFAST HOSPITAL FOR SICK CHILDREN, Queen-street (45 beds).—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards and in the Out-patient Department for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. Certificates are also granted for post-graduate study. A Gold Medal is offered for competition at the close of the session.

MATERNITY HOSPITAL, Townsend-street, Belfast.—Twenty-five beds in constant occupation, and exclusively *devoted to Midwifery and Antenatal conditions.* There is also a large district. The Queen's University of Belfast have erected a Students' Hostel in connexion with the Hospital where six Students and Post-graduates are received each month. The University Tutor in Obstetrics resides in the Hostel and Students conduct their cases under his supervision. There is a large Antenatal Department and a Department for Venereal Diseases. Communications should be made to the Hon. Secretary of the Medical Staff.

ULSTER HOSPITAL FOR CHILDREN AND WOMEN, Templemore-avenue, Belfast (58 beds).—Clinical instruction to students in Diseases of Children, Gynæcology and Obstetrics. Special departments: Radiology and Actinotherapy, Eye, Ear, and Throat, V.D. Clinic and Antenatal Clinic. Gold Medal awarded annually. Two House Surgeons appointed from students of hospital.

BENN ULSTER EYE, EAR AND THROAT HOSPITAL, Clifton-street (30 beds), and BELFAST OPHTHALMIC HOSPITAL, Great Victoria-street (30 beds).—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

BELFAST FEVER HOSPITALS.—City Fever Hospital, Purdysburn (300 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-graduate (D.P.H.) Classes are also held. Dr. A. Gardner Robb, Lecturer and Medical Superintendent.

BELFAST MENTAL HOSPITAL (PURDYSBURN VILLA COLONY) (1300 beds). University Lectures and Clinics.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Irish Conjoint Board requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to *any of them* the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (*a*) Anatomy, and (*b*) Physiology and Histology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, *and may be taken separately.*

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Children, and the Practice of Vaccination.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Further information can be obtained from the Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The College issues its Licence in Surgery to practitioners whose names are entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Irish Conjoint Board.

Candidates are examined in General Surgery (paper and oral), Clinical Surgery, Surgical Pathology (oral), Operative Surgery, Surgical Anatomy (paper), and Ophthalmic and Aural Surgery (clinical).

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND (SCHOOLS OF SURGERY).—The schools of surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes; Carmichael Scholarship, £15; Mayne Scholarship, £8: *Stoney Memorial gold medal*; *Operative Surgery*, gold and silver medals; Piercfoy Memorial Prize, value £150; Barker Prize, £26 5*s.*; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Hall entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence.

Candidates must pass two Professional Examinations, called the Primary Examination and the Final Examination, which are conducted at separate times, partly in writing, and partly practically and orally. The Primary and Final Professional Examinations are held twice a year—viz., in June and November, or such other dates as may be determined.

Candidates who produce satisfactory evidence of having passed an examination for a Degree or Licence in Medicine, conducted by any University or Royal College in the British Empire, or by any Foreign University whose Degrees are recognised in the Foreign List of the Medical Register, will be exempted from the Primary Examination.

The subjects for Part I. of the Primary Examination are: Anatomy, Physiology and Histology, including Bio-Chemistry; and for Part II., Materia Medica and Pharmacy, Pathology, and Medical Jurisprudence and Hygiene.

For the Final Examination the subjects are: (*a*) Medicine and Clinical Medicine and Clinical Methods. (*b*) Surgery—Clinical, Ophthalmic and Operative; and Surgical Anatomy. (*c*) Midwifery and Gynæcology, and Practical Pharmacy and Materia Medica (if not taken at Intermediate Examination).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied by the Registrar at 95, Merrion-square, Dublin.

WE take this opportunity of thanking the officials of Government Departments and the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

THE LANCET.

NDON: SATURDAY, AUGUST 31, 1929.

HYSIOLOGY AND THE MEDICAL CURRICULUM.

an issue devoted to considering the training of who are entering the medical profession, while ain information will bear relation to the curri- which they have to follow, some reflections the general circumstances of the medical career ertinent. During the year that has passed the last issue of the Students' Number alling of medicine has been in no way aly altered either in relation to the train- f students or in relation to their future sional prospects. The medical curriculum been unaltered since its inter-arrangement year following the resolution of the General al Council passed some seven years ago; the rowded schedules of study have been somewhat by the introduction of order, while the spirit by the licensing bodies when various details under discussion is of good omen for future es. And changes there must be both in the mic and the practical equipment of doctors in athy with the growth of professional knowledge, with the increasing intimacy between medicine rticular and science in general. The professional rtunities remain as good and as numerous as ofor, but the difficulties of the medical career t be said to have abated in any marked way. it is gratifying to be able to say that the rtunities, because of their vast implications, eigh the disadvantages. It is with the full ledge that the life of the doctor is a finer career over, because of the far-reaching and well-orted promises of good which the development of cine are giving, that we welcome into our ranks ecruits who will take their places next October o schools.

e anticipation that the studies preliminary to dical course, as well as those directly connected that course may always need variation is justified he proceedings before the Section of Physiology Biochemistry of the British Medical Association h we publish in another column. Prof. F. R. SER, in opening a discussion on the place which an physiology should occupy in the training of cal students, spoke exactly words which ought to ppreciated alike by the medical profession and the ic that it serves, and indicated an aspect of ical teaching whose importance will be seen readily. pointed out that human physiology must largely ern itself with the interaction of systems, and that ledge of it means comprehension of human stments to environment, the great responsibility edicine being to ascertain the causes of mal- stments, in order to remove or mitigate results. This view of the study of physiology introduces the question of how much should be taught to the medical student and at what place in his curriculum. All will agree that human physiology should be taught to the students before admission to the wards, but how much of what may be termed the science of living is it possible to impart while formal instruction is still being given in the processes of, say, the respiration and the circulation? The more the student has a chance of enlarging his knowledge of normal man before being introduced to the abnormalities of injury and disease, the easier will it be for him to appreciate human adjustments, and therefore to follow with intelligence the teaching of the clinicians who are his preceptors in the wards. Says Sir GEORGE NEWMAN, in his Annual Report for the Year 1928, as Chief Medical Officer of the Ministry of Health, which has just appeared (see p. 480): "There must be a standard in our minds, and that standard should not be one of disease or pestilence, but of health and physiology. It is true there is no fixed line of health for a nation any more than for an individual. But we must formulate an average, a norm, as best we may, establishing it on physiological facts. . . . Out of our rapidly extending knowledge of physiology and anthropometry we must build up a normal conception of body size, weight, and height, body temperature, the pulse-rate, blood pressure, the respiration-rate, lung capacity and chest expansion, muscle output, nerve efficiency, sense faculty, and mental tests. We must aim to bring the race, by means of the individual, steadily towards this standard." In these words we have a fine confirmation of Dr. FRASER'S thesis, and, further, an eloquent plea for an altered attitude towards the training of medical students in human physiology. And evidence in the same direction is contained in the pithy notes of Dr. G. F. WALKER, of Leeds, who writes in another column (see p. 481) out of his experience as medical tutor at the University. That changes in the indicated direction have already been made quietly and with success in certain schools shows that we have here no drastic measure of reform to clamour for, but only such an inter-arrangement of work as has already taken place along many other lines.

And the influence of such a modified curriculum should have wide-reaching effect. Human physiology is to-day becoming a study of real public interest, while in State, private, and public schools alike it is now felt that a knowledge of the fundamentals of biology should be in the possession of all. It is easy to see that with a public thus growing up to familiarity with normal standards, the doctor will find it far easier to obtain a comprehension of his efforts, of his difficulties, and, perhaps, of his successes when dealing with the variations of and divagations from the normal which constitute disease. But it is necessary, for his counsel to have prompt appeal, that he himself should understand the normal circumstances from which a default has occurred. Undoubtedly the plea made in the Section of Physiology and Biochemistry that more attention should be paid to the normal in the earlier stages of medical education is a forcible one. When this happens and when at the same time the public, in accordance with a routine upbringing, acquire also a knowledge of normal biology, a great deal of unnecessary dissension between the medical profession and the public will be abated, a quickening of public interest in the organisation of our calling will follow, and we shall witness more prompt manifestations of willingness on the part of the public authorities to use medical service intelligently.

The Medical Services.

ROYAL NAVAL MEDICAL SERVICE.

CHOOSING A CAREER.

THERE always have been, there are now, and there always will be a certain number of young medical men to whom life in the Royal Navy appeals more than does any other life of a medical man. The type referred to is the man who may have been brought up in Naval surroundings, he may have Naval relations, or he may just love the sea. To a man of this temperament a career as a Medical Officer in the Royal Navy offers very definite attractions. In these days his professional knowledge will most certainly not rust anywhere; but especially in the Naval Hospitals will he have opportunities of practising every branch of his profession, except, of course, diseases of women. He can obtain one of the 60 paid specialist appointments. These include medicine, surgery, diseases of the eyes, diseases of nose, ear and throat, radiology, anæthetics, genito-urinary and venereal diseases, physical training, bacteriology, pathology, and hygiene. He will be encouraged to work hard and play hard. He will see the world under ideal conditions, because wherever he goes he will be a welcome guest, as is always the case with those who are privileged to wear the King's uniform.

In any walk in life success and happiness depend primarily on two main conditions. You must like your fellow men and they must like you.

The right type of man for a Naval Medical Officer is a good doctor, keen on his work and keen on his play, unselfish and a gentleman.

If the doctor is of this type he is invariably everybody's friend. The Naval Officer and the blue-jacket are quick to recognise a Medical Officer who is keen on his work, thoughtful of his patients, and one who strives after improving the health of the Navy. Such a Medical Officer finds life agreeable as everyone is ready to befriend him, and nowhere can one find more delightful friends than in the Navy.

To help men to take higher qualifications opportunities are given, when the exigencies of the Service will permit, for medical officers to take post-graduate courses prior to sitting for these higher examinations. A large number of Naval Medical Officers since joining the Navy have taken qualifications such as M.D., F.R.C.S., M.R.C.P., D.P.H., D.T.M., and D.O.M.S., &c. It is recognised that this is good for the Navy and good for the officer himself.

Work of the Naval Medical Service.

In our large Naval Hospitals the medical, surgical, and specialist work is of a very high standard. The work is very exacting, and it is the aim of the Admiralty to arrange appointments a far as possible so that medical officers have an opportunity of alternating their work, not only at home and abroad, but also ashore and afloat.

To give Naval Surgeons opportunities for professional work has always been a very definite policy of the Admiralty, and within the last year or so this matter has received still further attention.

The General and Specialist Courses have been increased so that, as far as possible, every officer shall have a course of instruction of not less than four months' duration every four years. The number of specialists allowed is now 60 instead of 46 and the specialist allowance is 5s. a day instead of half-a-crown a day. The establishment of Surgeon-Captains has been increased from 16 to 20.

The total number of Medical Officers in the Navy is about 400, and every recent improvement has been made towards giving increased opportunities of advancement and accelerated promotion to the best men.

The advantages of a career with its period of strenuous clinical work, followed by a period of comparative leisure which can be devoted to study, &c., are laid stress on in the Presidential Address of the War Section of the Royal Society of Medicine delivered on Oct. 10th, 1927.

The work and professional opportunities of the Service Medical Officer are described, but the address is necessarily brief, and it is only by reading between the lines that one can really visualise the field for work which lies before the keen Naval Doctor.

Not only has he this purely medical work to interest him. He has opportunities to emulate some of the great Naval Surgeons of the past such as Darwin, Huxley, and many others, who have contributed so much to science.

Play in the Navy.

Recreation is a vital part of the Navy, and there is no branch of athletics or field sports in which the Naval Officer does not have an opportunity of trying his hand. Not only is the champion encouraged but also the less proficient.

In every home port and on most foreign stations there are opportunities for football, cricket, tennis, golf, rowing, sailing, swimming, and all other sports. On some foreign stations the Naval Officer can get shooting and riding in plenty; and so cheap that he can indulge in them on his pay alone. In civil life at home only a rich man could get such magnificent shooting as the Naval Officer does is some parts of the world.

Pay.

The cost of living in the Navy is cheap, and an officer can live on his pay and enjoy life if he is not extravagant, especially if he does not embark in matrimony too early. A small amount of private means goes much further in the Navy than in civil life. The three vital points—pay, prospects, and promotion—of the naval medical officer can be grasped by referring to the following clear and brief table.

FULL PAY.

		£	£	
SURGEON LIEUTENANT (short service and permanent service)	from	452 to	499	per annum
SURGEON LIEUTENANT - COMMANDER (promoted after six years' service)..	"	600 to	636	"
SURGEON COMMANDER (promoted after a further six years' service)..	"	772 to	976	"
SURGEON CAPTAIN (promoted by selection)	"	1110 to	1372	"
SURGEON REAR-ADMIRAL (promoted by selection)		1800		
MEDICAL DIRECTOR-GENERAL (Surgeon Vice-Admiral) ..		2350		

Allowances.

An outfit allowance of £50 towards cost of uniform is given.

Allowances when in charge of hospitals and sick-quarters ..	10s. and 5s. per diem.
Sixty Specialist allowances of ..	5s. per diem.
Allowances to Senior Medical Officers in flag ships ..	5s. and 2s. 6d. per diem.

Accelerated promotion can be gained under certain conditions; provision allowance and lodging allowance are paid when victualling and accommodation are not provided. Servants allowance is also payable in certain appointments.

The extra allowances alluded to in this table are not to be looked upon as very exceptional. About a quarter of the Medical Officers of the Navy are drawing extra allowances.

Pension.

Finally as regards pensions, is there any man in practice, panel or otherwise, who can say to himself with certainty, "I shall retire at the age of 50 with a life-long pension of £564 per annum for myself, and a pension for my wife should she survive me"? Obviously there are very few. Remember, too, that at the age of 50 a medical man is still young and full of work, and after some of the various specialist appointments he may have held in the Navy, he will be able to hold his own with his confrères on shore and start anew in any of the big centres of the country. His assured income helps him to carry on until his practice is established.

PENSION.

	Maximum retired pay.
SURGEON VICE-ADMIRAL ..	£1123 per annum, on vacating office.
SURGEON REAR-ADMIRAL ..	£950 per annum, at age of 60.
SURGEON CAPTAIN	£846 " " 55.
SURGEON COMMANDER	£564 " " 50.
SURGEON LIEUTENANT-COMMANDER AND SURGEON LIEUTENANT	£423 " " 45.

Officers permitted to withdraw receive gratuities on the following scale:—

	£
After 4 years' full pay permanent service ..	500
" 8 " " " " ..	1000
" 12 " " " " ..	1500
" 18 " " " " ..	2250

Of recent years Medical Officers have been admitted into the Navy without entrance examination, and for short service, with the option of turning over to the permanent service, but it is anticipated that it will not be long before the Admiralty will revert to the old established system of entrance by competitive examination twice a year, in batches of about ten officers.

The Medical Director-General of the Navy, Queen Anne's Chambers, Tothill-street, London, S.W.1. would be glad to receive inquiries from prospective candidates.

DENTAL BRANCH.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of the recently instituted Surgeon Captain (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Candidates are required to produce certificates of birth, registration, and of character, and must be physically fit for active service anywhere. An outfit allowance of £50 is payable to officers finally entered and commissioned. The rank of Surgeon Lieutenant-Commander (D) is attained on the completion of six years' satisfactory service. Promotions to Surgeon Commander (D) and Surgeon Captain (D) are made strictly by selection from the rank next below and are confined to officers who prove fitted in every respect for these ranks. The present establishment of dental officers is: 1 Surgeon Captain (D), 3 Surgeon Commanders (D), 60 Surgeon Lieutenant-Commanders (D) and Surgeon Lieutenants (D).

Provision has been made for candidates who, at the time of passing the examination, hold or are about to hold an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list. Surgeon Lieutenant-Commanders (D) of over two years' seniority will be eligible for a three months' Post-graduate Course while borne on full pay.

On the completion of two years' service in the rank of Surgeon Lieutenant-Commander (D), dental officers on the Active List are eligible for a three months' post-graduate course at a dental hospital and school at the public expense, and will draw full pay while attending the course.

Pay.—The current rates of full pay for Dental Officers are as follows:—

	£ £
Surgeon Lieutenant (D)	377–402
Surgeon Lieutenant-Commander (D) (promoted after six years' service)	650–687
Surgeon Commander (D) (promoted by selection to fill vacancies in Establishment)	730–933
Surgeon Captain (D) (promoted by selection to fill vacancy in Establishment).. ..	1073–1329

The Regulations regarding Pension and Withdrawal Gratuities are the same as for Medical Officers in the corresponding Ranks.

As in the case of the medical branch, 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay introduced in 1919 is considered as due to the high cost of living in 1919 and subject to change periodically either upwards or downwards according as the cost of living rises or falls. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., the second revision took place in July, 1927, when all rates were reduced by ½ per cent., and further revisions are due every three years—i.e., in July, 1930, and so on.

ARMY MEDICAL SERVICE.

ROYAL ARMY MEDICAL CORPS.

THE publication of the Royal Warrant of 1926 has removed many of the grievances of officers of the Corps, and this Service can again be recommended as a career to young medical men. Competitive examinations for regular commission, which have been in abeyance for some time, will again be held half-yearly in January and July. These examinations in medicine and surgery are entirely of a clinical and practical character, partly written and partly oral.

The regulations for admission giving full details should be obtained from the Permanent Under Secretary of State (A.M.D. 1), War Office, Whitehall, London, S.W. 1, and carefully studied. A personal interview with a representative of the Director-General, Army Medical Services, is readily obtainable.

The rates of pay and allowances are good; the opportunities of post-graduate study are generous, and the work is varied, responsible, and interesting. The gratuities after certain periods of service enable an officer should he so desire to leave the Service with a capital sum large enough to go a long way towards re-establishing himself in civil life, and, further, the knowledge of the world and the comradeship of his fellow officers that he has gained in the Army will be of no small value to him.

New entrants are commissioned in the rank of Lieutenant, and the first six months of service are spent on probation, during which time they undergo, in addition to their Military training at the Royal Army Medical Corps Depôt at Aldershot, a probationary course at the Royal Army Medical College in London in Hygiene, Pathology, Tropical Medicine, Military Surgery, Recruiting, the prevention and treatment of Venereal Disease, and the elements of Army Administration. At the end of this course, and after qualifying at the necessary examinations, their commissions are confirmed, and they take their places in seniority according to the total marks obtained at all examinations up to that date. Officers Training Corps service with possession of Certificates "A" or "B" (Medical) carry a definite value in marks in this total.

An entrant who is holding or about to hold at the time of the entrance examination a resident House Appointment at an approved Civil Hospital may be seconded while holding such an appointment up to a maximum period of 12 months. A candidate who has held such an appointment within six months of entry may be granted an antedate up to 12 months in respect of the period the appointment was held. This secondment and antedate counts in all respects as commissioned service, except that pay will not be issued for that period.

After a total period of one year's service at home the young officer goes abroad, probably to India, for his first tour of foreign service. Here he gains his first practical experience of tropical disease and tropical hygiene, and possibly his first experience of active service on the frontiers of India. His tour abroad lasts five years, with probably six months' leave home during that time. On returning home the R.A.M.C. officer has the opportunity to decide whether he will remain in the Corps or accept the gratuity of

£1000 after seven years' service, and try his fortune in civil life. If he elects to remain, he will, between his eighth and twelfth year of service, undergo a course of post-graduate study at the Royal Army Medical College and the London Hospitals of five months' duration, followed by a course of study of a special subject selected by himself, provided he has shown special aptitude in the post-graduate course or during his previous service. During this period of study he remains on full pay, and the fees for the courses are paid by the State. When qualified in his special subject, the officer becomes entitled to specialist pay at 5s. per day when holding a specialist appointment. After this post-graduate course the officer probably proceeds abroad again and promotion to Major rapidly ensues, and from that time onward the officer receives regular successive increases of pay, and is eligible for additional and charge pay as well. The Directorates of Hygiene and Pathology and the appointment of two serving officers as Consultants in Medicine and Surgery have been instituted and have proved a marked success, all these appointments being of the rank of Colonel or Major-General.

Under these conditions the possibilities for good workers are very great in the Royal Army Medical Corps. There is scope for original research in tropical disease, in preventive medicine, and in bacteriology, as well as in the large clinical field open to the specialist in Medicine, Surgery or Gynæcology, in Venereal Disease, and in Ophthalmology. Child welfare is also undertaken systematically by officers of the Royal Army Medical Corps.

At the same time instruction in administration is continuous. The Royal Army Medical Corps is essentially organised for war, and one of the lessons of the Great War was that trained administrators must exist to enable the fullest benefit to be obtained from professional talent. Many appointments carrying administrative responsibility are open to those officers who display capacity for this duty. All officers must be prepared to undertake command and to have a knowledge of Army administration, especially in war. Equally important is the technical training of the Non-commissioned Officers and men of the Corps in such "trades" as Trained Nurse, Nursing Orderly, Masseur, Radiographer, Operating Room Assistant, Laboratory Assistant, Hospital Cook, Dispenser, &c. This training is carried out by the Officers and Nursing Sisters, and opens a large field for those who have ability in lecturing and teaching as well as the power of influencing men.

Promotion.

Promotion takes place automatically to Captain after 3½ years, and to Major after 12 years' service, provided the officer is qualified and recommended for promotion. Promotion to the higher ranks is by selection from those senior in the rank below, but special promotion by brevet or otherwise is open to officers of the Royal Army Medical Corps.

PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Rations.†	Servant.	Married.			Unmarried.		Approximate daily total.		Approximate yearly total.	
				Lodging.	Fuel and light (average)	Furniture allowance.	Lodging.	Fuel and light (average)	Married.	Un-married.	Married.	Un-married.
	£ *s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£	£
Lieutenant	1 0 8	1 7	2 0	3 6	1 5	2 0	2 3	1 2	1 11 2	1 7 8	669	606
Captain—	1 5 4	1 7	2 0	4 6	3 0	2 0	3 0	1 8	1 18 5	1 13 6	701	612
After 8 years c.s. ..	1 8 2	1 7	2 0	4 6	3 0	2 0	3 0	1 8	2 1 3	1 16 6	752	664
After 10 years c.s.	1 10 6	1 7	2 0	4 6	3 0	2 0	3 0	1 8	2 3 7	1 18 9	795	707
Major—	1 15 4	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 8 6	2 6 2	883	824
After 15 years c.s.	2 0 0	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 13 1	2 9 10	968	909
After 18 years c.s.	2 2 4	1 7	2 0	4 6	3 0	2 0	4 0	2 3	2 15 5	2 12 2	1011	952
After 20 years c.s.	2 7 0	1 7	2 0	4 6	3 0	2 0	4 0	2 3	3 0 1	2 16 10	1096	1037
Lieut.-Colonel ..	2 14 0	1 7	2 0	4 6	3 0	2 0	4 6	2 3	3 7 1	3 4 4	1224	1174
After 3 years c.s. as such	2 18 10	1 7	2 0	4 6	3 0	2 0	4 6	2 3	3 11 11	3 9 2	1312	1262
Colonel	3 5 10	1 7	2 0	5 6	4 1	2 0	6 6	2 8	4 1 0	3 17 8	1478	1419
Major-General ..	4 9 4	1 7	4 0	11 0	5 1	2 0	11 0	3 8	5 13 1	5 9 7	2064	2000

c.s. = commissioned service.

* Pay Warrant rates as amended by A.O. 196/26 less 6 per cent. from July 1st, 1927, vide A.O. 1 of 1927. The Pay Warrant rates are subject to revision to an extent not exceeding 20 per cent. according to variation in the cost of living. The next revision takes place from July 1st, 1930.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

Additional Pay and Charge Pay for R.A.M.C. Officers.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by the Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under.

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology and Venereal Disease; Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; *subjects other than above, at the discretion of Our Army Council*, 5s. daily.

(2) (*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds ..	2s. 6d. daily.	300 beds ..	7s. 6d. daily.
150 ,, ..	5s. 0d. ,,	500 ,, ..	10s. 0d. ,,

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

	Daily. *s.* *d.*
(*b*) Senior medical officer, Royal Arsenal, not exceeding	10 0
(*c*) Officer in command of the depôt, Royal Army Medical Corps	5 0
(*d*) The senior officer of the Army Medical Services with an army in the field: A rate to be fixed by the Army Council according to the magnitude of the charge.	
(*e*) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5 0
(*f*) Adjutant R.A.M.C. Depôt	5 0
(*g*) Adjutant R.A.M.C. (Territorial Army)	2 6

Retirement and Retired Pay.

The following are the rates of retired pay:—

1. Retired pay will consist of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible to retire voluntarily on service retired pay.

2. The scale will be as follows, subject to the reduction of 6 per cent. referred to below:—

(a) Service element.—£15 a year for each completed year of service as a medical officer.

(b) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant - Colonel	150	30	240
Colonel	290	50	390
Major-General ..	440	50	540
Lieutenant - General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (a) and (b) together:—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General	1200

The above rates are those laid down in the Pay Warrant. They have been reduced by approximately 6 per cent. as from July 1st, 1927, and are subject to future variation with fluctuation in the cost of living.

3. Officers with seven and less than 20 years' service as medical officers may be permitted to retire with a gratuity in accordance with the following scale:—

After 7 years' service as a medical officer.. ..	£1000
„ 15 „ „ „ ..	£2800
„ 18 „ „ „ ..	£3500

THE ARMY DENTAL CORPS.

The Corps is administered by the Director-General, Army Medical Services. It is a joint service for the Army and Royal Air Force, and personnel is required to serve under either force and be interchangeable. Officers and other ranks posted for duty with the Royal Air Force will perform their duties under the Regulations of the Royal Air Force for the employment of dental personnel, but the conditions in the following tables apply equally in either force. Promotion is carried out on one general list. Regulations for admission to the Army Dental Corps should be obtained from the Under-Secretary of State, War Office, and carefully studied.

OFFICERS: *Appointment and Promotion.*

1. Commissions as Lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer who is commissioned after holding a whole-time appointment in a recognised civil dental hospital or in the dental department of a recognised civil general hospital for a period of not less than six months, may be granted an antedate covering the period of his appointment, but not exceeding six months, provided that the interval between the termination of the hospital appointment and the date of entry into the Service shall not ordinarily exceed six months. The period of such antedate will reckon towards promotion, increase of pay, gratuity or pension.

3. An officer is eligible for promotion to the rank of Captain on completion of three and a half years' service and to the rank of Major on completion of 12 years' service in the Corps, provided he has previously qualified in such manner as may be prescribed by the Army Council.

4. Promotion to the rank of Lieutenant-Colonel and Colonel to fill the establishments laid down from time to time for those ranks shall be made by selection of the Army Council, provided the officer has previously qualified for promotion to those ranks in such manner as may be prescribed by the Army Council.

Pay.

The following are the rates for officers of the Army Dental Corps.

These rates are 6 per cent. below those shown in the Pay Warrant, 1926, as amended by Army Order 190/26. The latter are subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place on July 1st, 1930.

	Per diem.		
	£	s.	d.
Lieutenant	0	18	10
Captain	1	3	6
Captain, after 8 years' total service	1	6	4
„ 10 „ „ „	1	8	2
Major	1	12	10
Major, after 15 years' total service	1	17	8
„ „ 18 „ „ „	2	0	0
„ „ 20 „ „ „	2	4	8
Lieutenant-Colonel	2	11	8
Lieutenant-Colonel after 3 years' service as such	2	16	4
Colonel	3	8	6

Charge Pay.

The officer in charge of the Dental Laboratories, Aldershot, receives charge pay at the rate of 5s. a day if holding the rank of Captain, or 2s. 6d. a day if holding the rank of Major.

Allowances.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the Royal Army Medical Corps.

Retirement and Retired Pay or Gratuity.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed:—

After 8½ years'	service as a Dental Officer,	gratuity of £1000.
„ 15 „		„ £2000.
„ 18 „		„ £3000.

The aim of the Corps is the prevention of wastage on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier is re-inspected at least once a year and his dental efficiency maintained at the best standard possible.

INDIAN MEDICAL SERVICE.

IT is the view of many senior officers in the Service that the period of depression is now passing and that the prospect is again bright for those who are fitted in physique and disposition for a medical career in India. The offer of permanent commissions on specially favourable terms to medical men of European descent who were free to sail forthwith to India met last year with the desired response, and the number of commissions granted during the last twelve months is 30.

But the new outlook involves frank acceptance of the Indian reform scheme, the essential of which is increasing participation of Indian-born subjects in the government of the country, although, so long as Europeans are employed in the various departments of the Indian Civil Service, nothing is more certain than that there will and must remain European doctors to attend them. India definitely requires European assistance, not only for the care of the military and civil European population, but for the maintenance in the country of that spirit of modern medicine which has accomplished already such mighty things, and which day by day is spreading in influence and value.

The Government of India issued a communiqué last year dealing in detail with the reorganisation of the medical services in India. The scheme then sanctioned is based on proposals framed in consultation with local governments. The Indian Medical Service, constituted on the same broad lines as at present, will be retained primarily to meet the needs of the Indian army, and in order to maintain two essential requisites—namely, (1) the necessary minimum war reserve of medical officers, and (2) the provision for European medical attendance on officers and their families.

Local governments in India will be required to employ a stated number of I.M.S. officers. It has been calculated that the war reserve to be employed by the civil side should consist of 134 British and 66 Indian officers, the larger proportion of British officers being due to the fact that they cannot be recruited on emergency in India from the ranks of private practitioners. Medical attendance on British personnel, and the requirements of civil administration, for which the Central Government is still responsible, involve the provision of a number of employments termed "residuary," the incumbents of which must be retained permanently in civil employment, so as to ensure the continuance under any circumstances of a skeleton staff to cope with civil requirements. Further details regarding the posts on the civil side were published in the Students' number of 1928.

Rules forming an integral part of the reorganisation scheme have been drawn up to safeguard the varied interests of the Indian army, the provincial governments, and the medical officers themselves (vide THE LANCET, May 19th, 1928, p. 1028). Under these it has now been ruled that as long as any Indian Medical Officers in civil employ in 1928 remain, the administrative posts will be filled from among them.

Thus the social effect of Indianisation should not press hardly on the medical service for the reason that European doctors will be chiefly requisitioned in stations with considerable European communities. In these communities the equipment and organisation of hospitals has been steadily improving and men with professional ambition will find positions which will satisfy their aspirations. On the military side the station hospital system has rendered the position of medical officers more independent by making teamwork possible and permitting of specialisation in various departments of medicine and surgery. Lastly, those who join now will have unequalled prospect of advancement in a Service which has been so depleted for 10 or 15 years or more, and the terms of service announced by the Secretary of State for India in 1926 assure conditions of pay, pension, and furlough much superior to those previously offered.

The New Regulations.

Competitive examination remains suspended for the present and admission to the Service is on written application to the India Office. As sound bodily health is a first essential candidates may, if they wish it, undergo a preliminary examination by a Medical Board which meets weekly at the India Office.

Candidates must be under 32 years of age at the time of application, and must possess a qualification registered in Great Britain and Northern Ireland, under the Medical Acts in force at the time of appointment. Arising out of the recommendations of the Lee Commission the Secretary of State for India in Council after consultation with the Government of India has decided that the Indian Medical Service constituted on the same broad lines as in the past shall be retained primarily to meet the needs of the Indian Army. In order to maintain the necessary minimum war reserve of military medical officers, and to provide for European medical attendance for European officers of the Superior Civil Services and their families, local governments will be required to employ a stated number of Indian Medical Service officers. The Government of India will draw on the same Service to meet the requirements of the civil administration for which they are responsible. For the present 237 such posts have been reserved, and including the leave reserve will provide employment for 302 officers. 212 of these officers will be British medical men and 90 Indians. As the proportion of European to Indian civil officers diminishes these figures will be subject to periodical scrutiny, and, if [illegible]essary, to revision. It will be a definite condition [illegible] for all future entrants to the Service that ability [illegible] to serve on either the civil or the of influen[illegible] [illegible]fficers are required to perform two years' military duty subsequent to permanent appointment before they can be considered eligible for civil employment. Executive medical officers in both civil and military employment may attend persons unconnected with Government service provided their duty admits of it. On the military side, however, the opportunities for private practice are not great. Service during the war as a medical or combatant officer, or in a position usually filled by an officer, counts towards promotion and pension so long as the rights of officers who have entered by competition are not interfered with.

Rates of Pay.

The monthly rates of pay for European officers of non-Asiatic domicile in the Service are as tabulated below. The rupee, it may be remembered, has now been definitely stabilised at 1*s*. 6*d*.

Rank and service in rank.	Basic pay.	Overseas pay.	Year of total service.
	Rs.	Rs.	
Lieut.	500	150	First
		150	Second
		150	Third
Captain:—			
1. During first three years' service as Captain.	650	150	Fourth
		£15	Fifth
		£15	Sixth
2. With more than three and less than six years' service as Captain.	750	£25	Seventh
		£25	Eighth
		£25	Ninth
3. With more than six years' service as Captain.	850	£25	Tenth
		£25	Eleventh
		£30	Twelfth
Major:—			
1. During first three years' service as Major	950	£30	Thirteenth and over.
2. With more than three and less than six years' service as Major	1100		
3. With more than six years' service as Major.	1250		
Lieut.-Colonel:—			
1. Until completion of 23 years' total service	1500		
2. During twenty-fourth and twenty-fifth years' total service	1600		
3. After completion of 25 years' total service	1700		
4. When selected for increased pay ..	1850		

Note.—Until the completion of 23 years' total service basic pay is regulated according to rank and service in rank (column 1) which, owing to the system of accelerated promotion, may be in advance of the time-scale of promotion. Overseas pay is regulated solely with reference to length of total service (column 4). In addition to the above rates various allowances are admissible for a large number of special appointments on both the military and the civil side which may be held by members of the I.M.S. Special high rates of pay are also attached to the numerous administrative appointments open to officers in both branches of the Service. The appointment of Director-General, I.M.S., which is held by an I.M.S. officer, carries pay of Rs.3500 per mensem. The appointment of Director of Medical Services in India, carrying pay at Rs.3200 per mensem, may also be held by an officer of the Indian Medical Service.

Initial rates of pay are based on the assumption that the majority of newly appointed officers will be bachelors. Officers on arrival in India will be posted for one year to specially selected stations. Officers in military employment, when in command or second-in-command of the larger station hospitals, receive special allowances. On the civil side there are public health, bacteriological, research, and professorial appointments carrying special enhanced rates. Officers on appointment receive an outfit allowance of £50.

Pensions and Allowances.

The rates of pensions are as shown in the table below.

There are additional pensions not subject to the above reduction ranging from £95 to £350 per annum for officers who have held high administrative appointments as colonels or major-generals.

Service.	Rates per annum.	Service.	Rates per annum.
After 17 years ..	£400	After 23 years ..	£620
" 18 " ..	430	" 24 " ..	660
" 19 " ..	460	" 25 " ..	700
" 20 " ..	500	" 26 " ..	750
" 21 " ..	540	" 27 " ..	800
" 22 " ..	580		

Note.—The above rates are subject to revision triennially upwards or downwards, to an extent not exceeding 20 per cent. in all, on account of a rise or fall in the cost of living, as compared with the year 1919. A deduction of 4½ per cent. on this account has already been made. Nevertheless the full pension of a lieutenant-colonel cannot be cut below the maximum of £700 under the old rules in the case of officers who entered the service before July 1st, 1920.

Officers on appointment are provided with free passage to India, normally by transport. The wives and families of officers who are married prior to the date of the officers' embarkation on first appointment will also be given free passage to India. Officers are granted a certain number of return passages home at Government expense during their career. There are special allowances for officers whilst on study leave.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1. Letters should be marked "Recruitment for I.M.S."

ROYAL AIR FORCE MEDICAL SERVICE.

THE Air Council attach great importance to attracting into the Service the best type of medical man, since on the capacity of the Medical Service depends in a peculiar degree the safety and efficiency of the Air Force. The duties of a medical officer in the Air Force include not only the prevention and treatment of those ordinary diseases to which the personnel of any fighting service are liable, but the special study of the mental and physical stresses imposed on the airman in diverse circumstances and climates—a new branch of medicine which still provides considerable scope for research.

As promotion to the higher ranks of the Service is by selection from officers who are eligible by reason of length of service, and as a certain proportion of the higher ranks will be reserved for purely professional as opposed to administrative appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in his professional work.

The work to be done, therefore, has a high professional interest which, combined with good rates of pay and allowances, offers a career for medical men which should prove both attractive and interesting. The life is one which is certain to appeal to the man of wide outlook who desires opportunities for travel, sport, and games, and can find interest and enjoyment in aviation.

His duties will, as a matter of course, give him flying experience as a passenger, which is necessary for the proper study of the medical problems of aviation and for gaining first-hand knowledge of the conditions under which his comrades serve.

The establishment will consist partly of permanent and partly of short-service officers.

An officer will on first entry be granted a short-service commission for a period of three years on the active list (which may be extended to five years at the discretion of the Air Council if the officer so wishes on the recommendation of the Director of Medical Services) and of four years in the Reserve of Air Force Officers. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

For those entrants who desire it the prospect of obtaining a permanent commission is approximately an even one. Experience has so far shown that the officers selected have included the great majority of those desirous of, and suitable for, retention in the Service; owing to the fact that the short-service commission with its gratuity after three or five years is in itself an attraction to many entrants who desire to enlarge their experience and outlook from the point of view of subsequently entering private practice, or who, on entry, have not made up their minds to the adoption of a permanent career in the Service and subsequently find that they would prefer to return to civil life.

For certain purposes medical officers may be allowed to count as service their time spent in resident appointments in civil hospitals under certain well-defined and generous conditions.

Officers who have been selected for permanent commissions may be permitted to attend for a period not exceeding nine months a post-graduate course

ROYAL AIR FORCE MEDICAL BRANCH: RATES OF PAY AND ALLOWANCES.

Rank.	Pay.*									Cash allowances at home rates in lieu of quarters, rations, and servant, if not available in kind (per annum).†						Pay plus allowances per annum.					
	Daily rates.						Per annum (current rate).			Married.			Unmarried.			Married.			Unmarried.		
	Standard.			Current.																	
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Flying Officer	1	4	0	1	2	6	410	12	6	155	2	6	141	8	9	565	15	0	552	1	3
Flight Lieutenant— ..	1	6	0	1	4	6	447	2	6	202	5	5	159	13	9	649	7	11	606	16	3
After 2 years as such..	1	8	0	1	6	4	480	11	8	202	5	5	159	13	9	682	17	1	640	5	5
After 4 years as such..	1	10	0	1	8	2	514	0	10	202	5	5	159	13	9	716	6	3	673	14	7
Squadron Leader— ..	1	14	0	1	12	0	584	0	0	202	5	5	170	6	8	786	5	5	754	6	8
After 2 years as such..	1	18	0	1	15	8	650	18	4	202	5	5	170	6	8	853	3	9	821	5	0
After 4 years as such..	2	0	0	1	17	8	687	8	4	202	5	5	170	6	8	889	13	9	857	15	0
After 6 years as such..	2	4	0	2	1	4	754	6	8	202	5	5	170	6	8	956	12	1	924	13	4
After 8 years as such..	2	8	0	2	5	2	824	5	10	202	5	5	170	6	8	1026	11	3	994	12	6
After 10 years as such..	2	10	0	2	7	0	857	15	0	202	5	5	170	6	8	1060	0	5	1028	1	8
Wing Commander— ..	2	15	0	2	11	8	942	18	4	202	5	5	180	19	7	1145	3	9	1123	17	11
After 2 years as such..	2	17	0	2	13	6	976	7	6	202	5	5	180	19	7	1178	12	11	1157	7	1
After 4 years as such..	3	3	0	2	19	2	1079	15	10	202	5	5	180	19	7	1282	1	3	1260	15	5
Group Captain	3	10	0	3	5	10	1201	9	2	278	6	3	252	9	2	1479	15	6	1453	18	4
Air Commodore	4	0	0	3	15	2	1371	15	10	333	1	3	307	4	2	1704	17	1	1679	0	0
Air Vice-Marshal.. ..	5	0	0	4	14	0	1715	10	0	398	9	2	371	1	8	2113	19	2	2086	11	8

* Except for periods of service under Indian administration. For such periods officers receive pay and allowances at rates and subject to conditions authorised from time to time by the Government of India.

† These allowances are issued only when accommodation, fuel and light, rations, and personal attendance are not available in kind. Normally, provision in kind is available for junior officers. "Married" rates of allowances are payable only to married officers who have reached the age of 30 or the rank of Squadron Leader. A colonial allowance is granted in certain commands abroad. The rates and general scheme of allowances are liable to revision as circumstances may require.

in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such permission may be granted at any time when the exigencies of the Service permit during the first 16 years of service, and when attending these courses officers will receive full pay and allowances.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will normally be promoted to the rank of Squadron Leader after ten years' total service. Accelerated promotion may be granted in a limited number of cases to officers who show exceptional ability after the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and that of Group Captain by selection at any period after 22 years' service.

Certain posts in these ranks are reserved for officers fully employed in professional work, such as surgery, pathology, ophthalmology, &c., numbering at present six in all. The number of these posts will be limited only by the needs of the Service and by the necessity of observing a similar proportion between the number of reserved posts and the officers from whom they can be filled, as exists between the total number of higher ranks and the remainder of the medical service. Selections for these reserved posts will be made only from officers professionally qualified to hold them. Officers filling the reserved posts will be eligible for selection to the administrative appointments of their rank, and to the highest administrative appointments.

There will be no competitive examination on entry; candidates must be under 28 years of age, be British subjects, the sons of British subjects, and of pure European descent, be nominated by the dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce:—

1. Birth certificate. 2. Medical registration certificate. 3. A declaration containing the following information: (*a*) Age and place of birth. (*b*) That he is a British subject, the son of British subjects, and of pure European descent. (*c*) That he is ready to engage for general service at home or abroad as required. (*d*) The qualifications he is possessed of, and what medical or other appointments he has held (if any). (*e*) That he is willing to fly as a passenger whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

On appointment entrants will undergo an initial course of eight weeks, during which they will be given instruction in the special medical aspects of aviation, the organisation and administration of the Royal Air Force, and the general and special duties to be performed by officers in the Medical Branch.

In order to avoid the necessity for further examinations the position of entrants in order of seniority in the Air Force List will be determined at the end of the initial course by a system of marking and reports on the actual work done during their instruction.

Uniform and Equipment.

Medical officers are required to provide themselves with the uniform, service dress and mess dress of their rank and with the distinguishing badges of the Royal Air Force Medical Branch. The provision of full dress is entirely optional at present. An allowance of £50 towards the cost of uniform is made on joining to candidates who have not had previous commissioned service in H.M. Forces.

Emoluments.

The emoluments of medical officers of the Royal Air Force are given in outline above. The standard rates of pay and retired pay were drawn up on the basis of the high cost of living in 1919, and 20 per cent. of each of the standard rates is detachable and subject to alteration either upwards or downwards as the cost of living rises or falls. Under this provision the current rates now in force represent a reduction of approximately 6 per cent. on the standard rates. The next revision will take effect from July 1st, 1930, and subsequent revisions will be made at intervals of three years.

RETIRED PAY.

The minimum period of service qualifying for retirement on retired pay is 20 years. Standard rates of retired pay are as follows:—

Air Officers.

Air Vice-Marshal ..	.. £790 to £1010 per annum.
Air Commodore ..	.. £650 „ £950 „ „

The maximum standard rates of retired pay and the compulsory retiring ages for the several ranks are:—

Rank.	Yearly rate of retired pay.	Compulsory retiring age.
	£	
Air Vice-Marshal ..	1010	60
Air Commodore ..	950	57
Group Captain.. ..	900	55
Wing Commander ..	600	51
Squadron Leader ..	500	48

Retired Pay of Officers below Air Rank.

Age on retirement.	Standard yearly rate of retired pay.	Years of service.	Addition for each extra year of service.*	Deduction for each deficient year of service.*
	£		£	£
40	300	17	15	15
41	337	17	15	15
42	375	18	15	15
43	412	18	15	15
44	450	19	15	15
45	487	19	15	15
46	525	20	15	15
47	562	20	15	15
48	600	21	15	15
49	637	21	15	15
50	675	22	15	15
51	697	22	22	15
52	720	23	22	15
53	742	23	22	15
54	765	24	22	15
55	790	24	22	15

* Limited to five years.

Gratuities.—A permanent officer allowed to retire before having qualified for retired pay may be granted a gratuity provided he has not less than ten years' commissioned service, namely:—

£1500 if he has 10 but less than 15 years' commissioned service.
£2500 „ 15 or more than 15 „ „ „

Short-service officers will be eligible on passing to the Reserve for gratuities on the following scale: £100 for each of the first two complete years of service, £150 for each of the third and fourth complete years, and £200 for the fifth complete year; that is:—

For three years' service on the active list ..	£350
For five „ „ „ „ ..	£700

These gratuities will not be payable to officers granted permanent commissions, but their service on a short-service commission will count towards retired pay.

COLONIAL MEDICAL SERVICE.

IN the self-governing Dominions (Canada, Australia, New Zealand, the Union of South Africa, the Irish Free State, and Newfoundland), and territories under their control, such as Papua and the Cook Islands and in the self-governing colony of Southern Rhodesia, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; application for appointments in North Borneo should be made to the British North Borneo Company, 17, St. Helen's-place, E.C., ; appointments in Sarawak are in the hands of H.H. the Rajah. Much valuable information will be found in the "Professional Handbook," Part II., issued by the Oversea Settlement Office, Caxton House, Tothill-street, London, S.W. 1, price 9*d.*

As a general rule, each Colony or Protectorate has its own public service distinct from that of every other; and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another. There are three exceptions to this rule: (*a*) The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, is one service. (*b*) The East African Medical Service, which serves Kenya, Uganda, Zanzibar, Nyasaland, Somaliland, and the Tanganyika Territory is one service. (*c*) In practice the medical services of the Straits Settlements and the Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States or vice versa; the two services are now called the Malayan Medical Service.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the Secretary of State for the Colonies are (*a*) the West African—viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia, with the Mandated Territories of Togoland and the Cameroons; (*b*) the East African—viz., the Kenya Colony and Protectorate, Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, the Tanganyika Territory, and Northern Rhodesia; (*c*) the Eastern—viz., Ceylon, the Straits Settlements and Malay States, Hong-Kong, Mauritius, and Seychelles; (*d*) the West Indian—viz., Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, and the Bahamas; (*e*) Fiji and the Western Pacific, Cyprus, Gibraltar, St. Helena, British Guiana, British Honduras, Bermuda, and the Falkland Islands; and (*f*) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. In the Bechuanaland Protectorate, Basutoland, and Swaziland appointments are usually filled locally. Appointments in Malta are all filled locally. In addition, certain medical appointments in the service of the Government of Iraq are filled with the concurrence, and normally upon the recommendation, of the Secretary of State. Vacancies occur most regularly and frequently in the West African Medical Staff, the East African Medical Service, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift of the Secretary of State for the Colonies should be *under 35 years of age, and must be doubly qualified*; preference will be given to those who have held hospital appointments as house physicians and house surgeons: testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Dr. P. H. Manson-Bahr, D.S.O., F.R.C.P., 9, Weymouth-street, Portland-place, W.1, and Dr. A. E. Horn, C.M.G., 14, Wimpole-street, W.1; Major-General J. J. Gerrard, C.B., C.M.G., the Royal Hospital, Kingsbridge, Dublin; Dr. Foster Coates, 22, College-gardens, Belfast; and Lieut.-Colonel Glen Liston, C.I.E., I.M.S., 33, Comely Bank, Edinburgh, and Dr. C. V. Le Fanu, *39, Rodney-street, Liverpool. Applications* for such appointments must be addressed to the Private Secretary (Appointments), Colonial Office, 2, Richmond-terrace, Whitehall, S.W.1.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction at the London School of Hygiene and Tropical Medicine, Endsleigh-gardens, W.C.1, the Liverpool School of Tropical Medicine, Liverpool University, or at Edinburgh University. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £25 a month will be paid to them monthly in arrear while they are under instruction. Payment of the allowance will be made subject to the candidate signing an agreement by which he is bound to refund it (1) if he declines to accept an appointment in any of the Colonies for which he may be selected; (2) if he fails to obtain a certificate or diploma; (3) if he leaves the Service within three years for any reason other than mental or physical infirmity not caused by his own misconduct.

EAST AFRICAN MEDICAL SERVICE.

The Medical staffs of the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory form one service, the members of which are liable to be posted or transferred to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible.

Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Medical officers (but not health officers) are permitted to take private practice at some stations on the understanding that they give precedence to their official duties. It must be understood that additions to their income from this source are not likely to be substantial, and that the privilege is liable to withdrawal at any time.

Officers are provided with quarters free of rent or the Government may provide temporary accommodation, or an allowance in lieu of quarters may be paid. The salary of a medical or sanitation officer is £600 per annum, rising by annual increments of £30 to £840, and thence by increments of £40 to £920, subject to an efficiency bar at £840. Senior medical officers and senior sanitation officers are paid on the scale £1000 by annual increments of £50 to £1100. Officers who possess the Diploma in Public Health on entering, or who acquire it while in the Service, receive two special increments in the scale.

Officers of the East African Medical Service are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity he thereby forgoes all claim to pension.

The grades and salaries (apart from ordinary medical and sanitation officers) in the medical departments are as *follows*:—

Kenya.—Director of Medical and Sanitary Services, £1500; Deputy Director of Medical Service, £1200; Deputy Director of Sanitary Service, £1200; Deputy Director of Laboratory Service, £1200.

Uganda.—As Kenya.

Tanganyika Territory.—As Kenya.

Nyasaland.—Director of Medical and Sanitary Services, £1200; Medical Entomologist, £1000–£50–£1100.

Zanzibar.—Director of Medical and Sanitary Services, £1400; Deputy Director of Sanitary Service, £1200; Resident Surgical Officer, £1000–£50–£1100.

Somaliland.—Principal Medical Officer, £1000–£50–£1100.

There are also the following posts:— Resident Surgical Officers (Kenya and Uganda), £1200; Specialist Officer, Sleeping Sickness (Uganda), £1150; Medical Superintendent and Principal of Medical School, Mulago Hospital (Uganda), £1150; Sleeping Sickness Officer (Tanganyika Territory), £1000–£50–£1100; Senior Bacteriologists (Kenya and Uganda), £1000–£50–£1100.

Health officers are selected from the ranks of medical officers as occasion arises.

ASIA.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: $500 per mensem, rising to $550 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to $575 per mensem, and thence by annual increments of $25 per mensem to $800 per mensem, with a strict efficiency bar at $600 per mensem. Officers possessing the D.P.H. receive an additional allowance (non-pensionable) of $100 per mensem.

Above the concluding figure of $800 per mensem there are certain higher appointments, as follows: Principal Civil Medical Officer, Straits Settlements, and Principal Medical Officer, Federated Malay States, $1200 per mensem; Director, Institute for Medical Research, Federated Malay States, Chief Health Officer, Federated Malay States, and Principal Medical College, Straits Settlements, $1100 per mensem; 12 posts at $1050 per mensem; and 20 posts at $850 per mensem, rising annually by $30 to $1000 per mensem.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed, but consultation work with another practitioner is permitted. Information about general conditions in Malaya is obtainable from the Malayan Information Agency, 57, Charing Cross, S.W. 1.

Seychelles.—The chief medical officer receives Rs.7000 per annum. There are four assistant Government medical officers, two receiving Rs.6500, the others Rs.3000 per annum.

Hong-Kong.—The present establishment of the medical department is: director of medical and sanitary services, £1200–£50–£1450; deputy director, £1125–£25–£1200; senior medical officer, £1025–£25–£1100; three medical officers of health, £740–£30–£1040; health officer of the port, and second health officer of the port, £740–£30–£1040; five medical officers, £600–£30–£1020; bacteriologist, £800–£1100; assistant bacteriologist, £740–£30–£1040; radiologist, £740–£30–£1040; analyst, £625–£25–£900; assistant analyst, £400–£25–£700. A temporary allowance on a scale varying with the sterling exchange value of the dollar is at present payable. Salaries are converted locally at the rate of 2*s.* = $1. Free quarters are not provided, but in certain instances a rent allowance is paid by the Government.

AMERICA.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000–£1200 per annum, with consulting practice; one medical officer of health, £900; ophthalmologist, £700; one bacteriologist and pathologist, £700; 37 medical officers at £500–£25–£700. Most of the senior posts in institutions carry duty allowances (varying from £50 to £300 per annum) and quarters.

Trinidad and Tobago.—In Trinidad and Tobago there are about 40 appointments. Government medical officers receive salary at the rate of £400 per annum, rising by annual increments of £25 to £600. An officer appointed to a district receives, in addition to his salary, a travelling allowance varying from £100 per annum in a normal district to £150 per annum, and is allowed private practice, the value of which is estimated at from £50 to £800 per annum. Officers employed in institution work receive a duty allowance varying from £50 to £300. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent). There are over 25 appointments. The chief medical officer, Grenada, receives £750. The chief medical officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government are on the scale from £400–£500, except in St. Vincent, where the maximum is £450. The Governor has the power to transfer a medical officer from one island to another. Appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are similar in number and character to those in the Windward Islands, and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary of £350, and is later appointed to a definite district at a salary varying from £312 to £400–£25–£450, and the Governor decides as to the district which is to be allotted to him, according to station. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands. The medical officers, except in St. Christopher and Nevis, receive fees for successful vaccinations, post-mortem examinations, evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also, as a rule, allowed private practice. The chief medical officer, St. Christopher and Nevis, receives £700–£25–£750, but is not allowed private practice, except as a consultant.

British Honduras.—There are seven medical appointments (besides the post of principal medical officer at a salary of $2430 per annum with increments of $120 to $3150. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is the same as that of the United States dollar.

OTHER OVERSEAS APPOINTMENTS.

Fiji.—The Chief Medical Officer receives £1000–£50–£1100, with free quarters, unfurnished; the Medical Superintendent, Colonial War Memorial Hospital, £800–£50–£1000, with £40 car allowance and free quarters; the Medical Superintendent, Leper Asylum, £750–£50–£950, with completely furnished quarters and one servant; the Medical Officer of Health, £750–£25–£900, no quarters provided. There are 14 District Medical Officers who receive £500–£25–£725, with partly furnished quarters or £50 house allowance (at the option of the Government) and duty allowance of £50 per annum in districts where no private practice exists. In certain districts house allowances or car allowances are granted. In others a medical officer is provided with a launch or boat. District Medical Officers are allowed private practice on the understanding that their official duties are not neglected. In five districts the Medical Officer is also District Commissioner and receives an additional allowance of from £175 *to* £275 and free partly-furnished quarters. In most districts there is private practice, the value of which has been estimated at from £100 to £600 a year.

Western Pacific High Commission.—The staff in the British Solomon Islands Protectorate consists of a Senior Medical Officer (£650–£750), two District Medical Officers (£550–£650), and one Travelling

Medical Officer (£550–£650). Partly-furnished quarters are provided and a local allowance of £50 per annum is paid to the Senior Medical Officer and the District Medical Officers. A local allowance of £50, consolidated travelling and subsistence allowance £200, and partly-furnished quarters are provided for the Travelling Medical Officer.

In the Gilbert and Ellice Islands Colony there is a Senior Medical Officer (£650–£750), with partly-furnished quarters, and one Medical Officer (£600–£25–£650), with partly-furnished quarters or house allowance. There is hardly any private practice in the British Solomon Islands Protectorate or the Gilbert and Ellice Islands Colony.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £850, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer and one of the district medical officers, who are allowed consulting practice only). There is also a post of consulting surgeon, £400–£20–£600 a year, with consulting practice. There is also a medical officer of health on £600, rising by £20 increments to £750 without private practice, and a specialist in venereal diseases with a salary of £700 a year and consulting practice; these are the only medical appointments open to British candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £730, and private practice. There are also two assistant surgeons with a salary of £600 for 3 years and thereafter £650–£25–£700 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £550 per annum, fees estimated at about £27 a year, and £30 horse allowance. The assistant colonial surgeon at present receives £500 a year and £30 horse allowance. Private practice is allowed, and such practice, together with the duties of non-Government appointments, is divided between the colonial surgeon and the assistant colonial surgeon in a proportion approved by the Governor. The value of private practice and appointments is estimated at about £530 a year.

Falkland Islands.—There are two appointments. The colonial surgeon is paid at the rate of £800 per annum, with free furnished quarters, and £200 in lieu of private practice. The assistant colonial surgeon is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters, and is allowed private practice. The office of colonial surgeon is pensionable.

Palestine.[1]—The grades and salaries of higher appointments in the Department of Health are: Director, £P.1200, plus £P.200 expatriation allowance. Deputy Director, £P.900–50–£P.1100, plus £P.150 expatriation allowance. Assistant Director (Laboratories), Specialist Surgeon,[2] and five Senior Medical Officers, £P.750–25–950, plus £P.100 expatriation allowance. One Senior Medical Officer and Government Analyst, £P.550–25–750, plus £P.100 expatriation allowance. The remainder of the staff is recruited locally. A temporary and variable cost-of-living allowance is at present payable in addition to the salaries stated above.

Iraq.—The grades and salaries of the principal appointments in the Department of Health are: Inspector-General of Health, Rs.1800–100–2800 a month; Health Specialists, Directors of Hospitals and Institutes, Chief Medical Officers in Mosul and Kirkuk, Medical Officers of Health in Baghdad and Basra, Rs.1500–75–1800–100–2300 a month; Medical Officers, Rs.1200–75–1800 a month. Posts in the service of the Government of Iraq are not pensionable. Every officer (unless serving on a 3 years' contract) is required to contribute one-twelfth of his pay to a provident fund, to which the Government makes a contribution equal to one-sixth of his pay.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa. The normal tour of service is 20 to 30 months (less in Somaliland) after which leave is granted with full salary for 2½ to 3½ days, according to the districts in which the officer has served, for each month of service, plus the period of the voyage to England. If the officer is returning to East Africa for further service, he receives a further similar amount of leave, plus the period of the voyage to East Africa. Extensions of leave with full salary are given in case of sickness or in the case of officers attending approved courses of instruction. In addition to the above, local leave may be granted up to 14 days a year. Officers serving in Northern Rhodesia are allowed four (or two) days' leave in respect of each month of service. Free first-class passages are provided for the officer on first appointment and on leave, and in certain cases assistance towards family passages is given.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Officers are provided with free passages on first appointment for themselves and their families (i.e., wife and children up to five persons, inclusive of the officer). Under temporary regulations at present in force, free return passages on leave to all officers (and their wives and their children under the age of 10) irrespective of salary. Improvements in the leave conditions of officers serving in Malaya are under consideration.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of three years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months[3] in any two years. British Guiana, Jamaica, and Trinidad officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, exclusive of the period of the voyages to and fro, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay may be taken in addition to six months' full-pay leave.

On first appointment an officer will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—East Africa.—Officers on the pensionable establishment may retire (or be retired by the Government) on attaining the age of 50 years; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-four hundred and eightieth of pensionable emoluments—i.e., salary and value of free quarters[4] in respect of each month's pensionable service—at the time of retirement, subject to an average of emoluments for the last three years before retirement instead of the actual emoluments at the time of retirement being taken as the basis for calculation in certain circumstances.

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[1] £P.1 = £1 sterling.

[2] A certain amount of private practice is allowed.

[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

Other Colonies.—In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

WEST AFRICAN MEDICAL STAFF.

Applicants for appointment as medical officers or medical officers of health in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government, and houses for the wives of junior medical officers are rarely available. Officers are not usually allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor. When an officer has obtained permission to be accompanied by his wife a grant of one-half the cost of his wife's passage to and from West Africa is made subject to certain conditions.

Candidates are allowed to express a preference for any particular Colony, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony at the discretion of the Secretary of State. Candidates who wish to be posted to Nigeria will probably find it useful to be able to ride. Transfers from one Colony to another will be made as seldom as possible. Candidates should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred.

Those transferred to pensionable Crown appointments elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies that this is unnecessary.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service within the above limits, the actual length of each officer's tour will be at the discretion of the Governor. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—Medical officers for the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £300 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Sanitary Service, Nigeria, and the Deputy Director of Sanitary Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Sanitary Service, Gold Coast, and the Assistant Director of Medical and Sanitary Services, Nigeria, receive salaries of £1400 a year, with duty allowances at the rate of £280 a year. Assistant Directors Medical Service: There are seven appointments on this grade, five in Nigeria, two in the Gold Coast. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Sanitary Service, Nigeria, the Deputy Director of Sanitary Service in the Gold Coast and the Deputy Director of Sanitary Service in Sierra Leone receive salary at the rate of £1300 a year, with duty allowance at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being eligible for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present five officers appointed specialists in Nigeria, three in the Gold Coast, and one in Sierra Leone. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Sanitary Officer: There are nine appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year. Possession of the Diploma in Public Health is usually required for appointment to this grade. Special facilities are granted to study for the diploma during leave. Medical Officers of Health: There are at present 24 appointments of this grade. The salary scale is the same as that of Medical Officers, except that Medical Officers of Health are granted an initial salary at the rate of £800 a year, together with seniority allowance at the rate of £72 a year and staff pay at the rate of £150 a year, half of which is payable during leave. After three years' service on the maximum of the scale, viz., £960 a year, and on undergoing an approved course of study, Medical Officers of Health are eligible, if unpromoted, subject to the recommendation of the Governor, to be placed on the scale £1000 a year rising by annual increments of £50 to £1150 a year, together with seniority allowance at the rate of £100 a year and staff pay as before. The holders of these appointments are not allowed private practice. Candidates selected for service as Medical Officers of Health must obtain the Diploma in Tropical Medicine and Hygiene of Cambridge, London, or Liverpool as a condition of appointment, or must be in possession of the Diploma in Public

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[4] The value of free quarters for pension purposes is taken as 15 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement, subject to a maximum of £150.

Health. They are appointed subject to the condition that, if after a period of service in West Africa they are considered unsuitable to serve in that capacity, they may be called upon to transfer to the medical side. In such cases the officers are given the rate of salary which they would have reached if they had been appointed to be Medical Officers instead of Medical Officers of Health in the first instance. Medical Officer: The salary attached to this grade is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £73 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year.

A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The Director of the Medical Research Institute, Lagos, and the Director of the Medical Research Institute, Accra, receive a salary of £1300 a year, with a duty allowance of £200 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. There are a number of appointments for pathologists and bacteriologists in Nigeria, the Gold Coast, and Sierra Leone. The salary and other conditions attached to these posts are similar to those of Medical Officers of Health. Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of an officer during the period of employment qualifying for increment is approved.

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, medical officers of health, research officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at many stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement are granted in accordance with the law and regulations of each individual Colony.

African Medical Officers.—In addition to the membership of the West African Medical Staff, which is limited to British subjects of European parentage, there are a number of Government appointments for African medical officers in the West African Colonies. These appointments carry a salary on the scale £500–20–£600, and there is a higher scale, £600–30–£720. In addition, in Nigeria and on the Gold Coast, arrangements have been made for the employment of a few young African medical men temporarily on the hospital staffs, with a view to appointment to the Government service later, if suitable. In such cases a salary of £400 a year is paid.

SUDAN MEDICAL SERVICE.

This Service is responsible for carrying out civil, medical, and public health duties in the Sudan.

The staff consists of: (*a*) A Director, pay £1500–£2000. (*b*) A Senior Physician and a Senior Surgeon to the Khartoum and Omdurman Civil Hospitals, each with a pay of £1200–£1750. (*c*) An Assistant Director. (*d*) Medical Officer of Health, Khartoum Province, at a special rate of pay. (*e*) 31 British "Senior Medical Inspectors" and "Medical Inspectors" whose pay commences at £720 and rises, subject to the recommendation of the Director, by five biennial increases to £1080, and after 13 years' service to £1200. The Senior Medical Inspectors are eligible, by selection, for the four senior posts. All Medical Inspectors are appointed, in the first place, on probation for two years, and if at the end of that time they are accepted for permanent service under the Sudan Government, the first increase of pay is subject to their passing an examination in Arabic.

In addition to the above there are (*f*) a number of Medical Officers trained at one of the Syrian Medical Schools, besides (*g*) Sudanese Medical Officers trained at the School of Medicine at Khartoum. There are several native (*h*) Assistant Medical Officers, who have been given a purely practical training in one of the larger hospitals in the Sudan.

Amongst the attractions of the Service are: The great variety of the work met with among many different races of the Sudan; *leave* of 90 days, which is granted every year after the first 18 months of service; *study-leave*, which may be given for some definite purpose, whilst two years towards pensionable service may be granted to those who have special qualifications and experience. The pension for Medical Inspectors who retire after 20 years' service is not less than £E.500 a year. If, however, he serves for a longer period, or is appointed to one of the higher posts, he will receive a larger pension. Private practice is allowed, but is limited to a few of the larger towns, and may be carried on so long as it does not interfere, in any way, with official duties. These duties include acting as consultant to the principal hospitals and the supervision of medical and public health work, the inspection of schools, the examination of candidates for Government service and pension, and the training of Assistant Medical Officers and native Sanitary Overseers. The Khartoum Medical School is staffed mainly by members of the Medical Service, who receive additional remuneration for their work as teachers. A Registrar of the Medical School is also selected from the Service, who receives £250 a year extra pay.

The country is developing rapidly, and the Medical Department is being increased to meet its growing requirements. Vacancies are always advertised in THE LANCET as they occur.

Candidates must be single and should be under 30 years of age, and they must have held a resident post, preferably that of house surgeon, in a large general hospital. As a rule they are required to take out a course in Tropical Medicine before they leave England for the Sudan. The fees for this course are paid by the Sudan Government, and in addition an allowance £.E.25 per month is made, under certain conditions, to each selected candidate who attends it.

Inquiries for further information should be made to Dr. Hodson, 24, Welbeck-street, London, W.1, or to the Deans of the Principal Medical Schools.

WOMEN'S MEDICAL SERVICE FOR INDIA.

AMONG careers open to medical women abroad the Women's Medical Service for India deserves honourable mention. This service is open to fully qualified medical women of British or Indian nationality, and with the present amount of Government subsidy the number of medical officers is limited to 42. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are as follows:—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1*s.* 4*d.*

Furnished quarters are provided, representing an additional Rs.150 per mensem.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent., which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Lt.-Col. Sir Leonard Rogers, India Office, Whitehall, London.

GUILD OF ST. LUKE.

THE Guild of St. Luke was founded over 60 years ago by a few medical students, chiefly to meet their own religious needs. It now makes a wider appeal, and its membership is open to all students and practitioners of medicine, both men and women, who are members of the Church of England, the clergy of which are eligible as Clerical Associates. The Chapter meets in every month of each term, and a festival service is held yearly at St. Luke's tide, usually at St. Paul's or Westminster Abbey. This year the service will be at the Abbey. Besides the parent Guild, there are a Women's Ward and a Hospital Student's Branch in London. There are also a Midland Counties Ward and a Cambridge Ward. Particulars of the objects and activities of the Guild and forms of application for membership can be obtained from the Secretary of the Guild of St. Luke, King's College, Strand, W.C.2.

SPECIAL DIPLOMAS.

DIPLOMA IN TROPICAL MEDICINE.

ALTHOUGH a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, London, W.C.; while the Universities of Cambridge, London, Edinburgh, and the English Conjoint Board grant the diploma.

London School of Hygiene and Tropical Medicine.—The courses of study in all branches of the work of the School will commence in October in the new premises in Keppel-street (Gower-street), the gift of the Rockefeller Foundation, which has excellent laboratories and research rooms, a fine lecture theatre and classrooms, library, and museum.

The courses of study in Tropical Medicine and Hygiene which have hitherto been given at Endsleigh Gardens will be given in the new building. There are two courses in the year, each lasting 20 weeks, inclusive of examinations. The dates for the commencement of the next courses are Sept. 30th, 1929, and Feb. 3rd, 1930. The course covers the work required for the D.T.M. & H. (England), and part of that required for the M.D. in Tropical Medicine of the University of London.

The first course of study for the Diploma in Public Health will commence on Sept. 30th, and will extend over a period of 12 calendar months. It is arranged in compliance with the requirements of the General Medical Council, and students taking the course will be able, should they so desire, to proceed to the new academic Diploma in Public Health of London University. The curriculum has been planned on very practical lines, and includes, in addition to work with Medical Officers of Health in two selected areas, a large number of visits to places of public health interest. A series of 5 o'clock lectures will be given by eminent authorities on special subjects, and these lectures will be open to members of the medical profession as well as to students of the School. The London County Council, the City of London, and various other bodies have placed their resources at the disposal of the School for teaching purposes.

The special course of study for the Diploma in Bacteriology covers a period of one academic year, beginning in October, and special three-monthly courses are given in Epidemiology and Vital Statistics.

University of Liverpool.—The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (*a*) Parasitology and Tropical Pathology. (*b*) Entomology. (*c*) Tropical Medicine, including Ætiology, Symptoms, Diagnosis and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. Applications should be made to the Dean of the Medical Faculty, University of Liverpool.

The University also grants a diploma in Tropical Hygiene (D.T.H.). The subjects of examination are (*a*) Tropical Hygiene (including Sanitary Engineering, Vital Statistics and Epidemiology and Applied Parasitology and Entomology). (*b*) Practical Sanitation. (*c*) Bacteriology. (*d*) Chemistry (including Meteorology and Climatology). Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

University of Cambridge.—The examination for the Diploma in Tropical Medicine and Hygiene is divided into two parts. Part I. is held in Cambridge in April and Part II. in July in London. Candidates for Part I. are examined under the same regulations and in the same subjects as candidates for the Diploma in Public Health, but any qualification in medicine or surgery recognised by the proper authority of any country outside the British Dominions may be recognised. The subjects for Part II. are Medicine, Surgery, and Hygiene in their relation to Tropical Disease.

The examination will be partly in writing, partly oral, and partly practical or clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment). Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma (D.T.M. & H.) testifying to his knowledge and skill in tropical medicine and hygiene.

Further information respecting the courses of study and examinations may be obtained from Mr. J. E. Purvis, Public Health Chemical Laboratory, Cambridge.

University of Edinburgh.—Candidates for the Diploma in Tropical Medicine and Hygiene must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. The course of instruction, comprising a primary and a second course, is given during the autumn and spring terms, October to March, and includes Tropical Hygiene, Bacteriology, Entomology and Parasitology, Diseases of Tropical Climates (systematic and clinical), Tuberculosis, and Venereal Diseases. The primary course alone is also given during the summer term, April to June. Provision is made in the University for instruction in all subjects. The examinations are written, oral, and practical, and are held at the end of the courses. Candidates are required on the first occasion of presenting themselves for examination to appear for all the subjects. Candidates who fail to pass the entire examination within a period of 12 months after first appearance are required to reappear for all the subjects. The University is included in the list of Institutions whose courses of instruction in Tropical Medicine may be taken by officers on appointment to the Colonial Medical Services or during study-leave. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The diploma of D.T.M. & H. Eng. is awarded on the results of an examination held twice yearly, in March and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than five months; (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Further particulars from the Secretary, Examination Hall, Queen-square, London, W.C.1.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

The Universities of Cambridge, London, Durham, Leeds, Manchester, Edinburgh, Dublin, National University of Ireland, and the Conjoint Board of the R.C.P. Lond. and R.C.S.Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given annually at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, commencing in January, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge. The parts may be taken separately; also during the year there are other short courses, lectures and demonstrations in psychological medicine.

Maudsley Hospital.—Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. Inquiries as to lectures should be addressed to the Director of the Central Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E.; and as to clinical facilities, to the Medical Superintendent at the same address.

Bethlem Royal Hospital.—A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various universities and the Conjoint Board, is held at Bethlem Royal Hospital, London, S.E., twice annually, during the spring and autumn. The fee for the full course is 15 guineas. Part A or Part B, however, may be taken separately at a fee of 10 guineas per part. In addition to the above, clinical instruction in Psychological Medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. The fee for students is 3 guineas for a period of three months' attendance and for post-graduates a fee of 5 guineas for a like period. A reduction is made to those who attend the Diploma Course. House physicians are appointed at Bethlem Royal Hospital for a term of six months, which may be extended. These appointments are made on May 1st and Nov. 1st in each year and the vacancies are advertised in the medical papers. Apartments, complete board, attendance, and laundry are provided and also a salary at the rate of £100 per annum. Clinical assistants are often appointed from time to time for periods of three months or longer. These are non-salaried and non-resident posts, but partial board is provided. The Physician-Superintendent, Bethlem Royal Hospital, London, S.E., will supply further particulars.

University of Edinburgh.—Candidates for the Diploma in Psychiatry must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualifications of some other licensing body. Candidates are required subsequent to the date of graduation or obtaining a registrable qualification to have held (*a*) a resident appointment for one year in a hospital for mental disorders approved by the Faculty of Medicine, or alternatively (*b*) a six months' appointment as defined in (*a*) and six months' practical study of nervous diseases in a special or general hospital approved by the Faculty of Medicine. There are two examinations for the Diploma. Part I. comprises 1. Anatomy of the Nervous System. 2. Physiology of the Nervous System. 3. Psychology and Experimental Psychology. Part II. comprises: 1. Neuropathology. 2. Clinical Psychiatry. 3. Clinical Neurology. 4. An additional subject selected by the candidate from a prescribed list. The examinations are held twice yearly in March and July. Candidates who have held an asylum appointment for a period of five years or more may be exempted from the course of study in one or more subjects of the curriculum. Full particulars can be obtained from the Dean of the Faculty of Medicine.

Dublin University.—A post-graduate diploma in Psychological Medicine is conferred upon registered medical practitioners who have held a resident medical appointment at a recognised institution for the treatment of Mental Diseases for 12 months, or who have held such an appointment for six months and have attended clinical instruction at an approved institution for six months. Candidates must also attend special courses of instruction and pass a special examination. Details can be obtained from the Registrar of the School of Physic, Trinity College, Dublin.

The National University of Ireland confers a diploma in Mental Diseases ; application should be made to the Registrars of the Constituent Colleges, University College, Dublin University College, Cork, and University College, Galway, for all information.

DIPLOMA IN OPHTHALMIC MEDICINE.

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.—The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in March, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in February and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable diploma or a Degree in Medicine and Surgery of a University recognised by the Board.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

University of Cambridge.—The D.M.R.E. is open only to those who have held for at least one year a medical qualification approved by the Committee. The new regulations, which came into operation in October, 1928, in some respects materially alter the scope of the Diploma. The course now occupies nine months, beginning in October. The first three months, which can be spent either in Cambridge or in London, are occupied with lectures and practical work in Physics in preparation for the examination for Part I. in January, and an introductory course in Radiology and Electrology. The second three months must be spent in London. The course includes lectures and clinical instruction in Radiology and Electrology, with clinical practice in the radiological department of a hospital approved for that purpose by the Committee. The examination for Part II. is held in April. During the final three months a candidate must hold a clinical clerkship or similar appointment in a radiological department approved by the Committee, and must then present a thesis in the form of a critical report with notes upon six cases either in Radiology or in Electrology or in both these subjects, illustrating various methods of diagnosis or treatment. A number of large provincial hospitals have been approved by the Committee to take clinical assistants for this part of the course.

Further particulars as to courses and examinations may be obtained from G. Stead, M.A., Cavendish Laboratory, Cambridge, Secretary for the Diploma, or from Dr. A. E. Barclay, Department of Radiology, Medical School, Cambridge, or from Dr. Stanley Melville, British Institute of Radiology, 32, Welbeck-street, London, W. 1.

University of Liverpool.—Candidates before admission to the examination for this diploma must possess a registrable qualification, approved by the University in medicine and surgery, and must have attended courses of instruction in (*a*) physics (two terms), (*b*) (*i*) radiology, and (*ii*) electrology during six months in the X ray and electrotherapeutic departments of a hospital or hospitals. An examination is held in March each year, the subjects being (*a*) physics, (*b*) radiology and electrology. Examination in either part may be taken separately. Fees: tuition, £24 5s.; examination and diploma, £6 5s. These courses commence during the first week in October. Application should be made to the Dean, Faculty of Medicine, the University of Liverpool.

University of Edinburgh.—Candidates for the Diploma in Radiology (D.R. Univ. Edin.) must be graduates in medicine and surgery of the University of Edinburgh or hold corresponding registrable degrees or qualification from some other licensing body. Candidates are not admitted to the examination for the Diploma until after the lapse of not less than one year from obtaining a registrable qualification, which qualification must be registered before admission to the Examination. The course of study begins in October and extends over a period of not less than three terms. The Examination, which is written, oral, and practical, is in two parts: (*a*) Physics, and (*b*) Radiology. The Examination is held twice yearly —viz., July and October.

Radiology can be taken as the special subject in the examination for Membership of the Royal College of Physicians of Edinburgh, which means that an Honours standard has to be attained. Full particulars may be obtained from the Dean of the Faculty of Medicine.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

The Conjoint Board R.C.P. Lond., R.C.S. Eng., grants the D.L.O. after an examination held in two parts, twice yearly, in June and December. Part I. comprises anatomy, embryology, and physiology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus. Part II. comprises the medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea and bronchi, and œsophagus, and the recognition and use of special instruments and appliances. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of one year of special study of the diseases of the ear, nose, pharynx, and larynx, after obtaining a registrable qualification, or a degree in medicine and surgery of a University recognised by the Board. The fee for admission to each part is 6 guineas.

DIPLOMA IN TUBERCULOUS DISEASES.

A Diploma in Tuberculous Diseases is given by the University of Wales. The regulations governing the award of the diploma prescribe that every candidate must have obtained a registrable qualification in Medicine, Surgery, and Midwifery for at least two years before he can be admitted to the examination. He must have held, for not less than 12 months, a resident medical or surgical appointment on the staff of a Tuberculosis Hospital or Sanatorium, or at an Orthopædic Institution providing not less than one hundred beds for cases of surgical tuberculosis. A candidate whose resident appointment has been held at a Hospital, Sanatorium, or Institution receiving surgical cases of tuberculosis only, must produce a certificate of having attended a course of instruction in pulmonary tuberculosis extending over one term in the Welsh National School of Medicine, or an equivalent course of instruction extending over at least the same period in an institution approved by the University for this purpose. A candidate whose resident appointment has been held at a Hospital, Sanatorium, or Institution for medical cases of tuberculosis only, must produce a certificate of having attended a course of instruction in non-pulmonary tuberculosis extending over one term in the Welsh National School of Medicine, or an equivalent course of instruction extending over at least the same period in an institution approved by the University for this purpose. Every candidate must have pursued a course of instruction in the epidemiology, pathology, and bacteriology of tuberculosis extending over one term in the Welsh National School of Medicine, or an equivalent course of instruction extending over at least the same period in an institution approved by the University for this purpose. The examination, which is held annually in the first week of June, is divided into two parts, and every candidate is required to satisfy the examiners in both parts at the same examination. Notice of candidature, together with the entrance fee of £10 10s., and the necessary certificates, must be forwarded to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 1st.

The Cecil Prosser Research Scholarship, of the value of £250 for one year, is awarded triennially for research in Tuberculosis.

DIPLOMA IN PUBLIC HEALTH.

THE following epitomises the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council. The diploma is registrable by the Council, whose rules on the curriculum become binding on the educational bodies concerned. The new regulations, which came into force in 1924, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

Conjoint Board of the R.C.P. Lond. and R.C.S. Eng. New regulations came into force on Jan. 1st, 1924, which apply to all candidates who have not commenced recognised study of Public Health in accordance with the above regulations before that date. They are as follows: The Examination consists of two Parts. Part I. will be held in the months of January, June, and October, and Part II. in the months of January, June, and October in each year. Candidates may enter for Parts I. and II. separately or at the same time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious Diseases, Food Inspection, and Inspection of selected Premises. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next Examination on payment of the same fees. Candidates intending to present themselves for either part of the Examination must give 14 days' notice in writing to the Secretary, at the Examination Hall, Queen-square, London, W.C. 1.

Candidates will be admissible to Examination in Part I. on producing evidence:—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended during a period of not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (*a*) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (*b*) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical laboratory work. (*c*) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence:—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects:—(*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours.

3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. The certificate must state that the candidate has attended on one or more days in each week of the three months, that each attendance was of two hours' duration, with a total attendance of 60 hours.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for children of school age, (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food; including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—The examinations for Diplomas in Public Health have been suspended until further notice.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) Part I. of the examination; or (2) Part II. of the examination. Candidates must before admission to either part of the examination produce evidence of having satisfied the regulations applicable to Part I. and Part II. The examination for Part I. is in April and for Part II. in October.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene, Chemistry, &c., and on Bacteriology and Parasitology. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital; and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also courses by special lecturers in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England. The courses and examinations are the same as for the Diploma in Public Health (except that the candidates are not examined in English Sanitary Laws).

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—Candidates for the M.D. Degree may offer State Medicine as a subject in which to graduate. The regulations have been revised and may be obtained on application to the Academic Registrar, University of London, South Kensington.

University of Durham.—The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University whose degrees are registrable on the books of the General Medical Council of the United Kingdom, and no candidate is admitted to the final examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a qualification registrable by the General Medical Council of the United Kingdom. Candidates for the B.Hy. must attend this course at the University of Durham; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or institution which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate must pass in all the subjects of Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects: Bacteriology and Parasitology (including medical entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (comprising sanitary construction), Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof. Doctor of Hygiene (D.Hy.): Candidates must be Bachelors of Hygiene of the University of two years' standing, and are required to satisfy the examiners that they have conducted original research in the subject of Public Health.

University of Birmingham.—Under the rules and regulations of the General Medical Council the University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. A Thesis on the Ætiology and Prevention of a Disease of which the candidate has made a special study must be submitted on entry for B.Sc. Part II. The examinations will be held in the months of March and October, and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5*s*. Medical Officers of the Royal Navy who have attended the required course of study at the Naval Medical School, Greenwich, will be admitted to Part I. examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied at the Staff College. Medical Officers of the Navy and Army are admitted to Part II. Examination (D.P.H.) on complying with the requirements laid down for attendance upon Courses of Study. These Courses need not necessarily be attended in the University of Birmingham.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken at any time, and students are allowed to work daily in the laboratories.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Instruction in Entomology and Meteorology is given in the first term, and in Sanitary Chemistry and Bacteriology in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Academic Sub-Dean of the Medical School.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulations, which can be obtained from the Registrar upon application.

University of Wales.—Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months subsequent to the attainment of a registrable qualification, must produce evidence of having attended for not less than five months at the Welsh National School of Medicine or at an institution approved by the Court, practical instruction in Bacteriology and Parasitology, Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must also produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of Part I. before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written and oral, and comprises

Bacteriology and Parasitology (including Medical Entomology); Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, comprises: Hygiene and Sanitation (including Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered before admission to Part II. of the examination. An examination in each part will be held annually. The examination in Part I. will be held in June, that in Part II. in October. Full information from the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th for the examination in Part I. and not later than Sept. 1st for the examination in Part II.

University of Edinburgh.—Candidates for the Diploma in Public Health must be graduates in medicine and surgery of the University, or hold corresponding degrees or registrable medical qualifications which must be registered before admission to examination. The course is divided into two parts for which examinations are held twice yearly, in March and July for Part I., and in October and March for Part II. In each part the candidate must pass in all the specified subjects at one examination. Candidates are not admitted to Part II. until they have passed Part I., nor until after the lapse of not less than two years from the date of obtaining a registrable medical qualification. The subjects of the examination are: Part I. (written, oral, and practical), Bacteriology; Medical Entomology and Parasitology; Chemistry, Physics, Meteorology, and Climatology. Part II. (written, oral, and practical), Hygiene, Sanitation, and Sanitary Construction; Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. There is also included practical examinations in Infectious Diseases, Food Inspection, and Inspection of Premises. The course, which extends over a period of 12 calendar months, begins in October, and provision is made by the University for instruction in all the subjects. Detailed particulars may be obtained from the Dean of the Faculty of Medicine.

University of Aberdeen.—Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months. At least one academic term must be spent at the University of Aberdeen. Every candidate shall produce evidence of having complied with the following requirements in respect of study and training:—1. Practical instruction in the following subjects within a laboratory or laboratories approved by the University: (*a*) Bacteriology and Parasitology (including Medical Entomology), in relation to diseases of man and diseases of lower animals transmissible to man—at least 180 hours, of which not less than 150 shall be occupied in practical laboratory work; (*b*) Chemistry and Physics, in relation to Public Health—at least 90 hours, of which not less than 70 shall be occupied in practical laboratory work; (*c*) Meteorology and Climatology, in relation to Public Health—at least 10 hours; such instruction to extend over not less than five months or two academic terms. 2. A course or courses of instruction extending over not less than 80 hours dealing with: (*a*) The Principles of Public Health and Sanitation—30 hours; (*b*) Epidemiology and Vital Statistics—20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services)—20 hours; (*d*) Sanitary Construction and Planning—10 hours; such course or courses to be given at an institution or by a teacher or teachers approved by the University. 3. Practical instruction, clinical and administrative, within a recognised hospital for general infectious diseases; such instruction to extend over three months, and to include 30 daily attendances of not less than two hours in each week. 4. Practical instruction and experience, during not less than six months (including attendance of at least three hours on each of sixty working days) in the duties, routine and special, of public health administration, under the supervision of a medical officer of health, who shall certify that the candidate has received from this officer or other competent medical officer, practical instruction in these duties, and also in those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The medical officers of health recognised for this purpose by the General Medical Council are: (*a*) a medical officer of health who devotes his whole time to public health work; or (*b*) the medical officer of health of a sanitary area having a population of not less than 50,000; or (*c*) in Ireland, the medical superintendent officer of health of a county or county borough having a population of not less than 50,000. The examination for the diploma is divided into two parts, each of which extends over not less than three days.

University of Glasgow.—Degree of B.Sc. in Public Health.—Candidates must be graduates in Medicine of a University of the United Kingdom, or of some other University recognised for the purpose by the University Court. Candidates must produce evidence (1) that, after they have obtained a registrable Degree in Medicine, a period of not less than two years has elapsed; (2) that, after they have obtained a registrable degree in Medicine, they have, during a period of not less than 21 calendar months, pursued the course of work and instruction prescribed, and have satisfied the examiners in the prescribed examinations. There are two examinations. Part I. includes the following subjects: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health; (iv) Higher Chemistry in relation to Public Health; (v) Physics and Geology. A candidate must pass in the subjects marked (i), (ii), and (iii) of Part I. at one examination. Part II. includes the following subjects: (vi) Hygiene and Sanitation (including Sanitary construction); (vii) Epidemiology and Infectious Diseases; (viii) Sanitary Law and Vital Statistics; (ix) Public Health Administration; (x) Applied Hygiene. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene may be on a selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.—The Diploma in Public Health is open to those who hold a registered medical qualification of the United Kingdom. The examination is in two parts. (1) (*a*) Bacteriology and Parasitology; (*b*) Chemistry and Physics; (*c*) Meteorology and Climatology. (2) Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. Before admission to the first examination the candidate must have held his medical qualification for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part or all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but holders of other registered medical qualifications must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in the Conjoint Medical School, Dundee. The examination fee for each division is £5 5*s*.

University of Dublin (Trinity College).—The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, five months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: the principles of public health and sanitation, epidemiology and vital statistics, sanitary law and administration (including public medical services), sanitary construction and planning; must have studied, practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The first part of the examination will have reference to the general principles of Sanitary Science and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The examination in both parts is held twice a year, in March and June.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. The examination is divided into two parts. For Part I. the candidate must produce evidence of having received during a period of not less than five months at an institution recognised by the Board practical instruction in: (*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work; (*b*) Chemistry and Physics in relation to Public Health during 90 hours, of which not less than 70 hours has been occupied in practical laboratory work; (*c*) Meteorology and Climatology in relation to Public Health during not less than 10 hours. For Part II. evidence must be given of having received instruction during not less than 80 hours in: (*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours; of having attended for three months the clinical practice of a recognised hospital for infectious diseases; and of having been engaged during a period of not less than six months in acquiring a knowledge of Public Health administration in addition to practical instruction in the duties relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 6 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in March in Glasgow, and October in Edinburgh. The published regulations provide detailed synopses of the subjects of examination. The Registrar for Edinburgh is Dr. David Thomson, 49, George-square, and for Glasgow, Mr. Walter Hurst, 242, St. Vincent-street.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must observe the following rules: 1. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery, and his admission to the Final Examination for a Diploma in Public Health. 2. The curriculum for a Diploma in Public Health shall extend over a period of not less than 12 calendar months subsequent to the attainment of a registrable qualification. 3. Every candidate shall produce evidence of having attended, during a period of not less than five months, at an institution approved by the Licensing Body granting the Diploma, practical instruction in—(*a*) Bacteriology and Parasitology (*including Medical Entomology*), *especially* in their relation to diseases of man, and to those diseases of the lower animals which are transmissible to man; (*b*) Chemistry and Physics in relation to Public Health; (*c*) Meteorology and Climatology in relation to Public Health. At least 180 hours must be devoted to Course (*a*), of which not less than 150 hours shall be occupied in practical Laboratory work. At least 90 hours must be devoted to Course (*b*), of which not less than 70 hours shall be occupied in practical Laboratory work. At least 10 hours must be devoted to Course (*c*). 4. Evidence of having received, during not less than 80 hours, at an institution or from teachers approved by the Licensing Body granting the Diploma, instruction in the following subjects: (*a*) The Principles of Public Health and Sanitation; (*b*) Epidemiology and Vital Statistics; (*c*) Sanitary Law and Administration (including Public Medical Services); (*d*) Sanitary Construction and Planning. 5. Evidence that he has attended for three months on the clinical practice of a recognised Hospital for Infectious Diseases. 6. Evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health. The examination for the Diploma is divided into two parts. The examination for Part I. includes Bacteriology and Parasitology (with Medical Entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. The examination for Part II. includes Hygiene and Sanitation (with Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination, which is written and oral, includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises—dwellings, factories, workshops, and schools.

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are *approved by the Secretary of State for the Home* Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. In the smaller prisons the medical officership is part-time, and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £000, making the pay at present with bonus £485 8*s*. to £770 7*s*.; Medical Officer, Class I., £050, rising by annual increments of £25 to £800, plus bonus, making the pay £837 5*s*. to £905 11*s*. Unfurnished quarters are provided or an allowance *in lieu is made*. *Study-leave is granted* annually to two of the whole-time Medical Officers. There are 12 full-time medical officers of Class I. and 15 Class II., and 23 part-time medical officers. The number of vacancies is never large and promotion is slow.

DENTAL SURGERY.

REGISTRATION on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma, and, until registered on the Dentist Register, no dental work under the Additional Benefit Scheme of the National Health Insurance Act can be undertaken.

The Examining Bodies in Dentistry which grant degrees and diplomas in the subject are as follows: Royal College of Surgeons of England, Royal College of Surgeons, Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Royal College of Surgeons in Ireland, and the following Universities: Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, St. Andrews, Dublin (Trinity College), Queen's University of Belfast, and the National University of Ireland. The respective *requirements of the various examining bodies in* dentistry are very similar, being designed to meet the requirements of the General Medical Council, but the examinations vary in stringency, and each school has its rules for matriculation and exemption, and its scale of fees. The student should apply to the secretaries of the various Conjoint Boards or to the Deans of the medical faculties or medical schools for a syllabus.

TEACHING INSTITUTIONS IN DENTISTRY: LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London. Women are admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the University of London for the B.D.S. Degree and the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. *Pupils are received for* the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for four months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £25. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25. Prizes and certificates are awarded by the lecturers for the best *examinations* in the subjects of their respective courses at the end of the summer and winter sessions. For full information as to scholarships and prizes, and other matters connected with the course, application should be made to the Dean.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the *National Dental Hospital*, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. A prospectus containing full information as to lectures, fees, and prizes may be had on application to the Sub-Dean for Dental Students, who attends at University College Hospital Medical School, University street, W.C.1, on Wednesday mornings from 9.30 to 10.30, and at other times by appointment.

Guy's Hospital Dental School.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for both general and local anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrators, the dental house surgeons, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. There is a separate room for denture patients affording accommodation for 15 chairs and a separate department for children with accommodation for 20 chairs. The Members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators, a house surgeon, and five mechanics.

Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. Students who enter for a medical as well as a dental course are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge.

Twelve house surgeons, 20 assistant house surgeons, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, dresser in the children's department, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and local anæsthetic extraction rooms, and probationary dresser. For particulars as to scholarships and prizes, as well as all information, application should be made to the Dean of the Medical School, Guy's Hospital, London Bridge, S.E. 1.

King's College Hospital.—The Dental School is part of the Medical School of King's College Hospital, and was opened in November, 1923. The Dental Out-patient Department of the Hospital is used for the performance of dental extractions. A large Conservation Room with provision for 40 dental chairs has been equipped. Smaller rooms are used for clinical teaching and administrative requirements, and a specially equipped laboratory for training in the art of dental mechanics. An X ray apparatus has been installed for special use in dental skiagraphy. A museum containing a large number of specimens illustrating oral, buccal, dental, and other diseases is available for teaching purposes. The library, lecture theatre, lecture rooms, common rooms, and the refreshment room are all available for the use of students. Courses of study, including practical work, are provided for the degree of Bachelor of Dental Surgery of the University of London, and for the Diploma in Dental Surgery of the Royal College of Surgeons of England. Special arrangements are made for those students who wish to take a medical degree or qualification in addition to a degree or diploma in Dental Surgery.

The following salaried appointments are open to qualified members of the School: Registrar, Resident House Surgeon, Non-Resident House Surgeon, and Tutors in Dental Mechanics, Orthodontics, and Dental Materia Medica.

Full particulars of the Dental School may be obtained on application to the Dean, or to the Secretary of the Medical School, King's College Hospital, Denmark Hill, London, S.E.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses, in addition to the Theatres, Laboratories, and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Metallurgy and Prosthesis. A systematic course of instruction is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean of the Medical School.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students for the study of dentistry and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women. The Eastman Dental Clinic will, when completed, provide a Dental School for women students; in the meantime the course for dental students is arranged in conjunction with the Royal Dental Hospital.

TEACHING INSTITUTIONS OUTSIDE LONDON.

Birmingham Dental Hospital, Great Charles-street.—Dean: Cyril Howkins, O.B.E., D.S.O., M.R.C.S., L.D.S. The Dental Hospital has accommodation for 100 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery, including Radiology and Ultra-Violet Ray Therapy and a new department for Practical Pathology and Bacteriology. The operations performed annually average 35,000, including gold and other fillings, crowns, bridges, porcelain inlays, and injections for block and infiltration anæsthesia. The orthodontic department is one of the foremost in the country. The Prosthetic and Mechanical Department is large and well lighted and under a highly skilled instructor who is always present. Application for information as to fees and scholarships must be sent to the Dean of the Medical Faculty, Birmingham University, or the Dean of the Dental Hospital, Birmingham.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. It forms a part of the Leeds School of Medicine whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital. The School is now in occupation of a spacious new building especially designed to the requirements of modern dental teaching. The School is also the dental department of the General Infirmary, and its close association with the work of that institution ensures an adequate supply of clinical material, and enables a fuller insight into the position dental surgery holds in relation to general medicine and surgery, especially with regard to the major diseases and injuries of the head and neck. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery, prosthetic dentistry, and mechanics, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia, Dental Radiography, Local and General Anæsthetics. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. *Clinical instruction is given* in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon is also in attendance. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from Mr. James Coltman, 18, Ellison-place, Newcastle-upon-Tyne, Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers.

SCOTTISH TEACHING INSTITUTIONS.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. A large and important extension of the existing buildings has now been opened. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, Radiology, Anæsthetics, and Dental Materia Medica. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extra-mural schools where special provision is made for Dental Students. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital. Clinical Medicine (three months) and Clinical Surgery (six months) are taken at the Royal Infirmary.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their Second Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

Births, Marriages, and Deaths.

BIRTHS.

McELLIGOTT.—On August 9th, at "Namona," Arnos-grove, Southgate, N.14, the wife of Dr. E. T. McElligott, of a son.

MARRIAGES.

JAUCH—IRMLER.—On August 28th, 1929, in London, F. Jocelin Jauch, M.B., B.S., F.R.C.S., to Irma C. J. Irmler.

PARKER TUPLING—SEDGLEY.—On August 1st, at St. Stephen's, Dulwich, Leslie Parker Tupling, M.R.C.S., L.R.C.P., to Daphne, youngest daughter of Mr. and Mrs. Ernest Sedgley, of Dulwich.

DEATHS.

BELL.—On August 21st, at 18, Ullet-road, Liverpool, as the result of an accident, Florence (Fon), the loved wife of Professor W. Blair Bell.

N.B.—A fee of 1s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 389.)

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY.

THE PLACE OF HUMAN PHYSIOLOGY IN THE TRAINING OF MEDICAL STUDENTS.

Opening Address.

WITH Prof. J. A. MILROY (Belfast) in the chair, a discusssion on this subject was opened by Prof. F. R. FRASER (London), who said there could be no better definition of the human physiology of to-day than that given by Haldane in 1916: "A new physiology which teaches what health really means, and how it maintains itself under the ordinarily varying conditions of the environment." This in turn depended on a definition of "health" and an appreciation of "the normal." For these human physiology must largely concern itself with the interaction of systems, therein differing from most animal physiology which was analytical. To-day a physician should ask to what extent and in what directions his patient's adjustments to his environment were disturbed, and when he found the cause of the maladjustment, if it be not removable, he helped the sufferer back to normality. Text-books of medicine gave a very false impression of its practice. "That awful word syndrome" dominated them, and pigeon-holing was emphatically not the best practice of medicine. The need of study of the individual as a whole rather than analytically had become increasingly apparent during the war.

Human physiology should be taught to the student before he came to the wards, partly because clinicians, though improving in this respect, were still rather inclined to ignore it. On the other hand, it was difficult for the student to understand man's adjustments and reactions until under the guidance of the clinician he saw the breakdown. The institution or addition of a course of human physiology in the final year of the medical curriculum had this objection, that it suggested that the lessons were something different and apart from the practice of medicine, and that the whole subject of physiology could be taught in the wards. As regards the physiology of the pre-clinical years, it must be remembered that these were years of scientific education, and that courses should not be altered to the detriment of their value as scientific training. Certainly the clinician could never take it all over; he had already too much to do. The physiologist must anticipate the clinician, and the clinician try to follow the lines of the physiologist. Too often the clinician, successful socially, did not seem to the student to follow a physiological or indeed any logical line of argument. Again the heads of physiological departments, for all their eminence, could not deal with semi-clinical problems, and the teacher must, indeed, be an investigator of his subject if his work was not to be dry as dust.

The reports of the Medical Research Council suggested great improvements in the teaching of physiology during the last ten years. For further progress there must be more coöperation between the physiology departments and the wards. Young clinicians should serve in the laboratory after their house appointments, but when they become consultants it was very difficult for them to continue to do any physiology. If only the heads of the departments would get together the younger men would follow. To allow time for this the heads must be relieved of excessive routine, in both teaching and administration. The discussion, Prof. Fraser thought, should deal with the following three practical points: (1) at what time or times in the curriculum is human physiology to be taught? (2) who can best teach it?; and (3) how may one best provide for its further investigation?

Dr. C. G. DOUGLAS (Oxford) said that to many a student physiology was a task imposed upon him which delayed his entry into the wards. The student saw no value in physiology apart from its clinical application, and much physiology is not so directed. That a student should think he could deal with the abnormal without an adequate study of the normal excited Dr. Douglas's apprehension as much as his amazement, yet the fault was not entirely the student's. The problem in medical education thus raised was solved by human physiology, which had altered the student's outlook and for which we have learned new methods which enable us to appreciate the close functional linkage of the systems of the body. Time should be devoted to the subject early in the student's career to ensure the getting of his interest, and thereafter the facts of the text-books stood out in a new light. For example, for a lecturer who cares to take the trouble the changes in the body as a result of exercise could be presented as a living subject, and the student, having grasped the principles, could easily fill in the details from text-books. Practical work was as yet more difficult and lagged far behind the lecture course, but recent biochemical advances, which were mainly quantitative, were a great help. The student was keen about facts which he could verify on himself, whereas elementary experiments on the heart, muscle, and nerve of the frog were mere exercises, and never aroused his interest in the slightest degree. When the student, in the speaker's experience, came to think of the organism as a comparative whole, quantitative work, normally considered tedious, became intensely interesting. In particular the fascinating field of the physiology of the sense organs could only be explored in man.

Dr. Douglas said he would emphatically dissent from the view that such work was too difficult for the pre-clinical years. Its introduction, which had changed listlessness into interest, should be at the beginning of the study of physiology, when it would attract the student's attention. The training should be continued through the clinical years to connect the work with medicine. Though we were bound to draw some of our conclusions from the effects of disease the student's interest should be focused on the normal—too much abnormal would merely confuse him. The development of a "synthetic view" would lead to improved treatment instead of mere diagnosis.

Sir HUMPHRY ROLLESTON, speaking as a member of the G.M.C., which body, he said, was too often thought of as merely inquisitional, asked if it were wise to separate human physiology in any way from physiology as a whole. There was the danger of its dropping behind clinical investigation, when advances which were at the time apparently devoid of practical application became later of great importance. He thought the physiologists might adapt the methods of instruction and illustrate them by cases from the wards. Where human histology differed from that of the cat and dog human material should be used. It should be remembered that physiology merged into experimental pathology and pharmacology, and clinical teachers should have one foot in each department. In hospitals without the clinical unit system the pathologist might teach human physiology—he hoped that the demand for teaching would create the supply. He would like to see the physician at the post-mortem table—the physician's operating table—forecasting what was there before the pathologist began, though at present this might only lead to a contest of wits. The course of physiology might be spread over the whole of the student's time or the teaching be given at two periods, first as now and again just before graduation. He then read a contribution to the discussion by Prof. Joseph Barcroft in which details of the instruction in human physiology in Cambridge were given, and which, while supporting the point of view of the opening speakers, emphasised the value of what was to be learnt from the study of evolution and the primitive forms of life.

Prof. B. A. MCSWINEY (Leeds) said that he had been struck by the keenness and enthusiasm of his students in the "human" part of their course. He believed in the correlation of animal experimentation and the study of human function. It was important *that the student should learn to realise normal* variations. In the past physiology had not been a sufficient bridge between biology and clinical work. The biochemical aspect required further development. Instructors in human physiology should have a clinical outlook, but in hospitals there was a lack of laboratory accommodation and facilities, and too much of the work was done as a routine by the officers of the institution. Facilities for the hospital staff should be provided in the physiology department, but the present hospital system was not good for coöperation, because of the clashing interests of the L.S.D. of consultant practice with the time demanded for research and teaching. Hospitals should have officers trained in and for experimental medicine, who would work both in the laboratory and in the wards. This would guarantee the supply of clinical material for the students. As regards the argument that the curriculum is already overcrowded, we had not removed as we had added, and a radical pruning was necessary.

Dr. J. A. RYLE (London) said that the younger clinicians who had had a physiological training really did explain symptoms instead of eliciting them. All medical registrars and clinical tutors should have had a laboratory training in research, and such training was now regarded as necessary for appointment to the staff of a clinical unit. He had been much refreshed by a paper by Dr. Batten in THE LANCET of June 15th, dealing with clinical physiology and the "limits of the normal." There was much bad medicine because of isolated tests of function—a radiologist might report a "dropped stomach" in a perfectly healthy person. Closer coöperation between medicine and physiology would, in his opinion, be better than a special department of human physiology, and the medical unit was a great help for the coöperation required. Even the occasional appearance of the physiologist in the wards would be most helpful.

Dr. F. W. LAMB (Manchester) described the course which he had developed during the last seven years, which started with the biological and physical characteristics of blood, and thence led to its carriage of gases, circulation in the human subject, and respiration. The sense organs were also investigated. In the course, which continued after the physiology professional examination and through the years of clinical study, he collaborated with his clinical colleagues, giving instruction on dyspnœa, cyanosis, and the special senses from a physiologist's point of view. He was emphatic that human physiology should be treated as a science subject, not as a means to a penny-in-the-slot diagnosis for physicians, and that it should be taught as a distinct course though in close relation to experimental and chemical physiology. Human physiology was the true synthetic physiology, the integrating factor to the student, and his students were so keen that he could not get them out of the laboratory at the end of the day. He regarded lectures on human physiology as absolutely essential, there being no adequate text-book, and the monographs and papers being too much for a student to master by himself.

Prof. A. V. HILL (London) said that he agreed very largely with the previous speakers, and always regarded Dr. Lamb as the apostle of human physiology. He thought it would be a calamity if the head of a physiological department had to be a medical man—as well insist on a professor of physics having passed through the engineering shops. He gave the human physiologists a motto: "Don't do bad experiments on man in place of good experiments on animals."

Dr. H. WHITRIDGE DAVIES (Leeds) said that he had worked with students from the point of view of experimental medicine, for which the student's methods were not good enough, and from the point of view of physiology, in which he tried to fit students for clinical research. Where there was no medical unit there was no conception in the wards of analysis. The indication to students of suitable courses of special reading was much appreciated. He thought the idea of experimental medicine greatly increased the student's interest, but that the physiologist should *not come to the wards unless he is prepared to come* every day.

Dr. C. G. IMRIE (Sheffield) regretted the absence of Prof. Leathes, who had developed a valuable fourth-year course. He thought that it was in the wards that human physiology was appreciated, and that a new generation of clinicians was required for the desired progress and coöperation.

Prof. H. S. RAPER (Manchester) said that the pre-clinical period should be reserved for pure science, but that the student's mind would be better orientated if he got the bile and pepsin he used, not from bottles, but from the natural source, and if he did his urine analyses on his own 24-hours specimen. He regarded a full-time physiologist as a necessity on a hospital staff—even such clinicians as Horsley and Rose Bradford could not latterly keep pace with the growth of physiological knowledge.

Prof. MILROY said that he had got more help from his colleagues in physics and chemistry than from the clinical side. There should be a department of applied physiology as there was of applied biochemistry. He would plead that the present demands on students were too severe and feared the diet offered exceeded the assimilation capabilities.

Prof. FRASER, in reply, again stressed the necessity of coöperation between the heads of departments, and regretted that there had been no *practical* suggestions as to improvements in teaching in the clinical years.

Dr. DOUGLAS, in his reply, explained that in Oxford human physiology was not taught till the second year of the physiology course, which was a mistake, but that there physiology was taught as a pure cultural science, not as a pre-clinical training.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 17TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 120 (last week 114); scarlet fever, 1688 (last week 1482); diphtheria, 844; enteric fever, 90; pneumonia, 504; puerperal fever, 43; puerperal pyrexia, 110; cerebro-spinal fever, 17; acute poliomyelitis, 12; acute polio-encephalitis, 1; encephalitis lethargica, 17; dysentery, 4; and ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on August 20th–21st was as follows: Small-pox, 147 under treatment, 1 under observation (last week 132 and 5 respectively); scarlet fever, 1314; diphtheria, 1483; enteric fever, 14; measles, 318; whooping-cough, 251; puerperal fever, 25 (plus 11 babies); encephalitis lethargica, 123; and "other diseases," 23. At St. Margaret's Hospital there were 10 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 27 (7) from measles, 5 (1) from scarlet fever, 17 (5) from whooping-cough, 22 (3) from diphtheria, 60 (10) from diarrhœa and enteritis under two years, and 20 (5) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa and enteritis under two, 9 were reported from Birmingham, 6 from Liverpool, and 4 from Hull. Liverpool recorded 4 deaths from measles and 4 from whooping-cough.

The number of stillbirths notified during the week was 252 (corresponding to a rate of 30 per 1000 total births), including 47 in London.

THE Medical Research Council issued at the end of last week the results of a series of studies on binocular vision, undertaken at the Royal Naval College, Greenwich, by Instructor-Lieutenant-Commander N. M. S. Langlands, R.N. Commander Langlands's work has extended over several years, special facilities for carrying it out having been granted by the Admiralty.

PUBLIC HEALTH AND LOCAL GOVERNMENT.[1]

THE state of the public health for 1928 is summarised in the annual report of the Chief Medical Officer of the Ministry of Health which is published this week. In an introductory chapter Sir George Newman sets out, always clearly and often eloquently, certain fundamental information which is necessary for a reasonable understanding of the chapters which follow. For the Report submits an extraordinarily varied body of information and opinions, as might be expected when we consider the simple yet complicated, the separate and yet connected conditions which go to make up society to-day, and when we recognise at the same time that those conditions, because the nation remains young and lively are often new, and yet, because we are an old people, often have their roots in a remote ancestry. The introduction is, in a sense, a sequel to the essay which prefixed Sir George's Annual Report last year,[2] in which he set out the principles which should guide forthcoming changes in local government. This year he proposes to help the public to form a sound judgment and, as far as may be, an estimate of the position of our public medicine, such a bird's-eye view enabling the reader to gauge the value of the different detailed communications as well as to understand how these form component parts of one work.

The sum of the responsibilities of the Minister, as defined by the Ministry of Health Act, 1919, are: "to take all such steps as may be desirable to secure the preparation, effective carrying out and coördination of measures conducive to the health of the people," and the first of these duties is the prevention and cure of diseases. The main part of the Annual Report, as might be expected, deals with these steps under such headings as general epidemiology, the incidence during the year of influenza, cancer, tuberculosis, and venereal disease; and those who have followed the reports of the medical officers of health of the various sanitary districts for the year in question will be prepared to find, with respect to the last two, that the tidings are good. The chapter on tuberculosis is far ranging, taking note of the progress of tuberculosis work as carried out in dispensaries and residential institutions, of the influence of the Act of 1929 on the development of tuberculosis schemes, of the value of after-care and of technical education, and, among special points, of the efficacy of Prof. Calmette's method of immunisation, the fate of young children in tuberculous households, and of tuberculosis in relation to occupation, the example here being the incidence of the disease on printers. The standard death-rates for tuberculosis of the respiratory system show that the gross death-rate from pulmonary tuberculosis in males has fallen from 1233 per million to 879, and in females from 900 to 641 since 1911, while the reduction in non-pulmonary tuberculosis, attacking both sexes, is even more striking. These figures may be said to justify the general opinion that notification of tuberculosis is year by year becoming more effective. The chapter dealing with the incidence of venereal disease is, on the whole, happy in its message. Although the returns from the treatment centres for 1928 show only a decrease of 2·7 per cent. in new cases of syphilis, against which has to be set off an increase of 9·9 per cent. in cases of gonorrhœa, the improvement in the ratio of females to males, which emerged from the figures last year, has been maintained, and there is distinctly greater promptitude in seeking treatment.

Two sections of the report call especially for mention—viz., the incidence of small-pox and the whole subject of maternity. In 1928 there were 12,428 cases of small-pox, most of them extremely mild, but 53 deaths were attributed to the disease. Seventeen of the victims were unvaccinated, 28 had been vaccinated in infancy only, and the vaccination of the remainder was doubtful. Cases occurred in every English county except Rutland, Westmorland, Cumberland, and the Isle of Wight. There were, however, some 2000 fewer cases than in 1927, and nearly 4000 fewer in the county of Durham, where the disease has for some years been prevalent. Many of the cases were at first mistaken for influenza. The report observes that even in Jenner's day some cases were so mild that children ran about the streets with the rash on them, and sees no reason to think that we have recently been dealing with a disease specifically different from small-pox. Where the disease is vigorously attacked it is controllable, but mild cases are frequently overlooked, and the infection spreads. The relative immunity of London is a remarkable fact for which there is no explanation. The introduction by the *Tuscania* on April 1st, 1929, of a severe type of small-pox called for vigorous action, which was so successfully carried out that only six secondary cases developed, and at the expiration of six weeks or so there was no infection of the *Tuscania* strain in the country.[3] The episode is noted in the Report although, not strictly speaking, belonging to the year 1928.

Much attention was paid during 1928 to the high mortality which still attends the process of childbirth; 2920 women died and an enormous number were invalided, while about 43,000 children died during their first year of life. The maternal mortality-rate of 4·42 per thousand births was the highest on record, and there is no doubt that much of the mortality and morbidity was preventable. Two official committees are exploring the problem. Pending the result of their inquiries Sir George makes trenchant remarks. First, he notes that many pregnant women are not making use of the facilities already provided for them. Secondly, he points out that many local authorities are not vigilantly engaged in perfecting every branch of their maternity service, and are not closely coördinating these branches into one unified attack on the problem. Merely to provide facilities is not enough. It is for the local authority to see that the provision it makes is effectively coördinated.

Another prime duty of the Minister of Health, as defined under the Health Act, is "the collection, preparation, publication, and dissemination of information and statistics," and Sir George's Report discharges the responsibility of the Minister succinctly, while many of the facts and figures of the Report speak for themselves. The birth-rate for the year was 16·7, a greatly reduced number, which is accompanied by a substantial saving of child life. Children are decreasing in proportion to the whole population, while the number of persons over 55 is increasing. The death-rate was 11·7 per thousand persons. The birth-rate thus exceeded the death-rate by 5 per thousand, and we seem to be within sight of a stationary population. In 1928, the country saved 41,500 babies' lives, over and above the average annual saving during the first ten years of the century. The incidence of sickness, apart from infectious disease, cannot be estimated except from the returns of insurance practitioners. These indicate that during the year the nation lost a total of 20¼ million weeks' work among the insured population to whom sickness benefit was payable—that is, among a very small proportion of the nation. In the list of diseases responsible for the loss of work among these people, respiratory maladies easily take the first place, accounting for some 30 per cent. They are followed by irregularities of the digestive system, injuries, lumbago, and rheumatism and septic conditions. The chief causes of death were diseases of the heart and circulation (23 per cent.), respiratory diseases

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[1] On the State of the Public Health. H.M. Stationery Office. 1929. Pp. 205. 3*s*.

[2] THE LANCET, 1928, ii., 875.

[3] The new Vaccination Order, which is the result of the work of the Rolleston Report, was discussed in our columns last week.

(13 per cent.), cancer (12 per cent.), diseases of the nervous system (9 per cent.), and tuberculosis (8 per cent.). These five conditions, accounting for 65 per cent. of the death-rate, are the outstanding physical scourges which we have to combat to-day. The year 1928 was exceptionally healthy.

An outstanding event of the year on the administrative side was the preparation of the Local Government Act. The Report discusses carefully the new duties laid upon the County Medical Officers of Health, and the Principal Medical Officer has no doubt that the reforming Act offers big potentialities if it is administered carefully. Also he sees no reason why the magnificent tradition of the voluntary hospital should not become widely established in municipal hospitals free from the taint of pauperism. He advises the municipal hospitals to imitate all that has proved good in the voluntary hospitals, and urges mutual coöperation. The great essential here is the preservation of the integrity of the medical profession; prevention and cure and their respective exponents must not be divided. So long as no one comes between the doctor and his patient all will be well, *and local authorities ought to be trusted to see* that such interference never takes place. In this country, the principle of local self-government has been generally recognised as the essence and genius of our national vigour. Our public health work is safeguarded by a comprehensive system of law, by-law and regulation, exercised by central and local authority working together, administered partly by a number of elected voluntary representatives and partly by a substantial number of medical advisers and trained sanitary and health officers. The chief business of the Ministry of Health is unification and coördination; its chief purpose is to secure sound national progress. This progress will be made certain in proportion as the State, the doctor, and the public work along right lines harmoniously.

We shall deal with the Report in further detail in subsequent issues.

Medical News.

MEDICAL SOCIETY OF LONDON.—A programme for the first half session 1929-30 has been issued. Mr. Donald Armour will deliver a presidential address entitled Some of Lettsom's Contemporaries on Oct. 14th. Mr. Hayward Pinch and Prof. Sidney Russ will open a discussion on Radium Therapy on Oct. 28th. On Nov. 11th a discussion on the Relative Value of the Different Methods of Diagnosis in Gastric Disease will be introduced by Dr. J. A. Ryle, Dr. Harrison Orton, and Prof. E. C. Dodds, and a discussion on the Treatment of Head Injuries by Mr. Wilfred Trotter on Dec. 9th. Sir John Thomson Walker will give the Lettsomian lectures on Enlarged Prostate and Prostatectomy, and Sir Arthur Keith the Annual Oration on Modern Medicine and Evolution.

Sir George Newman, who has been since 1910 a Crown Representative for England on the General Medical Council, has been re-nominated for a further term of five years from Oct. 9th next.

THE Medical Research Council announce the receipt from Mrs. Odo Cross of a sum of £10,000 as the endowment of a trust for the establishment of research *fellowships in the study of tuberculosis, to be known as the* "Dorothy Temple Cross Research Fellowship Fund."

Dr. W. E. Gye writes to disclaim responsibility for statements contained in a Sunday newspaper of August 25th concerning his work on cancer. It is true, he says, that a somewhat lengthy paper is in preparation, but the suggestion that he has something new and "sensational" to report is a guess and is untrue.

THE RADIUM HOSPITAL FOR WOMEN.—It is *expected that this hospital will be opened in September by* Madame Curie. It is housed in the former residence of the late Mr. John Petrie, R.A., in Fitzjohn's-avenue, Hampstead, which has been converted by Mrs. Elizabeth Scott, the architect. The large and lofty studio has been made into the chief ward and holds 16 beds; other small wards accommodate another ten beds. It is hoped to build another ward over the studio with X ray and other necessary equipment. The medical staff consists entirely of women.

Notes, Comments, and Abstracts.

THE TECHNIQUE OF STUDY.

BY G. F. WALKER, M.D., M.R.C.P.,

MEDICAL TUTOR AND REGISTRAR IN THE UNIVERSITY OF LEEDS, AND THE GENERAL INFIRMARY AT LEEDS.

To add one single drop to the torrent of written and spoken advice which almost overwhelms a medical student at varying phases in his career requires explanation. I am emboldened to submit the following notes because, while still retaining vivid memories of the doubts and difficulties of my own student days, I find myself engaged in tutorial work in a large teaching hospital. Much of what follows has necessarily been gleaned from my own teachers quite recently, and I hereby make acknowledgment, but some, I trust, is new.

Personal Factors.

"The first wealth is health." Medical students are far too ready to slump into a condition of middling physical health. A reaction against the athleticism of some public schools tends to set in early, forcibly and far too frequently when undergraduate life is reached. But sound physical health is all-important and must be maintained. The rich opportunities given by University or community life for the preservation of physical fitness should be exploited fully. Indeed, a certain portion of each week and each year should be set aside exclusively for recreation. Of collateral importance is the development of mental stamina. This term is comprehensive and includes not only the acquisition and maintenance of will and judgment, remote alike from rashness and pusillanimity, nor merely the ability to sacrifice the present to the future, but also the cultivation of the gentler arts of this world. Medicine may be a jealous mistress, but he who gives her his all will never experience the content and philosophical security which a broad general culture imparts. In the years of student-life time must be found for the study of a science for its own sake—any particular field of study such as astronomy or theology or any subject which happens to appeal to the individual—or for the cultivation of literature or an art. In this connexion must be mentioned the necessity for travel in the student years. Many great cities of Western Europe are cheaply and easily accessible and should be visited in the holidays. If these cannot be reached then—speaking to Leeds students—Edinburgh, York, and London must suffice. During these tours, whether at home or abroad, there can be no harm in visiting the hospitals and schools, but any attempt at promiscuous study should be firmly suppressed. But I have not forgotten that the medical student has to study medicine, and all through the student years the habit of study has to be diligently cultivated.

The Technique of Study.

Much knowledge has to be acquired in a relatively short time. It is necessary, for instance, to know that the islets of Langerhans are not in Polynesia. But this loading up with necessary facts is by no means the hardest or the most important part of the curriculum. Of much greater importance is the acquisition of technical skill, dexterity, practical experience, and clinical acumen. Of greater importance still is the keeping of a proper perspective during the various stages and appointments of the curriculum as will appear. In reading and practical work every student should periodically examine his methods of study, ruthlessly scrapping unprofitable habits and customs. Reading should be done in the evening. And the minute technique of reading is worth more than scanty consideration. At the very outset the student should decide whether he remembers best by merely looking at the written word, or by writing it down personally, or by hearing it spoken. That is to say, he should decide whether he has a "visual" memory or an "auditory" memory. The former is fortunately the more common, but no general rule can be laid down. By actual experiment every student must investigate his powers of memory, decide his own classification, and work on it. Once the most favourable channel for reception of facts is decided upon details of study can be regulated. Study from books should be done with elbows on the table. It should be done in privacy and in an environment conducive to alertness and clarity. Anything conducive to too much physical comfort must be shunned. No attempt should be made to read soon after a meal or when tired. Reading in the train or 'bus, or "at any old time," is waste of energy and promotes staleness. As a general rule, if the practical work of a working day has been faithfully performed, two hours' book work in the evening is ample, and it is then that reading should consolidate and fix the practical work done during the day. Therefore it should be an inviolable rule that whatever has been seen or heard in the lecture-room, laboratories, or wards during the day should have first claim on the time available for reading during the evening. Surgery must be read during the performance of surgical appointments, ophthalmology while the student is actually seeing ophthalmic patients, and so forth. It is worse than useless to attempt to acquire the formal dogmas of medicine by suddenly beginning at page 1 in a large text-book. The greater part of each morning and afternoon should be devoted to practical work and training. The surpassing value of dissection, of study in the wards, out-patient department, and receiving-room, of lectures which flavour facts with a lecturer's personal experience, and particularly of the "writing-up" of patients' records, needs no emphasis. It may be taken for granted that a "part" once thoroughly dissected is etched deeply in the memory. Similarly, a scientific or clinical investigation once thoroughly performed repays the investigator many times over by conferring ineradicable knowledge. In dissecting the student should display the region so that he can subsequently recall it in three dimensions. And in investigating patients, when once the full straight facts have been clearly displayed, the imagination should be invoked to illuminate the patients' own side of the problem. For the precise and formal extraction of data about a patient I know of no more pithy and significant advice than the exhortation "Look and see," and the cultivation of sincerity and the preservation of an ever open mind should be comprised in that advice. Further, the technique of practical study needs as much watchful care as does the technique of reading. It is very easy during the clinical years to be in a place where work can be done, should be done, and is in fact being done—by others. The tendency to lapse into intellectual somnolence during demonstrations is very insidious in its onset, but a habit of vigorous, enthusiastic attention is not difficult to acquire, and, when once acquired, being seldom lost, should be striven for. The mere acquisition of the habit is worth while for its own sake; its utility will probably outlive the utility of many of the topics to which it is first applied. A large teaching hospital usually abounds in places where dawdling is possible and prevalent, and which need not be specified.

Here are two little pieces of advice. First, the midday meal should be taken free from "shop." Secondly, the notebook is worth consideration—a good small loose-leaf notebook should accompany the student through his whole curriculum; it should be just small enough to fit in the pocket, it should be available at all times, and each night it should be tidied up and full pages withdrawn to be placed in appropriate accumulations.

The Course as a Whole.

The really fundamental thing to grasp is that the course *is* a whole and not a string of loosely connected segments each requiring a concentrated onslaught with subsequent relegation to the background. I do not mean that a student should attempt to go forward three steps at a time, but I do mean that he should look upon his curriculum as a series of phases of initiation into the science and art. Each phase prepares the student for subsequent phases, but is very dependent for its full consummation on preceding phases. To reduce this to practical terms it may be said that anatomy and physiology should forthwith be continuously studied during clinical work. And other examples will readily occur. It follows from the fact of the unity of the course that the text-books of each phase should be retained and kept viable during subsequent phases. Revision and maintenance of knowledge is much safer and easier if done from the actual pages of the big text-book used during the phase when it was intensely studied. I say "big" text-book, because one big text-book should be selected for each topic and adhered to from start to finish. The small summaries and cram books have their place, but they are mainly useful as a help to marshal facts. The author of a most successful synopsis, far from making the usual claim to be meeting a "long-felt want," says in his preface that ultimate reliance on anything but the larger books will lead to failure. Just as the text-books of successive phases should be carefully retained throughout, so must the microscope not be sold. Being "historically minded" is valuable. I do not mean that the shelves should be laden with large text-books on the history of medicine, but the bald facts of study can be enlivened by reference to an encyclopædia when a proper name is found. And from time to time monographs such as Flint's "The Heart: Old and New Views," should be perused.

Examination Incidents.

It is quite useless to ignore the fact that examinations loom largely in the curriculum. I have many times told my student friends that the examination incidents—and I am convinced that "incident" is the right word—should be happy little episodes. This information has always evoked incredulity and sometimes less amiable emotional reaction, but on several occasions graduates have subsequently admitted personal verification. Of course, no one but a fool would make light of examinations. Indeed, they should be taken very seriously; so seriously that the student, immediately he enters a particular phase, should plan out his work for the terminal examination of that phase by actual time-table and schedule. He should record diagrammatically his progress through the phase so that the work is spread out evenly over the time available. As a crude example let us suppose that a phase of study in one of the ancillary subjects lasts six months and that the text-book concerned is 500 pages in thickness. Then 100 pages must be covered each month by schedule, the actual pages being selected each evening according to the nature of the particular lecture, demonstrations, and practical work enjoyed during the day. In short, I am back at the platitude that the art of passing examinations consists in doing steady comprehensive work during the whole of the antecedent phase. The corollary to this is that he who works steadily in the practical work of a phase with concurrent systematic reading cannot be "ploughed."

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—M.O. At rate of £110.

All Saints' Hospital, 91, Finchley-road, N.W.—Jun. H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £180.

Ayr County Hospital.—2 H.S.'s. Each at rate of £150.

Beckenham Urban District Council.—Part-time Asst. M.O. £325.

Birmingham and Midland Eye Hospital, Church-street.—H.S. £110.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. At rate of £120.

Bootle Borough Hospital, Derby-road.—Hon. Laryngologist and Aurist. Also Jun. M.O. At rate of £125.

Bournemouth, Royal Victoria and West Hants Hospital.—2nd H.S. At rate of £120.

Bradford Children's Hospital.—H.S. and H.P. Each £120.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, Royal Alexandra Hospital, &c.—H.S. At rate of £100.

Calcutta, Presidency College, Bengal.—Prof. of Physiology. Rs. 1000.

Cambridge, Addenbrooke's Hospital.—Res. Anæsthetist. At rate of £180. Also H.P. and H.S. Each at rate of £130.

Cambridge, Papworth Village Settlement.—H.P. At rate of £100–£200.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Chief Clinical Assts.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Exeter, Royal Devon and Exeter Hospital.—H.P. Also Asst. H.S. At rate of £130 and £120 respectively.

Fulham Maternity and Child Welfare Clinics.—Part-time M.O. 1½ gns. per session.

Leeds Maternity Hospital.—Hon. Obstetric Surgeon.

Leeds, St. James' Hospital.—H.P. and S. £200.

Liverpool, Royal Children's Hospital.—Res. H.P. Also H.S. Each at rate of £60.

Liverpool, St. Paul's Eye Hospital.—H.S. £100.

Liverpool, Walton Institution, Rice-lane.—Res. Asst. M.O. £200.

London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.

London University.—William Julius Mickle Fellowship. £200.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Aural H.S. At rate of £200.

Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O. £350.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £100.

Middlesex County Council.—Asst. County M.O.H. £750.

Newcastle-upon-Tyne City Mental Hospital, Gosforth.—Jun. Asst. M.O. £350.

Northampton General Hospital.—H.P., H.S., and Asst. H.S. Each at rate of £150.

North Middlesex Hospital, Edmonton, N.—Anæsthetist. 2½ guineas per session.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Otago and Dunedin University Hospital, New Zealand.—Sen. Res. M.O. £500.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O. Also Asst. Res. M.O. Each at rate of £80.

Radcliffe-on-Trent, Notts County Mental Hospital.—Jun. Asst. M.O. £350.

Richmond Royal Hospital, Surrey.—Jun. H.S. £100.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Royal Liverpool Babies' Hospital.—Res. M.O. At rate of £90.

Royal Northern Hospital, Holloway, N.—H.P. Also Obstetric H.S. Each at rate of £70.

R.S.B.H. Offices, 15, York Buildings, Adelphi, W.C.—H.S. At rate of £100.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Swansea Hospital.—Sen. Res. M.O. Also H.S. £300 and £150 respectively.

University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.

Walsall General Hospital.—Res. Surg. O. At rate of £200.

Watford, Herts, Peace Memorial Hosp.—Res. M.O. At rate of £150.

Lettsomian Lectures

ON THE

RELATIONSHIP OF DERMATOLOGY TO OTHER BRANCHES OF MEDICINE.

Delivered before the Medical Society of London

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PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT, GUY'S HOSPITAL.

LECTURE II.*

I PROPOSE in this lecture to discuss the significance and nature of a group of eruptions provoked by micro-organisms or toxins, which reach the skin via the blood stream. For the sake of clarity, I would suggest for this group the generic name of the *exanthematides*. This term indicates a relationship with the exanthemata of the specific fevers, which is undoubted, and at the same time possesses the termination "ide," which has been commonly accepted for some of the eruptions under consideration—e.g., the tuberculides, syphilides, trichophytides, and leprides.

If, after excluding the specific fevers, one surveys the list of general infective diseases associated with cutaneous manifestations, two are outstanding by reason of their ubiquity, their serious nature, their chronicity, and the amount of accurate knowledge that has accumulated concerning them; these two diseases are tuberculosis and syphilis. They have dominated medical thought and research for generations; they still dominate dermatological thought and research throughout the greater part of the world.

Less obviously of interest to dermatologists is another group of diseases, which the general physician has labelled "rheumatic." But if tuberculosis and syphilis belong in great part to the domain of dermatology, the rheumatic diseases, especially, perhaps, rheumatic fever, also have cutaneous manifestations, which are not only of interest to physicians and dermatologists alike, but are in my opinion so closely akin in their mechanism of production and significance to certain tuberculous and syphilitic eruptions, that they enable us to draw deductions of the highest importance.

Since Poynton and Paine[1] in 1900 presented their thesis that rheumatic fever is due to streptococcal infection, evidence has gradually accumulated that both this condition, as well as certain other forms of rheumatic disease, are of streptococcal origin. Although I have reviewed a great deal of the experimental work that has been carried out in recent years on the pathogenesis of rheumatic fever, I am obviously not fitted to express an authoritative opinion on the streptococcal theory of its causation. Whether, however, one accepts the specificity of the particular strain or strains of streptococcus, isolated by Small[2], by Birkhaug,[3] and by Lazarus-Barlow,[4] or whether with Swift[5] and his co-workers one believes, as seems more probable, that the pathogenesis of the disease depends on the existence in certain persons of a condition of allergy to various strains of streptococci, resulting from repeated low-grade infections or the existence of chronic foci of infection, the evidence that like tuberculosis and syphilis, rheumatic fever is allergic in nature, and that the streptococcal group of organisms is responsible seems to me overwhelming. This evidence is based on clinical, pathological, bacteriological, and experimental findings, and I have yet to hear any argument to the contrary that will bear examination.

Swift[6] in America, and Bezançon and Weil[7] in France, have drawn striking comparisons between the various manifestations of rheumatic fever with those of tuberculosis and syphilis.

To quote Swift, Derick, and Hitchcock:—

"In all three diseases there is usually an initial lesion, which, when present, is followed shortly by distinct enlargement of the satellite lymph nodes. In all, the serious manifestations occur at a distance from this lesion, and usually are multiple in distribution. In tuberculosis, although the majority of the population is infected, only relatively few persons ever show clinical symptoms. In both rheumatic fever and tuberculosis a rise in the standard of general living conditions has been accompanied by a decreasing incidence of the diseases. A number of workers have called attention to a similarity in the familial incidences of these two infections. In all three diseases there is a decided tendency to relapses, which seems to be due to a breakdown of a partial immunity. In all the histopathological pictures of the typical lesion is that of a granuloma, the histogenesis of which in tuberculosis and syphilis has been definitely proven to be allergic in nature. This allergic lesion can be considered an effort on the part of the body to restrict the activity of the micro-organism to these local areas. The tubercle has the same general characteristics throughout the life of the individual, although there may be special features of the tuberculous infection in certain tissues or organs. While the different syphilides may seem to have decidedly different characteristics, these variations may be considered quantitative rather than qualitative. In both tuberculosis and rheumatic fever the presence of lesions in the walls of the serous cavities or joints is accompanied by the outpouring of serofibrinous exudate. In both rheumatic fever and syphilis there is a marked tendency to focal endo- and perivascular involvement; and both infections are prone to attack the heart. It is true that differences can be found in the three diseases; but it is in these differences that there reside the features which bring about the peculiar pictures of the respective maladies. Indeed, in individual cases it is sometimes difficult to decide whether one or another type of infection is active until specific differential diagnostic measures can be applied."

It is my general agreement with this thesis that has led me to sunbmit a comparison between certain cutaneous manifestations of tuberculosis and syphilis together with those of the severer forms of ringworm infection on the one hand, and of rheumatic or streptococcal infection on the other. All those eruptions may, I think, be conveniently classed together as the exanthematides.

A. THE SYPHILIDES.

In the average case of untreated syphilis there is:—

(1) A period of incubation, about three weeks in duration, between contamination and the appearance of the *primary lesion*.

(2) A primary period during which the spirochætes multiply locally, invade the lymphatics and glands, thence to reach the circulation, but the Wassermann reaction is negative; this is also about three weeks in duration.

(3) A second incubation period, again of about three weeks, between the first appearance of a positive Wassermann reaction and the development of the secondary eruptions—*the secondary syphilides*. With these the Wassermann reaction is at its height. The various forms of secondary syphilide become successively less extensive, but larger in size, and the Wassermann reaction also tends to diminish in intensity.

(4) With the subsidence of secondary manifestations, there may be a period of freedom from symptoms, and the Wassermann reaction may become latent or actually negative.

(5) Finally, there is the *tertiary* period, when the large nodular gummata represent the cutaneous manifestations, and the Wassermann reaction is found positive in from 60–80 per cent. of cases.

As in the specific fevers, there is thus an incubation period during which time a state of allergy towards the infecting virus is developing, and the secondary syphilides, corresponding to the exanthematous rashes, represent allergic reactions of the skin against the spirochætes reaching it via the blood stream, such reactions having for their object the destruction of the organisms in situ. This question will be discussed more in detail in connexion with the tuberculides and trichophytides.

B. THE TUBERCULIDES.

Although tuberculosis cannot so readily as syphilis be divided into primary, secondary, and tertiary periods, nevertheless such a division can be made, and the cutaneous manifestations of the two diseases be very closely compared. In the vast majority of cases, infection with the tubercle bacillus takes place via the digestive tract—mouth, nasopharynx, or small intestine—thence reaching the lymphatic system. As Calmette[8] has clearly shown, the view, still widely held, of a primary "chancre of inoculation" in the lung ("lesion of Parrot and Kuss") is open to serious criticism. Very occasionally, however, a true primary tuberculous chancre of the skin may occur, comparable to the primary sore of syphilis, and to that evoked by the experimental inoculation of the skin in animals. Holt[9] has collected 41 cases, including one under his own observation, in which the primary chancre developed on the penis of infants after ritual circumcision by a phthisical rabbi, and of these 16 are known to have died. Milian and Brocq have recorded two examples on the lips, and Bruusgaard has studied seven cases. From the primary lesion the neighbouring lymphatics and glands are invaded, and the Pirquet reaction becomes positive in from 12 days to some weeks. Boeck[10] and Bruusgaard[11] have seen an eruption of lichen scrofulosorum, with a phlyctenular keratitis, develop six weeks after the healing of such a chancre on the finger (compare with a secondary syphilide).

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* Lecture I. appeared in THE LANCET of August 24th.

In 1896, Darier[12] proposed the term "tuberculides" for a group of eruptions occurring in frequent association with evident manifestations of tuberculosis. Considerable discussion has naturally taken place, as to what are and what are not tuberculides. The list suggested by Darier himself in the last edition of his Précis, is as follows:—

(A) *Cutaneous Tuberculides.*—The situation of the lesions is dermo-epidermic in the following forms of tuberculide.

(1) *Lichenoid.*—Lichen scrofulosorum.

(2) *Papulo-necrotic.*—Folliclis; acnitis of Barthélemy.

(3) *Acneiform.*—Acne cachecticorum of Hebra (a simple variety of (2).

(4) *Lupoid.*—Benign sarcoid or lupoid of Boeck. Lupus pernio.

(5) *Erythemato-atrophic.*—Lupus erythematosus—fixed type.

(6) *Erythematous.*—Exanthematous lupus erythematosus: tuberculous form of erythema perstans.

(B) *Hypodermic Tuberculides.*—The situation is in the subcutaneous tissue. These are represented by the tuberculous form of erythema induratum (Bazin's disease), the subcutaneous sarcoids of Darier-Roussy, and the disseminated nodular sarcoids, all of which are probably merely varieties of the same type of lesion. Erythema nodosum probably should be included in some cases.

Of these every one is agreed as to the claims of lichen scrofulosorum, the papulo-necrotic varieties (folliclis, &c.), and at any rate the majority of cases of Bazin's erythema induratum. While most dermatologists consider that in some instances lupus erythematosus is of tuberculous origin, Schaumann[13] prefers to class it, not with the tuberculides, but, in association with lupus pernio, the sarcoids of Boeck, and the malignant lymphogranuloma of Sternberg, as a cutaneous manifestation of paratuberculosis, due to the filtrable form of the tubercle bacillus. In addition, erythema nodosum and erythema multiforme are considered by some to be toxi-tuberculides in certain cases.

Pathogenesis of the Tuberculides.

A great deal of very careful experimental work has been carried out in connexion with the pathogenesis of the tuberculides, and it has thrown much light on the phenomenon of allergy, and on the part played by the skin in the defence of the body as a whole. Briefly, the salient points may be summarised as follows:—

The clue to the nature of the tuberculides is provided by the phenomenon described by Koch[14] in 1891. As is well known, the subcutaneous inoculation of virulent tubercle bacilli into a susceptible animal like the guinea-pig is followed after 10–15 days by a nodule which ulcerates—the tuberculous chancre—comparable to the primary sore of syphilis, and identical with that occasionally met with in young children, not previously infected with tubercle, as already stated. This experimental chancre persists, and in it the bacilli multiply, invade the lymphatics and glands, and eventually produce a generalised visceral tuberculosis, affecting chiefly the liver and spleen, from which the animal dies. If the guinea-pig be reinoculated at another point in the skin before its death—preferably 4–6 weeks after the primary inoculation—with living or dead bacilli, an inflammatory hæmorrhagic lesion is rapidly formed, which breaks down, scabs over, and, unlike the primary chancre, heals, leaving a scar. In it the newly inoculated bacilli are destroyed, and there is no invasion of the adjacent lymphatic glands. This is the so-called Koch's phenomenon, and the lesion resulting from the second inoculation represents a defensive reaction against the superinfection (Calmette), and is comparable to certain forms of tuberculide as they occur in human beings. As Sequeira[15] puts it, the tuberculides are spontaneous examples of Koch's phenomenon.

Gougerot and Laroche,[16] Lewandowsky,[17] and others may be said to have produced tuberculides experimentally, the two first mentioned by rubbing the epilated skin of guinea-pigs, *previously tuberculised*, with emulsions of living and dead bacilli, Lewandowsky by inoculating bacilli directly into the left ventricle or veins. The lesions thus produced correspond clinically and histologically to human tuberculides—particularly of the papulo-necrotic type.

The explanation, then, of the tuberculides usually given is that in a person, already sensitised to tubercle—i.e., in a state of allergy, and with an active tuberculous focus, such as lymphatic glands—there occurs a bacteriæmia with dead or attenuated bacilli, and these, coming to rest in a small dermic or hypodermic vessel, provoke a local inflammatory tissue reaction of the tuberculoid type, which has for its object the destruction of the embolised bacillus, and is thus a protective mechanism. This would explain why bacilli are so seldom demonstrable in the lesions, and why animal inoculation with material from them so often fails; nevertheless, in recent lesions bacilli have been found, or successful inoculations have been made by several observers in lichen scrofulosorum, papulo-necrotic tuberculide, erythema induratum, lupus erythematosus, and in the lupoids of Boeck. Moreover the injections of tuberculin into a person with active tuberculosis may provoke an outbreak of tuberculides—e.g., lichen scrofulosorum, erythema induratum, and when such are already present, marked focal reactions occur.

It will be seen that in the mechanism of their production the tuberculides resemble the secondary and tertiary eruptions of syphilis, since they represent allergic reactions of the sensitised skin or subcutaneous tissue against tubercle bacilli circulating in the blood stream.

C. THE TRICHOPHYTIDES.

In 1912, Jadassohn,[18] and later Guth,[19] Sutter,[20] Bloch,[21] Rasch,[22] Pulvermacher,[23] Jessner,[24] Ambrosoli,[25] Bruusgaard,[26] and others, described a variety of *generalised* eruptions that might occur as a result of a local infection of the skin with ringworm fungi, when such infection caused an inflammatory reaction of sufficient intensity. Following Darier's terminology, these eruptions are called trichophytides, microsporides, and favides, according to the type of ringworm fungus responsible. For the sake of convenience I shall include them all under the name of trichophytide. They are exactly comparable to the syphilides and tuberculides. As in the majority of cases of syphilis, there is a primary lesion in the skin, which develops at the site of inoculation of the fungus. As a result of this, the skin as a whole may become sensitised, so that, should dissemination of the fungus or of its toxin through the blood stream occur, the secondary eruptions—trichophytides—result from their contact with the sensitised skin. It is only, however, in the severer forms of suppurative ringworm—usually of animal origin—that these secondary eruptions are likely to be met with. I believe that Neisser and Plato[27] in 1902 were the first to prepare an extract from ringworm fungi, which they named trichophytin, and which is analogous to tuberculin. They found that in cases of deep-seated ringworm—i.e., those in which there is a marked inflammatory reaction—the injection of this trichophytin provoked a general reaction with rise of temperature and constitutional symptoms, together with a local reaction at the site of injection and a focal response in the area of infection. Normal controls, patients with other diseases, and those suffering from the *superficial* forms of ringworm, gave no local or general reactions. Since then a good deal of experimental work has been carried out along similar lines. Briefly it may be said :—

(1) That a deep-seated ringworm in man, or an experimental infection with certain species of ringworm in animals, may produce an allergic state, so that general and focal reactions result from injection of trichophytin, and positive cutaneous or intracutaneous tests with this substance may be obtained, which persists for years after the infection is cured.

(2) In animals a lasting immunity to reinfection results. In man, a reinoculation produces a short-lived lesion, comparable to that arising from a second inoculation of tubercle bacilli in Koch's phenomenon. Clinically, a deep-seated ringworm produces a very considerable degree of immunity in the sense that second attacks are very rare ; this is probably due to cutaneous allergy, which causes rapid destruction of the reinoculated fungus, rather than to true immunity.

(3) It has been shown by Bloch, first, that animal immunity to ringworm can only be produced by inoculating the skin, subcutaneous or intraperitoneal inoculations being ineffective ; secondly, that in a sensitised person the sensitiveness is in the skin-cell itself, for by transplanting two pieces of skin, one from a sensitised and one from a non-sensitised person, on to a normal person, the piece from the sensitised person, after the graft had healed, gave a positive cutaneous reaction to trichophytin, whereas the other piece and the subject's own skin gave negative results.

(4) As a result of suppurative ringworm infection (most commonly in trichophytosis) there may occur generalised eruptions—the trichophytides, microsporides, and favides—accompanied sometimes by fever, enlargement of the lymphatic glands and spleen, swelling of the joints, and a polymorphonuclear leucocytosis. In some cases these eruptions are due to dissemination of the fungus spores through the blood stream, since the fungus has not only been successfully cultured from deep-seated nodular or papular trichophytides by several observers, but also from the circulating blood itself by Ambrosoli and by Jessner. In some cases, however, these general eruptions may result from exogenous spread from the primary site of infection by the lymphatics, for example, as in the corymbose forms ; or from the action of trichophytin on the sensitised skin-cells, since Bloch produced first a scarlatiniform erythema and later a typical lichenoid trichophytide by injection of trichophytin in a boy who had had a severe ringworm infection, but was cured.

We thus see how very closely in their pathogenesis the syphilides, tuberculides, and trichophytides are related. These infections may result in a high degree of allergy, whereby the tissue-cells, particularly of the skin, become sensitised, so that when the dissemination through the blood stream of the infective organism, or, in some cases, of its toxin—e.g., tuberculin and trichophytin—takes place, a variety of eruptions—or cutireactions—occur, representing defensive reactions against superinfection, and resulting in the destruction of the organism or toxin in situ.

D. THE STREPTOCOCCIDES.

Some years ago, at a combined discussion on focal infection in relationship to dermatology, I proposed the name "streptococcides" to designate certain eruptions that I believed to be allergic reactions to streptococcal infection, and comparable to the tuberculides, syphilides, and trichophytides, and I drew up a comparative list, showing how the same type of cutaneous or subcutaneous reaction might result from these four infections. Unfortunately, Sabouraud[13] has recently employed the same word in a different sense, to indicate certain *external* streptococcal infections of the skin, and this is to be deplored, since, in my opinion, the termination "-ide" should be reserved for allergic reactions to micro-organisms or toxins reaching the skin via the blood stream.

The majority of the eruptions that I have labelled streptococcides belong to the erythema group, and include some like erythema multiforme and erythema nodosum which have long been noted to occur in association with rheumatic fever, or, like lupus erythematosus, with chronic rheumatoid arthritis.

Now the dermatologists are in exactly the same position vis-à-vis the eruptions I term "streptococcides" as the physicians are with regard to rheumatic fever, and for the same reason. Tuberculosis, syphilis, and ringworm are well defined and established diseases, and a definite diagnosis of one or the other can usually be substantiated. But the streptococcal group of organisms, some strains of which are normal saprophytes that are ever with us, is in a state of flux ; strains that are in the laboratory apparently identical may have entirely different pathogenic properties, and a human being may die of one that is relatively innocuous to a mouse. It is often, therefore, impossible to furnish definite proof that a given condition is due to streptococcal infection, however strong the presumptive evidence may be, and it is almost as dangerous to draw conclusions from the effect of this or that method of treatment, as it is to infer that, because a pathogenic strain of streptococcus is found in some obvious focus of infection, it is necessarily the cause of a given symptom. Nevertheless, I believe the establishment of a group of streptococcides is justified by the evidence that has accumulated from independent sources during the last few years, evidence that is at least as strong as that upon which the theory of the streptococcal origin of rheumatic fever is based. If we accept it, then, just as Swift and others have drawn a comparison between tuberculosis, syphilis, and rheumatic fever as regards their evolution, and their clinical and pathological pictures, so may we compare the cutaneous manifestations of such well-defined infections as tubercle, syphilis, and ringworm with those of the less tangible streptococcal infections. The great interest of such a comparison lies in this fact, that, with certain types of cutaneous or subcutaneous reaction, not only are the clinical appearances much the same whatever organism is responsible, but the histological pictures are similar in form, showing that the various defensive allergic reactions to infective organisms may depend rather on the tissues affected than on the nature of the infection.

I emphasise this point because, although I agree with Adamson in believing that such distinctive eruptions as lichen planus, psoriasis, and pityriasis rosea must be due each to its own specific micro-organism, this view cannot, in my opinion, be maintained in the types of eruption we are now going to consider. They are, as Darier puts it, *syndromes* that may be provoked by more than one infection, their different morphological and pathological characters depending on the anatomical structures involved and in their situation, and not on the infecting organism responsible for them. Darier, for example, points out that not only may a lichenoid follicular syphilide be clinically identical in appearance with lichen scrofulosorum, but that histologically it may be impossible to differentiate between the two. On the other hand, the same infection may produce two or more of these eruptions at one and the same time.

NATURE OF THE ERUPTIONS.

Let us now consider seriatim some of these types of eruption—the exanthematides as I have called them. Their nature is indicated in Table I.

(1) *The Lichenoid Eruption.*

This is a polymorphic eruption consisting of small papules, some plane like those of lichen planus, but the majority follicular, varying in colour from pale yellowish-brown to bright red. The follicular papules may be capped by a horny scale or plug (one form of lichen spinulosus), or by a vesico-pustule. This form is represented, as will be seen in the table, by lichen scrofulosorum, the lichenoid trichophytide or microsporide, and by the lichenoid follicular syphilide.

Type of eruption.	Syphilides.	Tuberculides.	Trichophytides.	Streptococcides.
Papular lichenoid, usually follicular.	Lichenoid follicular syphilide.	Lichen scrofulosorum.	Lichen trichophyticus.	Lichenoid follicular eruption—e.g., in association with streptococcal impetigo.
Eczematoid.	—	Dermatitis scrofulosa (eczema scrofulosorum).	Eczematoid trichophytide.	Eczematoid, or frankly eczematous dermatitis associated with focal streptococcal infection.
Erythema multiforme.	(?)	(?)	Erythema multiforme trichophyticum (Bloch, Rasch).	Most cases of erythema multiforme of the classical and particularly *of the recurrent type.*
Erythema nodosum.	Doubtful.	Yes.	Yes (Bloch, Sutter, Pulvermacher, Bruusgaard.	Probably the great majority of cases.
Erythema circinatum.	Circinate tertiary syphilide.	Yes. (Darier.)	—	Erythema annulare centrifugum.
Erythema scarlatiniforme.	—	(?)	Yes. (Sutter, Bloch.)	Erythema scarlatiniforme recurrens. Scarlet fever.
Erythema induratum.	Yes. (Ravaut, Tzanck and Pelbois, Pautrier and Darier.)	True Bazin's disease.	—	Non-tubercular form (Whitfield) "Nodosités rheumatismales."
Lupus erythematosus.	(?) according to some authors.	Yes.	—	Yes.

Now Whitfield[29] was, I believe, the first to describe an eruption occurring in association with streptococcal impetigo, usually, but not necessarily secondary to pediculosis capitis. Let me quote his own admirable description:—

> "The first sign to be added to those of the simple impetiginous lesion is the eruption of extremely fine miliary papules, situated at the orifices of the hair follicles of the sides of the back of the neck extending down nearly to the clavicles. These papules appear to be produced by the erection of the hair follicles, and are at first slightly if at all reddened. They may remain in this stage until they subside, or they redden and even become covered with minute vesicles, though this is uncommon. They resemble closely, except as to situation, the papules of lichen scrofulosorum."

It will be seen how nearly the description corresponds to that of the lichenoid tuberculide, syphilide, or trichophytide. I have recently seen a patient with a widespread streptococcal impetigo of the face and neck; on stripping him, there was found on the back and chest an ill-defined erythematous eruption, associated with groups of tiny follicular papules. At his second visit, when his impetigo had almost subsided, all trace of this secondary eruption had disappeared.

(2) *The Eczematoid Eruption.*

There has been considerable discussion as to whether one is justified in describing an eczematoid tuberculide—the eczema scrofulosorum of the older authors. In 1920, Attwater, Marshall and I[30] described a series of cases of an eczematoid dermatitis, occurring almost exclusively in children and adolescents as scaly patches of a characteristic fawn or pale brown colour, usually dry, but sometimes oozing—probably as a result of scratching or rubbing—and situated chiefly on the extensor surfaces of the limbs, the trunk, and on the face, particularly on the temples and forehead below the margin of the hair.

In about 80 per cent. of the cases described Marshall and Attwater were able to demonstrate definite signs of active tuberculosis. I christened the eruption "dermatitis scrofulosa." In 1926, Dowling and I[31] described a further series of these cases, and we showed (1) that exactly similar patches may arise de novo, and persist for some time in tuberculous children at the sites where Pirquet's cuti-test with tuberculin has been done, and (2) that in children with dermatitis scrofulosa patches identical in appearance and histological structure with those already present may be produced by applying tuberculin to the skin. We also observed cases of undoubted lichen scrofulosorum, in which patches of dermatitis scrofulosa were coexistent, and put forward the view that the latter is an eczematoid variety of the former. I am also of the opinion that the so-called "fausse teigne d'Alibert" is merely dermatitis scrofulosa occurring on the scalp.

Some years ago a child whom I had treated in infancy for eczema was brought to me for scaly patches on the limbs and trunk, which were characteristic of dermatitis scrofulosa, accompanied by slight generalised enlargement of the lymphatic glands. The practitioner in charge of the case was entirely sceptical of my opinion that the child had active tuberculosis, but a week later there occurred an outbreak of typical lichen scrofulosorum, and the late Dr. J. J. Perkins confirmed the diagnosis of tuberculous adenitis.

Hügel, Eliaschoff, and Schaumann[32] have recorded cases of lichen scrofulosorum in which the normal papular eruption was associated with "brownish red scaly patches of psoriasiform aspect." Schaumann found in microscopical sections infiltration with epithelioid and giant cells around the follicles.

Comparable to dermatitis scrofulosa is, I think, the eczematoid trichophytide described by Jadassohn and Guth, and the eczematoid microsporide by Finnerud.[33] It is generally agreed that they are varieties of the lichenoid trichophytide or microsporide, just as dermatitis scrofulosa may be regarded as a variety of lichen scrofulosorum. I believe that these eczematoid eruptions are due to the sensitisation of the epidermal cells to the toxins—tuberculin and trichophytin respectively—and the artificial production of dermatitis scrofulosa by applying tuberculin to the skin is in favour of this view. The other tuberculides and trichophytides, with the possible exception in some instances of the lichenoid varieties, are, of course, held to result from embolism of the actual organism, dead or living, and not to their toxins.

Can we recognise a comparable eczematoid streptococcide? I think we can with reasonable certainty. Whitfield remarks in his description of the lichenoid eruption associated with streptococcal impetigo of the scalp:—

> "In some cases the secondary eruption is limited to this, but in others there occurs, after a variable number of days, an acute outbreak all over the chest, abdomen, and shoulders of an annular or figurate erythematous eruption with secondary scaling, such as would be classed in the ordinary way as a circinate seborrhœic eczema of the trunk."

This description tallies exactly with the description of eczematoid trichophytide and microsporide given by Guth and Finnerud respectively.

Like dermatitis scrofulosa this toxic eruption must be distinguished from the scaly, dry form of impetigo. Moreover, Whitfield,[34] Sutton,[35] Visher,[36] myself and others have drawn attention to eczematous eruptions associated with focal sepsis elsewhere—e.g., in the teeth or tonsils—in which the infective organism responsible usually seems to be a streptococcus.

To sum up—generalised eruptions of the lichenoid and, to a great extent, follicular variety, may occur in syphilis, tuberculosis, and trichophytosis, and, as a variant, an eczematoid form of dermatitis due to epidermal sensitisation can be recognised in the last two; eruptions similar in type occur in cases of focal streptococcal infection in the skin itself or elsewhere.

(3) *Erythema Multiforme.*

Unfortunately, the term erythema multiforme has been, and still is, used loosely to designate a variety of erythemato-urticarial and sometimes purpuric eruptions occurring, for example, after the ingestion of certain foods or drugs, and the injection of foreign sera. I would restrict it to an eruption which possesses definite enough clinical features, although few, I think, would claim it to be ætiologically specific.

Clinically, it is characterised by a symmetrical eruption of nummular erythematous papules, usually when fully developed of a characteristic dark lilac hue in the centre, pink or vermilion red at the periphery. To the touch they give a curious sensation like that of a rubber cap stretched over the mouth of a bottle full of fluid.

Numerous variations from this simple lesion may occur; thus the central portion may disappear leaving a ring (erythema annulare) which by excentric spread and intersection with similar rings may produce gyrate figures (erythema gyratum). Owing to the intensity of the serous exudation, vesicles or bullæ may form in the centre, and around these arise rarely the multi-coloured rings—erythematous or vesicular—giving the variety known as erythema or herpes iris; or from actual hæmorrhage the lesions may be purpuric.

The distribution is almost invariably the same, the backs of the hands, wrists and forearms, the elbows and knees, the dorsa of the ankles and feet, and the face being the sites of election. Sometimes the palms and soles are involved, the thick horny layer in these situations somewhat obscuring the characteristics of the papules. True erythema multiforme is one of the relatively few eruptions that affect the mucous membranes, particularly those of mouth, conjunctiva and vulva, and probably of the stomach and intestines, in view of the acute gastro-intestinal crises, so well described by Osler, that may rarely accompany the eruption.

Ætiology.—Excluding the rare cases of apparently classical erythema multiforme provoked by certain foods and drugs, and by infections such as gonorrhœa and enteric, or occurring after vaccination, we may say that several observers have stressed its association with manifest tuberculosis, and both Bloch and Rasch have described typical outbreaks in the course of suppurating ringworm, although at least one of Bloch's cases is open to question. But in the vast majority of cases of true erythema multiforme the eruption, I am convinced, is a manifestation of an acute or chronic infection with a streptococcus; particularly is this true of the recurrent form in which the mucous membrane of the mouth is usually involved, and in which acute attacks occur at intervals of from a few weeks to a year or more. In some cases the mucous membranes alone are involved, and the true nature of the attacks is often not appreciated until, perhaps, in one the cutaneous eruption appears.

For example, some years ago I was asked to see a girl who was supposed to be suffering from a syphilitic affection of the vulva and mouth, although the Wassermann reaction was negative. Inquiry revealed the history of former similar outbreaks, sometimes accompanied by a "rash" on the arms. Later she was admitted to hospital under my care for investigation, and very obligingly developed an attack of the oral and vulval lesions and an outbreak of generalised erythema multiforme, following a sore-throat with pyrexia. The tonsils, which were an obvious source of infection, were subsequently enucleated, and an autogenous vaccine from a streptococcus isolated from them was given; some weeks after her discharge she returned with a recurrence of her mucous membrane lesions and a typical eruption of *erythema nodosum* on the shins, which followed shortly after an injection of her vaccine. She ultimately ceased to have her attacks, but was kept under observation for some two years.

A considerable number of these recurrent cases have been investigated by me in association with Eyre, Knott, and Bulleid. In some of these investigation has been very complete, and the patients have been watched over long periods. Our experience may be summarised as follows: (1) There has usually been present some obvious source or portal of entry of infection, usually the nasopharynx and tonsils or the teeth, from which a predominant strain of streptococcus has been isolated. (2) Specific agglutinins to this strain have been found in the patient's serum. (3) Injection of a vaccine of the pathogenic streptococcus has in the majority of cases provoked at first abortive attacks of the erythema multiforme; this, I am aware, is not conclusive evidence of the specificity of the vaccine, but, as a control, other vaccines have been given without this result, and these focal reactions have been a very striking feature in these cases. (4) Of all the therapeutic methods employed—e.g., autohæmotherapy and non-specific protein injections—eradication or local treatment of the main source of infection followed by specific vaccine therapy over a long period has given the best results.

From a study of these cases of recurrent erythema multiforme, and of the conditions apparently due to chronic streptococcal infection, it would appear that the patient becomes infected by, and sensitised to, a strain of streptococcus which to him is specific, and which can often be recovered from various mucous surfaces—mouth, nasopharynx, and intestine. The presence of a "closed" focus of sepsis is by no means necessary; apart altogether from the tonsils, for example, the mucous membrane of the nasopharynx may be a potent source of infection. Apart from the presence in his blood of agglutinins specific for this particular strain, injection of it, even in small doses, may provoke a sharp general and focal reaction, exactly comparable to those induced by tuberculin in a person sensitised to tubercle, whereas he will tolerate quite large doses of other strains recovered from his own mucous membranes or from other patients.

The association of erythema multiforme with acute rheumatic fever, or with rheumatoid arthritis, is, to my mind, beyond question; I have seen it too often, both in my pre-dermatological days and since, to have any doubt on this point. Although the eruption both in its simple and recurrent form is usually not of serious significance, it may be so. Thus, some years ago, a child, at my request, was admitted to hospital for an acute attack of erythema multiforme, with swelling of the joints, following tonsillitis; endocarditis and pericarditis supervened, a streptococcus was obtained on blood culture, and the child died in a few weeks.

Quite recently a girl of 18 years was admitted under my care for erythema multiforme, of characteristic appearance and distribution, except that many of the lesions were purpuric. She had had recurrent attacks of tonsillitis during the previous six months. Shortly after admission another attack developed, accompanied by considerable fever, and with this a scarlatiniform erythema appeared on the face, limbs, and trunk, the erythema multiforme lesions being still present on the backs of the hands. There was an apical systolic bruit with dilatation of the left ventricle. Later an indurated area of cellulitis arose on the back of the neck, which broke down and discharged pus; from this an acute erysipelas spread downwards over the shoulders and back to the buttocks; in the centre of the back a considerable area of skin became gangrenous, and around this large bullæ formed. Pus from the original site of cellulitis gave a mixed growth of *Streptococcus pyogenes longus*, *Staphylococcus aureus*, and *Bacillus xerosis;* from the serous exudate in the lumbar region a pure growth of *S. pyogenes longus* was obtained.

In spite of injections of scarlatinal antistreptococcal serum the patient's condition grew steadily worse, and she died.

Post Mortem.—Soft vegetations were found on the posterior wall of the left ventricle, extending to the edge of the posterior cusp of the mitral valve, and covering the chordæ tendineæ and the apices of the papillary muscles. There was no evidence of previous valvular damage. The other findings

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(2) *The Eczematoid Eruption.*

There has been considerable discussion as to whether one is justified in describing an eczematoid tuberculide—the eczema scrofulosorum of the older authors. In 1920, Attwater, Marshall and I[30] described a series of cases of an eczematoid dermatitis, occurring almost exclusively in children and adolescents as scaly patches of a characteristic fawn or pale brown colour, usually dry, but sometimes oozing—probably as a result of scratching or rubbing—and situated chiefly on the extensor surfaces of the limbs, the trunk, and on the face, particularly on the temples and forehead below the margin of the hair.

In about 80 per cent. of the cases described Marshall and Attwater were able to demonstrate definite signs of active tuberculosis. I christened the eruption "dermatitis scrofulosa." In 1926, Dowling and I[31] described a further series of these cases, and we showed (1) that exactly similar patches may arise de novo, and persist for some time in tuberculous children at the sites where Pirquet's cuti-test with tuberculin has been done, and (2) that in children with dermatitis scrofulosa patches identical in appearance and histological structure with those already present may be produced by applying tuberculin to the skin. We also observed cases of undoubted lichen scrofulosorum, in which patches of dermatitis scrofulosa were coexistent, and put forward the view that the latter is an eczematoid variety of the former. I am also of the opinion that the so-called "fausse teigne d'Alibert" is merely dermatitis scrofulosa occurring on the scalp.

Some years ago a child whom I had treated in infancy for eczema was brought to me for scaly patches on the limbs and trunk, which were characteristic of dermatitis scrofulosa, accompanied by slight generalised enlargement of the lymphatic glands. The practitioner in charge of the case was entirely sceptical of my opinion that the child had active tuberculosis, but a week later there occurred an outbreak of typical lichen scrofulosorum, and the late Dr. J. J. Perkins confirmed the diagnosis of tuberculous adenitis.

Hügel, Eliascheff, and Schaumann[32] have recorded cases of lichen scrofulosorum in which the normal papular eruption was associated with "brownish red scaly patches of psoriasiform aspect." Schaumann found in microscopical sections infiltration with epithelioid and giant cells around the follicles.

Comparable to dermatitis scrofulosa is, I think, the eczematoid trichophytide described by Jadassohn and Guth, and the eczematoid microsporide by Finnerud.[33] It is generally agreed that they are varieties of the lichenoid trichophytide or microsporide, just as dermatitis scrofulosa may be regarded as a variety of lichen scrofulosorum. I believe that these eczematoid eruptions are due to the sensitisation of the epidermal cells to the toxins—tuberculin and trichophytin respectively—and the artificial production of dermatitis scrofulosa by applying tuberculin to the skin is in favour of this view. The other tuberculides and trichophytides, with the possible exception in some instances of the lichenoid varieties, are, of course, held to result from embolism of the actual organism, dead or living, and not to their toxins.

Can we recognise a comparable eczematoid streptococcide? I think we can with reasonable certainty. Whitfield remarks in his description of the lichenoid eruption associated with streptococcal impetigo of the scalp :—

> "In some cases the secondary eruption is limited to this, but in others there occurs, after a variable number of days, an acute outbreak all over the chest, abdomen, and shoulders of an annular or figurate erythematous eruption with secondary scaling, such as would be classed in the ordinary way as a circinate seborrhœic eczema of the trunk."

This description tallies exactly with the description of eczematoid trichophytide and microsporide given by Guth and Finnerud respectively.

Numerous authors have reported focal reactions after injection of tuberculin, and even acute generalised outbreaks have been thus provoked.

Dyson,[47] rubbed tuberculin and streptococcal ointments into the lesions in a number of cases, and out of 43 patients tested with tuberculin 30, or 68 per cent., gave positive reactions; of eight cases tested with streptococcal ointment 3, or 35 per cent., were positive.

That tuberculosis is, however, not the invariable cause would appear certain from the published post-mortem records of acute fatal cases, in which little or no trace of tuberculosis was found after the most careful search. Schaumann's attempt to reconcile this with his view that the eruption is always tuberculous is too complex to discuss now. The majority of fatal cases published recently have apparently died of streptococcal septicæmia, in some a pure culture of a streptococcus has been obtained from the blood during life, as in those recorded by Sibley[48] and Gibson.[49] Gray suggests this may have been due to a terminal infection, although in one of his own cases, in which a positive blood culture was obtained, the patient recovered.

Without pursuing the discussion further, I would emphasise the clinical similarity between erythema multiforme and lupus erythematosus, which was remarked upon by Galloway and MacLeod[50] many years ago. In the more acute forms of the latter, as I have said, the lesions are indistinguishable from those of the former, and both eruptions involve the mucous membranes of the mouth and conjunctiva. It is of interest, too, that, whereas erythema multiforme is not uncommonly associated with rheumatic fever, lupus erythematosus sometimes accompanies chronic rheumatoid arthritis. The eruption of erythema multiforme, although liable to recur, disappears without leaving any trace, and in rheumatic fever, though recurrence is the rule, the joints recover completely; lupus erythematosus, on the other hand, tends to persist and to produce scarring, just as rheumatoid arthritis is essentially chronic and liable to cause permanent damage to joint structures. One of the worst and most intractable cases of lupus erythematosus I have ever had under my care has mitral and aortic valvular disease dating from childhood, with auricular fibrillation, chronic rheumatoid arthritis chiefly of the finger-joints, and extensive lupus erythematosus of the face neck, and hands. The eruption has remained entirely unaffected by injections of sanocrysin and krysolgan, which are strikingly successful in the majority of those cases of the disease in which tuberculosis is the probable underlying cause.

(6) *Erythema Induratum.*

Under this term are included two types of indolent subcutaneous nodule.

The first type is merely a variety of the so-called hypodermic sarcoid, and is a subcutaneous tuberculide; commonly known in this country as Bazin's disease, it is seen almost exclusively in young girls with the condition of the legs that I described in my first lecture under the term "erythrocyanosis crurum puellaris"—i.e., fat, blue, œdematous legs, in which there is vascular stasis, most evident on the posterior external surfaces of the lowest third. Since the nodules of erythema induratum are of embolic origin, they occur most commonly, as one would expect, on the above area. The nodules may slowly resolve or may rupture and exude an oily fluid, the product of fat necrosis; in the latter case indolent ulcers, which become secondarily infected with pyogenic organisms, result. I believe that all genuine cases of this type are tuberculous; numerous successful animal inoculations with material from the nodules have been made both in this country and abroad; the patients give strongly positive cutaneous and intracutaneous tests with tuberculin, and marked focal reactions if this be injected. Like lichen scrofulosorum nodules may arise for the first time in a tuberculous person after a therapeutic injection of tuberculin. Not uncommonly, papulo-necrotic tuberculides and erythema induratum coexist in the same patient.

The second type was well described by Whitfield[51] many years ago. The lesions, I think, correspond to the "nodosités rheumatismales" of the French. Whitfield says that he has seen it "exclusively in women of from 35—45 years of age, who have suffered from chronic rheumatism supervening on typical acute rheumatism" and he believes "that they are the result of septic absorption, often from the teeth."

I have recently seen a case of this sort in a middle-aged man, who consulted me for an indolent subcutaneous nodule above the right ankle, with considerable brawny œdema around it; later, several fresh smaller nodules appeared on the lower parts of both legs. He was found to have apical infection of several dead teeth, with considerable involvement of alveolar bone. These teeth were extracted, and a vaccine prepared from a streptococcus isolated. The nodules gradually disappeared, but a fresh one appeared after the third dose of vaccine. There has been no further recurrence.

It is possible, as Guy[52] suggests, that other organisms apart from the tubercle bacillus and a streptococcus may produce similar embolic subcutaneous lesions.

PATHOLOGICAL ANATOMY.

A study of the pathological anatomy of these allergic eruptions is of extreme interest, but I can only deal with it very briefly. As might be expected, the changes are for the most part centred round the vessels either of the dermis or hypodermis. A comparison may well be made between the histological picture presented by some of these lesions and that of Aschoff's nodules in the myocardium of cases of acute rheumatism, and of the subcutaneous nodules, both of this disease and of chronic infective arthritis, which, as Carey Coombs[53] emphasises, must also be of embolic orgin.

One may ask upon what depends the differences between these various types of eruption, seeing that some of them can be provoked by widely different organisms; or, for that matter, why does the circulation of the same organism—e.g., the tubercle bacillus—give rise in some cases to a lichenoid eruption, in others to a papulo-necrotic lesion, in others to an erythema induratum or nodosum? I think the chief factor determining the type of lesion is the localisation of the embolised organism or the action of its toxin.

In eruptions such as the roseola of syphilis the organism presumably comes to rest in the superficial capillaries of the skin; in the lichenoid eruptions, the inflammmatory reaction is also superficial, in the papillary body or more particularly around a pilo-sebaceous follicle; in the papulo-necrotic type it is deeper in the dermis. In erythema nodosum and erythema induratum the reaction takes place around a vessel in the subcutaneous tissue. From the observations of Hadfield, recorded in Symes's recent book, made on material supplied by the latter, it appears that the essential lesion in erythema nodosum is "an acute and widespread *arteriolitis* in the subcutaneous fat, resolving rapidly without suppuration." His statements that a recent lesion "showed all the phenomena of acute inflammation, such as follows the actual presence of pyogenic cocci in the subcutaneous tissue," and that "it would have been permissible from an examination of the recent lesion alone to form the opinion that suppuration was likely to occur in it," are of great interest. They suggest that in the cases from which the material was taken were of streptococcal origin. Hadfield failed to find cocci, and he concludes that the lesion is "due to a circulating toxin," but this opinion does not take into account the essential nature of these allergic eruptions—namely, the rapid destruction of embolised organisms.

In erythema induratum Schaumann has adduced evidence to show that the embolism occurs in one of the vasa vasorum of a subcutaneous vein—the lesion being essentially a *phlebitis.*

In both erythema nodosum and erythema induratum there is extensive *fat necrosis*, the products of which are absorbed by histiocytes and giant cells.

FACTORS PREDISPOSING TO THE OCCURRENCE AND LOCALISATION OF THESE ERUPTIONS.

I have already indicated, when discussing the tuberculides and trichophytides, that there are two factors essential for the occurrence of these and similar eruptions—namely, the presence of the causal organism or its toxin (the antigen), and the sensitisation of the tissue cells in the skin or subcutaneous tissue—i.e., the presence in them of antibodies. The various lesions constituting the eruptions are inflammatory reactions resulting from contact of the antigen with the antibodies of the specifically sensitised cells. This phenomenon constitutes "allergy" in the sense originally employed by Pirquet; of late, however, the term has been given a wider significance, as I shall point out in my next lecture, although its essential meaning remains the same.

As Bloch[54] says: "It is clear that an organism which possesses or has acquired (by previous contact) such specific antibodies, will react to the application of the specific antigen differently from an organism which does not possess such antibodies (allergy = different reaction)." Bloch also makes the following deduction, which to my mind is of fundamental importance, both with regard to the eruptions we have been considering and to allergic reactions in general: "The type and course of the allergic reaction are independent of the nature of the antigen, but vary according to the localisation of the antibody—that is, according to which organ reacts to the antigen."

Now until recently it has been held that in true anaphylaxis and allergy the antigen must be a protein, but this view is no longer tenable; it is, in fact, highly probable that the actual specific antigenic bodies, no matter what their source, are non-protein substances of relatively simple chemical composition. This question I shall refer to also in my next lecture. For our present purpose, if this be accepted, it is clear that it is of no consequence whether the various eruptions—tuberculides, trichophytides or streptococcides—are produced by the actual causal organisms, or by their toxins, circulating in the blood stream, and reaching the sensitised tissue of the skin or subcutaneous tissue, since the antigenic substance is presumably present in both. Given, however, the *essential* factors for the production of these eruptions—namely, sensitisation of the cutaneous or subcutaneous tissues, and the access to them *via* the blood stream of the specific antigen—there are, nevertheless, certain other factors predisposing to their occurrence and distribution. Of these I think the most important are: (1) circulatory stasis in the skin and subcutaneous tissue of certain areas; and (2) the action of physical agents such as light, heat, and cold.

This question has been dealt with by Adamson,[55] both in his Goulstonian Lectures and in a more recent communication, and by Lewis[56] in his work on the blood-vessels of the human skin.

It is obvious that, in the case of eruptions dependent upon circulatory micro-organisms or their toxins, stasis in the blood-vessels of a given area will predispose to the embolism of the former or the more prolonged noxious action of the latter. This influence of circulatory stasis is clearly seen in erythema induratum, in the papulo-necrotic tuberculides, in lupus erythematosus, and to a less extent in erythema multiforme and nodosum. Moreover, Adamson has suggested that the roseolar and papular eruptions of secondary syphilis arise at the angles of the vascular network, demonstrated many years ago by Renault—i.e., at the sites of maximum capillary stasis. This network is revealed in certain subjects by exposure of the skin to cold (livedo annularis), or to prolonged heat (erythema or ephelis ab igne), both of which agents increase the stasis in the vessels of low tone farthest away from the central arteriole. Lewis has shown that these vessels are irresponsive to adrenalin and refractory to histamine.

The second factor—namely, the action of light in determining outbreaks and the localisation of certain of these eruptions, is illustrated by some cases of erythema multiforme and lupus erythematosus.

One of my patients with recurrent erythema multiforme, who formerly had frequent attacks, now has one annual attack, which invariably occurs when she first exposes herself to strong sunlight in spring or early summer.

Another, a little girl, whose erythema multiforme began after scarlet fever, was always free in winter, but developed fresh lesions every time she was exposed to sunlight. She was comparatively free last summer, after enucleation of septic tonsils and subsequent vaccine treatment. In her case there was little doubt that her skin became sensitised to a *Streptococcus longus* at the time of her scarlet fever. This provoking action of sunlight is also seen in some cases of lupus erythematosus.

SIGNIFICANCE AND VALUE OF THE CUTANEOUS AND INTRACUTANEOUS TESTS.

When we survey the problem of rheumatic fever and rheumatoid arthritis on the one hand, and of some of the eruptions with which I have just dealt—such as erythema multiforme, erythema nodosum, and lupus erythematosus—on the other, we are struck by one very significant fact—namely, that the chief point of controversy concerning their ætiology centres round the streptococcal group of organisms. Personally, I am satisfied that erythema multiforme of the classical type and erythema nodosum are, in the majority of cases, streptococcides, and that the latter, at any rate, may less commonly be a tuberculide; with regard to lupus erythematosus, I think the evidence that it is sometimes of tuberculous origin is conclusive, and, since in 1915 I first put forward the view of its streptococcal origin in certain cases, confirmatory evidence has accumulated in favour of my claim. I believe that it is often possible clinically to distinguish between the tuberculous and the streptococcal form from the appearance of the eruption.

I have already referred to the difficulty of establishing beyond question the streptococcal origin of a given eruption, or, for that matter, of general diseases such as rheumatic fever or rheumatoid arthritis. I think, however, that valuable evidence might be obtained by carefully controlled intracutaneous tests with emulsions or preferably filtrates of streptococci, such as have been employed by Birkhaug,[57] Strauss,[58] Kaiser,[59] Swift and his co-workers, in their researches on rheumatic fever. This leads me, however, to a consideration of the whole question of diagnostic cutaneous tests with tuberculin, trichophytin, and similar extracts.

With regard to the tuberculin test, I agree with Burhans[60] and Lyle Cummins[61] that the intradermal method of Mendel[62] and Mantoux[63] is preferable to the cutaneous test of Pirquet. I believe that the significance of these tests is widely misunderstood, and it is for this reason that by many they are regarded as comparatively useless. To my mind they afford evidence of one thing and one thing only—namely, that the skin is sensitised to the specific antigenic substance of the infective organism in question. It follows that a positive reaction indicates that an infection with the particular organism has taken place and that there is cutaneous allergy towards it; a negative one excludes the latter, but *not* the former. Lyle Cummins says: "Tuberculin sensitivity is at its height in healthy but infected adults, and is still high in those tuberculous persons in whom the disease is taking a relatively benign course, and it tends to diminish with the gradual deterioration of health consequent on advancing tuberculosis." This statement is true, but it does not emphasise the real meaning of his observations. Since a positive cutaneous or intracutaneous reaction is an index of the degree of cutaneous allergy, it follows that the higher the latter the stronger the reaction. As one would expect, therefore, it is in patients with tuberculide eruptions, which depend for their occurrence on an allergic state of the skin, that some of the strongest reactions are obtained.

As I shall point out later, cutaneous allergy is a protective mechanism against more serious visceral involvement; it disappears for a while after acute infections such as measles, during which time also the Pirquet and intradermal tests become negative; and in advanced cases of tuberculosis, when the protective function of the skin has failed, these tests diminish in intensity.

Colliver[44] has shown that in tuberculosis the Pirquet test, if positive, gives the same degree of reaction in different areas, but this is not so in trichophytosis, in which, of course, the primary site of infection is always in the skin itself. This is shown by the experiments of Pedersen[45] and of Sutter[46] with trichophytin.

Pedersen tested nine cases of suppurating ringworm without secondary trichophytides, with trichophytin by Pirquet's method. All gave positive reactions on the abdomen, seven were positive on the arm, and only four on the leg. The abdomen is one of the chief sites of election for the trichophytide eruptions. Pedersen also tested six cases in which secondary trichophytides were present. All were positive on the abdomen and upper arm where the trichophytides were situated, and only two on the leg where there were no trichophytides. He and Sutter both showed that the cutaneous reaction was always strongest near the site of the suppurating ringworm infection.

From their analogy to the tuberculides and trichophytides the eruptions that I have termed streptococcides should be accompanied by a similar cutaneous allergy towards streptococcal antigen, and positive cutaneous or intracutaneous tests should be obtained with it. An obvious difficulty, however, is the question whether the actual antigenic substance is common to the streptococcal group as a whole, or whether different strains have their own specific substance.

I have already referred to the tests carried out by several workers with emulsions or filtrates of streptococci in rheumatic patients. Recently Forman, in my clinic, has made intradermal tests with streptococcal emulsions, using staphylococcal emulsions and normal saline as controls, in patients with eruptions that I consider to be streptococcides, in apparently normal subjects, and in patients with other diseases. So far as our observations go, this line of research has given significant and promising results.

THE RÔLE OF THE SKIN IN THE DEFENSIVE MECHANISM OF THE BODY.

I have already referred to the importance of impaired function of the skin as a predisposing factor to the development of rheumatic conditions, and in my first lecture I emphasised the relationship between the skin and the activity of the endocrine glands, particularly the adrenals and thyroid, and of the autonomic nervous system, upon which the resistance of the tissues to certain bacterial infections, as Cramer's work suggests, appears largely to depend.

Llewellyn, Gordon, and Gunzberg, in their remarks at the Bath Conference, all laid stress on the symptoms of disordered cutaneous circulation and sweat secretion that are so apparent in rheumatic subjects, and Langdon Brown, Thomson, Pringle, and Strauss dealt with the endocrine factors.

I think it will be generally admitted that, apart from removal and treatment of definite sources of infection, and the employment of vaccines in suitable cases, the methods of treatment in chronic rheumatic conditions which have proved of most value depend very largely, as Howitt[47] has recently emphasised, on stimulation of the skin, whether by increasing the secretion of sweat, or by flushing the cutaneous blood-vessels, or by producing in it a definitely inflammatory reaction, as with erythema doses of ultra-violet light, or the deliberate application of irritant substances. By these various methods one can utilise the excretory function of the skin, increase tissue oxidation, stimulate the adrenal-thyroid-sympathetic system, as by alternate hot and cold douches, and lastly produce what is apparently mild protein shock, which, after a preliminary leucopenia, leads to a considerable leucocytosis and an increase in the bactericidal power of the blood. It is my contention that susceptibility to active infection with the less virulent types of streptococci, as well as with some other organisms, such as the tubercle bacillus, is dependent largely on the prevention of the normal physiological functions *of the skin by the unnatural conditions imposed by* civilisation, and that by far the most effective treatment for such infection, when it has occurred, is the restoration of those functions by all the means at our disposal.

Apart from this, however, in conclusion I would raise a question that to my mind is of profound interest and importance—namely, that, when active infection is present, to what extent do the cutaneous manifestations of such infection constitute a protective mechanism against invasion of deeper and more important organs? May not the rashes of the acute exanthemata, and of the more chronic infections such as syphilis and tubercle, represent part, at any rate, of the body's campaign against the invading organism, since, as we know, they represent antigen-antibody reactions designed to destroy the former in situ? May not, in fact, recovery from an acute exanthem be partly dependent on the rash?

The evidence in favour of this view is very strong. The popular conception of most skin eruptions is that they represent an effort to drive out some poison from within, and anxiety is often expressed about the danger of driving it in again! We should not be too ready to dismiss this idea as an ignorant superstition. Brocq[48] has long upheld the view—earning for himself much scorn in so doing—not only that certain eruptions alternate with various visceral and nervous disorders, which is an indisputable fact, but that the successful treatment of the former may precipitate an attack of the latter, which in turn may be promptly relieved by exciting an inflammatory reaction in the skin. On this idea depend the older methods of treatment by blistering, setons, cupping, scarifications, and the like. We now attempt to treat the underlying infection or toxæmia, on which both the cutaneous and visceral symptoms depend.

In tuberculosis it has long been recognised that patients who suffer from tuberculides and lupus vulgaris are comparatively immune to the more deadly forms of this disease, such as actively progressive phthisis. According to Burnet,[49] it is probable that the skin of all the tissues is that which lends itself best to the spontaneous attenuation of the tuberculous virus. "It is not a matter of indifference," he says, "for a tubercular person that his skin be affected before his lung, or his lung before his skin, and his phthisis is without doubt not the same as if his skin were not involved." Moreover, we know that should the severer forms of visceral involvement, or a general miliary tuberculosis supervene in a patient with tuberculides or lupus, the skin lesions automatically disappear, and the Pirquet reaction—the index of cutaneous allergy—often vanishes with them.

In syphilis it is common knowledge how seldom tabes and general paralysis occur in those who have had severe cutaneous manifestations. Years ago when I was investigating the histories of large numbers of tabetics, I was struck by the fact that few of them retained any recollection of a syphilitic eruption. Moreover, the recent publication by Bruusgaard[50] must give us pause. His predecessor, Boeck, always taught that mercury and iodide were symptomatic remedies, which not only fail to cure the disease, but actually paralyse the body's natural defences, so that when they are administered the infection runs an atypical course, and is much more liable seriously to damage internal organs, particularly the central nervous system. This, of course, was in the pre-salvarsan days. Boeck only employed these drugs in cases in which the disease failed to run its natural course. Bruusgaard and Dählstrom in an exhaustive analysis of Boeck's old patients (some of whom, no doubt, did receive mercury and iodide from other doctors), found that only 0.0 per cent. developed general paralysis, as compared with the usual computation of 4 per cent.

In ringworm (trichophytosis) we know from Bloch's experiments that immunity to reinfection is a function of the allergic condition of the skin cells. In human favus the cuti-reaction is almost always negative, showing that to this fungus (*Achorion schönleinii*) the skin fails to develop antibodies; this fact may well explain why human favus is a chronic disease without any tendency to spontaneous cure.

Lastly, when we come to the eruptions that in my opinion may legitimately be termed rheumatic, or at any rate streptococcides, cannot we detect the same protective rôle against visceral damage? Those, who like Gosse,[71] Lendon, and Symes, base their opinion that erythema nodosum is not a rheumatic disease on the fact that it is comparatively seldom associated with permanent damage to the heart or with chorea, and that it infrequently recurs, have, I believe, failed to grasp the whole story of rheumatic infection, and to understand the significance of its cutaneous manifestations. One might equally well argue that gummata are not syphilitic because they so seldom occur in tabetics and paralytics, or vice versa. That erythema nodosum *is* sometimes associated with typical rheumatic fever and its cardiac complications is certain. That the association is not more frequent is, I submit, because as with the tuberculides and syphilides, the allergic state of the skin on which it depends protects the more vital organs. The same may be said of erythema multiforme.

CONCLUSIONS.

(1) My conclusions are that one may justifiably compare tuberculosis, syphilis, and rheumatism.

(2) That there is increasing evidence that rheumatic fever and some of the chronic forms of rheumatic disease are due to streptococcal infection.

(3) That certain cutaneous manifestations of these three infections and of the severer forms of ringworm are comparable and sometimes indistinguishable; and that they depend on an allergic condition of the skin.

(4) That this allergic condition of the skin is to some extent a protective mechanism against involvement of more vital organs.

(5) That interference with the normal physiological functions of the skin, such as is bound to occur in the majority of persons living under civilised conditions, is an important factor in predisposing to active infection with certain organisms, such as the tubercle bacillus, and with the common saprophytes of the mucous membranes and skin.

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FURTHER OBSERVATIONS ON THE HISTOLOGY OF CARCINOMA OF THE BREAST.

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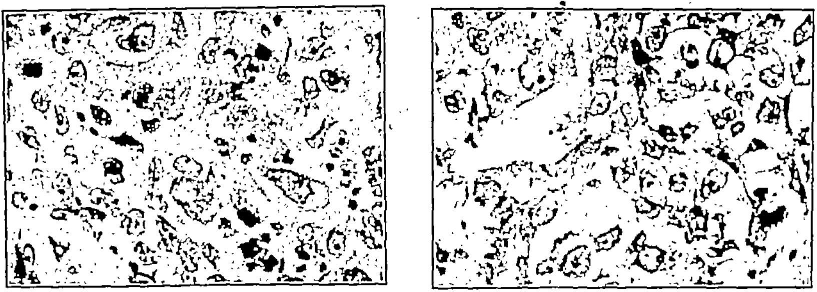
WITHIN recent years many investigations have been conducted with the object of ascertaining the relationship, if any, which exists between the varied histological pictures presented by carcinomata of similar organs and their response to treatment, either surgical or radiological. As a result, certain workers (e.g., Broders, Healy, Greenhough), have concluded that an index of malignancy based on the histological features should prove of value clinically. As a rule it has been found that attention is best directed to the actual tumour cells, neglecting or paying small attention to stromal changes.

In a previous communication [1] we brought forward evidence to show that in the case of carcinoma of the breast such a relationship between the histological appearance and the subsequent clinical course of the disease does exist; but we came to the conclusion that the histological index of malignancy should be used only as an auxiliary to other factors, and that the important point was the stage to which the disease had advanced at the time the treatment was undertaken. In actual practice it was believed that the histological malignancy should prove of prognostic value in cases in which the disease had spread from the breast to the axillary glands, but had not yet widely infiltrated those glands—i.e., a group intermediate between the early and the advanced cases of carcinoma of the breast. In furtherance of this work, we thought it might be of interest to study the relationship between the histological appearance of the primary growth and that of its secondary deposits. The results of such an investigation are herewith recorded (A). In addition, under (B) the histology of those tumours of the breast which have given rise to metastases in the glands is compared with the appearances of those growths in which microscopical examination of the axillary glands has failed to demonstrate metastases.

FIG. 1.

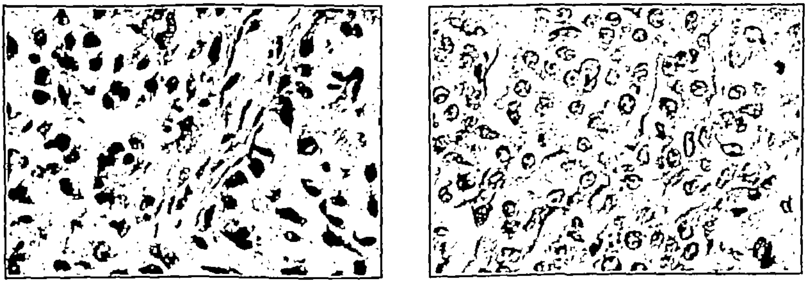


A.—Primary tumour.

B.—Secondary deposit in axillary gland.

The tumours are identical in appearance and malignancy.
(The majority of the cases were in this category.)

FIG. 2.



A.—Primary tumour (Group 3).

B.—Secondary deposit (Group 2).

The secondary deposit is less malignant than the primary growth.

(A.) *The Relationship between the Histological Appearances of the Primary Growth and its Secondary Deposits.*

In spite of its apparent importance no detailed accounts of the comparative histology of primary carcinomata and their secondary deposits have been traced, although generalisations on the subject are not infrequent. Ewing,[2] discussing carcinomata in general, states that "in metastatic deposits preservation of structural type is often remarkable yet, as a rule, there is increased anaplasia and more rapid growth in metastatic tumours." Delbet and Mendaro,[3] on the other hand, speaking of breast carcinomata, say that the secondary deposits in lymphatic glands are often more differentiated than the primary tumours. In neither case are examples quoted, nor is any detailed analysis given.

The material examined consisted of the microscopic sections of 110 consecutive cases of carcinoma of the breast submitted to the operation of radical removal at the Middlesex Hospital, from 1926 to 1928 inclusive, in which histological examination showed metastasis in the axillary lymph nodes. The method of study of the cases was identical with that used previously, and the material was classified into three groups, Group I. representing a low and Group III a high degree of malignancy.

The criteria adopted in assessing the malignancy have already been given,[1] and briefly are those changes which indicate the degree of departure from the structure and arrangement of normal breast epithelium. The three characters on which most stress has been laid are: (1) tubule formation; (2) irregularity in size and shape of nuclei; (3) hyperchromatism. Other factors which have been noted are: (4) the amount of secretion and (5) the number of mitoses.

No attention has been paid to the presence of fibrosis, leucocytic infiltration, nor any factor not directly concerned with the appearance of the epithelial cells.

In order to obtain an opinion as unbiased as possible the sections of all the primary tumours were first examined, and then independently the sections of the secondary deposits. Each primary growth was then compared with its metastases, and any differences noted on the independent examination were discussed and, if necessary, confirmed.

The results of the analysis are summarised in Table I.

TABLE I.—*Showing Numbers of Cases with and without Changes in Malignancy of Metastases.*

Histological group of primary.	No. of cases.	Metastases in same group.	Metastases in lower group.	Metastases in higher group.
1. Low malignancy	24	24	—	0
2. Moderate ,,	39	28	10	1
3. High ,,	47	39	8	—
Total	110	91	18	1

It will be seen that, of the 110 cases studied, in 91 the breast and glands were classified as being similar in histological type and malignancy; of the remaining 19, in 18 the secondary deposits were placed in a lower category than their corresponding primaries, whilst in only one instance was it found that the glandular deposits had been placed in a higher category. As a result of these findings one may say that in the large majority of cases of carcinoma of the breast (approximately 83 per cent. in this series) the histological malignancy of the secondary deposits in the axillary glands is almost identical with that of the primary tumour; in an appreciable minority (16 per cent.) the secondary deposits have a less malignant appearance, whilst only rarely (one case) does the growth in the glands appear more malignant than the primary tumour.

Discussion.—With regard to the practical application of this investigation two points of importance suggest themselves. In the first place it is seen that in assessing the malignancy of carcinoma by histological means attention should be directed to examination of the primary growth. Furthermore, it is obvious that it would be useless to look for signs of prognostic value in the primary growth if, in many cases, the metastases were of a higher malignancy, as each secondary growth would serve as a focus for the spread of carcinoma more malignant than the original primary tumour. But the investigation has shown that in the breast, at any rate, this occurs so rarely as to be negligible.

The other point upon which this investigation has some bearing is that of radium treatment. It is well recognised that, in many situations, the radium treatment of lymphatic secondary deposits is less successful than that of the primary growth. The question arises whether this is due solely to difficulties of access or whether other factors, such as alteration in the radiosensitivity of the growth cells, are concerned. Regaud,[4] Healy,[5] and other workers maintain that the more differentiated a tumour the less is its response to radium. If this hypothesis be correct, since in the breast the large majority of the glandular secondary deposits have a similar appearance to that of the primary growth, they should react in the same way to radium; but in the occasional case in which the growth in the gland is more differentiated this secondary growth might prove more refractory to radium.

(*B.*) *Histological Malignancy and Metastasis.*

During the period in which the above 110 cases of carcinoma of the breast with axillary secondary deposits were encountered there were 53 cases which showed no secondary deposits. These 53 cases constitute 32·5 per cent. of the total number which underwent the radical operation, a figure which agrees closely with that of 30 per cent. quoted by Barling for the cases in the Birmingham Hospitals.[6] They also were examined and classified in the manner noted above, and the reults are given in Table II.

TABLE II.—*Histological Malignancy and Metastasis.*

Histological group of primary.	Total No. of cases.	No. with metastases (from Table I.).	No. without metastases.
1. Low malignancy ..	54	24	30
2. Moderate ,, ..	57	39	18
3. Marked ,, ..	52	47	5
Total	163	110	53

It will be seen that more than half (56·6 per cent.) of the cases which have not metastasised are of low histological malignancy, whilst only about one-tenth (9·4 per cent.) are in the high category. When these results are compared with those of the tumours which have shown secondary deposits a striking difference is noted, as of the latter only 22 per cent. are in the low grade, whereas 43 per cent. of the tumours are of high malignancy.

These results, in addition to verifying the relationship between histological appearance and clinical malignancy, support the conclusion previously expressed that in a carcinoma of the breast of low histological malignancy the early or favourable stage is of longer duration and that patients are more likely to present themselves for treatment before there has been much spread of the disease.

Summary.

(1) 110 carcinomata of the breast with their secondary deposits in the axillary glands, and 53 cases without secondary deposits have been examined from the point of view of the histological appearances of malignancy. (2) In the large majority of instances (83 per cent.) the secondary deposits in the lymphatic glands are similar in appearance and malignancy to the primary growth; in an appreciable minority (16 per cent.) the malignancy of the glandular metastases is lowered, but only in one case is the malignancy raised. (3) The series of cases in which secondary deposits have not been found in the axillary glands shows a relatively much greater number of tumours of low histological malignancy than does the series with such deposits.

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THE OCCUPATIONAL DISEASES OF HOP-PICKING.

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THERE are three recognised affections due to hop-picking, and seen only among hop pickers. These are known as "hop rash," "hop eye" and "hop gout," and are familiar to those who have worked in and among hop gardens. The literature concerning them is, however, scanty.

Hop Rash.

The first mention of hop rash was made by Badham[1] in 1834, who contracted a dermatitis as the result of putting his own chapped hands into a "bin" of hops. He also records the case of a girl of 14 years of age who, while suffering from chilblains, plunged her hands into a "bin" of hops to warm them and then developed a rash similar to the one he had suffered from himself. O'Donovan,[2] in 1924, again drew attention to the condition, and recorded two cases which he saw at the London Hospital. He points out that they follow the general type reaction as described by Sequeira in cases of dermatitis caused by plants. He states that "females only, so far, have been affected from the ages of 12 up to 67, *and always in the month of* September." Lewith[3] notes the occurrence of three cases, all females.

In a letter to THE LANCET in October, 1924, after reading O'Donovan's article, Streich[4] describes a case of hop rash in a woman of 40 who, in addition to the rash on her hands and face, which was typical in appearance, also developed a purpuric rash on her legs. A further reference to the condition was made about the same time by Galbraith,[5] who says that "Dr. Ebden, in charge of the Hop Pickers' Hospital and Dispensaries at Marden, noted 58 cases of hop rash." Galbraith also states his belief that this hop rash, together with the conjunctivitis and synovitis noted, is produced by some irritant from the hop plant. In support of this belief he says that "owing to the remarkable absence of vermin from the hops in the present year (i.e. 1924), no washes have been used." This discountenances any theory there may be that *the affections under consideration are due to the* chemical washes used on the plants. This is *further supported by the fact that* no regular garden employee applying washes to the hops during their period of growth has been known to suffer from the rash, conjunctivitis, or gout.

The next reference to the subject is found in a brief note in the Annual Report for Kent for 1926, as reported in THE LANCET,[6] in which of 25,000 pickers it is said that 237 suffered from hop rash, 95 from hop eye, and 87 from hop gout. It is thus evident that the affections are fairly common among the pickers.

My own attention was first drawn to the subject when acting as medical officer to the Hop Pickers' Hospital and Dispensaries at Marden in 1927, when a number of cases were seen and treated. In 1928, *when acting in the same capacity, I made careful* notes of all cases seen throughout the hop-picking season of August and September, and out of a total of 1172 cases of all kinds 52 were of hop dermatitis. Of these, 4 were men, 39 were women, and 9 were children of both sexes under 14 years of age. The incidence of cases among males is of interest in face of *the fact that all recorded cases have hitherto been* females.

The 52 cases mentioned made a total of 81 attendances at the hospital for treatment, thus indicating the short duration of the disease. It appears to recur in the same individual year after year. One or two adults remembered suffering from it as children and had thereby been deterred from hopping, but they had ventured again thinking that they might have *outgrown their susceptibility. This was not so. One* boy of 12 years of age had suffered from it severely on each of his two visits to the hop gardens, and was not anxious to return the following year, in spite of the alluring prospect camp life in the country must offer to the East-end child.

The onset of the disease is marked by a papular erythema occurring on exposed surfaces; hands, arms, face, in one or all of these situations. The accompany*ing irritation is intense, and it is usually this which* drives the patient to seek medical advice. Concomitant with this is usually some general constitutional disturbance which may be severe. In the worst cases the patient complains of headache and irresistible drowsiness. One case which came to the hospital almost fell asleep as she described her symptoms, and it was only by making a considerable effort that she was able to concentrate sufficiently on her tale to make herself clear. In this case *headache* was a prominent feature. The face and hands were covered with a dense papular erythema, and there was considerable œdema of the parts, so much so that the woman could scarcely see out of her eyes, and was unable to clench her fists.

The papular stage may rapidly become vesicular and then pustular, the pustules varying in size from about one-tenth of an inch to half an inch in diameter. Associated with the dermatitis are invariably a number of small scratches from the hop bines. Pickers' hands are always deeply stained a dark green colour, and have the characteristic smell *of hops about them. The colour is no doubt due to a* conglomeration of hop washes, hop juices, and hop pollen. The presence of innumerable scratches, together with an inevitable inoculation of them with hop juices and pollen, suggests some kind of protein sensitisation.

Hop Eye.

Hop eye has received much less attention than hop rash. It was first discussed by Adams,[7] who made an exhaustive examination of the hop plant, and came to the conclusion that hop eye is due to a mechanical irritation of the eye by the spine-shaped hairs found *on the top bracts, leaves, and bines. The condition is* also recognised by Prosser White,[8] and is mentioned by Galbraith,[5] and the Kent Annual Report, 1926.[6]

At the Marden Hop Pickers' Hospital in the 1928 season, 14 cases of hop eye occurred among the total of 1172 patients treated. Of these, 11 were women and 3 were children. No cases were noted *among men. The condition in a previously healthy* eye is a conjunctivitis. There is considerable lacrymation, and usually there is œdema of the eyelids associated with it. Hop eye comes on rapidly after the eye or eyes have been rubbed with fingers dirty from hop-picking. The patient comes complaining of pain in the eye, smarting in character, which *rapidly becomes worse. On examination the* conjunctiva is uniformly reddened and lacrymation is marked. The amount of accompanying œdema of the lids varies considerably. In one case a woman came running in from the hop garden with a "swollen eye." She was positive that the swelling came up within a few moments of having rubbed the eye with *her fingers.* Her fingers were covered with the usual dark green stain from the hops. The conjunctiva of the eye was *perfectly clear and there was no lacry*mation. The lids were both swollen so much that the patient was unable to open them herself.

As in hop dermatitis, the association between a receptive body surface and a possible source of protein irritation is striking. The similarity between these conditions and those produced experimentally *on a much smaller scale by the cutaneous and ophthal*mic reactions used in the estimation of individual susceptibility to such proteins as those, *for example*, which are known to produce hay-fever, is arresting and merits further investigation.

Hop Gout.

The only references to hop gout are made by Prosser White[8] and Galbraith.[5] It is recognised by *hop pickers and growers as a condition peculiar to the* hop-picking season. Like the dermatitis and conjunctivitis it is never seen at other times of the year among workers in the hop gardens.

At the Marden Hospital in the 1928 season, of the 1172 cases seen only 17 were treated for hop gout. Although 50 per cent. of all cases were children, not *one of them* was found to be suffering from hop gout. Women appeared to be more frequently affected than men, *for of the above 17 cases* 11 were women varying from 20 to 70 years of age, and the remaining 6 were men of from 20 to 58 *years of age. It should* be pointed out that in all three of these conditions the prevalence among women is probably due in part, if not entirely, to the fact that the number of women employed is very much greater than the number of men. The patient suffering from hop gout comes complaining of pain, limitation of movement, and *swelling of fairly rapid onset. It may occur in the* fingers, hand, wrist, or forearm, and is unilateral. The *swelling is red and tense, and on palpation a typical* fine crepitation is felt like the crunching of crisp snow. In most cases the condition runs as short a course as the allied rash and conjunctivitis.

The following are notes of a typical case :—

A man of 20 years came complaining that he could not use the first and second fingers of his right hand, and of a painful swelling on the back of the hand. He had started work on the previous day feeling quite fit as usual. In the afternoon he had noticed that the first finger was "getting tired," It then began to feel numb, so that he had to stop picking and rub it till sensation was restored. After the tea interval the back of the hand had begun to ache, but no swelling was noticeable. He rubbed some liniment into the hand that night and slept soundly. The next morning he found, while dressing, that he could not pick things up easily, and kept dropping them. The back of the hand then appeared to be red and a little swollen. He tried to work in the hop garden that morning, but found that he could only use the hand for short spells at a time. After half an hour's picking a quarter of an hour's rest was necessary to restore the feeling in the hand.

On examination a red tense swelling was seen on the dorsum of the right hand. On palpation it appeared to be very tender. No fluctuation was felt and there was no pitting on pressure. On passive movement of the first finger fine crepitations could readily be felt in the swelling especially along the line of the first metacarpal bone, and similarly on passive movement of the second finger crepitations were felt along the proximal third of the corresponding metacarpal bone. None was felt on movement of the third and fourth fingers. Measurements were made of the swollen parts and comparison made with the sound hand. The patient was not subject to any digestive disturbances, and no trace of a gouty diathesis was apparent.

Whether one is justified in associating this synovitis with the dermatitis and conjunctivitis described remains to be seen. The ætiology of all three of them is as yet obscure, and it is to be proved whether the origin of one or all of them can justly be attributed to a protein sensitisation.

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Clinical and Laboratory Notes.

SPONTANEOUS REDUCTION IN VOLVULUS OF THE BOWEL.

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IT is generally believed that volvulus is sometimes reduced spontaneously, but direct evidence is difficult to obtain. for once reduction has occurred there is usually no occasion for either operation or postmortem examination. The following cases are of interest, in that they provide evidence of reduction having occurred.

CASE 1.—A Mohammedan agricultural labourer, aged 50, was admitted to the King George V. Hospital, Lucknow, with a much distended abdomen, occasional vomiting, and periodic attacks of griping pain. He said that in the last four years he had had three similar attacks which had passed off after a day or two. This attack was more severe, and had lasted four days, during which he had passed neither fæces nor flatus. Enemata produced no result, and at operation a volvulus of the sigmoid was found. The affected loop was enormously distended, and its walls were hypertrophied. It was easily untwisted and at once emptied into the rectum. It was then noted that besides a few soft recent adhesions there were old firm adhesions at the pedicle of the volvulus binding the two ends of the loop together, and a patch of old scarring on the bowel, evidently the result of a previous attack. The ends of the loop were separated so far as possible, and fixed, in the hope of preventing a recurrence. The patient recovered.

The next two cases concern the small intestine, and it is necessary here to refer to the frequency of volvulus of the small intestine in India. I have met with it in 6 out of 25 operations, and in 2 out of 4 postmortems.

CASE 2.—A Hindu male, aged about 40, was admitted to the Thomason Hospital, Agra, on the third day of obstruction. He gave a history of a similar attack about two years previously. The general condition was grave.

At operation the cæcum and lower ileum were empty, and on tracing the empty bowel upwards it was found that a few inches above the ileocæcal valve it was firmly adherent to the root of the mesentery. Above this point were some feet of normal but empty bowel. The bowel was then again adherent to the root of the mesentery; from this point upwards it was distended.

The arrangement of the bowel and mesentery was exactly like that of a volvulus; the mesentery was *gathered up like a pedicle between the points of* adhesion to the bowel. But the intervening loop was empty instead of distended, as in volvulus, no twist was really present, and further examination showed that the obstruction was due to a stricture, the result of extensive scarring of the bowel. Obviously there had once been a volvulus which had undergone spontaneous reduction after causing grave damage to the intestine.

The third case is an example of a type very common in India, in which what appears to be grave obstruction is relieved by a succession of enemata, leaving the surgeon wondering what was the nature of the obstruction. But this patient died soon after the relief of the obstruction, and furnished a most interesting postmortem.

CASE 3.—A Nepalese road labourer, aged about 30, was admitted to the Crossthwaite Hospital, Nainital, with distension, vomiting, and pain. The onset, 12 hours previously, had been sudden, and the patient showed some degree of collapse. He had already taken a purgative. He refused operation, and two enemata failed to relieve him. An hour later, after a third enema, he passed a copious watery motion, but became so collapsed that an intravenous infusion was called for. Twenty minutes later a further action occurred and all distension disappeared, but he died a few minutes later.

A post-mortem examination was made within two hours. The only abnormalities found were the following. There were subserous hæmorrhages in the ileum, most marked at the antimesenteric border, and increasing in intensity as the bowel was traced downwards to a point about 4 inches from the ileocæcal valve, where they ceased abruptly. There was also a contusion on the left face of the mesentery at this level, in the form of an oblique streak near its root. There was no thrombosis in the mesenteric vessels. The lower limit of the subperitoneal hæmorrhages corresponded with the usual lower limit of a volvulus of the small intestine, and I have noted identical bruising in one post-mortem and in one operation in cases of volvulus, the bruise being simply the impress of the tense lower end of the loop.

It is impossible to explain these findings, except on the basis of a volvulus which had undergone spontaneous reduction.

EPIDEMIC (LETHARGIC) ENCEPHALITIS

IN A VERY YOUNG INFANT.

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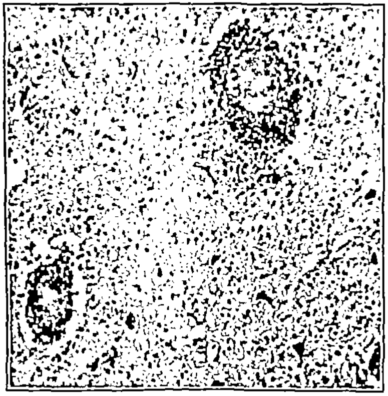
CASES of encephalitis lethargica in very young infants are of rare occurrence, although instances of infected mothers passing on the disease to their offspring have been recorded. The youngest of this type contracted the disease when two weeks old, as described by W. Harris[1] and subsequently further discussed in the Ministry of Health report.[2] Sporadic cases of the disease in early infancy have been described. Neal[3] in a collection of 274 instances of the disease finding four under the age of three months. Happ and Mason[4] recorded a case of encephalitis lethargica in a black baby at the age of five weeks, and Findlay and Shiskin[5] described a non-fatal case of an infant which became drowsy at three weeks of age, with a left internal squint. The following case is put on record because of its exceptional nature, in that symptoms appeared at the end of the second week of life, although there is no evidence that the mother was the source of infection.

A. B. was the first child, born at full term of healthy parents. The mother was in excellent health throughout pregnancy, and neither then nor at any other time had suffered from any symptoms which could be attributed to encephalitis lethargica. The labour was normal and light chloroform anæsthesia was induced during the last hour. The baby was not at all cyanosed at birth and for the first 14 days of life remained perfectly healthy. At the age of one week circumcision was performed under light ether anæsthesia, and the subsequent progress was excellent for a week. At no time was the child in contact with any patient suffering from any of the symptoms of encephalitis lethargica. Vaccination was not performed.

At the age of 14 days it was noticed that the child was irritable. Then drowsiness set in and it became increasingly difficult to rouse the child, who was admitted to the Hospital for Sick Children at the age of one month. The bowels had been acting normally, there had been no vomiting, no head retraction, and no convulsions.

On admission the baby lay in a very drowsy state, from which it could not be roused even for feeding. No cry could be elicited by any form of stimulation. The left side of the face was paralysed, and there was some slight rigidity of the limbs. The knee-jerks were active and the plantar responses flexor. The pupils were contracted and did not react to light. Ophthalmoscopic examination revealed normal discs. The fontanelle was depressed, the temperature was normal, and the pulse-rate was 130 per minute. No abnormalities could be found in the other organs or systems. The urine was normal and the blood-urea was 42 mg. per 100 c.cm. A superficial nævus about two inches in diameter was present behind the left ear. The respirations ceased on several occasions before death, but artificial respiration was effective in restoring the normal respiratory rhythm until two days after admission, when death occurred. The cerebro-spinal fluid was not examined.



Section of optic thalamus. (× 100.)

The *post-mortem examination*, 20 hours after death, showed no naked eye abnormalities of any organ. The brain was more congested than normal, but there was no special localisation of this congestion in any part of the brain. No sign of any nævoid condition of the vessels of the meninges or brain was present. Portions of the cerebral cortex and basal ganglia were submitted to histological examination. In the optic thalamus definite evidence of the presence of encephalitis of the "lethargica" type was obtained (see figure). The perivascular lymphatic spaces were full of small round cells giving the classical appearance of "cuffing," while there is also a more diffuse but less well-marked infiltration of the brain-tissue between the blood-vessels. Other regions of the brain examined appeared normal.

I am indebted to Dr. Hugh Thursfield for permission to publish this case, and to Prof. J. McIntosh and Dr. J. G. Greenfield for kindly examining the histological sections of the brain.

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CONTINUOUS ARTIFICIAL RESPIRATION,

WITH MAINTENANCE OF THE CIRCULATION FOR TWELVE HOURS AFTER APPARENT DEATH.

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Many cases have been reported in which patients who have collapsed during, or shortly after, operation and apparently died, have been resuscitated, and their life maintained for varying periods; yet I consider the following case exceptional enough to be reported.

History of the Case.

A married man, aged 61 years, a railway clerk, was admitted to the David Lewis Northern Hospital, Liverpool (case No. 1894/29), suffering from trigeminal neuralgia. Seven years previously he had had a right lower molar tooth removed on account of a root abscess. Shortly after the extraction the neuralgia started, and at first involved the whole of the right side of the face. Three years later a sequestrum was removed from the site of the previous trouble in the lower jaw, and after this the neuralgia was confined to the right inferior maxillary nerve. The nerve had been injected with alcohol on three occasions with definite, but only temporary, relief. The relief from pain after the third injection lasted only a few weeks.

As life, especially in cold weather, had become unbearable owing to the frequency and severity of the attacks of neuralgia, it was decided to cut the sensory root of the right Gasserian ganglion. On July 13th, 1929, under rectal ether anæsthesia, the ganglion was approached through a subtemporal trephine opening one inch in diameter, and its two maxillary divisions and its sensory root were clearly defined. While the ganglion was being shown to the students the overlying brain suddenly bulged, forcing the brain retractor down on to the base of the skull. It was immediately obvious that an intradural or cerebral hæmorrhage had occurred, and all thought of cutting the sensory root of the nerve was abandoned, and instead, a hook-shaped knife was quickly passed round the inferior maxillary nerve between the ganglion and the foramen ovale, and in this way the nerve was cut.

The dura was now bulging through the trephine hole, and all cerebral pulsation had stopped. The opening in the skull was enlarged with bone forceps and the dura was opened. No blood escaped, but the brain was pushed out and lacerated on the edge of the skull opening, so great was the intracranial pressure. The opening in the skull was still further enlarged, and as some pulsation could now be seen, and as the general condition of the patient did not warrant further interference, the wound was quickly sewn up. The patient returned to the ward at 12.40 P.M., and at that time he was breathing regularly, and the pulse did not give any cause for alarm.

At 1.0 P.M., shortly after the rectum had been washed out to remove the ether, the patient collapsed and stopped breathing. The house surgeon was called to the ward, and found the heart beating very feebly; he started artificial respiration, but at 1.40 as there was no sign of active respiration restarting, and as the heart beat could no longer be felt or auscultated, he ceased his efforts and came to report that the patient had "died."

I saw the patient about 1.50 P.M.; he was then apparently dead. The eyes were dilated and fixed, all the muscles flaccid and the reflexes absent, respiration had stopped and there was no indication that the heart was beating. We decided, however, to make a last effort, and restarted artificial respiration. After a few minutes the pulse began to return and steadily increased in volume, but there was no other sign of life. By 2.15 the heart was beating rapidly (140), but so strongly that there was marked intercostal and epigastric pulsation. All attempts to restart active respiration were in vain, and by 3.30 P.M. the heart had again become weak and the pulse impalpable.

An intracardiac injection of 1 c.cm. of 1-1000 adrenalin was given and within a few minutes the heart was once more beating strongly. After about twenty minutes the force of the heart beat once more began to fade, but a second injection of adrenalin again restored its force, so that, even through the bed-clothes, it was possible to see the precordial and epigastric pulsation.

And so it continued, the pulsation of the heart the only sign of life. Intracardiac injections of adrenalin were given every 15–20 minutes; after each injection the heart beat strongly for ten or more minutes, and then gradually faded away, only to come back promptly after another injection. At 6.0 P.M. the wound was examined; little or no blood had drained out, but the whole area bulged markedly, so the skin stiches were removed. At this moment an injection of adrenalin was given, and immediately there was a burst of hæmorrhage from some of the skin vessels, and artery forceps had to be applied and the vessels ligated. Slight pulsation of the brain was noted. The dressings were replaced.

At 8.0 P.M. the pulse-rate was 140, and in the brachial artery the systolic pressure was 125 and the diastolic pressure 75 mm. of Hg. At 8.45, immediately after the 18th injection of adrenalin, the pulse-rate was 148 and the systolic and diastolic pressures 135 and 80. Though the effect of the injections was still phenomenal it was now noted that the pulse-rate was steadily increasing, and the effect of each injection was not as lasting as the earlier ones had been. Yet even then, if, when the patient was quite pulseless, an intracardiac injection of 1 c.cm. of adrenalin was given, within a minute the heart would be beating so strongly that pulsation could be easily seen in the epigastric region and in the vessels in the neck.

Artificial respiration and the injections of adrenalin were continued until midnight when the 27th and last injection was given. The heart continued to beat feebly until 1.30 A.M. Artificial respiration was then stopped. Except for the ten minutes between 1.40 and 1.50 P.M., artificial respiration was maintained continuously for twelve and a half hours, during which time the patient showed no sign of life other than the pulsation of the heart.

Post-mortem Examination.

We were unable to obtain permission for a full post-mortem, but we examined the lungs, heart, and brain.

The *lungs* were normal. The *heart* was also normal, except for an area of ecchymosis extending from the surface almost through into the heart cavity. This area was about the size of a sixpence, and was situated on the anterior wall of the right ventricle, and had been produced by the numerous intracardiac injections.

Head.—Except for the opening made to decompress the brain there was no opening or puncture in the dura. No hæmorrhage was found on the right side of the brain. There was considerable diffuse subdural hæmorrhage on the left side of the cerebrum and on the front of the pons and medulla. The left lateral ventricle was filled with blood, but there was no hæmorrhage in the brain substance.

Very careful examination of the operation field showed that at no place had the dura been opened, nor was there any hæmorrhage either within or without the dura. The inferior maxillary division of the trigeminal nerve had been cut through close to its origin from the Gasserian ganglion, but otherwise the nerve was intact. There was no bony covering to the carotid canal, but neither the carotid artery nor the superior longitudinal sinus was injured. The cavernous sinus was intact. The right superior cerebellar artery appeared to be severed, but there was no clue as to how this had happened, and I am of the opinion that it was injured in removing the brain.

It is very unsatisfactory that no explanation was found to account for the sudden, dramatic, and fatal hæmorrhage. Exactly the same technique was used in this case as in all our previous cases of section of the sensory root of the Gasserian ganglion, none of which had given rise to any trouble or anxiety.

Lieut.-Colonel C. T. Samman, J.P., R.A.M.C., was recently re-elected Master of the Society of Apothecaries of London for the ensuing year.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—An all-day course in diseases of the chest will be held at the Brompton Hospital from Sept. 9th to 14th. From Sept. 9th to 22nd, under the direction of Dr. Eric Pritchard, a course will be given at the Infants Hospital designed for those engaged in infant welfare work. A course of lecture-demonstrations in psychological medicine will be undertaken by Dr. Porter Phillips and members of his staff at the Bethlem Hospital, on Tuesday and Saturday mornings at 11 A.M., from Sept. 10th to Oct. 5th. An intensive course of medicine, surgery, and the specialties (for men only) will be held at the Westminster Hospital from Sept. 16th to 28th, daily, from 10.30 A.M. to 5.30 P.M. The Prince of Wales's General Hospital, in conjunction with the North Middlesex Hospital, Tottenham, will give a course in gastro-enterology from Sept. 30th to Oct. 4th. Another evening course for the first M.R.C.P. will be held from Oct. 15th to Dec. 6th, on Tuesday and Friday evenings, at 8.30 P.M. in the lecture hall of the Medical Society of London. Full particulars of the above and other courses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W.1.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 479.)

SECTION OF MEDICINE.

PATHOGENESIS AND TREATMENT OF ASTHMA.

Dr. A. F. HURST (New Lodge Clinic) remarked that this was the sixth occasion on which asthma had come up for discussion at an annual meeting, and while he doubted whether any real advance in knowledge had been made, yet he believed the disease was better understood now than heretofore. An appreciation of the variations, within the limits of the normal, of the chemical constituents of the body fluids afforded a basis upon which inherited constitutional tendencies might be explained. The pathogenesis of asthma lay in slight deviations from average blood chemistry whereby vagal overaction was favoured as against the opposing sympathetic effects. Thus arose muscular bronchial spasm and mucous secretion producing the classical changes. Suprarenal exhaustion, he thought, played no insignificant part, as shown by the increased liability to asthma as the result of fatigue, which partially explained week-end, menstrual, and pre-holiday attacks. The part played by adrenalin was demonstrated by the low blood-sugar content, the low blood pressure, and the effect of adrenalin treatment. The hypersensitiveness made familiar by the cutaneous reactions had led to little result except for the help given by proteins in children and pollens at all ages. The nose was important from the point of view of restricted air inlet; a distended stomach or rectum might be the source of an attack. The psychological factor of expectation was potent.

Of the many forms of treatment only two approached a cure—namely: (1) Careful dietary as applied more particularly by Dr. Adam to children, and (2) residence in the Alps at a height of 4000 ft. or more. The effect of the latter was due more to atmospheric rarefaction than to freedom from dust and allergens. Nasal hygiene involved three factors: (*a*) Removal of sepsis from the sinuses; (*b*) securing a free airway; (*c*) destroying the asthma-reflex area. Biochemistry seemed to offer some prospect of cure, but this aspect had not yet been fully developed. A cheery optimism did much to help the psychological factor in many patients; reflex exciting causes, especially from stomach and rectum, always needed careful attention. The treatment of the paroxysm remained, and for this adrenalin was a specific. The principle of giving the patient instructions and a hypodermic syringe was maintained and the method of continuous adrenalin administration in status asthmaticus was described. Ephedrine had proved more useful in mild hay-fevers than in real asthma.

Dr. JAMES ADAM (Glasgow) reported his experience in the treatment of 1100 cases of asthma over a period of 30 years. He believed that their origin was: (1) toxic, (2) dependent to a large extent on nasal conditions. The toxic effect was due to combined absorption of nitrogenous poisons from the gut and to error in nitrogenous metabolism. Excessive carbohydrates in the diet were often the determinant. Over-feeding and under-exercise were the chief factors in week-end attacks. The periodicity of nocturnal, weekly, and menstrual attacks all indicated a metabolic origin. The eczema and urticaria commonly associated with asthma were due to the same cause and amenable to the same treatment. A large number of cases occurring before the sixteenth year could be cured if mouth-breathing was corrected. Oriel's work was referred to as supporting the theory of nitrogenous metabolic errors. The disappearance of eosinophilia along with the asthma in acute pyrexias was due to increased adrenal activity, which was also the basis of success in the cold bath or cold douche treatment. The frequency of a family history in asthma was attributed by the speaker to identity of environment rather than to inheritance of defect.

Prof. R. J. S. McDowall (London) showed how asthma could be induced by: (1) Local irritation, as by inhaling irritant gases; (2) chemical stimulation, as by injecting bodies of the histamine group; (3) nervous stimulation, as shown by Brodie and Dixon, and reflex from stimulation of the nose; (4) psychic stimuli via the vagus, on the same basis as salivation at the prospect of food. The part played by the vagus in asthma was further indicated by the associated vagal phenomena of increased bronchial secretion and occasional colitis. Week-end and digestion asthma, the low blood pressure, slow pulse, low blood-sugar curve, and eosinophilia were all, possibly or probably, vagal in origin. The two asthma camps, championing nasal defects or allergy, were both concerned with vagal activity, and he reported some recent experiments of his own, which showed that a foreign protein (peptone) injected into the circulation enormously enhanced the capacity of pilocarpine to stimulate the vagus. Hess had for years stated that asthmatics were abnormally sensitive to pilocarpine, and it was known that foreign proteins increased the amino-acid content of the blood as well as causing a temporary constriction of the bronchioles. In this way the widely varying causes and cures of asthma fitted into a more or less intelligible physiological picture.

Dr. G. H. Oriel made the following points: Asthmatics do not all belong to one type. In asthma associated with eczema, migraine, and urticaria the van den Bergh reaction is often positive, the amino-acid is high, urates are deposited in the urine, and the blood-sugar may be low. In uncomplicated asthma the van den Bergh reaction is usually negative; the amino-acid may be high, but the blood-sugar and pressure are low, pointing to under-action of the sympathetic. A complex nitrogenous substance may be extracted from the urine during paroxysms, and this gives positive skin reactions with the patient from whom it is extracted. This substance is probably specific. In the first biochemical type treatment should be directed to the gut and liver; Adam's detoxicating treatment has proved beneficial, especially with the addition of glucose to the diet, as suggested by Osman, along with spirits of ammonia in one drachm doses, especially in children. In the second type treatment, in addition to attacking the diathesis, should be directed to stimulating the sympathetic by thyroid.

In the ensuing discussion Dr. Watson-Williams reiterated his belief that asthma arises from a nasal reflex, while Dr. F. T. Harrington emphasised the factor of nasal sepsis and the need for general detoxication, while training in diaphragmatic breathing was important. Dr. Wharry was also a believer in nasal sepsis as a cause, but thought some method of reducing the general sensitivity of the nervous system was requisite in many cases. Dr. Camps recorded his experience of the inhalation of adrenalin vaporised by an oxygen stream, and claimed this as a simple and safe method which patients could easily manage for themselves.

SECTION OF SURGERY.

Papilloma of the Bladder.

Mr. J. B. Macalpine (Manchester), who opened the discussion, defined a papilloma as a tumour made up of hypertrophied papillæ. Two problems invited brief preliminary discussion: (1) Do all papillomata, if left to themselves, eventually undergo malignant transformation? Many surgeons, he said, regarded all papillomata of the bladder as premalignant tumours, an attitude which produced the necessary solicitude in their treatment. (2) How shall the nature of the growth be decided? Pathological diagnosis was extremely uncertain; in the experience of many surgeons recurrence might follow the removal of tumours regarded as simple, and vice versa. Mr. Macalpine said he had come to rely solely on cystoscopic data for his diagnosis of these growths; those he judged to be simple he treated with perurethral diathermy, and those which he suspected of being carcinomatous by open operation. The longer and more delicate the villi the more benign the growth. When surface necrosis appeared malignancy was indicated. In the less benign varieties the layers of epithelium were more numerous and the tumour coarser and paler. The appearance of the pedicle was important; a thin flexible and long pedicle occurred with benign papilloma; a stiff, stumpy one indicated malignancy. The type of papilloma that was sessile over a wide area had a very unfavourable outlook. If such had been treated by diathermy some inflammatory swelling might remain closely resembling true neoplastic infiltration; regarding diagnosis, repeated cystoscopy was the only way of excluding this "pseudo-carcinoma." In about one-third of all patients papillomata were multiple, with a tendency to return, and the prognosis after operation was not so good.

In deciding on treatment perurethral diathermy was unanimously agreed to be most suitable for simple papillomata and open operation for malignant growths. When there was doubt as to the nature of the tumour, and diathermy was not plainly succeeding, open operation should be undertaken without delay. In some patients cystoscopy was impossible owing to the extent of the growth and the accompanying cystitis or hæmorrhage. In these cases valuable information might be obtained by filling the bladder with a radiographically opaque solution, when X ray examination might demonstrate the outline of any growth present. In this series six cases occurred in workers in aniline dye, which was almost certainly an exciting cause. Prior to the onset of the neoplasm in these workers there had been a premonitory period in which the patient suffered from symptoms of cystitis with occasional hæmaturia. Dr. T. H. Wignall had drawn attention to the long period of contact necessary, 20 to 30 years being the average.

Mr. Macalpine outlined his method of treatment, stating that bipolar diathermy was generally used in this country for small benign papillomata. At the end of about two to three weeks benign papillomata should be definitely smaller and have separated, their appearance simulating granulation tissue. If slough still adhered to the growth malignancy must be suspected. If the growth was malignant excision offered the only hope, and in order to remove the lymphatics which ran in the deep layers a generous area of bladder wall must be removed after mobilisation of the bladder, the operation wound being protected by swabs soaked in silver nitrate (1 in 1000). He concluded by remarking that cases of symptomless hæmaturia should be submitted to immediate cystoscopy.

Mr. Henry Wade (Edinburgh) urged the importance of immediate cystoscopy for all cases of symptomless hæmaturia, and stated that the mucous membrane adjoining the stem of the papilloma should be observed, as at times there was a roughened area round the base of the papilloma from which fresh tumour tissue might grow, hence it was important to destroy this. He regarded perurethral diathermy as the method of choice for the treatment of the majority of cases of papilloma, and thought the growth should be destroyed at one sitting under a general anæsthetic, warning the patient that a secondary hæmorrhage might occur later when the slough separated, which latter might with advantage be removed in order to obviate the possibility of stone formation. He regarded the following cases as suitable for open operation: (1) Growths of the size of a walnut or larger. (2) Growths situated round the vesical orifice. (3) Cases in which there was a tumour with vesical spasm in persons aged 50 and over. Spasm suggested infiltration. (4) Cases with accompanying disease, such as enlarged prostate, where there was fear of infection. In malignant infiltration the growths were found to be more sessile, the villi were fused, and the surface irregular; for these open operation should be performed. If the growth could be picked up when the bladder was opened then he did a mucous resection of the growth. If the growth was fixed (it was important to make sure that the growth did not arise from, e.g., the bowel) partial cystectomy was the operation of choice. In these cases, if the ureteric orifice was involved, the speaker left the divided ureter just in contact with the sutured bladder when communication was re-established by natural processes. Complete cystectomy must be done in stages; first cystotomy to confirm diagnosis, then operation for disposing of the ureters either externally or preferably, into the bowel, and finally the bladder was dealt with.

Mr. **Swift Joly** (London) described treatment and its results in cases with no malignant infiltration; he included cases with thickened epithelium as he did not regard these as malignant. If the tumour was superficial the correct treatment was perurethral diathermy, but if there was even slight infiltration he opened the bladder and did either wide resection or open diathermy, inserting radium round the scar. Before 1913 all cases of papilloma of the bladder were treated by open operation, and he gave an account of 30 cases of single papilloma thus treated with four recurrences, and nine cases of multiple papilloma which recurred, all being fatal. Of 25 cases of single papilloma treated by perurethral diathermy six recurred more than five years afterwards. Multiple growths were common, but with perurethral diathermy good results might be ultimately expected with care and patience. If there was recurrence after open operation for papilloma, the patient was in a worse condition than before, for the secondary growths were often multiple and sessile. Mr. Joly described his retrograde cystoscope, including its uses for growths near the internal meatus and on the anterior wall of the bladder; he used continuous irrigation in the diathermy of extensive growths. For growths in the posterior urethra and in the internal meatus he used a posterior urethroscope.

Mr. **R. J. Willan** (Newcastle-on-Tyne) said that of 68 cases under his care 53 were males and 15 females; their age varied from 23 to 77. In distinguishing between simple and malignant papilloma he thought the best help was obtained from examination of the pedicle, although pathological diagnosis was often fallacious. Of the 26 fatal cases of his own the following were the causes of death: 6, general dissemination; 6, cachexia; 2, local extension into rectum and vagina; 2, hæmorrhage; 1, surgical kidney; 1, heart failure; 1, post-operative shock; 7, cause unknown.

Prof. **Andrew Fullerton** (Belfast) described his technique of cystectomy, which is to cut the ureters above the bladder, not preserving their orifices (as some do), and stressing the importance of drainage by means of a rigid tube passing through the levator ani muscle and the ischio-rectal fossa.

Mr. **H. H. Rayner** (Manchester) gave an account of two cases of extensive carcinoma of the bladder, both apparently cured after suprapubic cystotomy and insertion of radium.

Short Papers.

Dr. **A. T. Bazin** (Montreal) gave an account of paraffinoma of the rectum simulating carcinoma in a case which was referred to him and which previously had prolapsed piles treated by a course of paraffin injections. The interest of this case lay in the differential diagnosis from carcinoma and in the treatment, which consisted in excision of the affected bowel, the ends being joined up with preservation of the sphincter. In the ensuing discussion Mr. J. P. Kilner condemned the use of paraffin injections, mentioning a case of extensive epithelioma of the skin after injections of the chest.

Prof. **Dean Lewis** (Baltimore) gave an account of congenital arteriovenous fistulæ which presented a very different problem from the treatment of the acquired condition resulting from injuries. The former, by reason of the large number of anastomotic communications, at times baffled treatment.

SECTION OF OBSTETRICS.

Surgical Tendencies of Modern Obstetrics.

Prof. **E. Essen-Möller** (Lund, Sweden) said the art and science of midwifery was developing in a manner as important as it was interesting. Physiological research was investigating the biology of pregnancy in normal and pathological conditions. X rays, pelvic measurements, examinations of urine were being applied to detect anomalies and apply prophylactic treatment to lessen the risks to mother and child. And now surgical interference was increasingly taking the place of the older obstetrical methods. In placenta prævia the only resource used to be tamponade until version could be performed. In eclampsia venesection and chloroform were the only means of avoiding new fits. Prophylactic treatment was well-nigh unheard of. The merits of the old midwifery must, however, not be disregarded. The most important advance dated from the revival of the classical Cæsarean section and the invention of the vaginal section; by the latter means it was possible to empty the uterus at any period of pregnancy or labour. The risk or value of an operation ought not to be estimated solely on the primary results, infection, embolism, and the like. The secondary risks were just as important, as, for example, the risk of thinning or rupture of the scar after Cæsarean section, and fear in subsequent pregnancies. Prof. Möller quoted Hirsch, of Berlin, who advocated surgical interference in normal labours in order to avoid examination and risk of infection, alleging that this was the only way of diminishing maternal mortality. He did not agree with Hirsch, although he admitted that owing to the rush for more speed Cæsarean section was now being abused. Labour, he said, was a physiological process in which there should be no interference without due caution and consideration.

Prof. **A. Donald** (Manchester) said he represented the old school; there had been, he thought, more innovations and greater advances in midwifery than in gynæcology. When he was a house surgeon at St. Mary's Hospital the visiting surgeons took little interest in midwifery, most of which was conducted in the patients' houses. Maternal mortality was low then probably because they used antiseptic methods rather than aseptic. The introduction of pituitrin into obstetric practice had brought with it dangers of its own. The greatest advance of all had been in the provision of careful antenatal supervision.

Prof. **R. J. Johnstone** (Belfast) said his maxim was avoid interference. Operation was now so safe that it required more courage to refrain than to operate. He did not think it practicable to carry out aseptic midwifery in the patients' houses, and he always taught his students to use antiseptics.

Prof. **R. W. Johnstone** (Edinburgh) thought that Prof. Möller's paper should have been entitled "operative" rather than "surgical" tendencies, as surgical technique, especially the use of antiseptics, was always adopted in obstetrics. He agreed with those who advised antisepsis in domiciliary treatment. The Edinburgh school did not favour vaginal hysterotomy for emptying the uterine contents, as they had not had satisfactory results. He referred to abdominal hysterotomy for cases of hydatidiform mole and pernicious vomiting of pregnancy.

Dr. **B. Solomons** (Dublin) said that a person practising gynæcology could not be a specialist in obstetrics. By patience and observation in labour many operative procedures could be avoided.

Prof. **Möller**, in reply, said the possibility of Cæsarean section was a great asset to the elderly primigravida, with a breech presentation, where the life of the child was a little uncertain if delivered through the natural passages; he advocated great caution before resorting to it as a routine method. In Sweden, apart from versions and forceps, operative treatment was carried out in a hospital or nursing home.

The Gynæcologist's Training.

Prof. **T. S. Cullen** (Baltimore) said that every surgeon, if he was to get the most out of his work, must have had a thorough grounding in general pathology and in the surgical pathology of the particular subject which was to become his life-work. He outlined the system adopted at the Johns Hopkins Hospital. Each year five men from the graduating class were assigned to the gynæcological department, during which year they had charge of patients, took histories, and assisted at operations. At the end of the year one of these was selected for promotion; he then became an assistant to the professor of pathology for the next year, when he had ample opportunity to make autopsies, gain knowledge of gross pathology, and familiarise himself with anatomy. He then returned to the gynæcological department, examined and described the material coming from operations, with time to devote to the investigation of gynæcological problems. The fourth year he was made first assistant and for the final year resident gynæcologist in full charge of the department, when in addition to assisting the visiting surgeons, ample opportunity was afforded for doing both major and minor operations. Every gynæcologist should be able to treat any abdominal emergency, and he gave a large series of cases he had encountered where such knowledge was essential.

Dr. J. W. Riddel (Plymouth) said that for those who intended to adopt gynæcology and obstetrics as a specialty, and were not fortunate enough to be attached to teaching hospitals, it might still be possible to gain the necessary surgical experience whilst carrying on general practice, where the necessary breadth of mind was also acquired.

Prof. R. J. Johnstone agreed that the gynæcologist should be ready to deal with all emergencies; other lesions were often met with when the diagnosis of a pelvic lesion had been made. All gynæcologists should, he thought, do a year's demonstrating in the anatomy department and also be obstetricians.

Prof. J. P. Maxwell (Pekin) said he had been both an obstetrician and a gynæcologist; it was only a gynæcologist with clinical experience who could estimate the value and give an opinion on curettings.

Dr. A. E. Giles (London) thought anyone going in for gynæcology should have a broad preliminary training in obstetrics and gynæcology, specialism to come later. He considered diagnosis and experience more important than actual knowledge of abdominal surgery as most operative procedures were similar, and a surgeon accustomed to a certain surgical technique could easily follow others.

Prophylactic Treatment of Albuminuria.

Dr. L. C. Rivett (London) dealt with the prophylactic treatment of cases which had had albuminuria in a previous pregnancy. The publications of Young and Gibberd had, he said, stimulated this attempt to guard against permanent renal damage. The essential feature of the treatment was to maintain the urine throughout the whole of subsequent pregnancies at a minimum alkalinity of pH 7·7. In order to achieve this, large doses of alkali were given by mouth. To guard against over-dosage it was advisable to estimate the bicarbonate content of the blood plasma at repeated intervals, especially if any change of the original dose was indicated. The normal plasma content in pregnancy was 0·030 molar concentration. In 85 per cent. of women, however, there was a considerable reduction, the average being 0·0247. The dose found to be safe and effective was usually about 400 grains a day of equal parts of sodium bicarbonate and potassium citrate, but this should be varied according to the reaction of the urine. In some up to 780 grains had to be given, whilst in others it might be reduced to 1–2 drachms. Especial attention should be paid to the bowels, diet, and hygiene, while strenuous exercise was to be avoided. Dr. Rivett gave the clinical histories of a series of 14 cases submitted to the treatment.

Dr. J. Young (Edinburgh) thought the treatment described held out hope for these cases and would probably throw light on the ætiology of the albuminuria of pregnancy. He did not agree that a great many of these cases sustained permanent renal damage as estimated by kidney function tests; he found it only occurred in about 8 per cent. There was evidence of recurrence in about 50 per cent. of the cases who subsequently became pregnant, and in these the tendency to permanent renal damage was greater.

Dr. A. Crook (Norwich) had used alkalis in many cases of albuminuria with good results. Some cases known to him as chronic nephritic with high blood pressure had shown no albuminuria when they subsequently became pregnant, although there was a tendency to abortion.

Dr. H. L. Greer (Belfast) said he had given alkalis to pregnant women for heartburn and had noticed that they were more comfortable in the latter part of pregnancy. The incidence of eclampsia was diminished in cases treated with alkalis.

Dr. F. Lacey (Manchester) said he had been regularly examining urines antenatally, and had found a large number containing the colon bacillus. In his experience pyelitis was a common condition.

New Inventions.

SURFACE SUTURES.

I have devised what may be described as surface sutures ("Surfasutes") for approximating the cut edges of wounds without stitching. They are intended to largely do away with the necessity for using clips, or a needle to suture lacerated wounds. The device consists of strips of specially adhesive plaster cut in various shapes and sizes, each furnished with small smooth eyelets. As shown in Fig. 1 after the laceration has been cleaned, sterilised, and dried, they are laid in interrupted position on each side of the wound, the eyelets being about half an inch distant from the cut edge. A sterile, half-curved needle, threaded with silk, or silkworm gut, is then passed through the eyelets instead of the skin and the edges of the wound can be accurately approximated as shown in Fig. 2. There are many obvious advantages: sterile surface sutures, needle and silk, or silkworm gut, can be carried in the doctor's bag and are always ready for immediate use; the pain of stitching is entirely done away with; no stitch scars are left; there is no danger of stitch abscesses; dressings can be changed without disturbing the surface sutures; the plaster strips are antiseptic and specially adhesive, and therefore cannot slip; and the smooth surface of the eyelets is in contact with the skin and therefore there is no chafing. The eyelets can be raised for the ready introduction of the sutures because the adhesive surface does not run beyond them, but is enfolded to strengthen their insertion. Messrs. A. de St. Dalmas and Co., Ltd., Leicester, are the manufacturers.

FIG. 1.

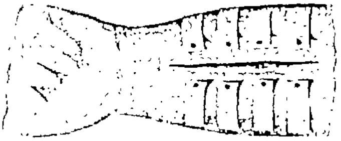
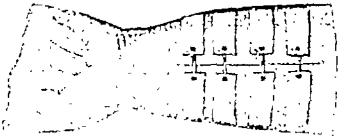


FIG. 2.



Henry de P. B. Veale, M.R.C.S. Eng.

Reviews and Notices of Books.

OTO-RHINO-LARYNGOLOGY.

The Nose, Throat, and Ear and their Diseases. In original contributions by American and European authors. Edited by CHEVALIER JACKSON, M.D., Sc.D., LL.D., F.A.C.S., Professor of Bronchoscopy in the University of Pennsylvania; and GEORGE MORRISON COATES, A.B., M.D., F.A.C.S., Professor of Otology, University of Pennsylvania Graduate School of Medicine. London and Philadelphia: W. B. Saunders Company. 1929. Pp. 1177. 60*s.*

THIS important work is one of those written by a very large number of experts in various departments of their specialty. It retains a predominantly transatlantic outlook, for of the 76 contributors, only five are European, three hailing from Great Britain and two from France. Each section is written by one who has interested himself specially in the subject discussed, and the whole is edited by men of such eminence in laryngology and otology that its appearance is an event of some importance. Since the book is full of valuable detailed information, contributed by acknowledged experts, it seems ungrateful to criticise defects inherent in any work of this type; but some of them could doubtless have been mitigated by a vigilant editorial survey before publication. There is considerable overlapping and unevenness in the treatment of different subjects, and some of the descriptions are disappointingly terse for a book of this size. For example, the section on tonsillectomy teaches that "before proceeding to the removal of the other tonsil it is essential that all bleeding should have been completely arrested," and that "arterial or venous hæmorrhage of any moment should be arrested by ligation." A method of ligation is shown in Fig. 179, but although several ingenious devices are in general use among laryngologists for this purpose there is no description of any method in the text. No account of the treatment of cancer of the larynx and pharynx by radium and deep Rontgen ray therapy, which has lately made considerable progress, is included in the book, and the methods of operation included under lateral pharyngotomy are not set out in sufficient detail. As an instance of the difficulty of adjustment of material under multiple authorship, we note that intubation is described very clearly and at length early in the book under the treatment of diphtheria, and tracheotomy towards the end, after laryngectomy. The important question whether intubation or tracheotomy is the best method of coping with obstruction in diphtheria is dismissed in the earlier section with the words: "Laryngeal diphtheria may require intubation on tracheotomy; the operation of choice is usually intubation." We prefer the advice offered later in the book: "If the case is one of diphtheria and there is a skilled intubator who will not only introduce the intubation tube but will remain in the house to reintubate in case the tube is expelled, intubation is worth consideration; otherwise it is not." The book is well produced, and the editors are to be congratulated on the general plan adopted. Most of the illustrations are excellent, a bibliography concludes each section, and, most important in a work of this scope, the index is full and adequate.

SURGICAL INFECTIONS AND INFLAMMATIONS.

Trattato generale e speciale delle infezioni o infiammazioni chirurgiche. Vol. I. By DEMETRIO B. RONCALI, Director of the Royal Institute of Surgical Pathology at the University of Naples. Naples: Stabilmento Tipografico I.N.A.G. 1929. Pp. 336. L.65.

THIS volume is devoted to general infective or inflammatory processes; a successor will treat of acute and subacute processes such as tetanus, erysipelas, gas gangrene, and suppuration in general, and a third volume with chronic diseases such as syphilis, actinomycosis, epithelioma, and tuberculosis. The preface contains the astounding statement that "clinical medicine persists in asserting with no uncertain voice, and without requiring the permission of any Imperial or Royal Institute, or national or international commission for the study and treatment of cancer, that all malignant neoplasms having a beginning, course, and result identical with those of the majority of processes of parasitic origin cannot logically be otherwise than infections or inflammations, *sui generis.*" A second no less astounding statement is found in the historical survey which precedes the classification of surgical inflammations—viz., that Harvey was not the discoverer of the circulation of the blood, but that following on the observation of the non-permeability of the cardiac septum and consequent perception of the pulmonary circulation by Realdo Colombo, the real discovery of the general circulation was to be attributed two years afterwards to Andrea Cesalpino.

The leading idea of this work seems to be that all surgical inflammations are really infections and due to parasitic action which engages in a struggle for life (1) at the site of infection, (2) in the parenchymatous organs, and (3) in the torrent of the sanguineous and lymphatic circulation. Such being the main conception much space is given to recording the views of numerous observers—the index of these authors contains considerably more than 500 names. The work shows considerable erudition, but it may be doubted whether any real advance in surgical pathology is made in its pages. Dr. Roncali's conclusions seem to be that the struggle for mastery at the site of infection takes place between the host, with its histiogenic and hematogenic cells and its antibodies, and the parasite with its bacterial cells and antigens. That this struggle may end in the victory either of the host, resulting in cure, or of the parasite when organisms invade the blood, is no new conception in pathology and this is the main thesis here developed.

THE CLIMACTERIC.

The Critical Age. By GREGORIO MARANON, Professor of Medical Pathology in the Madrid General Hospital; Member of the Royal National Academy of Medicine. Translated by K. S. STEVENS. Edited by CAREY CULBERTSON, A.B., M.D., F.A.C.S., Associated Clinical Professor of Obstetrics and Gynæcology, Rush Medical College of the University of Chicago. London: Henry Kimpton; The C. V. Mosby Company, St. Louis, U.S.A. 1929. Pp. 425. 18*s.*

THIS is an English translation, revised by the author in 1925 from the second edition of Prof. Maranon's well-known work, originally published in Spain in 1918. It is curious that an event of such obvious importance in the life of women as the climacteric has received so little scientific attention in the past. A full account of almost any rare disease would be easier to find in medical literature than a discussion of the clinical aspects and physiopathology of the climacteric. Prof. Maranon points out that the climacteric is not merely a syndrome of genital insufficiency, as was thought until recently, but is the pathological consequence of a complex and constant endocrine crisis like that of puberty, the glandular elements of which can be made out with some degree of accuracy. This greater knowledge of the mechanism of the crisis enables us to interpret clearly and to treat correctly many phenomena which were previously obscure. The classic concept of the climacteric as a simple genital incident disappears. In its place appears the more comprehensive concept of the "critical age," that of a long period of life in either sex the nucleus of which is the genital disturbance, but in the development of which all organic activities participate. The author's comprehensive outlook is well illustrated by a review of some of the chapter headings of the present volume. He first describes the ovarian, thyroid, suprarenal and hypophysical factors, and gives an account of the rôle of the vegetative nervous system in the symptomatology. There are other chapters on the psychological problems of this period, the psychic, genital, metabolic, and endocrine symptoms. Finally, a full account is given of the artificial or surgical climacteric, and every aspect of treatment is considered. The book is conceived from the point of view of the general practitioner, but will also be of considerable interest to gynæcologists.

NEUROLOGY.

Revision de la doctrine des localisations cérébrales. By Dr. R. BRUGIA, Professor in the University of Boulogne. With a preface by Prof. PIERRE MARIE. Paris: Masson et Cie. 1929. Pp. 100. Fr.24.

WE are always a little dubious of iconoclastic revisions, especially where they concern any body of doctrine built up on the laboriously collected evidence of generations. It is a priori unlikely that in these modern times such evidence should be based on mistaken ideas throughout, or that had it been built up on insecure foundations this would not have been recognised long since. Prof. Brugia invites us to believe that there is no such thing as a nervous "centre"; that psychical, speech, inhibitory, and sensorimotor "centres" are unreal; that no collections of ganglionic cells effect some "magical" action; and that their place is taken by "zones in which spinal or cerebral receptoric activity precipitates itself, without transformation, in terms of movements." Spinal and cerebral "reflexes" indicate the free passage (more or less direct, more or less rapid) to the organs of expression, of activities derived from the mechanisms of sensibility. It may be so. But after all, what is meant by a "centre," and what by "localisation"? What is the difference between a "centre"—misleading word—and a "zone"? And what of the accumulated clinicopathological data in respect, say, of the visual cortex? What of Jacksonian epilepsy? If there is no specificity as regards neural cerebral mechanisms, nothing but a non-specific "electro-colloidal change," why should any sufferer remain blind, deaf, halt, or aphasic as a consequence of cerebral lesions? Unfortunately, we have ample clinical evidence that compensation and substitution are not prominent characters of cortical function.

Neurological Examination. By CHARLES A. MCKENDREE, A.B., M.D., Associate Physician, Neurological Institute of New York. London and Philadelphia: W. B. Saunders Company. 1929. Illustrated. Pp. 280. 15*s*.

THERE are many small handbooks for the tyro in neurology to slip in his pocket and refer to at the bedside or in the out-patient clinique, until such time as his acquaintance with neurological method becomes second nature and book aid superfluous. This newcomer is welcome for its clarity and completeness. Probably none has ever been written in which the expert has not found something to criticise and something to amend, and Dr. McKendree's is no exception. But it serves its purpose well.

Text-book of Clinical Neurology. For Students and Practitioners. By M. NEUSTAEDTER, M.D., Ph.D., Visiting Neurologist, Central Neurological Hospital, Welfare Island. Philadelphia: F. A. Davis Company. 1929. Pp. 692. $6.

Dr. Neustaedter covers the field of clinical neurology in compendious fashion, his working arrangement being mainly semiological. Under the headings Spastic Paralyses, Flaccid Paralyses, Ataxias, Trophic Disorders, and so forth, he manages to include a great deal of useful knowledge, described in precise terms and amplified by a liberal supply of illustrations. The method, doubtless, has its merits, but its disadvantages are no less apparent. The thalamic syndrome is raked in under spastic paralyses, amyotrophic lateral sclerosis under flaccid paralyses, Charcot-Marie-Tooth amyotrophy under diseases of the cranial nerves (itself a subdivision of flaccid paralyses), facial neuralgia under tremors and spasms. Such classifications are highly unsatisfactory, but after all tabulation is of minor importance. We have noted but few errors or misleading statements. It is scarcely accurate to say in a case of Bell's palsy that if taste is abolished on the anterior two-thirds of the tongue "we are dealing with a middle ear affection." Rod-cells are not, as a matter of fact, "pathognomonic of paresis." Why the "functional neuroses" should be limited to hysteria and neurasthenia is not clear. The clinical descriptions embody the most modern investigations and deserve high praise.

MENTAL DEFICIENCY (AMENTIA).

Fifth edition. By A. F. TREDGOLD, M.D. Durh., F.R.C.P. Lond., F.R.S. Edin., Lecturer on Mental Deficiency, London University. London: Baillière, Tindall and Cox. 1929. Pp. 535. 25*s*.

THIS valuable standard work has now attained its majority, the first edition having appeared in 1908. Since that time great changes and developments have occurred in this field. The importance of mental deficiency as a national handicap and disgrace is becoming more and more fully recognised; its causes, manifestations, and incidence are being studied by an increasing number of gifted and devoted workers, and the efforts which have been initiated to combat it are rapidly gathering momentum. Dr. Tredgold's book has developed with the times, and represents a thoroughly up-to-date survey of the position as it is to-day. Since August, 1922, when the fourth edition appeared, two important events have occurred: the alterations in the legal definitions made by the Act of 1927, and the publication by the Joint Committee of Dr. E. O. Lewis's report on the number and condition of defectives in this country. The treatment of this material has meant a complete revision of the book, and, although the general plan remains the same, many chapters have been much altered, and some have been entirely rewritten. Several illustrations have been added. Dr. Lewis's figures indicated that the number of defectives in England and Wales in 1927 was approximately 314,000, or 8 per 1000 of the population. This represents an apparent increase of no less than 100 per cent. on the figures of the Royal Commission of 1904. Dr. Tredgold's analysis of this striking difference deserves close attention, since the question of whether the incidence of mental defect has really doubled or whether the increase can be accounted for in other ways is very important. He concludes that, although it is not conceivable that the number of defectives has actually doubled, there has nevertheless been a relative and an absolute increase in mental deficiency in the last 20 years. This growth in the severity of the problem, with the corresponding growth in public concern, render even more vital the necessity for well-informed leadership of the kind represented in this book.

THALLIUM ACETATE TREATMENT OF RINGWORM.

Le traitement des teignes par l'acétate de thallium. By Prof. J. G. URUEÑA, Clin. Dermat. Med., Faculty of Mexico. Paris: Masson et Cie. 1926. Pp. 144. Fr.16.

THE author's reasons for devoting a book to a subject on which the bibliography threatens to become voluminous are that European writers are apt to ignore the initial impetus given to it by Mexican workers, that many authorities are inclined to condemn a method which is fraught with certain risks, and that it appeared advisable to concentrate all that is known of the subject in an accessible and readable form. Prof. Urueña and his Mexican confrères, Cicero, Salvador, Peter, and others certainly deserve credit for having brought the method into the realm of practical therapeutics, but it must not be forgotten that without the pioneer work of Buschke, who first determined the dosage, and whose investigations were carried on for a period of over 20 years, thallium acetate treatment would still be under the strictures imposed on it by Sabouraud in 1913 (Les Entretiens Dermatologiques). The subject is considered in six main sections. Chemical and experimental aspects are first dealt with; a report follows on animal autopsies, well illustrated by photomicrographs, and the remaining sections are devoted to the biological, therapeutic, and toxic reactions in the human subject. It is claimed that a dose of from 5–8 mg. per kilo body-weight is non-toxic for children between the ages of 2 and 12 years. A dose of more than 8 mg. per kilo should not be exceeded although experiments on the guinea-pig and rabbit demonstrated that fatalities do not occur until a dose of 14 mg. per kilo is reached. A second dose, in cases of failure to epilate should not be given when the first produced toxic symptoms, and only after a considerable interval (three months according to general opinion). The value of thallium acetate in the treatment of tinea tonsurans is undoubted, but it is an indisputable fact that the drug attacks healthy hairs in preference to the infected. Prof. Urueña would have earned more appreciation if he had devoted a section to the after-treatment, which is laborious and cannot be left to subordinates; without it failure to cure is almost inevitable. Although much has been written in this country on the subject, not a single British writer finds a place in the bibliography.

PUBLIC HEALTH.

Collected Studies from the Bureau of Laboratories of the Department of Health of the City of New York. Vol. X. Covering years 1920-1926. New York: Department of Health. Pp. 583.

DIPHTHERIA ranks with pneumonia and diarrhœa as a highly prevalent and fatal malady among children of all classes and races in New York. This volume of collected papers from the Department of Health of the City of New York contains, among other matters, reprints of many weighty contributions to the literature of prophylaxis. Dr. William H. Park and Dr. Abraham Zingher are the chief authors, the former being one of the pioneers of therapeutic measures against diphtheria on modern lines over 30 years ago. Most of the papers were first published in 1925, but the facts they contain will bear reiteration.

Taken as a whole they comprise a plea for the educational propaganda necessary to enable mass immunisation of the children of a community against diphtheria to be carried out. And the fact that the weapon for this mass immunisation is now in our hands is eloquently expounded. The first consideration is the Schick test. Provided the technique is correct and reagents are accurately arranged—desiderata often notably lacking—the Schick test appears to be almost infallible. After the age of 2 a negative Schick test indicates complete and lasting security from diphtheria. Indeed, so emphatic are certain authors in this belief that they contend that a patient who has recently shown a negative Schick test and who, nevertheless, presents a faucitis, with diphtheria bacilli recoverable from the lesion, can be classed as a carrier who has by chance developed a sore throat. In other words, a child who has shown a negative Schick test will not suffer from diphtheritic toxæmia. One of the papers contains an analysis of 150,000 Schick tests. By this immense survey the liability to diphtheria was shown to be anything from 60 per cent. to 80 per cent. of all children, the lower figure being given by the returns from schools in less salubrious districts. As a guide to the need of giving immunity by toxin-antitoxin injections the Schick test has its limitations. It is not significant under six months, because at that age a child almost always has a fair amount of naturally inherited immunity. In the age-period of 6 to 24 months the Schick test, though infallible as a guide to the state of immunity or otherwise at the time it is done, is not an accurate guide to the desirability or otherwise of toxin-antitoxin injections because in this age-period the natural immunity is waning and changing. From 2 years to 5 years is the period of *greatest susceptibility to the disease.* The patient's natural immunity having now become stabilised, the Schick test can be used as a guide to the need of therapeutic immunisation. In later childhood the same remarks apply.

In the reports of therapeutic immunisation an enormous mass of data is presented. They should therefore be studied in the original by all engaged in public health. Therapeutic immunisation consists of three injections of a suitable toxin-antitoxin mixture at weekly intervals to children who are shown by the Schick test to be susceptible to diphtheria. In about 85 per cent. of all children so treated immunity will develop in less than six months, and it will last at least six years. Unfortunately for the children, but fortunately for the purposes of statistical survey, the workers were denied the facilities for therapeutic immunisation in 90,000 susceptible children. These served as controls against another group of 90,000 children whose parents consented. The value of therapeutic immunisation was shown by the overwhelming preponderance of morbidity and mortality in the unprotected group.

LES PHÉNOMÈNES DE RÉPERCUSSIVITÉ.

By Dr. ANDRÉ THOMAS, Physician to the Saint Joseph Hospital, Paris. Paris: Masson et Cie. 1929. Pp. 246. Frs. 32.

IN his introduction, Dr. André Thomas seeks to provide the reader with a definition of "repercussion" or "repercussivity" and with a general exposition of his point of view. When in the bodily organism a given organ is affected it reacts on other healthy mechanisms—this is known as "sympathy," or sympathetic action. But when the physiological activity of other viscera reacts on the affected organ, the phenomena are considered to be different, and the suggestion is that the process should be distinguished as one of "repercussion," and the condition, "repercussivity." For example, the pilomotor reflex can be elicited in the normal subject by simple cutaneous excitation—for the upper limb, by excitation in cervical or axillary regions. Now if the arm has been wounded, with evident skin cicatrisation (peripheral nerves need not have been involved) the reflex appears more rapidly, is of greater intensity, and lasts longer on the affected than on the healthy limb. In other words, a change has taken place whereby the local or regional susceptibility of the skin has increased, and this is regarded as an instance of repercussivity. The abnormal reacts to the normal in an exaggerated way; the resistance of the pilomotor mechanism to stimulation has been reduced, the threshold lowered. Dr. Thomas then proceeds to apply this discovery to a number of differing conditions in which a given part of the organism is already affected, taking for a further example sudoral activity. He finds that in the vicinity of wounds (say in arm or neighbouring region of thorax), homolateral hyperidrosis occurs with some regularity, and he notes the same in respect of vasomotor repercussivity. Proceeding in an ingenious if rather speculative fashion, he next argues that some of the symptoms of the epilepsies can be explained on the supposition that stimuli otherwise inert or minimal produce their effect precisely because of an increased susceptibility—that is, repercussivity—the result of some existing abnormality; similar reasoning is applied to those of migraine, asthma and angina pectoris.

On the whole, this book provides stimulating reading, unwise though it may be to generalise hastily from the relatively restricted basis of observed facts.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 7, 1929

VITAL STATISTICS OF 1928.

THE first of the three parts, in which the annual vital statistics of this country are now presented by the Registrar-General, contains a wealth of detailed information of which only the salient features emerge on cursory perusal. Much interest attaches to the growth and changes in the age-constitution of the population of England and Wales, and, although not contained in the volume at present under review, this information is already available, and its direct bearing on questions of morbidity and mortality makes it essential to emphasise certain fundamental points. The population of this country, the estimated total of which for 1928 is 39,482,000 persons, has of recent years been undergoing changes in composition which profoundly influence the total annual quota of deaths. The declining birth-and death-rates have resulted in a diminution in the proportion of infants and young children, and a corresponding rise in that of persons in the later life. For instance, the figures contained in the last two censuses show that in 1911 the population aged 0-5 years, and 55 years and over, formed respectively 10·7 and 11·6 per cent. of the total, whereas within the succeeding decennium the proportion of young children had fallen to 8·8, and the 55-years-and-over group had increased to 13·7 per cent. For 1928 the corresponding figures work out at 8·1 and 15·8 respectively. Obviously, the effect of such a change on crude mortality-rates will be unfavourable because of the larger proportion of persons now living at ages subject naturally to heavy rates of mortality, and this emphasises the need for some method of "standardisation" when long-time secular changes in the death-rate are under consideration. The total deaths registered in the past year (460,389) correspond to a crude rate of 11·7 per 1000 population, compared with 12·3 in 1927. With two exceptions this is the lowest rate ever recorded. When the influence of the changes in age distribution is eliminated (as far as can be done by a statistical process) the "standardised" death-rate is reduced to 9·9 per 1000 living, the lowest ever recorded since the beginning of registration. Compared with the previous year, 1928 must therefore be regarded on the whole as exceptionally healthy, the improvement being however practically confined to childhood and ages over 45 years.

Analysis of the separate causes of death shows that the chief contributors, in descending order of importance, are: disease of the heart and circulation, which recently have shown a tendency to increase, respiratory diseases (all forms) from which, possibly owing to the mildness of the winter, mortality in 1928 was abnormally low, malignant disease, diseases of the nervous system, and tuberculosis. The relative frequency of the several important cause-groups is substantially similar to that of the previous year. The deaths registered from tuberculosis, both respiratory and other forms (29,709 and 6824 respectively) are in each case the most favourable returns since the end of the war, which marked the commencement of what since then has been an almost uninterrupted decline. Deaths from cancer again show an increase, the total number, 56,253, being equivalent to a rate of 1425 per million persons living. The distribution of mortality by site affected shows a fairly close correspondence with that shown in the statistics of immediately preceding years. Although relatively unimportant causes of mortality, diabetes and, this year more particularly pernicious anæmia, possess for the clinician a special interest. Mortality from diabetes shows an increase over that recorded in the previous year, but here, as in other years since the introduction of treatment by insulin, the increase is confined to the later ages of life. The introduction during 1927 of liver treatment for pernicious anæmia has coincided with a reduction in the number of deaths from 2655 in 1927 to 2130 in 1928, the crude annual death-rates per million for each of the years of the triennium 1926-8 being 71, 68, and 47 respectively. More careful analysis is obviously required before causal connexion is established between the introduction of a new therapeutic remedy and an improvement in mortality, but the figures at least must be regarded as exceptionally encouraging. Among epidemic infectious diseases, we note in 1928 the continued though slightly diminished prevalence of small-pox, an increase in the incidence of scarlet fever, diphtheria, and erysipelas, a decline in the number of deaths from whooping-cough and influenza (the recent epidemic was just beginning towards the end of the year), and in the notifications of acute poliomyelitis and encephalitis lethargica.

The number of children born in 1928 was 660,267, an increase of some 6000 births over the previous year. This is, apart from 1927, the lowest birth-rate on record. The decline in fertility has its influence on the risk of death to infant and mother. A falling birth-rate is generally associated with an increasing proportion of first births and a decreasing frequency of infants born into large-sized families. Recent statistics have shown how great is the loss of life in these large families compared with that experienced in small families, and although first-born infants fare slightly worse in respect of mortality than do second or third-born, their chance of living through the dangers of the first year of life is, on the average, bright compared with that of infants born into families of more than three. Thus the declining birth-rate leads to a parity distribution of infants increasingly favourable to a low recorded rate of mortality. How much of the improvement in the loss of infant life which has taken place since the beginning of the present century may be due to this circumstance and how much to intentional efforts of control, to which it is more generally attributed, has not yet been thoroughly investigated. Maternal mortality has an opposite tendency. The increasing proportion of first-births with its attendant enhanced dangers to the mother (more especially in certain diseases such as eclampsia) may offer a partial explanation at least of the lack of amelioration in this mortality-rate. The deaths of infants under one year of age show a decline from 70 per 1000 births in the preceding year, to 65 in 1928, the major part of the improvement being attributable to the fall in bronchitis and pneumonia. We note also the continued high level of deaths from injury at birth and congenital malformations; and that, in general, the decline is in the main in the latter half of the first year of life. The inclusion of a table showing for the

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[1] The Registrar-General's Statistical Review of England and Wales for the Year 1928. Tables: Part I. Medical. H.M. Stationery Office. 16s.

separate sanitary areas the number of stillbirths by sex and legitimacy—the only difference in substance and form of presentation of this from previous reports—offers to workers in the field of maternity and child welfare data of a most valuable nature. County boroughs and other urban districts show, in the aggregate, the highest rates, rural districts occupy an intermediate position, and London has the most favourable experience. Geographically, the order in respect of antenatal mortality of the separate areas is, from highest to lowest: Wales, Northern Counties, Midlands and South (including London). Males experience a stillbirth mortality 16 per cent. in excess of female, and illegitimate show a rate 40 per cent. in excess of legitimate infants. The need for careful study of the factors which operate to produce such wide divergencies is obvious. The record of mortality among child-bearing women offers little scope for optimism; indeed the experience of the year under review is the worst on record since 1911. There were 2920 maternal deaths (a rate of 4·42 per 1000 live births) compared with 2690 in 1927, the increase being found chiefly in the three cause groups, accidents of childbirth, puerperal sepsis, and puerperal albuminuria and convulsions. Although, as we have seen, there are certain changes occurring in the reproductive section of the female population tending towards an increase in the death-rate, we might reasonably have hoped for better results, and are forced to admit how urgent is the need for further efforts towards a diminution in a section of mortality generally considered to be pre-eminently avoidable.

The value of these reports to research and public health workers generally has often been stressed, but too few of them, we fear, yet avail themselves of the manifold opportunities for research into the pressing problems of the day which these admirable collections of data offer.

THE COMPLICATIONS OF VACCINIA.

A SERIES of cases of encephalitis following vaccination which, although few in number, are by their nature distressing, have stimulated the interest and concern of both the public and the medical profession. That vaccination is a procedure of necessity, attended by sequelæ which, in rare instances, are severe or even fatal, has never been denied; the study of the clinical aspects of vaccinia by T. D. ACLAND in Allbutt and Rolleston's System of Medicine, remains the classical presentation of the case. The medical profession as a body, and the educated public to a large degree, have always preserved a sense of proportion, and have weighed in the balance the exceptional disadvantages and the universal advantages. While this remains true to-day, it is yet highly essential that questions of technique, both in the process of vaccination and in the preparation of the lymph, should be reviewed in the light of accumulated experience. A virus originally procured from a lesion in a cow may, to-day, be propagated in a number of different ways, such as by passage through rabbits, and by culture in association with tissues. These modifications are not the technique of JENNER; and our knowledge of "filter-passing viruses" is still so rudimentary that a strict watch must be kept for any evidence of change of type or virulence. Until recently, the gravest dangers of vaccination have been regarded as those of sepsis, common to all skin lesions, and largely avoidable. We have, however, to visualise to-day the possibility—for it is certainly no more—of lesions in organs other than the skin, and in particular, in the central nervous system.

Material is too scanty as yet for legitimately dogmatic inferences in the human subject. But, in the work of Prof. J. C. G. LEDINGHAM and Dr. MARY BARRATT, published on p. 515 of our present issue, we have definite evidence that, in the rabbit, two strains of the vaccinia virus, when applied by scarification of the skin, led to death with visceral involvement in certain cases. It has in the past been suggested that such deaths are due to excitation of a latent infection with a practically universal bacillus of the food-poisoning group—a bacillus which frequently decimates animal houses. The work of Prof. LEDINGHAM and his colleague completely disproves this assumption on histological and bacteriological grounds. Lesions of the type described may be produced in rabbits either by the intravenous injection of the normal cutaneous virus, which is in everyday use in the human subject (though never injected intravenously) or by scarification of the skin by certain modified viruses which, in this country, are not in use. And, as the authors point out, this work clearly shows that they must not be used. It is to be noted that encephalitis was not a feature in any of the affected rabbits, which suffered rather from generalised vaccinia. Such generalisation is a rare occurrence, usually not fatal, in man, and is not associated with encephalitis. The strains of vaccinia virus available are very numerous. Originally they were propagated by serial scarification of calves, or by using the material from one human case to infect another. Early in the present century rabbits were used as intermediates between one calf and another. Still more recently LEVADITI prepared his neurovaccinial virus by injecting the skin virus into the brain of rabbits. He claimed thereby to have "fixed" the virus, so as to make it affect the brains of subsequent rabbits; this has not been confirmed. But his neurovaccinial virus has been propagated in the testes of rabbits and used extensively in Spain on human cases without, apparently, any disadvantages following; as noted in this paper, it is stated to have led to encephalitis in Holland when similarly used.

There seems to be no evidence whatever that any additional encephalitic virus has been picked up from rabbits, which never suffer from this type of encephalitis spontaneously. But propagation in the brain and testes of rabbits is shown to alter the virus, not in the direction of the production of encephalitis, but in the direction of dissemination of the virus, rather than localisation in the skin when applied by scarification. The immediate bearing of this work on post-vaccinial encephalitis is not, therefore, direct. It is clearly proven that there is a choice of material, and that some material is to be discarded. It is suggested that a modification in the properties of vaccine lymph may be induced by the technical methods employed. That is a great advance. It should be more simple, in the future, to carry this process of analysis further, and to determine whether any grounds at all exist for the belief that the vaccinia virus may be modified so as to lead, however rarely, to encephalitis. The practical aspects of this question should not however blind us to the important theoretical issues involved. Few problems of infection have remained so obstinately elusive as that of the "filter-passer"—a name quite inappropriate to the virus of vaccinia at any rate. Its study in tissue culture, and by propagation in the rabbits' testes, open new avenues. Its modification with modified technique may throw new light on its properties. And every new fact ascertained with regard to it serves as a guide to analogous investigations into the nature of other diseases of analogous origin. Perhaps, in the widest interest of humanity, it is this aspect of the study of vaccinia which we should welcome, rather than the light it throws on the clinical accident known as post-vaccinial encephalitis.

OPEN-AIR BATHING FACILITIES.

THE return of the heat-wave brought a reminder of the disabilities suffered by Londoners who have few opportunities to get rid of their surplus heat in semitropical weather. The sufferers will gladly learn of the plans in the mind of the new Commissioner of Works. Mr. LANSBURY is providing seats in Trafalgar-square and a playing space for children around the Albert Memorial in Hyde Park. He proposes further outdoor shelter for children in Bushey Park and is opening to the public the Cambridge enclosure at the Admiralty Arch. In all the public parks the policy is to be carried out of taking down the railings where they are not required to protect natural beauties. But all this leaves untouched the great desire of all children and most healthy adults to bathe in the open air during a hot spell of weather, and not only to bathe but to have the opportunity of sitting about in undress both before and after the dip; and the proposal to make the Serpentine available for this purpose will be welcomed. Holiday visitors to the continent this year must have been struck by the prodigious increase in the facilities for open-air bathing provided wherever a lake or a bathing pool of any size is available. The capital outlay is small and the running cost is covered by the modest fee paid by the throngs of people of all ages who find refreshment and vigour from bathing in a judicious mixture of sun, air, and water. At the present time the Serpentine is of little, if any, use to women bathers since no provision has been made for dressing and undressing. Their need may be the less urgent since one of the most striking features of the emancipation of women in all civilised countries is the comparative freedom with which her clothing transmits air and sunshine; there has been no effective corresponding movement to secure similar skin culture for the male population. But happily the problem of providing open-air swimming facilities need no longer be complicated by sex differentiation. Honest fears of the harmful effects of mixed bathing have long been set aside by experience, and there is now no possible excuse for refusing the facilities on any such grounds. Indeed, it is refreshing to see how the newer generation accepts, without thought of evil, behaviour that those of maturer years once feared as threatening inviolable principles. A little healthy humiliation may result to the elders from the comments and puzzled questioning of young people on hearing descriptions of ladies in voluminous garments, emerging from discreetly hooded bathing machines and bobbing in the shallow water as they clung to the end of a rope, whilst in a remote part, to which none of them would dare approach, the males carried out more daring feats; for not only the garments but the other restrictions of those days made women swimmers rare among those whose visits to the seaside were an annual event. By insistence upon sex these elaborate taboos, with their opportunities for more or less indecent jest and allusion, cultivated, or perhaps indicated, the Peeping Tom state of mind. If we apply the standard of "evil to him who evil thinks" we must congratulate the present generation, for in the less populous seaside places anyone once familiar with the old régime must be impressed by the way young people of both sexes, in the absence of formal rules, regulate their undressing and dressing without offence and without self-consciousness. The healthy human figure is beautiful, and the student of human nature may wonder how it came to be associated with those taboos from which we are now freeing ourselves with benefit to health and happiness and with no detriment to our morals. If he lives long enough he may learn, for the history of fashion either in clothes and habits of thought gives little support to the idea that the sensible conventions now adopted will remain stationary. They will inevitably change—whether in the direction of what we would now call greater licence or in that of greater prudery. In either case we do not anticipate that any obstacles will be placed in the way of mixed bathing in our time. The plans of the Commissioner of Works accord with the trend of the times, and it is to be hoped that they will take some practical form before the summer comes to an end.

Annotations.

"Ne quid nimis."

THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

THE Ophthalmological Congress which was opened by the Queen Mother of Holland at Amsterdam on Thursday afternoon resumes the long series of international gatherings which have twice been broken by wars in Europe since the first meeting at Brussels in 1857, when the ophthalmoscope was newly discovered and pioneers like von Graefe and Donders gave the fruits of their experience. The fourth meeting appointed for 1871 in Berlin was prevented by the Franco-German War, and the twelfth planned to take place at Petrograd in 1914 was not held, although the communications prepared for it were circulated to members. The present Congress is guided by the rules and by-laws drawn up by a committee under the chairmanship of Mr. Treacher Collins which met in conference at Scheveningen in 1927. Papers printed beforehand include reports on visual standards, standardisation of perimetry, of visual acuity, of the notation of the meridians of astigmatism, and on the light-sense test, on uniformity in the programme of teaching ophthalmology for medical students and future ophthalmologists, and on unification of the standards for airmen, motor drivers, railwaymen, and sailors. A directory has been brought out of all practising ophthalmic surgeons in the world, of all ophthalmological societies, institutes, hospitals, and asylums for the blind, and of ophthalmic journals. This alone makes a volume of over 350 pages, of great value for reference purposes. The list of papers to be read at the present Congress includes 232 items, each of which is abstracted in five languages—English, French, German, Italian, and Spanish. The programme obviously covers a wide range of subjects, many of them of international interest, and the promoters are to be congratulated on the achievement of a Congress which is likely to be a new landmark in the science and practice of ophthalmology. The gathering should not only advance knowledge but engender a spirit of mutual respect and esteem among the participants. Besides the devoted work of Mr. Collins the arrangements, as far as they concern the English-speaking world, owe much to the labours of Sir John Parsons, Mr. Leslie Paton, and Dr. de Schweinitz, of Philadelphia.

THE PATHOLOGY OF TRYPANOSOMIASIS.

TRYPANOSOMES are harmful in many ways. Within the vessels their mere presence and multiplication may block capillaries and do mechanical damage; during their life or after their death they may form toxins causing perivascular inflammation. In the serous cavities they may multiply and cause irritation, giving rise, e.g., to pericarditis; invading the tissues they may set up inflammation and degeneration. The presence of trypanosomes in the tissues after death is not often reported. P. Regendanz and R. Hoeppli of the Hamburg Tropical Medicine School, who have just published[1] the outcome of their prolonged investigations, believe it to be because autopsy is delayed too long, for the parasites are altered by post mortem changes more quickly in the tissues than in the vessels. The flagella disappear first, then the protoplasm assumes a rounded shape and loses its special staining affinities; the blepharoplast and nucleus persist longer, but are apt to be mistaken for bacteria unless examined under a high power, when their irregular edge and lighter central staining distinguishes them. Subjects of trypanosomiasis are apt to suffer from peri- and myo-carditis with dilatation; is the infection brought by the blood stream? The Hamburg investigators think not, but due rather to an extension from the pericardium within which the trypanosomes are growing; morbid changes are more advanced in the epicardium than in the heart, and in the superficial layers of the myocardium than in the deeper. The first histological evidence of trypanosome infection is an œdema which may be due to toxins, though such toxins have not yet been isolated. Into this œdematous area the trypanosomes having penetrated, they increase, setting up a small-cell infiltration similar to but less in degree than that of bacterial inflammation; the muscle cells degenerate later. Trypanosomes, living and moving, may be found in plenty in the fluids of serous cavities and in that of the conjunctival sac, even when they are but scantily present in the blood. Conjunctivitis is not unusual in trypanosome-infected animals; iritis and keratitis also occur, and living trypanosomes have been found in the anterior chamber. Thence they make their way along the lymph stream into the subconjunctival connective tissue, causing œdema and inflammation, and so reach the conjunctival sac, where they are most numerous about the fornix. This sequence of events was first observed with *T. equiperdum*, although most of the work was done with *T. gambiense* and *T. rhodiense*, of which the latter gives rise to the more acute infection in apes. Whether the growth of trypanosomes in serous cavities accounts for relapses will be discussed in a subsequent paper.

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[1] Arch f. Schiffs-u. Tropen-Hygiene, July, 1929, p. 376.

MINIMAL DOSES OF HEAVY METALS.

DR. Guiseppe Sabatini, professor of special pathology in the University of Rome, has been investigating[1] the effect of injecting into the circulation extremely small quantities of salts of the oligo-dynamic metals, such as copper, zinc, and mercury. The vogue of the infinitely small, he remarks, is continually extending its influence in biology, and even in clinical medicine. He has been impressed by the demonstrations of "ultravirus," of aphanozoa, of fatal anaphylaxis produced by minute doses of serum, of the powerful effects of imponderable amounts of hormones, and of the posology in fractions of a decimilligramme of pure alkaloids. In Italy there has been a tendency to reconsider the doses of commonly used drugs, and claims have arisen for remarkable effects from doses conspicuously smaller than those generally employed in therapeutics. It may easily be predicted that the edifice of necessary and sufficient therapeutic doses fixed by scientific medicine is not really on the verge of collapse, but according to Prof. Sabatini we should be guilty of stupidity to ignore such investigations altogether. His own experiments were inspired by the observations of A. van Egmond on the action of certain drugs on the bundle of His, and on the production of heart-block by the action of oligo-dynamic metals. This author showed that simple contact of the bundle of His with a copper wire 2 mm. in diameter caused heart-block. Having excluded the possibility of thermic effect, pressure, and galvanic current, he concluded that it was due to an infinitesimal chemical action on the cells in the bundle. In the same field of observation, Stock, in 1926, maintained the possibility of mercurial intoxication in man caused by the amalgam used in stopping carious teeth, and Seifert, examining several hundreds of syphilitic patients belonging to every social grade, noticed that about 80 per cent. of them had no teeth filled with metallic stopping, while in a series of patients with many filled teeth syphilis was much less prevalent than in others, and he suggests that the minute doses of mercury absorbed by the organism in these subjects may act as a prophylactic. The researches carried out by Prof. Sabatini fall into five groups: (1) chloride of copper, one milligramme dissolved in 2 c.cm. of distilled water; (2) chloride of zinc, in the same proportion; (3) bichloride of mercury, in the same proportion; (4) bichloride of mercury, half that strength; and (5) controls consisting of injections of 2 c.cm. distilled water only. These quantities were injected into a vein and samples of blood taken after 1 hour, 8 hours, and 24 hours. These samples were examined as to the number of red cells, the number of leucocytes, the leucocytic formula, and for glycæmia. The specimens showed very definite changes, the number of red cells and leucocytes being distinctly, and sometimes conspicuously, increased, while the glycæmic content was raised to about double the normal. The changes were transitory and a return to the previous condition took place after 24 hours. Dr. Sabatini is continuing his investigations especially with other salts.

RESEARCH IN TUBERCULOSIS.

Two years ago the Prudential Assurance Company provided a new pathological department for the City of London Hospital at Victoria Park, and the report for 1928, recently issued, testifies very clearly to the value of this benefaction. The laboratory has examined nearly 10,000 specimens from the wards and outpatients during the year, and the report includes also reprints of four papers published by Dr. S. Roodhouse Gloyne and his assistants. The chief one is a useful review by Dr. Gloyne of the clinical pathology and bacteriology of fluids obtained by tapping the pleura. With Dr. J. R. Simpson he has also attempted, and failed, to produce tuberculous meningitis in rabbits. It is curious that generalised infections produced by intravenous injections in these animals hardly ever involve the meninges, and it is suggested that this is so because the bacilli do not lodge in the cerebral vessels; tuberculous meningitis is perhaps always preceded by lesions in the choroid plexuses. Lesser papers deal with the viability of tubercle bacillus at freezing temperature and with the relationship between syphilis and tuberculosis which seems to be very small. The whole report indicates a lively response to the help given by the Prudential Company and augurs well for the extension and expansion of activity which future years will doubtless show.

LUNATICS AS A PUBLIC DANGER.

Lord Alness, the Lord Justice-Clerk, has been commenting in the Glasgow High Court upon the danger to the community from the freedom allowed to persons of unstable mind. In the case to which our Scottish correspondent draws attention on p. 525 a man had been proved to be of unsound mind and unfit to plead. He was also described in the evidence as being in the same mental condition when released some time earlier from a mental institution. While thus at large he had shot a young woman dead and had attempted to shoot a man. The Lord Justice-Clerk, while refraining from attributing blame to individuals, suggested that the general position was disquieting and that the authorities should inquire whether some machinery could not be devised to prevent the recurrence of such deplorable incidents. Similar comments might at any time be made in England where full investigation has been officially made without any attempt to give effect to the resultant conclusions. Royal Commissions may make recommendations but, until some prominent personage is killed by a lunatic, it may be difficult to translate those recommendations into law. More than one judge has warned the public in England of the consequence of exposing members of the medical profession to the risk of huge and capricious awards of damages for alleged negligence. When a jury gives a verdict of this nature, medical practitioners are scarcely encouraged to sign the certificates which are the statutory preliminary to a magisterial order for the detention of a lunatic in a suitable institution for treatment.

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[1] Policlinico, Medical Section, June 1st, 1929, p. 281.

There is an allied question whether issues involving an exact estimate of medical skill are best determined by juries consisting entirely of laymen. In this connexion a correspondent in the daily press has lately been giving an interesting illustration. He describes his experiences as foreman of a jury at a trial at the Old Bailey in a case involving charges of fraudulent income-tax returns. The nature of the issues involved frequent references to columns of statistics and complicated figures and calculations. A woman member of the jury said to him at one point, "I do not know what they are all talking about: this is not a case that women should be asked to try, do you think?" So frank a confession by a layman faced with technical issues is significant. The correspondent remarks upon the incongruity of expecting persons who have had no financial training to adjudicate upon facts in which complicated figures form the material. How is it any more reasonable to expect 12 laymen to adjudicate upon complicated issues of medical diagnosis and treatment?

THE TASTE OF CHLORINATED WATER.

It is well known that although one part of free halogen in a million of water will render drinking water sterile, yet the taste produced is offensive to most people. As this taste resembles that of iodoform and is not like that which would be produced by free chlorine itself, its investigation is a matter of considerable interest, both on theoretical and practical grounds. In the *Medical Officer* of August 17th Mr. B. A. Adams describes some work done by him which seems to show conclusively that the taste is to be attributed to the action of chlorine on salicylic acid or some of its derivatives extracted from the leaves or twigs of certain willows and waterside plants, such as the meadow-sweet (*Spirea ulmaria*). Mr. Adams points out that although it is usual to attribute the development of taste to phenolic bodies, it appears that only those which are associated with coal-tar products will produce the taste, and in some cases these have been shown not to be present. The phenols found in vegetable and animal substances do not appear to yield the taste, but natural salicylic acid (which cannot be suspected of containing even traces of phenol) will give a faint taste when present to the extent of only one part in a hundred millions of water if treated with 0·25 part of chlorine, as will sodium salicylate, phenyl salicylate, salicylaldehyde, and salicyl alcohol. On the other hand, salicin, methyl salicylate, acetyl salicylic acid and coumarin do not give the taste in any concentration examined. As salicin, which is an easily hydrolysed glucoside, occurs in large quantities, together with its appropriate hydrolytic enzyme, in many willows and poplars as well as in meadow-sweet, all of which are, along with other salicyl compounds, typical waterside plants, Adams experimented with this and with other natural salicyl compounds. He found that infusions of willows (*Salix fragilis* and *alba*), poplars (*Populus tremula, candescens, alba, nigra, deltoida, italica*), and meadow-sweet are all capable of producing an iodoform taste on chlorination, whilst the sallows do not invariably give the taste, and a large variety of other trees do not do so. The taste tends to be prevalent in autumn when there is a great fall of leaves and small twigs into the water, by which willows and meadow-sweet grow. It is easy, therefore, to see that an appreciable amount of salicyl compounds may thus pass into solution, and when the water, which is likely at this time to need chlorination more than at any other time, is so treated the taste is developed. A remarkable point brought to light in this research is the non-formation of taste when ammonium salicylate is chlorinated, a fact which throws some light on the use of ammonia in removing the taste from chlorinated water. Direct proof of the presence of salicylic acid or its derivatives in the water of any river or other natural water would be very difficult. The American workers who investigated the organic matter of lakes found it necessary to evaporate hundreds or thousands of litres of water in order to obtain enough to examine. Besides this it by no means follows that evaporation will leave all the organic matter behind. We feel, however, that Mr. Adams has sufficiently maintained his thesis, more especially as his experiments were made with well water, which may be considered as originally free from either salicyl compounds or their chloro-derivatives.

INSTITUTES OF RADIOLOGY.

The twelfth volume of the series called "Methods and Problems of Medical Education," issued by the Rockefeller Foundation, is concerned with rontgenology and radiation work in general. Beautifully printed and lavishly illustrated it describes 30 installations in different parts of the world, five of them in Britain—Edinburgh, Liverpool, Manchester, Cancer Hospital, and Guy's. Despite the general title this volume will be of less interest to teachers than to those engaged in the therapeutic and diagnostic applications of radiations. For these it will be particularly useful, because the technical details of the arrangements are really important, and not, as is often the case, matters of preference or prejudice. Especially informative is Dr. A. E. Barclay's description of the X ray department which he organised at the Royal Infirmary in Manchester, for he gives careful and detailed lists of the equipment and personnel, with their cost, which are needed for hospitals of different sizes and varying characters, and discusses many of the problems of construction and arrangement with much informative detail. The account of the Finsen Institute in Copenhagen is also conspicuous and gives us a pleasing photograph of Finsen's statue in the grounds. Careful study of books such as this should do something to correct the parochial experience which our in-bred hospitals too often show.

PREVENTING DIPHTHERIA IN NEW YORK.

It is now on record that in certain districts in America diphtheria has been almost entirely eliminated as a result of immunising all children with toxin-antitoxin. In Auburn, for example, the death-rate from diphtheria has been reduced from 38·4 to zero, while New York State, which began a campaign three years ago, has a mortality and morbidity rate considerably lower than New York City. On another page we comment on a collection of studies from the laboratories of the health department of New York City which show the overwhelming evidence now available of the value of therapeutic immunisation. These considerations, coupled with the fact that in New York City there were last year over 10,000 cases of diphtheria with 912 deaths, led to the formation of a "Diphtheria Prevention Commission," under the presidency of Mr. Thomas W. Lamont, which launched a campaign early this year. The methods employed in this campaign and some of the early results are recorded in a handbook, entitled "How to Protect your Children from Diphtheria," which has been prepared under the supervision of Dr. Shirley W. Wynne, commissioner of health for the City of New York, and edited by Mr. E. Fisher Brown. Mr. Lamont gave an address to the editors of the various city newspapers at the Harvard Club in January, and leading articles appeared in the more important journals during the following week indicating the scope of the campaign. Some of these are reproduced in the handbook. The Health Department wrote to 11,315 practising physicians asking them to circularise their patients with notices prepared by the department urging immunisation, and it was arranged to approach 150,000 families for a test demonstration with the coöperation of five medical societies. Toxin-antitoxin is prepared by the Health Department and is available at 750 pharmacies where physicians can at any time obtain what supplies they may need in their private practice. At the same time 44 stations have been opened in various parts of the city where free immunisation treatment can be given. Dr. Wynne is quite clear as to the exact part which the private practitioner and the public health official have to play in the campaign. At the inaugural luncheon he said:

> The public owes the medical profession a more liberal attitude in the matter of fees. The public must learn to pay for preventive medicine as ungrudgingly as it pays periodically for its theatre tickets and moving-picture shows. I am not willing that the Department of Health be the official doctor, nurse, clinic, and hospital regardless of the ability of the individual citizen to pay the doctor for such a service. Nor is the department prepared to undertake all these services. We are, however, willing and prepared to immunise every unprotected child where its parents for any reason are unable to pay for the same.

Ten years ago the Schick test and toxin-antitoxin immunisation were introduced into the municipal schools in New York, and in examining the results it is estimated by Dr. William H. Park that the amount of diphtheria reported among those receiving immunising injections was only a fifth of that among those not injected. Out of 500,000 immunised not a single patient suffered any ill-effects. These results are excellent, particularly when it is remembered that of all children receiving toxin-antitoxin probably only 80 per cent. are definitely immunised, but it is desirable to extend the protection to all children between the ages of 1 and 9, estimated at 750,000, in the city of New York. It is with this object that the new campaign has been started, and already in March it was possible to state that there had been since the beginning of the year a decrease of more than 30 per cent. in the diphtheria rate and in the death-rate. With close coöperation between public health authorities, parents, and doctors, it is hoped to eliminate the scourge of diphtheria from the city where Dr. Park originated his method of protection.

APPENDICITIS IN PREGNANCY.

SINCE a large percentage of pregnant women complain of abdominal pain, vomiting and other symptoms which disappear either during or after the pregnancy, cases of acute abdominal disease occurring in pregnancy may be masked. A. L. McDonald in a recent paper[1] compares a large series of cases of appendicitis in pregnant with another series in non-pregnant women. Apart from difficulties in diagnosis pregnancy increases the dangers of the disease. As the uterus rises in the abdomen, the cæcum tends to be less protected. The omentum is generally to be found resting on the uterus, far removed from its normal situation in close relation to the intestines, and some authorities state that the uterus as it rises pulls the cæcum away from the less absorbent pelvic peritoneum. General peritonitis is therefore on theoretical grounds more likely to follow perforation of the appendix during pregnancy, and local abscesses to be less frequent. Dr. McDonald's statistics support this view. The series he has used as a control is that collected by E. P. Quain, consisting of 1000 cases, and he has compared with these a series of 204 cases occurring in pregnant women, studied by E. Jerlov, and a group of 70 investigated by himself. The control series show general peritonitis in 16 per cent., and localised abscesses in 29 per cent. In the pregnant patients—a much smaller group—these figures are exactly reversed, namely, general peritonitis in 29 per cent., and a localised abscess in 16 per cent. The mortality of appendicitis complicated by general peritonitis, which is 11 per cent. in Quain's cases, rises to 30 per cent. in the group of pregnant women, while the mortality with a localised abscess rises from 2.4 per cent. to 23.5 per cent in pregnant women. The lesson of the investigation is that delay in the diagnosis of appendicitis is even more dangerous during pregnancy than at other times, and that every effort should be made to operate on cases of appendicitis during pregnancy before the infection passes beyond the appendix. The mortality is greater when the patient aborts or goes into premature labour; the author notes, however, that the onset of labour depends largely on the severity of the toxæmia. Many cases do not die because they abort, but abort because they are dying. Pregnancy does not in any way modify the surgical treatment of acute appendicitis. Every effort must be made to prevent the onset of labour; if delivery is inevitable, it should, if possible, be vaginal and not abdominal.

TWENTY YEARS' EXPERIENCE AT A FEVER HOSPITAL.

THE special characteristic of the study of scarlet fever, diphtheria, and enteric fever, recently published by the Medical Research Council,[1] is that one observer, Dr. E. W. Goodall, was responsible for the clinical work throughout the period under survey. The statistics, which refer to more than 21,000 cases of scarlet fever, 15,000 cases of diphtheria, and 2000 cases of enteric fever, have, therefore, a peculiar value, since those already available in the Annual Reports of the Metropolitan Asylums Board and elsewhere have been compiled from several hospitals, and conclusions drawn from their study may have been vitiated by variations in standards of classification. Tables are given here showing for each disease the age distribution, the variations from year to year, the seasonal distribution, and the age and seasonal incidence of complications, also the relation of complications to form of disease, and the fatality. The statistics here presented do not show any relation of school closure during the summer holidays to the incidence of scarlet fever, though in diphtheria a diminution was found. Since a reduction of scarlet fever cases is found almost every year for the holiday period in the notification statistics for London as a whole its existence cannot be doubted. The statistics for the whole of London certainly contain a moderate percentage of erroneous diagnoses which have been eliminated from the figures supplied by Dr. Goodall, but the diminution is too great to be attributed to this cause. Another discrepancy between the two sets of figures concerns seasonal variations at different ages. A table in the study just published shows a marked difference of seasonal variation between the first and second decades in scarlet fever, though in diphtheria there was little change. The charts published in the M.A.B. reports indicate that the seasonal variation is always largest in epidemic years, and may be quite absent in years of low prevalence, like 1903 and 1910. The large epidemics of 1907 and 1914 must be considered in relation to the figures presented. The tables dealing with form of disease, complications, and fatality mostly break new ground. The characteristic autumn rise in scarlet fever is shown to be almost entirely due to the mild cases; the distribution of septic cases throughout the year shows no regular trend. Among scarlet fever complications albuminuria is rather more frequent in late summer, but otitis, nephritis, and adenitis more so in the first half of the year. Otitis is much more frequent in infancy, and the incidence regularly decreases with age, both in scarlet fever and diphtheria. Albuminuria and adenitis follow the same course, but the differences are less marked. Nephritis is less common under 4 and over 20 than at intermediate ages. All complications, except relapse and secondary tonsillitis, are much commoner after septic than after mild scarlet fever. With one or two exceptions complications were less frequent in the quinquennium 1910–1914 than between 1895 and 1899; but the intervening periods show higher rates than either. In diphtheria, laryngeal and rhinorrhœal forms occur more frequently in young children. At ages over 25 years 98 per cent. of the cases are faucial. Albuminuria shows a maximum age incidence at 6 years, and paralysis at 9 years. Otitis is most frequent in infancy. As with scarlet fever, complication-rates are somewhat lower in the last quinquennium. In enteric fever complications become more common as age advances and were higher for females than males, with the exception of otitis. In all three diseases the case fatality decreased during the periods, but whereas in the first two diseases the decline was regular, in enteric fever a minimum was reached in the third quinquennium, and a rise occurred in the fourth. The authors of the report point out that data referring to patients not wholly drawn from one district, and to a period of change in the extent to which the public have resorted to institutional treatment of the diseases, cannot throw light on the real incidence of these diseases, while even the statistics of fatality must be interpreted with caution. On the other hand the expert statistical analyses of the forms and complications of the diseases here presented are of unusual value and interest.

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[1] Amer. Journ. of Obstet. and Gyn., 1929, xvii., 110.

[1] Medical Research Council Special Report Series, No. 137. Scarlet Fever, Diphtheria, and Enteric Fever, 1915–1924; a Clinical-Statistical Study, by E. W. Goodall, M. Greenwood, and W. T. Russell. H.M. Stationery Office. Pp. 58. 2s.

ÆSTHETICS AND MENTAL DEFICIENCY.

IN the annual report for 1928–29 of the Metropolitan Asylums Board Dr. E. B. Sherlock criticises the current standards of diagnosis of mental deficiency. Like many other examiners he holds that too much stress is laid on the cognitive side and upon the results of the application of intelligence tests, other aspects of their psychological make-up being ignored. More important than testing is the question of guidance and training, and Dr. Sherlock makes a plea for the development of the æsthetic sentiment in mental defectives and for the cultivation of such sense of beauty as they possess, as a contribution to their happiness and the moulding of their personalities. A preliminary difficulty to be faced is the fact that the æsthetic sentiment is conditioned very largely by the stage of intellectual development; Dr. Sherlock therefore set himself to discover in what degree æsthetic sensibility is normally present in defectives. A true æsthetic sensibility is a fairly late product of development, even in the normal. Its earliest manifestations can only be some evidence of interest or pleasure in objects usually regarded as beautiful, coupled with practical attempts at reproduction or self-expression in some artistic form. It was in these two directions that Dr. Sherlock sought for evidence, taking as his subjects the defectives in Darenth Training Colony. He describes two tests of sensitivity: one, in which the child's opinion of the pleasantness or otherwise of a variety of odorous substances was required, and a second, in which he collected the pleasurable impressions of the children derived from a performance of Cinderella. As a practical test each child was required to make a drawing of a church. It may be questioned whether inferences could fairly be made from the responses to these sample tests. Dr. Sherlock does not claim that the inquiry revealed either any sensitivity or talent in defectives different in kind from that of normals, and in degree both were, on the average, below normal. As tests, then, they reveal nothing beyond what is already known. In our view no test of æsthetic sentiment is ever likely to contribute much to a diagnosis of mental deficiency, the ultimate criterion of which is social inefficiency. The cynic might point to instances of supernormal æsthetic *development accompanied by almost complete* incapacity to attend to the practical affairs of everyday life. The real value of this or any similar inquiry rests rather in the fact that it may reveal educational possibilities in individuals. Where a definite sensitivity or talent is shown, it is the duty of the educationalist to foster it. Modern educational systems are not neglecting this matter. The cultivation of the child's sense of beauty, whether in nature or art, is an integral part of education to-day, perhaps more in the elementary than in the secondary school. That mentally defective children are not without some elementary sense of beauty, in the form of appreciation of rhythm or tone, or of relations of forms and colours is well known to special school teachers. Dr. Sherlock is disposed to doubt whether the possibilities in these directions are being fully utilised and the question he has raised appears to merit further inquiry.

STANDARDS OF FITNESS IN AIRMEN.

WE do not yet know the name or even the nationality of the winner of the Schneider Cup, but we know a good deal about his physiological make-up. He will have a visual acuity of 6/6, he will be able to exercise single vision binocularly, at very near range, and to maintain binocular vision under increasing disability. His visual field will be wide and his colour sense accurate. His Eustachian tubes will be free and efficient to regulate and equalise the continual changes of atmospheric pressure. His respiratory efficiency will be high, and his chest expansion good, and his cardiovascular system equal to the maintenance of an adequate circulation under adverse conditions of strain and low oxygen pressure. In other words, he will possess the physical and physiological attributes of any good pilot as well as a neuromuscular coördination above the normal, but in addition he must have special ability of a high order. As Sir Samuel Hoare has pointed out, it is the human side of the enterprise for the Schneider Cup that is more valuable and enthralling than the actual production of a record machine. At an early stage in the development of the Royal Air Force it was found that the existing state of medical knowledge was insufficient to entitle medical officers to give trustworthy opinions on the unsuitability or otherwise of candidates for flying. It was found that men who were apparently fit in every way, some of them even noted for their athletic prowess, were unable to acquire the art of flying, or having acquired it painfully and expensively, never became safe pilots. The question really turned on the possession of peculiar aptitudes—a question to which, of course, industrial psychologists have been devoting their attention for many years in other fields; but which at once assumed an urgent practical importance when it had to be answered, and to begin with in the stress of war, concerning the profession of aviation, in which ineptitude spells calamity. Nowadays the medical tests to which the candidates for the flying services are exposed, whilst making no pretence that every candidate selected by them will turn out to be a good pilot, are definitely selective in the sense that they are directed definitely towards the ascertaining of capacity for performance in a particular field—viz., aviation.

Some of the standards exacted by the medical selectors of flying personnel for the R.A.F. may be quoted. It is not surprising that sickness in swings or trains should debar candidates from admission, or that visual acuity of high degree is insisted on. But it is noteworthy that, according to the Manual for Medical Officers of the Royal Air Force, no candidate, whatever his visual acuity, may be passed into the service who reveals a manifest hypermetropia of + 2·00 D. sph. or over. The reasons for this restriction are that (1) the continued effort to focus rays correctly on the retina is apt to induce a tonic action of the ciliary and internal recti muscles, which tends to produce errors of judgment of distance in flying; (2) loss of accommodation is liable to occur under flying conditions, leading to bad landings; and (3) quite apart from flying the hypermetropic eye is more easily fatigued by close work or glare. Lack of true ocular balance is the most common cause of bad landings. Exophorics (sufferers from external lateral deviation) tend to flatten out their aircraft too early, having judged the ground to be nearer than it is; conversely, esophorics are inclined to fly into the ground. The need for excluding those with defective visual judgment from the flying services is emphasised by the distortion of objects when seen from the air—the verticals are fore-shortened, shadows are viewed from an unfamiliar aspect, and the pilot's judgment of distance is anyhow likely to be disturbed by the unusual speed at which he is travelling. At one time, in some countries great importance was attached to the supposed "motor-sensing functions" of the vestibular apparatus, but it has been found that its reactions to rotation are not reliable indications of flying ability. The so-called otolithic functions of the semi-circular canals afford little information about position in space, which is estimated chiefly by deep muscle sensation; their integrity is nevertheless important for air work, probably for the exertion of steady, subconscious neuro-muscular control. The rotatory chair is used now not so much as a test of the vestibular apparatus but as a means of bringing out abnormal reactions such as giddiness, nausea, vertigo, or anxiety in men whose history throws some doubt on their ability to perform aerobatics. If an aeroplane is spinning, and thus out of control, the human subject must himself be fit to take the action necessary to stabilise the machine. To test this power he sits on a chair as in an aeroplane, with eyes open and directed inside the knee furthest from the direction of spin, and is then subjected to a relatively fast spin ten times in 20 seconds. In fit pilots, especially those accomplished in aerobatics, rotation has little effect on pulse-rate or arterial pressures. A rise in pulse-rate and systolic and diastolic pressure is associated with vertigo and nausea, a fall in diastolic pressure with fainting; while in anxious subjects an anticipatory rise of pulse-rate and systolic pressure before rotation may or may not be accentuated by rotation.

Broadly speaking, it may be said that the tests, of which only a few examples have been given, are directed to ascertain: (1) that the candidate possesses sound physiological control over his circulatory, respiratory, and nervous systems, on which the stresses of flying and of altitude chiefly fall; and (2) is in possession of sound perceptive faculties and of a sound effector motor organisation through which his perceptive faculties can function; the elucidation of the latter factor is sought by the aid of tests of a definitely vocational character. Much has been found out, but much still remains to find out. It might be thought that experience of this kind had no immediate bearing on general medical practice, but this is not true for any practitioner who regards every patient who comes to see him as a candidate under examination for his fitness to perform his allotted or chosen task in life. His chief concern is in the patient's capacity for such performances. The standard use of physiological and psychological (using the word in its broadest sense) tests and of medical examinations of men in apparent health, conforms with the ideals of clinical medicine set forth by Sir James Mackenzie when he started his clinical research centre at St. Andrews—namely, to discover the signs and symptoms of failing health in the pre-sickness stage.

Lieut.-Colonel A. J. H. Russell, I.M.S., has been appointed medical assessor to the Royal Commission on Labour in India and will accompany the Commission during its tour through India this winter. Colonel Russell has been Director of Public Health in Madras since 1922.

Sir John Campbell, who died at Belfast on August 31st, was senior surgeon to the Samaritan Hospital for Women and consulting surgeon to the Maternity Hospital. He figured largely in public life, being chairman of Convocation of Queen's University and representative of the University in the Northern Parliament of Ireland.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLII.—SIGNIFICANCE OF THE ACID BASE BALANCE IN THE BLOOD.[1]

SOME 16 years ago, as can be readily seen from a study of the literature of the time, the disturbances of the acid-base balance in disease were subjects of controversy and vague speculation. Since then clear ideas on the subject and methods of expressing deviations from normal in figures have developed, and the vague speculations have been replaced by definite and wide accepted facts. It is necessary now to use precise terms in order to avoid vagueness. The significance of the terms in common use is explained below.

Dissociation; Meaning of cH and pH.

When dissolved in water strong acids, like most salts, dissociate completely or almost completely into ions—e.g., $HCl \rightarrow H^+ + Cl^-$. The kations (marked with a + sign) carry positive electrical charges and differ from the corresponding atoms by having given up one or more (depending on the valency) electrones, while the anions (carrying a − sign) carry negative charges and have gained one or more electrons. Weak acids, however, dissociate only partially, for example, acetic acid

$$CH_3COOH \rightleftharpoons H^+ + CH_3COO^-$$

The weaker an acid the less its dissociation into ions, and at the limit we have water which dissociates very slightly, as $H_2O \rightleftharpoons H^+ + OH^-$. Similarly bases dissociate to a degree depending on their strength—e.g., $NaOH \rightarrow Na^+ + OH^-$. The dissociation of weak acid is a reversible reaction; if the concentration of the hydrogen-ion or of the anion is increased the reaction shifts in the direction of the undissociated molecule. It is the presence of hydrogen ions in all watery solutions and the part they play in such reversible reactions that make hydrogen-ion concentrations of great importance in biochemistry.

The *hydrogen-ion concentration* (represented by the symbol cH) is expressed quite simply by the number of grammes of hydrogen present in the ionic form per litre; thus in N/100 hydrochloric acid, with 1/100 gramme of hydrogen ion per litre cH 1/100; while in N/100 acetic acid, in which only 1/78 of the acid present is dissociated, there is only 1/7800 gramme of hydrogen ion per litre (cH = 1/7800). In pure water, at 38° C., cH = 1/5,000,000.

When the hydrogen-ion concentration of a solution is the same as that of water the solution is said to be neutral; a solution with a cH greater than this is acid and one with a lower cH is alkaline. In biochemistry and medicine we have to deal with fluids with a cH near that of pure water, and to avoid cumbrous figures another method of representing hydrogen-ion concentration—pH—is used; pH = log 1/cH, or if $cH = 1/10^x$, pH = x. *Table II.* shows the pH corresponding to the cH of various fluids. When the cH increases (that is, when the solution becomes more acid) the pH decreases, and vice versa; increasing the pH of a solution by 1·0 is equivalent to dividing the cH by 10; increasing pH by 0·30 is equivalent to multiplying the cH by 2.

It is probable that the disadvantages of the general use of the expression pH outweigh the advantages, but its use is now firmly established.

Buffers.

As the range of hydrogen-ion concentration compatible with life is a narrow one, it is necessary to prevent great variation. This is done by removing excess of acid or base, but during the process, or if the removal is not complete, the effect of such excess is mitigated by the buffer systems of the body. These buffer systems consist of mixtures of weak acids with their corresponding salts; although such a mixture contains free acid its hydrogen-ion concentration may be low, since the dissociation of the *free acid is very slight in* the presence of its fully dissociated salts—it is given by the equation

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[1] The diagnosis of acidosis, alkalosis, and ketosis will be discussed next week.

$$cH = K\frac{c(HA)}{c(NaA)}$$

where c(HA) is the concentration of free weak acid, HA c(NaA) the concentration of its salts, and K a constant for this acid (the dissociation constant). *For convenience this equation will be quoted below* as equation (1).

If a strong acid like HCl is added to such a mixture it combines with the base of the NaA forming NaCl, *and setting free HA, which is very little dissociated,* so that only a slight rise of hydrogen-ion concentration takes place. Similarly if a strong base like NaOH is added it combines with some of the free *acid and the cH is but little reduced.*

The chief buffers in the body are carbonic acid, H_2CO_3, and its salts, the bicarbonates, chiefly $NaHCO_3$, and proteins, which behave as weak acids at the reaction of the body and *form salts. When CO_2 is* retained in the body the concentration of H_2CO_3 in the body fluids is increased; part of this H_2CO_3 combines with the base of protein salts, setting free protein in the acid form (which is but slightly dissociated) and part remains as free H_2CO_3, which, however, is very slightly dissociated in the presence of its salts. Using equation (1) in its most familiar form (the Henderson-*Hasselbalch equation),* which we may call equation (2),

$$= K_{H_2CO_3}\frac{c(H_2CO_3)}{c(NaHCO_3)}$$

we can calculate the increase in cH produced by a given increase of H_2CO_3. The amount of CO_2 formed by a resting man in one minute (about 0·33 g.) would *raise the cH of 50 litres (about the volume of fluid in* the body) of distilled water to 1/40,000 (pH = 4·6); but would only change 50 litres of a solution of H_2CO_3 and $NaHCO_3$ such as is found in normal plasma, *from cH = 1/25,000,000 (pH = 7·40) to cH =* 1/23,000,000 (pH = 7·30), or 50 litres of blood, which is better buffered owing to the presence of proteins, from pH 7·400 to pH 7·397.

If an acid such as HCl is added to blood the larger part combines with the base of the protein salts, setting free protein acid, and some with the base of bicarbonates, setting free H_2CO_3. The chief buffers of blood in this way are *thus* the proteins, especially hæmoglobin, but because the free H_2CO_3 and bicarbonate can be estimated attention is mainly fixed on these two. Similarly excess of base combines with acid protein, and with free H_2CO_3.

Since equation (1) applies to proteins (P), we can write it also as equation (3).

$$= K_P\frac{c(HP)}{c(NaP)}$$

and see that the ratio of protein present in acid form to that present as salt varies with the hydrogen-ion *concentration. Herein lies one reason for the importance* of changes of cH to living organisms; the chemical state of one of their essential constituents changes proportionally to changes of cH.

Removal of Acid.

One of the chief factors controlling respiration is the cH of the blood. When this is raised or lowered the respiratory exchange is increased or decreased. Respiration thus not only removes excess CO_2 but also compensates for the effects of retention of bases or other acids. When an acid such as HCl has been retained in the body, combining with some of the bicarbonate, so that $c(NaHCO_3)$ in equation (2) is reduced and cH increased, increased respiration takes place washing out CO_2 until $c(H_2CO_3)$ is so reduced that the ratio

$$\frac{c(H_2CO_3)}{c(NaHCO_3)}$$

and hence cH are again normal. When this has occurred the ratio of protein acid to protein salt equation (3) must again be normal and, since the total amount of protein cannot have been reduced, *c(NaPr) must be restored to normal and all the* retained acid must have combined with $NaHCO_3$. When a retention of acid is thus "compensated" by washing out CO_2, the retained acid has taken base *only at the expense of the bicarbonates, and its* concentration can be estimated by the amount that the bicarbonates are reduced. The base combined as bicarbonates in the body fluid thus acts as a reserve which can be used up to neutralise retained acids, without change in the cH or utilisation of base combined with the other acids of the body fluids; it is therefore spoken of as the "*alkali reserve.*" When *excess of base is present in the blood, $c(NaHCO_3)$ in* equation (2) is raised, the cH consequently lowered, and respiration depressed.

Most organic acids are oxidised into CO_2 and water; this oxidation is so rapid that acids such as citric and tartaric when taken by the mouth cause no disturbance of the acid-base balance. Mineral acids and bases, and organic acids and bases that have escaped oxidation or other metabolic change, are removed by the kidneys. But the kidneys do not merely remove surplus amounts of any particular acid or base but also "compensate" for variations of $c(H_2CO_3)$ by excreting an acid urine, when owing to retention of CO_2 the cH of the plasma is too high; thereby they reduce the amount of fixed acid in the body fluids, and raise the amount of base available to form bicarbonates, so that $c(NaHCO_3)$ tends to be raised and the ratio

$$\frac{c(H_2CO_3)}{c(NaHCO_3)}$$

and consequently the cH tend to return to normal. Similarly when $c(H_2CO_3)$ is reduced by overbreathing, alkaline urine is passed with a consequent tendency to *a compensatory fall of $c(NaHCO_3)$.*

When an acid urine is passed a considerable part of the acid is neutralised by ammonia formed in the kidney, but ammonia plays no part in neutralising *acids in the blood and tissues.*

Disturbance of Acid-base Balance.

In disturbances of the balance of acids and bases there may be little or no disturbance of cH, nor of the buffers other than the carbonic acid-bicarbonate system, owing to the success of compensation; but there must always be a change of concentration of free carbonic acid or bicarbonate or both. The concentration of these two substances in the blood or plasma are therefore used as indices of disturbance of the balance. The concentrations of free carbonic acid and of bicarbonates are usually expressed as th number of *cubic centimetres of CO_2 gas in these tw* forms per 100 c.cm. Thus 100 c.cm. normal pla contains 55 to 65 c.cm. and 100 c.cm. of normal bl 46 to 51 c.cm. of CO_2 combined as bicarbona about 1/20th of these amounts of CO_2 as fre acid.

Disturbances of acid-base r conveniently classed in two gr primarily cause changes in the H_2CO_3; and (2) those that pr concentration of bicarbonate.

If the word "acidosis" is meaning it should be used for *type 2 (b) may* be called acetone bodies in the uri thereby avoiding confusio which the plasma bicar recognising the fact th base balance does excretion of aceto ac

In type 1 (*a*) interference with respiration owing to failure of the heart to pump blood through the lungs sufficiently rapidly or to disease of the lung would seem a likely cause of CO_2 retention, but actually, since it is much more difficult to get oxygen in than to get CO_2 out, the CO_2 is usually kept down to normal levels in the efforts to take in sufficient oxygen.

TABLE I.—*Types of Disturbance of Acid-base Balance*·

1. *Affecting c(H_2CO_3).*	2. *Affecting c($NaHCO_3$).*
(*a*) *Increase.*—Increased formation—violent exercise. Impaired elimination. Depression of respiratory centre by narcotics, and sleep. Interference with respiration (disease of heart or lungs). Breathing CO_2. (*b*) *Decrease.*—Overbreathing—voluntary, in hysteria, emotional, as a result of peripheral stimuli, in fevers, at high altitudes, in renal asthma.	(*a*) *Decrease.*—Excessive ingestion of acids, or potential acids (NH_4Cl or $CaCl_2$). Excessive formation of acids—lactic acid in exercise. Failure of oxidation of acids—especially acetoacetic acid. Failure of excretion of acids in nephritis. Loss of base. (*b*) *Increase.*—Excessive ingestion of bases ($NaHCO_3$) or potential bases (e.g., sodium citrate). Loss of acid.

In the same way in type 1 (*b*), when the atmospheric oxygen pressure is reduced at high altitudes, the excessive breathing required to take in sufficient oxygen reduces the H_2CO_3 in the blood below normal so that at 15,000 feet the pH may rise to 7·5 or 7·6. The kidneys can remove moderate amounts of acid or base as fast as they are formed or ingested; it is only when the amounts are excessive or the kidneys damaged that appreciable acidosis or alkalosis occurs. Thus a patient may pass considerable amounts of acetone bodies in the urine without any reduction of c($NaHCO_3$) or increase of cH, and large doses of aklalis such as grs. 300 of sodium bicarbonate may be taken daily without an increase in c($NaHCO_3$).

TABLE II.—*Examples of Disturbance of Acid-base Balance.*

Type.	—	pH.	cH.	Bicarbonate c.cm. of CO_2 per 100 c.cm.		Free H_2CO_3 c.cm. of CO_2 per 100 c.cm. plasma.	—
				Plasma.	Blood.		
—	Normal.	7·30 to 7·45	$\frac{1}{20,000,000}$ to $\frac{1}{28,000,000}$	55–65	46–54	2·5 to 4·0	—
1 (*a*)	CO_2 Breathing.	7·10	$\frac{1}{12,500,000}$	65	54	6·5	Primary increase of c(H_2CO_3).
1 (*b*)	Voluntary hyperpnœa.	7·60	$\frac{1}{40,000,000}$	50	43	1·6	Primary decrease of c(H_2CO_3). Some compensatory reduction of c($NaHCO_3$). Tetany.
	High altitude. Compensated.	7·40	$\frac{1}{25,000,000}$	40	34	2·0	Primary decrease of c(H_2CO_3). Compensatory reduction of c($NaHCO_3$) by excretion of base in urine.
2 (*a*)	Ketosis (starvation). Moderate acidosis. Compensated.	7·40	$\frac{1}{25,000,000}$	45	38	2·2	Primary reduction of c($NaHCO_3$) by retained acetone bodies. Compensatory reduction of c(H_2CO_3).
	Exertion. Medium acidosis. Uncompensated.	7·15	$\frac{1}{14,000,000}$	38	32	3·4	Primary reduction of c($NaHCO_3$) by lactic acid.
	Nephritis. Severe acidosis. Uncompensated.	7·10	$\frac{1}{12,500,000}$	15	13	1·5	Primary reduction of c($NaHCO_3$) by retained H_3PO_4 and H_2SO_4. Some compensatory reduction of c(H_2CO_3). No signs of uræmia. Blood-urea 0·32 per cent.
2 (*b*)	Dosage with $NaHCO_3$. Mild alkalosis. Compensated.	7·43	$\frac{1}{27,000,000}$	78	65	3·6	Primary increase of c($NaHCO_3$). Rather high c(H_2CO_3).
	Pyloric obstruction. Severe alkalosis. Uncompensated.	7·60	$\frac{1}{40,000,000}$	119	99	3·8	Primary increase of c($NaHCO_3$) owing to loss of HCl by vomiting. Collapse, cyanosis, feeble breathing, tetany.

Compensation.

In all these conditions attempts at compensation take place; in particular, in type 1 (*a*) alkali is excreted in the urine so that c($NaHCO_3$) is reduced, while in 2 (*a*) CO_2 is washed out by increased respiration and c(H_2CO_3) is reduced. Thus in both types both c(H_2CO_3) and c($NaHCO_3$) are reduced, and it may be difficult to decide which was the primary change. However, as a rule, the compensation is not complete—that is, the cH is not brought completely back to normal, so that measurement of cH settles the question; in many cases also the history excludes any doubt.

Effects of Disturbance.

Disturbances of the acid-base balance produce general effects only in so far as the cH of the body fluids is altered. Within limits increase of cH has little effect beyond causing hyperpnœa. The acidosis produced by NH_4Cl and $CaCl_2$ is followed by a profuse diuresis, and has been used for treating œdema in nephritis; also increase of cH appears to reduce the irritability of the neuromuscular junctions and NH_4Cl acidosis has been used for the treatment of tetany in children due to low plasma calcium. The bad effects of severe NH_4Cl acidosis found by J. B. S. Haldane in experiments on himself were probably due to an extremely severe local acidosis in the liver, where neutral NH_4Cl was converted into an acid mixture of urea and hydrochloric acid; such an intense local production of strong acid does not occur in any natural acidosis. It is significant that violent exercise normally produces an acidosis with great increase of cH, since owing to the increased production of CO_2 at the same time it is impossible to compensate for reduction of $NaHCO_3$. The acidæmia at the end of a quarter-mile race must exceed anything seen in pathological conditions except just before death. Neither uræmia, nor the symptoms of diabetic coma (other than hyperpnœa) are due to acidosis, per se, nor are they improved by alkalis. There is therefore no evidence that acidosis is the cause of any disease.

The conditions in types 1 (*b*) and 2 (*b*), in which the change is towards the alkaline side, are more serious. In the first place compensation presents difficulties; compensation for reduced c(H_2CO_3) is slow, so that accommodation to high altitudes takes some weeks, and compensation for increased

$c(NaHCO_3)$ involves reduced respiration with consequent reduction of oxygen intake.

When uncompensated, both these conditions lead to a reduction of cH, which is accompanied by interference with the oxygen supply to the tissues and various nervous manifestations. When the cH is reduced hæmoglobin gives up oxygen to the tissues less readily, so that the body may be starved of oxygen although the blood is well oxygenated; and with reduction of cH the neuro-muscular junctions are more irritable, so that tetany or even general convulsions may develop. A mild ketosis is frequently found in conditions in which the blood cH is decreased.

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Special Articles.

ON THE VISCERAL LESIONS THAT MAY ACCOMPANY EXPERIMENTAL VACCINIA IN RABBITS.

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IT is the purpose of this communication to place on record certain observations on a subject to which attention has been drawn by Douglas, Smith, and Price (1929) in a recent important paper.

That the virus of vaccinia is capable of invading the system from a skin area in which it has been inseminated and may be recovered from the blood and organs, though at times with considerable difficulty and by the aid of special methods, is now fully recognised. It was largely the work of Ohtawara (1921) based on the intratesticular method of virus-propagation devised by Noguchi (1915) that paved the way for demonstrating experimentally this capacity of virus to invade. The new knowledge accorded well with what we have long known of the symptomatology of localised vaccinia, both in man and animals, as a febrile disease accompanied, it may be, by at least one clinically demonstrable visceral disturbance —viz., acute splenomegaly. So long as the ordinary cutaneous strains of lymph continued to be used for the study of experimental vaccinia in rabbits, there was no good evidence that such virus, though capable of invading, had also the power to produce discrete naked-eye lesions in viscera after simple cutaneous insemination. The early work of Calmette and Guérin (1901) showed, indeed, that after intravenous introduction of such virus, vaccinial lesions were liable to appear on shaved areas of skin. In eliciting even this simple and striking phenomenon, however, subsequent observers have not been invariably successful and, doubtless, the reason for the failure has to be sought in the employment of inadequate doses of virus. It was, in fact, the comprehensive and minutely documented work of Camus (1917–18) which demonstrated clearly and for the first time that vaccine virus of cutaneous source was capable, when administered intravenously and in adequate dose, of producing characteristic vesicles and papules about the mouth, lips, nose, tongue, buccal cavity, eyelids, palpebral conjunctivæ, and genital orifices of experimental animals.

The work of Camus, comprehensive and detailed as it was, does not appear to have received the attention it undoubtedly merits as a fundamental contribution to this subject. Camus describes and figures the lesions of generalised vaccinia not only in rabbits, but also in guinea-pigs, dogs, cats, bovines, and monkeys. These lesions were invariably produced provided an adequate dose of a "purified" virus was inoculated into their veins. Adequacy of dose was of prime importance. While the generalised lesions in rabbit and guinea-pig were largely confined to the sites mentioned, and were only occasionally noted in the unshaved skin, in the dog and cat cutaneous lesions were the rule. It does not appear that Camus noted any visceral lesions, regarded by him as vaccinial, in those rabbits which died either owing to the intensity of the eruption itself or from secondary bacterial infections. It is, however, of very considerable interest in the light of more recent work that some of Camus's animals, which died later in a cachectic state, showed white spots in liver and spleen which Camus interpreted as evidence of secondary bacterial infection. He records, indeed, the cultivation of staphylococci from such spots. Congestion of the ovaries was noted by him, but he makes no mention of renal or pulmonary lesions.

The results of Camus's work, in so far as they concern the production of lesions in the neighbourhood of mucous orifices, have been fully confirmed (Uhlenhuth and Bieber, 1923; Watanabe, 1924, &c.).

Levaditi and Nicolau (1923) in their study of neurovaccine saw similar lesions to those described by Camus after intravenous injection of the virus. Their work was, in the main, directed to the recovery of virus from various organs with a view to securing evidence of affinity of virus to tissues of epiblastic origin, and in the course of this work they demonstrated the fairly constant presence of virus in adrenals, lung, &c. No naked-eye lesions in liver, lung, or adrenal were noted by them, but they describe and illustrate what they take to be microscopic inflammatory foci of vaccinial origin in lung, liver, and interstitial tissue of the ovary. Watanabe (1924), using glycerinated lymph and the intravenous method, demonstrated in rabbits the production of vaccine pustules about the face, as Camus had done, but his results are of special interest in that he noted the presence on the hairy skin of numerous small papules with hæmorrhagic centres. Histological examination of these papules revealed inflammatory reactions in the dermis only. Epithelium was not involved. These papules he believed to be caused by the virus. They did not appear when the virus was inoculated intravenously into immune rabbits. One of us (Ledingham, 1924) in the course of an investigation of the tissue affinity of vaccinia, inoculated the virus directly into the spleen. A specific lesion was produced locally, and a crop of secondary vaccine papules which were described and figured appeared on the serosa of adjacent coils of bowel. Similarly, when introduced into the peritoneum the virus gave rise to omental papules of like histological structure. It appeared, therefore, that vaccine virus of cutaneous origin had the capacity, if a somewhat feeble one, to produce lesions in abdominal viscera when directly introduced.

Our knowledge, however, of the generalising potentialities of the vaccine virus has been considerably increased by the experimental results recorded by Douglas, Smith, and Price (1929) working with potent doses of neurovaccine or neurotesticular vaccine introduced by various routes. In addition to lesions about the mouth, nose, and eyes corresponding to the picture of Camus, and which were frequently accompanied by acute catarrhal processes, they describe and illustrate multiple lesions in the hairy skin and macroscopic foci in lungs, liver, adrenals, testicles, ovaries, mammary glands, spleen, and intestinal serosa. Though elicited with greatest constancy and intensity by the intravenous route, these visceral lesions were liable on occasion to follow intracutaneous, intracerebral, and intraperitoneal inoculations of neurovaccine. Douglas and his colleagues give no histological details of these visceral lesions. They state, however, that bacteriological examinations of various tissue lesions and fluids gave consistently negative results and that, therefore, secondary bacterial infections might definitely be excluded from playing a part in the genesis of the lesions. McIntosh and Scarff (1929), who have encountered similar lesions by similar methods, also state that there was no evidence in their rabbits of the presence of secondary infections such as—e.g., pasteurella.

Some months before the paper by Douglas, Smith, and Price appeared, one of us (L.) who had had the advantage, through the kindness of Capt. Douglas of seeing these visceral lesions in the rabbit, and of studying the histology of casual specimens, commenced experiments with neurotesticular vaccine in order to secure some personal experience with this potent type of strain. It was soon noted that certain animals after intravenous inoculation developed acute catarrhal eye conditions, while other animals inoculated intradermally with the same virus presented characteristic lesions on adjacent areas of shaved skin. At later stages these animals also were liable to develop acute catarrh about the eye and nose. If such animals died or were sacrificed the remarkable picture described by Douglas, Smith, and Price was generally in evidence either in full or modified form. A very notable feature of this picture was the massive involvement of the uterine horns in pregnant females which at one time led to abortion and at another to death in loco of the fœtuses. The latter picture was especially noted at autopsies performed some two to three weeks after intracutaneous titration of neurotesticular vaccine on the shaved backs.

The successful cultivation of *P. lepiseptica* from the eye discharge in some of these cases, and from similar discharges in uninoculated stock rabbits during the winter months led one of us (L.) to put forward the suggestion, in the course of recent discussions on viruses, that in the genesis of these remarkable lesions latent bacterial infections stimulated to activity by the introduction of a potent vaccine virus, might play a part, and that the vaccine virus might not be solely responsible. Histological examination of visceral lesions and of tissues kindly lent by Capt. Douglas had revealed the presence of massive cell necroses (chromatin comminution) with little or no evidence of repair, and it became, therefore, a question how far it was possible to distinguish casual lesions of this character from those due—for example, to pasteurella organisms which are known to produce necrotic lesions in lungs and liver. Moreover, the not infrequent occurrence in uninoculated rabbits or rabbits inoculated with materials other than vaccinia, of casual discrete pearly spots in lungs and livers, required careful consideration in correctly appraising the visceral lesions following inoculation with neurovaccine. Such spots are often bacteriologically sterile, but they may, nevertheless, represent healed or healing granulomatous lesions due primarily to bacteria. Histological examination has shown that slight coccidial liver infections may, on occasion, take the form of quite small pearly foci liable to be confused with the miliary pearls described in the liver following the introduction of neurovaccine. These difficulties are illustrated below in discussing the histological features of the visceral lesions, and the point emerges clearly that the examination of successive stages in the evolution of the lesions can alone give confidence in interpretation.

The suggestion that organisms of the pasteurella group might possibly play a part was also strengthened by the experimental data of Pette (1928) who, in the course of an attempt to repeat the work of Luksch, had the unusual experience of seeing rabbits, scarified or otherwise inoculated with lymph, die of acute pasteurellar infection. Examination of the nasal mucosæ of clinically healthy stock rabbits revealed pasteurellar infection in 10 per cent. of the animals.

Record of Authors' Experiments.

We propose here to place on record a brief series of experiments designed to determine whether such suggestion as to the origin of the visceral lesions was valid, and if so, to what extent; and, secondly, to give some details of the histology of these visceral lesions which are new to pathology. It may be said at once that the above-cited suggestion, based on the initial experiences, has received only a modified support from further work, and that the capacity of vaccine virus under appropriate conditions to produce widespread visceral lesions in rabbits must be frankly admitted.

The present bacteriological and histological study is based on two main sources of material:—

Source A.—Eight rabbits were inoculated intradermally in numerous spots over the shaved back in the course of titration of neurovaccine or of similar virus grown in contact with living cells. For this material we are indebted to Drs. Eagles and McClean. The following brief particulars are appended with regard to these eight animals:—

R.65: Conjunctivitis noted fifteenth day. Killed sixteenth day. Scattered foci in liver. *R.69*: Intradermal reactions feeble, but generalisation on skin noted seventh day, and conjunctivitis on twentieth day. Killed twenty-first day. Lesions in liver, lungs, and uterine horns. *R.70*: Intradermal reactions feeble. Conjunctivitis noted tenth day. Killed twenty-first day. Foci in ovary, uterus, liver, and lungs. *R.76*: Intradermal reactions feeble. No conjunctivitis. Dead on twentieth day. Pregnant, multiple lesions in uterus, ovary, kidney, and liver. *R.81*: Intradermal reactions strong. Skin generalisation. Dead on twenty-fifth day. Pregnant, massive necrotic lesions in uterus and multiple foci in lungs. *R.85*: Intradermal reactions strong. Emaciation ensued. Killed sixth day. Not pregnant. Numerous foci in spleen, liver, lungs, and adrenals, and a few in uterine horns. *R.73*: Intradermal reactions feeble. No generalisation. No conjunctivitis. Died after 60 days. Some white spots on liver and uterus *R.93*: Intradermal reactions normal. On this occasion pure dermal virus used. Killed on fourth day to secure passage material. Liver showed many pearly foci.

Source B.—Sixteen animals were inoculated intravenously or intradermally and intravenously with neurotesticular vaccine. Of these 16 animals 12 belonged to one series, all of which received the same dose of neurovaccine intravenously on the same day—viz., 2 c.cm. of a 1 in 10 dilution of a strain of neurovaccine which was capable of producing dermal reactions in a dilution of 1 in 1,000,000.

The weights (in oz.) and temperatures of these 12 animals before and after inoculation on July 2nd are shown in the Table. (+ = death).

It will be noted that eight animals died between the sixth and twelfth day. Apart from the picture described by Camus (pocks about the lips, nose, and eyelids) particularly intense lesions appeared on the ear employed for intravenous injection. The ear either showed a diffuse board-like thickening or more commonly the substance of the ear was beset with hard shotty papules. In one case only were shotty nodes observed in the opposite ear. At the autopsies of the fatal cases the picture was substantially that described by Douglas, Smith, and Price, but varied slightly in intensity in individual cases. Five of the animals had pocks about the mouth, tongue, nose, and eyes, but in two only was there an acute purulent discharge with keratitis. Slight mucoid discharges at the canthi were usually associated with the presence of a pock on the eyelid. In four of the fatal cases the skin of the back and the underlying fasciæ were beset with purpuric spots often confluent, the picture recalling strongly that met with in the skin of rabbits inoculated with an antiplatelet serum. The purpura was associated with considerable œdema of the dermal tissues, and the lymph glands of axilla and groin were of the red hæmolymph type. In these essentially hæmorrhagic cases lungs and other organs were beset with petechiæ. The bladder usually contained blood-stained urine, and in one case a large fresh blood-clot almost filled the vesical cavity. It should be noted also that the purpuric areas in the skin of the back contained no formed papules, death having taken place too early for these to develop.

Bacteriological Investigations.

During the months November, 1928, to April, 1929, when acute catarrh of eye and nose was liable to intervene at some period following intradermal or intravenous inoculation with neurotesticular vaccine bacteriological examination of these catarrhal discharges and of organs in which lesions were detected when the animal was sacrificed or succumbed were carried out by one of us (B.). It is unnecessary here to record the findings in detail, as in a few cases only were results of definite significance obtained. From the eye discharges of three of the earlier cases of the winter series, organisms corresponding in cultural and biochemical characters with *P. lepiseptica* were recovered, while from five cases pasteurella-like organisms more closely resembling *Bacillus bronchisepticus* were obtained. From the nasal discharges of four cases *P. lepiseptica* was recovered in one case and from another a pasteurella-like organism. Representatives of this group were naturally searched for with special care in view of their association with snuffles in rabbits and their possible "activation" from latency by the inoculation of a potent virus. No evidence, however, was obtained of the presence of organisms of this group in organs showing lesions. When such organisms were present in an eye discharge but absent from an organ lesion it was not possible to exclude definitely participation of pasteurella if the lesion happened to be of some standing, as it is known that these organisms may be only with difficulty, if at all, recoverable from lesions in process of repair.

As we shall see later, the pearly lesions found in the livers of intradermally inoculated animals after a period of three weeks were usually of the granulomatous type. In no case was a blood invasion by *P. lepiseptica* demonstrated. On the other hand, in two cases in which cultivations were made from the intensely hæmorrhagic and œdematous dermal tissue characteristic of the dermal response to neurotesticular vaccine, and from adjacent generalised skin papules, an organism not yet identified, but culturally resembling *P. lepiseptica* was recovered in pure culture. While, therefore, in intradermally inoculated animals sacrificed about the third week no clear evidence of participation of bacterial infections in the visceral lesions was forthcoming, it was definitely established that secondary bacterial infections were a contributory cause of death when such animals succumbed as occasionally happened. In *R. 81* (see Source A) for example, which was found dead on the twenty-fifth day, all the organs examined contained pneumococci in pure culture, and sections revealed a massive invasion by these organisms. Doubtless the pregnant state coupled with the necroses of the uterine wall due to virus action predisposed to secondary bacterial invasion. In another instance evidence of bacterial invasion was obtained in a rabbit which was killed for histological study on the seventh day after intravenous inoculation of neurovaccine. Spleen films made immediately after sacrificing the animal revealed the presence of a Gram-positive rod, and a culture of an anthracoid organism was obtained, not only from the spleen but from uterus, liver, and lung. The colonies obtained were few in each case, and in all probability the organism was in process of dying out after a brief blood invasion. The circumstance is noted, however, as it recalled a former case in the experience of one of us in which a rabbit inoculated with calf lymph intradermally was found dead on the fourth day. From all its organs *B. anthracis* was recovered. No work on anthrax was in progress at the time.

TABLE SHOWING COURSE OF TEMPERATURE AND WEIGHT AFTER INTRAVENOUS INOCULATION ON JULY 2ND. (12 RABBITS.)

No.	July 2nd		3rd		4th		5th		6th		7th		8th		9th		10th		11th	
	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.
9	103·4	54	102·0	54½	105·0	55	104·3	56	105·8	—	103·4	—	<97	40	+		—	—	—	—
10	102·2	46	102	47	104·6	47	105	48½	105·6	—	105	—	103	47	103	46	103	45	102·6	43
11	102	47	102·2	48½	104·8	!	105·4	49	105·2	—	104·8	—	104	50½	103·8	48	103·2	46	102·4	42½
12	102·4	49	101·8	49	104	49	104·0	48	100	—	96	—	+		—	—	—	—	—	—
13	103	45	102·8	45½	104·8	49	105	48	106	—	101·2	—	102·6	43½	95·6	42	+		—	—
14	102·6	49	103	50	103·8	47½	105·2	49½	106·2	—	105	—	103·2	48	100·2	47½	97·8	44	+	
15	102·6	49	102·2	49	105	50½	103	48	103	—	100·4	—	95·4	41½	+		—	—	—	—
16	102	49	101·6	49½	105·0	49	105·2	48½	102·8	—	95·4	—	+		—	—	—	—	—	—
17	102	50½	102·2	51	104·8	—	105	51	103·4	—	100·2	—	<97	48 +	—	—	—	—	—	—
18	102·2	50½	102·2	53½	105·1	53½	105·2	51½	105·4	—	104·3	—	104·2	37½	104·6	50½	103·6	55	103	56
19	102·2	49	102·6	48	105·6	47½	105·4	49	105·6	—	104·6	—	104	46	104	45	103·8	43	102·2	41½
20	103·2	50	102·4	51	106·2	51	105·4	54½	106	—	105·2	—	105	56	105·2	54½	101	52	103	50½

No.	July 12th		13th		14th		15th		16th		17th		18th		20th		21st		27th	
	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.	T.	Wt.
10	101·2	40½	97·8	38	+		—	—	—	—	—	—	—	—	—	—	—	—	—	—
11	101·4	41½	100·2	41½	100·8	43½	100·8	44½	102·2	37	101·6	50½	100·8	52	101·2	49½	100·2	50½	—	45½
18	103	56½	102	55	102	56	102	58	102·6	60	102·8	50½	101·0	63½	101·2	55½	101·8	58	—	59
19	99·6	38	99·8	37½	100·2	37½	100	37½	99	37½	98·8	41½	99	41	101·6	39	100·6	40	—	44½
20	101·8	49½	100·2	50	99·6	52	100·2	56	101	58½	100·6	57½	100·8	59	100·4	55	99·8	56½	—	61½

Weight in ounces. + = death.

Finally, with regard to the eight fatal cases of the tabulated series, in one case only (No. 14) was evidence obtained of a secondary streptococcal invasion. Heart bloods post mortem were usually sterile. From spleens, livers, and lungs only occasional contaminants, mainly of coliform or gelatin-liquefying types, were recovered. The freedom from secondary bacterial invasions exhibited by these early fatal cases gave the necessary confidence in interpreting the histological features of the visceral lesions. To this subject we now come.

Histology of the Visceral Lesions.

The histological features of visceral lesions following the introduction of neurotesticular vaccine by intravenous and intradermal routes have been studied so far in 22 rabbits—viz., (A) 8 fatal cases at six to twelve days after intravenous inoculation (see Table); (B) 4 rabbits similarly inoculated, but sacrificed between the sixth and sixteenth day; (C) 3 rabbits, *R. 70*, *R. 81*, *R. 73*, intradermally inoculated and showing some evidence of generalisation at death on twentieth, twenty-fifth and sixtieth days; (D) 5 rabbits intradermally inoculated and sacrificed on fourth, sixth, sixteenth, twenty-first, and twenty-first days, *R. 93*, *R. 85*, *R. 65*, *R. 69*, *R. 70*; and (E) 2 rabbits sacrificed five months after an intravenous inoculation from which they did not appear to suffer. In addition, suspicious spots in organs of animals inoculated with various bacteria (pasteurella, anthracoid organisms, pneumococcus, &c.) have been examined for comparative purposes. It is proposed here to record the main features only, pending a fuller illustrated study to be published later.

Series A.—The most satisfactory material has been that obtained from the early fatal cases (see Table) in which there was no evidence that death was due to other causes than the virus. The four surviving animals of this series are being retained for study of possible late lesions.

Liver.—Multiple focal necroses of liver cells, showing, as a rule, evidence of initial hæmorrhage, is the prevailing lesion. These necroses are precisely similar to those met with in certain acute bacterial infections—e.g., spontaneous rat plague—and need no description. In those rabbits which died at the later periods (9–12 days) there was evidence of rapid replacement of necrotic areas by bile-duct proliferation.

Lung.—The feature here also is the presence of discrete or confluent areas of necroses of alveolar tissue accompanied by hæmorrhage. In the worst cases little healthy alveolar tissue may be left. Walls of blood-vessels and bronchi are severely involved in the general necroses and there is little or no attempt at delimitation of the lesions by proliferation of adventitial cells of vascular sheaths. Where a hæmorrhagic necrotic focus is situated in the subpleural region, as frequently happens, a striking defence mechanism is afforded by the formation of a lens-shaped hyperplasia of the overlying serous endothelium. This structure is responsible for the raised macroscopic foci on the lung surface.

Ovary.—Lesions, when present, took the form of acute hæmorrhagic necroses, sometimes very extensive, in the interstitial tissue of the organ. There was no evidence of repair.

Spleen.—Isolated focal necroses in the pulp were noted in one case only.

Brain.—The animals had shown no symptoms pointing to cerebral disturbance during life. In three of the fatal cases, however, the brain was examined microscopically and showed no obvious lesions.

Adrenal.—In all the fatal cases of the series this organ presented focal necroses, discrete or confluent. As many as 25 discrete necroses have been counted in a cross section, so that the amount of functioning cortical tissue is greatly curtailed. The necroses are most commonly found in the mid cortex, but in two cases they have been noted in the medulla. The destruction of the adrenal cells is accompanied in the early stages by hæmorrhage, and considerable congestion of vessels is seen at the periphery of the lesion. In one case only (No. 10) which was the last to succumb (on the twelfth day) was there evidence of reaction on the part of the local reticulo-endothelial tissue. In this case the single large necrotic focus present was surrounded by a narrow zone of adventitial cells of plasmacytoid type.

Pocks on Skin of Back.—As noted above these lesions took the form of purpuric foci accompanied by œdema of the dermal tissue. Section of these areas showed massive necrosis with hæmorrhage of all vascular tissues in dermis down to the skin muscle, the bundles of which were also degenerate. There was no trace of repair.

Series B.—Of the four animals of this series (all older animals and weighing about 5 lb.) two were killed on the sixth and seventh days respectively, while apparently unaffected clinically by the intravenous dose, and the other two on the thirteenth and sixteenth days.

In one of the two former there were no necroses in liver, spleen, or adrenal, and only one fairly large focus in the lung section. Here, however, it was noted that the reticulo-endothelial tissue in the neighbourhood of the larger vessels and bronchi showed very marked proliferation, and that polynuclear cells were infiltrating the necrotic area. In the other animal the lungs contained numerous confluent necroses, but there was very definite reaction on the part of the vessel sheaths. These proliferated sheaths are striking objects in all vessels not completely necrosed. The liver also showed foci containing proliferated bile-duct epithelium, apparently replacing areas of initial necroses. Uterus and ovaries contained widespread hæmorrhagic necroses, but even at this early stage defence processes were in evidence. Ovarian and uterine necroses showed vast numbers of infiltrating polynuclears which were usually absent in the necroses of the early fatal cases, and there were numerous wandering macrophages with included polynuclears. Collections of the latter cells with their nuclei fused together in horseshoe form, and their granules massed in the centre simulated in a remarkable way the Langhans giant-cell. When the necroses underlay the serosa, the serosal endothelium was proliferated to form a dome of many layers.

The adrenal section presented four large necroses with many infiltrating polynuclears, but no ring of new reticulo-endothelial tissue. This case also was the only one of the series in which grey papules were present on the serosa of the bowel wall. The necrotic lesion here was confined to the serous coat and underlying tissue. The muscular coats were not penetrated. At the surface the serous endothelium showed great hyperplasia with many mitoses.

Of the two killed on the thirteenth and sixteenth days, one only presented both in lung and adrenal isolated necroses surrounded by proliferated adventitial and plasmacytoid cells.

Series C and D (with exception of *R. 85* and *R. 93*).—The lesions met with in these animals, particularly those affecting the liver, were at times difficult to interpret.

Only *R. 70* and *R. 81* presented necroses in the lungs. In *R. 70*, which was killed on the tw[illegible] day, the single large necrosis noted in the lung s[illegible] surrounded by proliferated reticulo-endothelial [illegible] there was evidenc[illegible]ation of new alv[illegible] In *R. 81*, whic[illegible]d to a pneumoco[illegible], the lung show[illegible] and many [illegible] infiltrating the [illegible], but no ret[illegible]sponse.

In *R. 70*, *R. 81*, and *R. 73*, the adrenals presented necroses, usually single, and surrounded by massive development of reticulo-endothelial cells.

R. 76, *R. 70*, and *R. 81* presented massive necroses in the walls of uterine horns extending to the mucosa, but there was already an attempt to delimit these areas by new reticulo-endothelial tissue. The small spot on the uterus of *R. 73* proved to be a granulomatous nodule of undetermined nature, attached to the serosa.

The scattered pearly spots observed on and in the livers of certain animals of this series and which, to the naked eye, corresponded tolerably well with those in the acute fatal cases, though fewer in number and of somewhat larger size, proved on section to be granulomatous areas with dense fibrous walls infiltrated with eosinophil cells. Occasionally enormous syncytial giant cells with many nuclei were present, and not infrequently a necrotic mass was present in the centre of the granuloma. We have come to the conclusion that all these spots represent some phase or other of the strange granulomatous foci known to be associated with coccidiosis, and that they have no relation to any antecedent vaccinial infection.

There is collateral evidence in support of this view. *R. 85*, which was killed on the sixth day after intradermal inoculation, presented similar granulomata in the liver with walls infiltrated by eosins. The adrenal section showed five necrotic foci round one of which there was already a new ring of reticulo-endothelial tissue. This case is of interest in that it demonstrates visceral generalisation so early as the sixth day after intradermal inoculation. Also in No. 16 (see Table), in addition to the multiple acute necroses in the liver, there were older areas containing *Eimeria stiedæ*.

The spots on the liver of *R. 93*, killed four days after inoculation intradermally with pure dermal virus, which is not known in our experience to have the property of generalising, were examined and found to consist of granulomatous masses containing remarkable giant-cell formations. Interlobular cirrhosis was present in the liver of this animal and in the livers of certain other animals of this series.

Finally, with regard to the two animals of *Series E*, which were sacrificed 148 and 165 days after an intravenous injection of neurotesticular vaccine, one of them showed an adrenal necrotic focus with massive development of new reticulo-endothelial tissue at its periphery. The giant-cell granulomata found in its liver were probably of coccidial origin. The other animal presented no lesions in liver or adrenal, but in the lung there were areas of massive perivascular infiltration containing occasionally giant cells of the fused nuclear type. No remains of initial necroses were seen, but the distribution of these areas might reasonably suggest a late stage in the healing of initial necroses. They appear to be identical with those figured by McIntosh and Scarff (1929) in a recent paper.

To conclude this section, it may be noted that spots simulating (to the naked eye) those met with in *Series C* and *D* have been found in the livers of animals inoculated with various bacteria. They cannot, however, be attributed to these experimental infections. For example, in animals inoculated intravenously with large doses of *P. lepiseptica* granulomatous areas have been present in the livers alongside the characteristic focal necroses due to the bacterial infection.

Discussion.

The observations we have recorded in this communication are in substantial agreement with those of Douglas, Smith, and Price, of McIntosh and Scarff (1929), and of Bijl and Frenkel (1929), whose paper dealing with the histology of visceral lesions following cutaneous vaccination of rabbits with neurovaccine appeared while these notes were being written. The suggestion for which one of us (L.) was responsible, that pasteurellar or other latent infection in rabbits might become active in response to the virus invasion and account for the lung and liver lesions has not been supported by the data here adduced. It is clear that the vaccine virus in the form of neurovaccine or neurotesticular vaccine is capable, in whatever site introduced, of doing what cutaneous strains of virus are capable of doing only when introduced into the blood stream (picture of Camus). The "organ" virus has the further property of producing macroscopic lesions in many viscera.

It is remarkable that our present knowledge of the generalising properties of vaccinia has been reached so gradually. Camus attributed his successful results with cutaneous vaccine intravenously introduced to adequate dosage, and this factor is also of importance with neurovaccine. Young animals also would appear to be more responsive, as Douglas, Smith, and Price assert. Consideration of the histological features of lesions following neurovaccine does not suggest that the virus by passage through testis or brain or both has acquired new properties, but rather that it has become possessed in intensified form of properties shared also in a limited degree by strains of cutaneous source. The latter, when introduced into the dermis, will invariably produce some degree of necrotising action on vascular endothelium and reticulo-endothelial tissues generally, with consequent hæmorrhage. Introduction of neurovaccine into the dermis is followed on the other hand by widespread destruction of vascular tissue and widespread hæmorrhage. The diffusive uncircumscribed character of the skin reaction following intradermal inoculation of neurovaccine, with its peculiar purplish-black tint, is due to this, as histological examination shows. Increased endotheliotoxic or endotheliolytic powers, therefore, must increase not only the chance of invasion from a skin area, but also the strength of that invasion, and it is on the latter presumably that the production of actual visceral lesions will depend.

Reynals (1928) has shown that the addition of certain tissue extracts—(e.g., renal or testicular) to cutaneous strains of virus will very markedly enhance the dermal response following intradermal inoculation, thus rendering it very similar to that produced by neurovaccine. As neurotesticular vaccine can produce its characteristic skin reaction when employed in very high dilution, the "Reynals" factor is likely to account, only in a minor degree, for the enhanced virulence exhibited by strains which have been repeatedly passed through organs. That by repeated passage through a particular tissue a virus may acquire an increased power of proliferation in that tissue, and at the same time lose much of its power of propagation on the tissue on which it was originally propagated (scarified skin surface) has been shown by Ledingham and McClean (1928) in the case of virus propagated from dermis to dermis. This dermal virus, however, has never shown signs of generalisation either in skin or organs when implanted in a dermal area. Further research must elucidate the mechanism of these adaptations.

In the meantime it seems clear on general grounds that neurovaccine, while not apparently neurotropic, has nothing to recommend it as a form of vaccine lymph for human use. Bijl and Frenkel (loc. cit.) state that neurovaccine, which has been employed to some extent in Holland, involves a greater risk of postvaccinal encephalitis. So far, we have not seen the Dutch statistics on which this important assertion is based. It is freely stated, however, that the neurovaccine is liable to produce rather severe local reactions and to be followed not infrequently by generalised vaccinia. On the other hand, as Bijl and Frenkel remark, postvaccinal encephalitis is not known to be accompanied by generalised vaccinia in any form. Indeed, in the great majority of cases the vaccinations (with calf lymph) have run a normal course. There is the further fact that so far as our present knowledge goes, the brain is not involved in the generalised lesion syndrome (as distinct from simple virus invasion) following the introduction of neurovaccine in rabbits. Moreover, when neurovaccine is introduced directly into the brain of the rabbit, meningitis but not encephalitis is produced.

Huon and Placidi (1921) some years ago reported the occurrence of cerebral and paralytic symptoms in rabbits inoculated with a particular strain of lymph which had been propagated on asses. Death in coma was liable to occur on the fourth or fifth day, and vaccinal pustules were present on the tongue and buccal mucosa. A sample of this lymph, which had been kept in cold storage for some time, was kindly forwarded to one of us (L.) by M. Huon, of Marseilles, and tested on rabbits in London. The rabbits reacted normally to the virus, and there was no evidence whatever of cerebral disturbance.

Owing to its liability to spontaneous forms of encephalitis the rabbit has not proved a very suitable experimental animal for the investigation of problems concerned with the possible implication of the central nervous system in the syndrome that may follow the introduction into the skin of any form of vaccine virus. Though activation of latent bacterial infection has played no part in the production of the visceral lesions following introduction of neurovaccine, it is not to be assumed that such activation is a negligible contingency. The above-cited experience of Pette and many collateral data concerned with bacterial activations in the course of experimental avitaminoses show that the seasonal factor, as well as the degree of incidence of latent infection, are of importance. Moreover, there appears to be no doubt that for the occasional late deaths of rabbits following intradermal inoculation of neurovaccine secondary bacterial infections may be immediately responsible.

With regard, finally, to the visceral lesions and their histological features, perhaps the most interesting are those affecting the adrenals. For the early fatalities described in this paper the severe lung lesions and the widespread hæmorrhages were probably mainly responsible, but the equally severe necrotic lesions present in the adrenals suggest new clinical problems which it may be possible to attack experimentally. We have shown here that after five months such lesions may be demonstrable in process of repair. The experience of Douglas and his colleagues in connexion with pregnant female rabbits and the severity of the uterine lesions in such cases we fully confirm. As to the liver lesions, the vaccinial origin of the multiple focal necroses is not in dispute, but the greatest caution must be exercised in assigning a vaccinial origin to liver spots met with in animals sacrificed at later stages, though these may simulate in a remarkable way the naked-eye appearance of the acute necroses. It is probable that the true initial focal necroses in the rabbit liver become very rapidly replaced by new liver tissue in animals that are to survive.

Brief Summary.

(1) The observations of Douglas, Smith, and Price on the occurrence in rabbits of visceral lesions following the introduction of neurotesticular vaccine are confirmed. (2) These lesions are due to the virus and not to any latent bacterial infection activated by the virus. (3) Some account is given of the histological features of the visceral lesions, and attention is drawn to errors of interpretation that may arise in connexion with liver lesions of other than vaccinial origin. (4) Though not responsible for the visceral lesions, bacterial infections may intervene in the course of the cachexia produced by the virus, and may be responsible for a fatal issue. (5) The bearing of the new knowledge on some current problems is discussed.

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Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table brings out some remarkable contrasts in the 1928 statistics of three of our largest cities:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	†Maternal mortality from childbirth.
Glasgow .. (1,060,500)	22·3*	11·8*	1·22	1·35	2·7	1·9	107/39	61	8·3
Birmingham . (968,000)	18·1	10·9	1·00	1·36	1·7	1·8	65/30	25	3·8
Liverpool .. (866,000)	22·1	13·2	1·38	1·27	3·0	1·0	94/32	54	3·4

* According to the local estimate of the population the Glasgow birth-rate is 20·6 and the death-rate 13·7.

† The death-rates from puerperal sepsis alone were: Glasgow, 3·8; Birmingham, 1·9; Liverpool, 1·0; *and the proportion of* stillbirths to live births: Glasgow, 4·4 per cent.; Birmingham, 3·4 per cent.; Liverpool, 4·0 per cent.

Glasgow.

In this report Dr. A. S. M. Macgregor devotes special attention to the housing problem. The number of houses completed during the year ended August 31st was the highest for half a century—namely, 6885—and included 132 of two rooms, 4184 of three rooms, and 2238 of four rooms. There has also been much building beyond the city boundary. These operations, combined with slum clearance and rehousing, are causing a salutary redistribution of the population. In certain areas there are slight signs of a diminution of overcrowding, but a large volume of overcrowding is due to the occupancy of small houses by large families. The crux of the problem is the provision of houses within the competence of small wage-earners. The report of the supervising nurse-inspector, whose duty it is to visit the families transported from the slums to new houses, shows the extreme difficulty of her task. An effort has recently been made to provide a cheaper house, this type being known in Glasgow as the "intermediate house." In January, 1928, 972 three-roomed and 258 four-roomed houses of this type were available at weekly rentals of 12*s.* 0*d.* and 14*s.* respectively, inclusive of rates, and the corporation decided to let them to overcrowded families with a maximum income of £4 per week, but preferably with less. The director of housing is at an early date to submit the design of a three-roomed house to be let at 10*s.*, and Dr. Macgregor hopes this cheaper "intermediate" house will soon be available for families whose incomes are less than £3 per week, but whose needs are no less clamant than those with higher incomes. The Glasgow Corporation thought they had obtained power to restrict the rentals of farmed-out houses, but a legal decision has shown that it will be necessary to insert a special clause with this object in the next provisional order promoted by the corporation.

The first recorded outbreak of poliomyelitis in Glasgow occurred in 1928. The acute cases coming to the knowledge of the health department numbered 112 and there was usually a long delay between the date of sickening and the official discovery of the case, until the existence of the epidemic had been made known to the medical profession. During the first five months only 10 cases sickened; during June, 5; July, 16; August, 25; September, 28; October, 22; November, 5; and December 1. There was a tendency to grouping in areas, a feature noted in the Glasgow encephalitis outbreak of 1924. The disease showed no predilection for any social class; there were 58 males and 42 females affected; 82 cases occurred under 5 years, 18 from 5 to 10 years, 4 from 10 to 15 years, and 8 were over the age of 15. In two instances cases were associated—two infants living in the same tenement building sickened on July 28th and August 1st respectively, and there was a group of six cases in the junior classes of a day school. There was no evidence of abortive cases, but Dr. Macgregor points out that such evidence is much more difficult to obtain in a town than in a rural area. In 79 per cent. of the cases paralysis appeared within seven days of onset; eight cases ended fatally—four on the third day, three on the fourth day, and one on the fifth day of illness. As regards the relation of these nervous diseases to influenza Dr. Macgregor shows the relationship of encephalitis epidemics to previous influenza epidemics, and points out that the influenza epidemic of January to February, 1929, was preceded by this poliomyelitis outbreak and associated with a concurrent outbreak of cerebro-spinal fever.

The discrepancy between the local and the R.-G. population is now 86,608, and makes an appreciable difference in the birth- and death-rates. There were 23,649 births and 7082 mothers attended the prenatal clinics. The mortality from puerperal sepsis—namely, 3·8 per 1000 births, was the highest ever recorded. 602 cases of ophthalmia neonatorum were notified, but no damage to sight was recorded among the survivors.

Birmingham.

Dr. H. P. Newsholme reports many improvements in environmental hygiene. The hydrographical survey of the river Trent has been continued. The waters of the river Tame have been remarkably clear, but there has been no appreciable increase in the oxygen content. Small fish have, however, been observed in the river in the Witton area of the city. There has also been a big improvement in the oxygenation of the upper river Tame. An increasing number of authorities are favouring the principle of admitting liquid trade-waste into the sewers, and in one instance at Bilston the admission of this waste has actually improved the standard of purification. Several firms have constructed settling tanks, and in one instance the recovery of the oil has more than compensated the firm for the expenditure incurred. The Birmingham Tame and Rea Board is increasing its bio-aeration installation from a capacity of 7½ to 20 million gallons. The policy of abolishing tipping has been continued, and the percentage of refuse tipped has been reduced from 34 in 1924 to 10 in 1929. The percentage of standard dust-bins is now 99. A new scheme has been introduced for converting vegetable refuse, which is incombustible and especially liable to cause a nuisance if tipped, into a fertiliser. New by-laws have been drafted for that very unsatisfactory class of dwelling known as houses let in lodgings. An attempt was made by a local Bill in the spring of 1929 to obtain powers to restrict excessive rentals in these premises. Though the gravity of the abuse was not denied, the clause was rejected on the grounds that general and not local legislation was needed to deal with the problem. The new houses built numbered 4992, of which 3505 were municipal. There is still a considerable shortage which makes it difficult to close and demolish unfit houses. Houses with only a short lease of life have, therefore, to be repaired as an alternative to closure.

The examination of pasteurised milk shows that the "positive holder" gives better results than the "flow retarder" type, and that there is extreme variation with high bacterial count in the case of the "flash-point" type. The prices per pint of graded milks are given as: Certified, 5*d.*; Grade A (T.T.), 4½*d.*; Grade A, 4½*d.*; Grade A pasteurised, 4*d.*; Pasteurised. 4½*d.* The cows in the city sheds at the end of the year numbered 1532, and amongst them 19 were dealt with under the Tuberculosis Order—viz., 8 with tuberculosis of the udder, 9 with

" emaciation," and 2 with " chronic cough, &c." Of 1050 samples of milk examined 9·1 per cent. were found to be tuberculous as compared with 7·1 per cent. in the previous year. The 1050 samples included 77 from city dairies of which 5, or 6·1 per cent., were infected. The local scheme for encouraging tubercle-free herds does not progress. At the beginning of the year the scheme included 21 herds with 718 cows. Two new herds came in, but four were withdrawn owing to the high percentage of reactors. At the end of the year there were 19 herds with 688 cows in the scheme. Of 1774 cows tested in connexion with the scheme 1546 passed, 213 failed to pass, and 15 were doubtful.

The general death-rate, the infant mortality-rate, and the birth-rate were the lowest ever recorded. The average general death-rate for the central wards was 14·0, for the middle ring 10·8, and for the outer ring 8·7. The death-rate from respiratory diseases was for the central wards 2·43, for the middle 1·55, and for the outer 0·99. There were 54 known cases of small-pox with one death. Most of the cases were in connexion with a poor-law institution. There were 1552 notifications of diphtheria with 70 deaths, and Dr. Newsholme says it is obvious from a review of the cases that bad housing conditions, overcrowding, and insanitation play a large part in its propagation. It is not infrequent to discover several children at one and the same time occupying the same room all suffering from diphtheria. A disturbing feature is the insidious onset causing delay in obtaining medical advice. A circular has been issued to medical practitioners asking them to administer antitoxin in doubtful cases without waiting for the result of the swab examination.

Some increase in the prevalence of dysentery due to an organism of the Flexner type is reported. There were 84 known cases. An outbreak affecting nine children occurred in the ward of an institution. Another outbreak of 10 cases occurred in some houses let in lodgings and was attributed to an ex-soldier carrier. One affected child of 2 years, who was in a debilitated condition previous to infection, died. Two families were affected by food poisoning. In one case the infection was due to *Bacillus aertrycke*, and the vehicle of infection was "à la mode" beef. In this case there were two patients and one death. The beef had no objectionable odour or unpleasant taste. In the other family there were two deaths and the medium of infection was thought to be "pig scratchings" or black puddings. The diagnosis of encephalitis lethargica was confirmed in 41 cases. Twenty-three were males with 13 deaths and 18 were females with 9 deaths. The problem of post-encephalitis still remains one of urgency, and these unfortunates "drift as in-patients or out-patients from one hospital to another leading a life of continual misery." There is no substantial difference in the rate of infant mortality during the first fortnight after birth in the central, middle, and outer wards, and the same observation is applicable to the stillbirth rate.

A special inquiry into deaths from pneumonia *in children under 5 years by Dr. Ethel Cassie* brings out the fact that the common type of pneumonia seen in young children is dependent to a great extent on environmental conditions. Another striking point is the high incidence of bad health and especially of pulmonary tuberculosis among the parents of the affected children. The training course for health visitors established jointly by the University of Birmingham and the public health committee in the autumn of 1927 has proved most successful in encouraging a supply of properly trained health visitors for the district. The number of ultra-violet light clinics has been increased from five to nine, and 1375 children and 21 mothers received the treatment. The number of expectant mothers who made use of the medical help insurance scheme was 3008, and medical help was sent for in rather more than a third of the cases. The cost to the corporation works out roughly at 18*s*. per case for both insured and uninsured.

Both the incidence of ophthalmia neonatorum and the damage resulting from this infection were heavier in 1928 than in any recent year. There were 530 notified cases as compared with 409 in 1927. Of the affected infants 18 had scarred eyes, and of these four were rendered quite blind, three had grave impairment of vision in both eyes, and 11 had permanent damage to one eye, the sight being completely lost in three cases. The factors responsible for this increase in the incidence and the severity of the disease are discussed. There was coincidently an increase in both male and female cases attending the V.D. clinics for gonorrhœa. No changes have been made in the prophylactic precautions adopted against ophthalmia or in the hospital provision for the cases which occur. "The majority of the patients received out-patient treatment until or unless there was clearly need for in-patient treatment," and the experience of 1928 seems to indicate as stated in the report that "early and prompt admission to a hospital bed for all but the mildest cases is therefore to be recommended."

Liverpool.

Dr. A. A. Mussen reports that the city boundary was extended on April 1st, 1928, to include the parishes of Croxteth Park and West Derby. The area of the city has thus been increased from 21,219 to 24,772 acres.

The building of the new abattoir has been begun. The subsidy houses erected during the year were 2330 municipal, and 208 by other enterprise. In 1919 the Housing Committee began to erect houses in the suburbs, and up to the present 17,432 and 160 flats have been completed and 747 houses are in progress. The difficulty with regard to the removal of insanitary houses in the congested part of the city will be lessened by the erection of 200 tenements (in progress) in Melrose-road and 198 in South Hill-road, Dingle (completed). The Queen Anne-street area has now been approved. This site consists of 5¼ acres, upon which it is proposed to erect 408 houses, which will form another addition to the sanitary dwellings in the central area.

At the end of the year influenza deaths began to increase, the prelude to the most serious visitation of influenza since 1918–19. The pandemic began on the western seaboard of the U.S.A. in October, 1928, and reached its height on the Pacific Coast on Dec. 8th. A fortnight later it reached the Eastern seaboard and appeared in Glasgow on Jan. 12th. Shortly afterwards Northern Ireland and the continent were attacked. The epidemic definitely began in Liverpool in the third week of January and reached its height in the week ended Feb. 2nd, when the general death-rate was 37·8. Liverpool was fortunate in getting the epidemic over before the really severe weather, and suffered less than many other large towns. Room was made for the numerous pneumonia cases in the poor-law hospitals by the transference of other types of disease to the city hospitals. During the first quarter of 1928 there were two cases of small-pox. One attended a doctor's surgery and was promptly isolated; the other case was a child in a gipsy caravan. There was no further spread, and Dr. Mussen points out that the child population of Liverpool is relatively well vaccinated. During the year the city arranged with 12 adjoining local authorities to treat their small-pox cases in return for an annual retaining fee and an additional payment per case admitted. There were seven Liverpool cases of anthrax, four among handlers of hides, one of a female who had to handle East Indian wool, and two among tanners' labourers. During the past five years striking results have been obtained at the City Hospital, Fazakerley, by serum treatment; 31 cases treated all made a good recovery without the excision of the malignant pustule. During the same period three moribund cases were taken in and died within a few hours of admission. Of the two 1928 cases, which ended fatally, one was diagnosed too late and the other by his own neglect was admitted to hospital too late. Steps have been taken to inform the

Liverpool hide and skin trades of the successful results of the serum treatment. A bull suffering from anthrax was slaughtered in Cheshire and the carcass sent to the Liverpool abattoir. The Cheshire butcher who dressed the carcass was seriously ill for some weeks. Those who handled the meat at the Liverpool abattoir received preventive doses of the serum and remained well.

Good results are claimed for light treatment at the Carnegie centre and at the Children's Hospital for non-pulmonary tuberculosis, Leasowe; and the medical staff who treated tuberculosis at Fazakerley Hospital are convinced that "light treatment is of very definite value." All degrees of inflammation were included in the 545 notifications of ophthalmia neonatorum. The damage done included one blinded child and one with the sight of the right eye affected. The total births numbered 19,120 and 8702 expectant mothers attended the 28 prematernity clinics, which are held weekly in Liverpool. Dr. Mussen complains of the delay in notifying tuberculosis; 22 per cent. of the pulmonary cases notified died before the end of the year, and 216 of the 1148 deaths from tuberculosis were those of unnotified cases. The attendances of gonorrhœa cases at the Seamen's Dispensary have been much reduced, as a shorter time is required for cure and irrigations since the installation of electrical treatment apparatus.

The transport of milk by motor vehicles on the road is increasing and has many advantages. Thus the farmer has his empty churns returned direct to the farm and the dairyman is saved the expense of collecting his milk at the railway station. During 1928 there was a considerable increase in the quantity of designated milk. The cow population of Liverpool is 3947, and amongst them 25 cows with tuberculous udders were found. 488 samples of outside milk were examined and 34, or 6·9 per cent., were found to be infected with tubercle.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Average attendance	Routine inspection.	Special exams. and reinspections.	Percentage of defects.
City of Liverpool	Not stated		45,110	61,757	18·3
City of Nottingham	40212	35,938	10,610	32,597	20·7
Cambridge	6924	6266	2141	2335	10·6
Scarborough	Not stated.		1541	995	17·0

Liverpool.

THE immense improvement in physique and general health brought about at least partially by the activities of the school medical service is strikingly demonstrated in this report.

Dr. A. A. Mussen quotes from a report on the condition of the Liverpool school-children in 1907 descriptions of malnutrition, ill-clothing, and physical defect which seem incredible to-day. Dr. Mussen also reproduces statements from two head teachers, whose long experience enables them to recall the state of the children 20 years ago when teaching in a slum school was repulsive to many because of the dirt and its results. Quite half the boys were barefooted, and the teacher recalls the picture of "older boys carrying on their backs little chaps unable to walk because of festering sores on their feet." Another telling picture of the improvement is a graph showing the fall in the exclusions for verminous conditions, from over 950 in 1910 to under 20 in 1928. Dr. Mussen mentions some of the facilities now established for dealing with school-children, including residential open-air treatment in the committee's own institution at Woolton Vale, and the 30 beds reserved at Torpenhow, adding that there will be soon two new day open-air schools in the city. He makes special mention of the extensive and beneficial work carried out by the Committee's Inspector of Physical Training, the report of which appears as an appendix.

The care of pre-school children is now recognised as essential, and in 1927 arrangements were made for their treatment when suffering from otorrhœa or squint. Parental ignorance prevents more extensive dental treatment, the proportion of parents accepting treatment being less than three-fifths of that for the whole country. The charge (6*d.*) may have been responsible in some cases and the extension of free dental treatment is worth considering. But ignorance is the real difficulty in this matter and also in connexion with the refusals of the facilities afforded in the stammering class. In another connexion difficulty is caused by the mental attitude of the children themselves; 34 per cent. of those who had been provided with glasses were found not to be wearing them, the proportion rising to over 50 per cent. in certain schools. Often these children are afraid of ridicule. However, the marked change of attitude of parents and children to school medical work noted in Dr. Mussen's introductory pages will no doubt extend and the early removal of the obstacles still in the way of complete success can be anticipated.

Nottingham.

The earlier pages of the report by Dr. E. M. Wyche are taken up by photographs of facilities for treatment and examples of the fine results. Soon after comes a diagram showing the comprehensive scheme for diagnosis, treatment, and care, and the introduction to the text of the report shows how this organisation has been gradually built up. Among the more recent extensions is the orthopædic scheme dating from 1925. Two gaps remain in this work; the lack of a special school for the 377 cripples still in elementary schools, and the difficulty in securing enough beds for orthopædic cases; this latter difficulty is likely to be obviated shortly, when the new Harlow Wood Orthopædic Hospital is completed. An apparatus for ultra-violet ray therapy was installed in 1927, and an interesting account is given of the benefits obtained in certain cases. Plans are under consideration for a large open-air recovery school, a new minor ailment clinic, and an additional special school for 100 mentally defective children. Except for a school for physical defectives, which is lacking, there will soon be almost complete arrangements for care and treatment in the city, where, moreover, the value of the clinics is being increasingly realised by the private practitioner. A scientific study of the problem of mental deficiency made by Dr. A. A. E. Newth suggests that bad scholarship, poverty, and large families tend to be associated.

Cambridge.

The percentage of defects found at routine inspections in Cambridge is below the average for the country and so are the numbers of some of the groups of exceptional children. In any district this circumstance may be due to fortunate local conditions or to variations in the standard of ascertainment of defects. This year's figures are not quite so low as those of previous years. Dr. A. J. Laird attributes the increase to the larger number of children suffering from enlarged tonsils, adenoids, anæmia and debility, due, in his opinion, to the recent increased prevalence of measles, scarlet fever, and diphtheria. The general physique of the Cambridge children is very good and is still improving, but the number of delicate children (397) is very high, so that there was ample justification for the provision of an open air school in July.

The dental scheme, under the direction of Mr. W. Baird Grandison, is so thorough that every elementary school child in Cambridge has the opportunity each year of dental inspection and treatment, and in 1928 out of the 6266 children in average attendance, 6080 saw the dentist and 2996 received treatment. As a result of good work extending back for 21 years, the dental condition of the children has steadily improved, 34 per cent. of them had, this year, no decay in either dentition and there was an average of only 4 unsaveable permanent teeth among batches of 100 children. 886 children took no advantage of the facilities offered. Mr. Grandison thinks that this was due, *not so much to antagonism or ignorance as to* inconvenience—for example, the mother might find difficulty in accompanying the child at the time appointed.

With such figures as 94·0 of sound temporary teeth after treatment, those responsible may be gratified by the success of the Cambridge dental scheme.

Scarborough.

Dr. S. Fox Linton introduces a detailed report by Dr. Anne Roxburgh. Scarborough is a town with rather a small child population, and there are some fortunate local circumstances and energetic social workers. The small numbers have perhaps been the reason for the absence of special schools; accommodation has been found for several defective children in institutions belonging to other authorities. There is no open-air school, nor is it deemed so essential as in the large and industrial towns; but for playing fields a piece of ground has been levelled on the Castle Hill and a large field has been rented by the Education Committee on the Northstead estate. The authority does not provide spectacles gratuitously; help is given to the poor children by the Amicable Society, often repaid by the parents in small weekly amounts. This Society also supplies cod-liver oil, milk, and free meals when needed. There are few cripples, so that an extensive orthopædic scheme is not wanted; but a clinic is held at the local hospital, attended by the orthopædic surgeon, Dr. H. L. Crockatt, and a massage sister. Institutional treatment is obtained when required at the Kirbymoorside Orthopædic Hospital. Cases of chronic deformities, such as those produced by old infantile paralysis under treatment by private practitioners or at the hospital, may need massage. This the poor can obtain by the help of the Council of Social Service, the parents paying what they can towards the cost.

Some at least of the reduction in the number of infantile deformities may be due to the activity of the infant clinic, where the health visitor has the assistance of a strong body of voluntary workers; several cases of early rickets are at present under treatment there. Another factor for good is doubtless the nursery class, at which the infants are kept under close medical supervision. X ray treatment for ringworm will be provided by a private arrangement with a skin specialist in the town.

Though there is no special M.D. school, there is a really adequate class for dull and backward, under a specially trained teacher, who has this year been given an assistant. A Council of Social Welfare, working in conjunction with the Yorkshire Association of Mental Welfare, takes over the after-care of children leaving this class. While in many branches of the work the ordinary official methods have not been developed, keen unofficial agencies have creditably filled the gap.

MENTAL HOSPITAL REPORTS.

THE 132nd report of *The Retreat, York*, records the gratifying fact that during the year 1928 over 60 per cent. of the patients admitted came as voluntary boarders, and the medical superintendent concludes that the era of the certified lunatic is drawing to an end. On Dec. 31st there were 210 patients on the books, the number of admissions (126) being the highest on record. The recovery-rate was 25 per cent., which is a high figure for the standard in use. A patient is only put in the "recovered" group when he is adjudged fit to resume his ordinary occupation without further supervision. The death-rate was 8·2 per cent. The general health was good, except for an outbreak of very mild paratyphoid fever which affected six patients and one nurse. A house was taken at Whitby for the summer months, and was much appreciated. The further development of occupational therapy is being considered, and every effort is made to induce the patients to share in their own entertainment. Fifteen patients have parole outside and 34 inside the grounds. The main part of the building had to be re-roofed last summer; the slates taken away were the original ones put on in 1793. Fourteen male and 20 female nurses are certificated in mental nursing; a sister, who was appointed matron of the Gloucester County Mental Hospital last year, was the seventh Retreat official to be promoted to a matron's post within six years.

James Murray's Royal Asylum, Perth, published its 102nd annual report for the year 1928–29. Ninety patients were admitted during the year—a record number—and the total on the books on March 31st was 192, an increase of 55 in four years. This increase has severely taxed the accommodation of the hospital, and a self-contained and detached reception block for 40 patients is to be built. The beds will be about equally divided between private rooms and dormitories, and the block will have its own nursing and domestic staff. There will be a surgery and dental room, clinical rooms, a laboratory, facilities for hydrotherapy and continuous baths, and an electrical treatment room with X ray apparatus and ultra-violet lamps. Acute cases will be sent to this block. The building has been so planned that another one like it can be erected near by in a few years if need arises. Many of the patients—over 62 per cent.—were admitted on a voluntary basis, and of these rather more than two-thirds were able to leave hospital restored or improved. Only about half the certified patients were discharged recovered. One general paralytic, treated by malaria followed by intensive antisyphilitic medication, has now been managing a successful business for 18 months. The death-rate was 9 per cent., and post-mortem examinations were made on half the fatal cases. The staff suffered a good deal from sickness during the year, but the hospital was remarkably free from epidemic disease despite the severe weather; there was only one case of influenza and no tonsillitis. A long series of patients was treated by protein shock and another series by ovarian extracts, but the results were confused and uncertain, as were also the results of ultra-violet therapy. Septic foci have been sought and treated, and a number of urinary antiseptics were tried. The occupational therapy department was attended by a great many patients; rug-making, basket-work, leather-work, and wood-carving all attract much interest. Open-air treatment is extensively used. The dairy herd has been disposed of; the fruit and vegetables did fairly well. A good deal of renovation has been carried out, and old-fashioned casements have been replaced by large panes or vita-glass. In January the carriages were replaced by a 24-h.p. seven-seater Austin limousine. Nine nurses sat for the R.M.P.A. certificate and were all successful, but there is a dearth of candidates for the State certificate.

At the beginning of this year there were 668 patients in the *City of Cardiff Mental Hospital*, an increase of ten on the previous year. The death-rate was 9·26 per cent. and the recovery-rate 38·7 per cent. The general health was good; there were three cases of tuberculosis, three of erysipelas, one of scarlet fever, and one of paratyphoid B. General paralysis was the cause of 31·84 per cent. of the deaths. Autopsies were held in all cases in which permission could be obtained. The dental surgeon has attended regularly throughout the year; the gynæcologist has examined 32 patients and the aurist 53. A wireless set has been installed; its cost was largely borne by members of the Japanese Community in London, in recognition of the care of certain Japanese patients in the hospital. The out-patient clinic in psychiatry is held weekly at the Cardiff Royal Infirmary, and the secretary attends there to follow up discharged cases. Various physiological tests are carried out on all suitable new patients, and investigations are being made into the condition of the vegetative nervous system, the blood cholesterol and hydrogen-ion concentration, and the carbon dioxide combining-power of plasma.

All but three of the male wards are nursed by women. Three nurses and one attendant passed the final State examination during the year.

There were 1081 patients in the *County and City of Worcester Mental Hospital* at *Powick* at the end of 1928. The recovery-rate for the year was 32·6 per cent. and the death-rate 4·7 per cent., the principal causes of death being old age (26 per cent.), heart disease (20 per cent.), and phthisis (12 per cent.). Autopsies were held on 68 per cent. of cases. Apart from a mild epidemic of influenza in the spring, the general health was good. Only six patients, all men, have parole beyond the estate; 32 men and seven women are free within the grounds. A dentist visits the hospital once a fortnight. The farm showed a profit of over £600 on the year's working, but does not supply enough milk for the needs of the institution. The visiting commissioners express anxiety about the use of nearly 200 twelve-ounce tins of condensed milk weekly, especially as margarine and not butter is given for breakfast and tea. The hospital is handicapped by having no electricity and very few clinical rooms. The committee is considering the introduction of an electric supply. One male and two female nurses gained the R.M.P.A. certificate during the year.

The report of the *Brighton County Borough Mental Hospital* at *Hayward's Heath* has as frontispiece an aerial photograph of the institution. There were 895 patients in the hospital at the end of 1928. Forty-five of the 264 admitted were over 60 years of age, and the recovery-rate was therefore a little lower than last year—36·6 per cent. The death-rate was 9·15 per cent. Twenty patients suffered from tuberculosis, but otherwise the general health was good. Eight general paralytics were sent to Hellingly for malarial treatment, but only one showed any improvement. Forty-six patients have been on full parole and 52 more on parole within the grounds. The hospital is crowded during the day, and the committee are considering the purchase of a neighbouring estate for an admission hospital. The dentist attended 685 patients during the year and extracted 757 teeth. One ward on each side is administered on the open-door principle. Ultra-violet ray treatment has been found valuable for convalescents. The out-patient clinic at Brighton served 438 patients, including 98 new ones during the year, and has done very good work. Four nurses obtained their R.M.P.A. certificate, and it is hoped that improvements in accommodation for the staff will diminish the matron's difficulty in securing suitable female nurses.

The *West Sussex County Mental Hospital* (*Graylingwell, Chichester*) had 877 patients on the books at the end of 1928, an increase of 65. The hospital is already uncomfortably overcrowded, and another two years must elapse before the new buildings will be available. The provisional scheme includes a block for 115 women, a villa for 50 women, an admission hospital for 35 women, and a nurses' home. Meanwhile the heating system of the old blocks is to be modernised. The medical superintendent hopes that the new admission hospital will, by the time it is ready, be allowed to receive patients on a voluntary basis. The death-rate was 6·1 per cent. and the recovery-rate 32·7 per cent. The general health throughout the year was good. There was one case of severe chicken-pox and a few cases of influenza. Two patients and the medical superintendent contracted typhoid fever. Five major operations were performed and one general paralytic was sent to Knowle for malarial treatment, but he did not improve. During the summer the usual picnics to the seaside were arranged. Several patients have been allowed out on leave for periods varying from a day to three weeks and parole beyond the estate is given to 23 patients, and within the grounds to 50 more. Three male and five female wards are administered on the open-door principle. Two nurses and one attendant obtained their R.M.P.A. certificate and one nurse passed the final State examination. The medical superintendent mentions the excellent work of the nursing staff in the face of peculiar difficulty incident to the overcrowding.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 24TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 139 (last week 120); scarlet fever, 1678; diphtheria, 793; enteric fever, 89; pneumonia, 490; puerperal fever, 40; puerperal pyrexia, 95; cerebro-spinal fever, 8; *acute poliomyelitis, 14*; *acute polio-encephalitis*, 3; encephalitis lethargica, 24; dysentery, 6; ophthalmia neonatorum, 110. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on August 27th–28th was as follows:—Small-pox, 144 under treatment, 24 under observation (last week 147 and 1 respectively); scarlet fever, 1313; diphtheria, 1430; enteric fever, 14; measles, 325; whooping-cough, 228; puerperal fever, 26 (plus 11 babies); encephalitis lethargica, 123; poliomyelitis, 1; "other diseases," 20. At St. Margaret's Hospital there were 14 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 18 (5) from measles, 3 (1) from scarlet fever, 24 (2) from whooping-cough, 20 (3) from diphtheria, 67 (11) from diarrhœa and enteritis under two years, and 17 (2) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa 7 each were reported from Liverpool and Hull, 6 from Birmingham, and 4 from Sunderland. Liverpool recorded 5 deaths from whooping-cough and Manchester 3. The deaths from enteric fever occurred at Wood Green, Sheffield, and Cardiff.

The number of stillbirths notified during the week was 259 (corresponding to a rate of 37 per 1000 total births), including 55 in London.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A Memorial to Sir William Thompson.

A MEETING of the friends of the late Sir William John Thompson has been held to consider the establishment of a memorial to him. The meeting decided to appeal for funds to establish a tuberculosis village settlement in connexion with the Peamount Sanatorium, Co. Dublin. Sir William was greatly interested in anti-tuberculosis work and was, indeed, one of its pioneers in Ireland. He had been honorary treasurer of the Peamount Sanatorium since its foundation some 17 years ago, and had been interested for some time in the project of adding to its utility by a tuberculosis settlement. If adequate funds are forthcoming no doubt the Papworth model will be followed, and the Memorial Committee arranged with Dr. Varrier Jones to give a lecture a few days ago on his work at Papworth. At the sanatorium he addressed a large audience, including many of the patients, and having described the object and achievement of Papworth, he showed a large number of illustrative lantern slides.

Examination of Milk.

The difficulties arising in the examination of milk in regard to the amount of fats present were exemplified in two cases which came recently before one of the Dublin magistrates. A milk-dealer was prosecuted by the Dublin Corporation on the ground that certain milk offered for sale contained only 2·7 per cent. of fats, the legal standard being 3 per cent. Evidence was submitted, in defence, of a finding of 3·67 per cent. of fats in another portion of the same specimen. The magistrate adjourned the case for the report of the State analyst on the third portion of the specimen. His examination found 4·9 per cent. The magistrate dismissed the case with costs. In a similar case the three analyses gave percentages of 2·4, 3·59, and 6·7. This case also was dismissed with costs.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Investigation of Maternal Mortality.

THE Department of Health for Scotland has taken an important step to secure the closer investigation of maternal deaths during pregnancy or within a month after the termination of it. This was one of the many recommendations made by Lord Salvesen's Committee on Puerperal Morbidity and Mortality, which reported to the Scottish Board in 1924. Why it should have taken five years to give effect to the recommendation may not be easy to explain, but the new department has lost no time in creating the necessary machinery and in issuing instructions. The form of death certificate in use in Scotland has now, under the powers of an Order in Council dated June 8th, 1929, been altered "to provide for a statement by the medical attendant if, in the case of a married woman, the death occurred during pregnancy or within four weeks of the termination of pregnancy." The Registrar-General for Scotland has notified the alteration in the certificate to the local registrars and authorised them to supply medical officers of health, when requested to do so, with a special return in a prescribed form in respect of cases in which the question as to pregnancy is answered in the affirmative. Registrars will be prepared to make these returns from Oct. 1st next. The second difficulty is the question of method. Fortunately, Aberdeen's ten years' systematic investigation (published by the Scottish Board of Health last year) provides a model and the Department now issues an elaborate form and a memorandum of directions to every medical officer of health. This is the most important step yet taken in Scotland to get to grips with the causes of deaths associated with pregnancy. There is every hope that practitioners will coöperate as they did in Aberdeen, since every care is taken to keep the investigation of individual cases strictly confidential.

Mental Defectives and the Public Safety.

At a Glasgow sitting of the High Court of Justiciary, a plea of insanity in bar of trial was accepted on behalf of a young seaman charged with shooting and murdering a woman in a Glasgow public-house. But insanity was not the whole case. Dr. Gilbert Garry, Duke-street Prison, considered the prisoner of unsound mind and unfit to plead; he did not appear to appreciate the difference between right and wrong. Dr. J. H. Macdonald, of Hawkhead Mental Hospital, regarded him as a moral imbecile and insane. Dr. R. D. Clarkson, under whose charge he had been at the Royal Larbert Institution, said the man had no sense of moral obligation and that he (Dr. Clarkson) had, without effect, recommended that his detention at Larbert should be extended. He had examined the man that day and found him in the same mental condition as when he was a boy. He declared that the accused, for the protection of others, should have been placed under proper supervision and control from the time he was 8 or 9 years old right through his life.

The Lord Justice-Clerk (Lord Alness), who tried the case, made some observations on it at an informal banquet given by the Lord Provost and magistrates. It raised the question, he said, whether adequate machinery existed for preventing persons being at large in the community when their mental state rendered them a danger both to themselves and to others. In this case an individual was found to be of unsound mind and unfit to plead. He was also described as having been in the same mental condition when released some time before from a mental institution. In that mental state, apparently, he went about the world, with the result that he shot a young woman dead, and attempted also to shoot a man. That, to his mind, seemed a disquieting state of affairs. He was not suggesting blame to anyone in connexion with the case, but he did suggest in the interests of the safety of the public consideration by the appropriate authorities whether machinery could not be devised to prevent the recurrence of such deplorable incidents.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

White House Conference on Child Health.

President Hoover's interest in child health has long been known in America. His presidency of the American Child Health Association was but one indication of this interest, and another is his intention to summon a White House Conference on the health and protection of children. The first meeting of the planning committee was held in Washington on July 29th and was addressed by President Hoover, who hopes that the policies adopted by that Conference will be followed up by definite organisation throughout the country. Progress in this direction must for the most part be made by voluntary action and by activities of local government, but the Federal Government will attempt to secure some measure of unity as to view and as to programme.

Every subject bearing on child health, including the difficult subject of child labour upon which Congress has twice attempted to legislate without success, is to be brought under consideration. A sum of half a million dollars from private sources has been placed at the President's disposal to cover the expenses of the preliminary committees and for investigations which they may require. The Secretary of the Interior, Dr. Ray Lyman Wilbur, a past president of the American Medical Association, will have general charge of the Conference. The planning committee itself is drawn from organisations of quite diverse interests, and has a personnel which will inspire confidence.

Diploma Forgeries in Illinois.

Five men have recently been indicted before a grand jury in Chicago for the sale of licenses to applicants who were not properly qualified to practise medicine. True bills were returned on July 30th. The chief among this group is W. H. H. Miller, who was formerly director of the State Department of Education and Registration. This man was found guilty of selling licenses while in office, and eventually discharged, but is said to have claimed since his discharge that he retained all his influence in the department. The evidence is said to indicate that more than 1000 forged licenses have been issued. One man, said to be in possession of such a license for which he is supposed to have paid $1500, has already been arrested. He was found working as an orderly at the West End Hospital. A blank abortion release slip is alleged to have been found in his pocket.

Silver Polish Poisoning.

Several cases of acute poisoning of guests in hotels have been reported to the New York State Department of Health and are under investigation. A typical severe case is that of a man, aged 45 years, who was seized suddenly with nausea and severe colic. From midnight until 2.30 A.M. he vomited continuously, and thereafter suffered from tenesmus, diarrhœa, nausea, and continued retching. The patient was now covered with profuse perspiration, the skin cold, pallid, and cyanotic. The pulse was rapid, of low tension, and irregular. After three hours of active treatment with applied heat, hot coffee by mouth, and caffeine hypodermically, the shock subsided. One-eighth grain of morphine was placed under the tongue and the patient went to sleep. Recovery was uneventful. Three other persons who had partaken of the same evening meal had similar though less severe symptoms. The State Department of Health has found that in every case where these acute poisonings have occurred the hotel management is in the habit of employing a silver polish manufactured by a New York firm. Analysis of this firm's products gives in every case a positive cyanide reaction. One silver polish put out by them was found to contain as much as 20 per cent. of sodium cyanide. Hotel managers who have ceased to use the polish on advice from the Health Department report a cessation of symptoms among their guests.

Lethal Possibilities of Vibratory Massage.

As Sandow exercises were the fashion in England a generation or so ago, at the present time in the United States there is a vogue for vibratory massage. The modern fad is mechanical—driven by electric motor. Apparently it is not without its dangers. The case is recently reported of a man who after an hour's "exercise" in a gymnasium under the supervision of a "physical director" developed an acute soreness in the abdomen, about an inch to the right of the umbilicus, some weakness and dizziness. He had, it seems, used an electrically driven vibrating massaging belt applied to his abdomen for the space of ten minutes. Next day he passed about 15 well-formed tarry stools, after which he was short of breath and of blood, and called his physician. The latter, as well as a consultant, believed that he was bleeding from a duodenal ulcer; the consultant had at that time in hospital a patient whose ruptured appendix was attributed to the use of a similar apparatus. The committee on physiotherapy of the Medical Society of the County of New York has on record a case of severe hæmorrhage of the bladder, resulting from five minutes use of an exercising machine, and is appealing through its chairman, Dr. Richard Kovacs, for information regarding other accidents that may have resulted from such machinery.

Diet in Tuberculosis.

The opinion of 36 prominent phthisiologists has been ascertained recently on the subject of diet in tuberculosis by Dr. John B. Hawes, of Boston, by the questionaire method. The idea that the patient should be stuffed seems now to have been universally abandoned. Extra meals are, on the whole, regarded with disfavour. Egg-nogg was the subject of considerable disagreement and violence of attack on the part of some specialists, rather surprising since no reason is offered for their aversion to this particular combination. As for milk, most of those questioned favoured a maximum allowance of one quart given daily—with, rather than between, meals. A good deal of emphasis was laid upon the importance of rest immediately before and after meals. Some were strongly of the opinion that five or six glasses of water should be drunk daily, others that most patients drink too much water. It is difficult to judge of the value of these opinions without knowing on what principles they were founded.

Governor Roosevelt creates a Spa.

The Governor of New York State has decided to exploit the resources of the State in mineral waters, and has selected Saratoga as the site of a model spa. The town is already a fashionable resort in beautiful country, not many miles south of Lake George, and devoted to horse-racing. It will be of interest to observe whether those in search of health will be deterred by the present somewhat noisy display of wealth or whether the Governor's plans will overshadow the existing attractions A medical advisory committee, including the president and the director of the New York Academy of Medicine, and the professors of medicine at Cornell University and the Albany Medical College, has been appointed to assist the State Commission charged with the development project. In a speech to the annual conference of Health Officers and Public Health Nurses the Governor explained the scope of his ambition. It is his hope that Saratoga may do great good for many human ills of the people of the State, and, moreover, point the way so that other States and other mineral springs can be developed along scientific and medical lines. From the Adirondacks to Georgia there are wonderful springs on both sides of the range, and both in the west and middle west there are springs going down through the Ozark mountains and borders of Oklahoma and Texas. Those of the Rockies extend down to Montana and Arizona, and in the Allegheny Mountains. The development of all these natural advantages may follow the Saratoga scheme should this prove a success.

Dental Research in Alaska.

The first complete dental equipment, including X rays, to be sent to the Eskimos of Northern Alaska is now on its way. The expedition is in charge of Dr. Leuman M. Waugh, the associate dean of the school of dental and aural surgery of Columbia University, who has been given a temporary commission in the public health service.

Appointments.

Dr. David Rapport, who has been appointed to the chair of physiology at Tufts College Medical School, graduated from Harvard in 1912, and from the Harvard Medical School in 1916. During the next two years he worked under Sir Thomas Lewis on the effort syndrome in soldiers, and has since taught at Harvard, Cornell, and Western Reserve Universities. Dr. William G. Gallie has been appointed to the chair of surgery at the University of Toronto. He gave the Hunterian lecture before the Royal College of Surgeons in 1924 on Transplantation of Fibrous Tissues in the Repair of Anatomical Defects.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The All-India Medical Council.

THE proposed Bill "to establish a Medical Council in India and to provide for the maintenance of a British Indian Medical Register" met with a further check last month. The conference of Provincial Ministers of Public Health, Surgeons-General, and Inspectors-General of Civil Hospitals, assembled at Simla to consider the proposed measure, showed considerable opposition to the Bill. Although the deliberations of the conference have not been made public it is evident that the various provinces are unwilling to transfer their present powers of regulating medical education to a centrally constituted body, despite the fact that adequate provincial representation is provided for in the proposed scheme. Nevertheless, the case for the immediate formation of an all-India council is a strong one. The suspicion that such a council would arrogate to itself the function of prescribing the courses and curricula of the universities and medical schools is unfounded. It would naturally have to be satisfied of the adequacy of the standard of instruction in any given training centre before recognising its degrees for registration, but the onus of drawing up curricula so as to conform to the standard of proficiency set up by the council would rest with the various educational authorities concerned.

Tuberculosis in Bengal.

The gravity of the tuberculosis problem in Bengal may be realised when it is stated that there are in the neighbourhood of 800,000 cases in that province. Of these, about 200,000 require sanatorium treatment and there is no provision whatever for their accommodation. Dr. A. C. Ukil in a recent address urged the immediate necessity for the establishment of provincial organisations to study the disease and to devise measures for its prevention. A beginning has already been made by the establishment on a purely voluntary basis of the Tuberculosis Association of Bengal.

A New Leprosy Publication.

The Indian Council of the British Empire Leprosy Relief Association have decided to issue quarterly a small brochure entitled Leprosy in India, which is intended to form a means of communication between leprosy workers in this country. The first number, which has just come to hand, contains informative articles on the objects of the council, on a leprosy survey in Travancore State, and on anti-leprosy work in Bihar and Orissa and in Burma. These quarterly notes are distributed free of charge to those taking an active part in the work of eliminating leprosy from India.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. H. J. Chater is placed on the Retd. List.

A. M. Lawrence-Smith and B. St. John Lyburn to be Surg. Lts.

The following appointments are notified: Surg. Comdrs. M. S. Moore to *Vindictive*; J. F. Haynes to *Victory* for R.N. Hospl., Haslar; P. L. Gibson to *President* for R.A.F. Medical Officers' Course; G. L. Ritchie to *Lowestoft*; D. C. Eglington to *Pembroke*, for R.N. Hospl., Chatham; and J. F. Place to *Pembroke*, for R.N. Barracks, Chatham.

Surg. Lts. R. C. Webster to *Shropshire*, and J. Johnston to *Lowestoft*.

Surg. Lt.-Comdr. J. F. Ainley to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. J. B. Oldham to *Victory* for R.N. Hospl., Haslar, for training; E. C. Johnston, commission terminated on entry into R.N.; R. W. H. Tincker to *Pembroke*, addl., for R.N. Barracks, Chatham, addl., for 14 days' training; and H. M. Willoughby to *Victory*, addl., for R.N. Barracks, Portsmouth, addl., for 14 days' training.

Surg. Lt. H. M. Petty to *Pembroke*, for R.N. Barracks, Chatham, for training.

A. J. W. Beard entered as Proby. Surg. Sub-Lt. and attached to the London Division, List 2.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. L. Popham, having attained the age for compulsory retirement, is placed on retd. pay.

Maj. T. B. Moriarty, D.S.O., to be Lt.-Col., vice Lt.-Col. R. L. Popham to retd. pay.

The undermentioned to be Lts. (on prob.): D. A. O. Wilson, T. R. J. P. Kerwick, T. G. D. Coneys, J. G. Black, A. N. B. Odbert, Temp. Lt. C. A. Levy (and relinquishes the temp. rank of Lt.), and S. W. K. Arundell.

Lt. A. H. Weston, from the R.A.M.C., T.A., to be Lt. (on prob.).

Lt. (on prob.) T. G. D. Coneys is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

Temp. Lt. H. T. Chiswell relinquishes his commn.

ARMY DENTAL CORPS.

Capt. W. Philp to be Maj.

Lt. (on prob.) E. C. Irish is confirmed in his rank.

ARMY RESERVE OF OFFICERS.

Lt.-Col. R. L. V. Foster, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. S. McCausland, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flight Lt. G. H. H. Maxwell is promoted to the rank of Squadron Leader.

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS.

The following have been granted commissions as Lieutenants on probation in the Corps:—D. A'Brook, M.R.C.S., University College Hospital; D. A. O. Wilson, M.B., Queen's University, Belfast; T. R. J. P. Kerwick, M.B., University College, Dublin; T. G. D. Coneys, L.R.C.P. & S.I., Royal College of Surgeons, Dublin; J. G. Black, M.B., University of Aberdeen; A. N. B. Odbert, M.B., Trinity College, Dublin; C. A. Levy, M.R.C.S., St. Thomas's Hospital; S. W. K. Arundell, M.R.C.S., Middlesex Hospital; A. H. Weston, M.B., University of Edinburgh; and E. A. Wilson, M.B., University of Edinburgh. Two of these officers have been seconded for the purpose of completing appointments in civil hospitals.

Correspondence.

"Audi alteram partem."

PENAL TREATMENT FOR NERVOUS DISORDER.

To the Editor of THE LANCET.

SIR,—That a police magistrate should consider the penal treatment of a patient suffering from a nervous disorder proper and fitting is not very surprising, but it is rather disturbing to find that you should approve of such a proceeding as you do in your issue of August 17th (p. 351).

The case to which I am referring is that of a man who had been addicted to morphia to the extent of 15 grains a day. Under treatment this was reduced to ½ grain, and at this point the patient was discharged from treatment through no fault of his own. He was given a prescription for one single half grain of the drug. What was the man to do? Everyone knows that such a patient must somehow obtain more morphia. He seems to have regularised his position later on by getting prescriptions from other doctors, but unfortunately before doing so he falsified this prescription, and so illegally got possession of 12 grains. For this he received three months' imprisonment, with your approval.

The first point that strikes me is this: is imprisonment likely to cure such a patient? I know of one patient who was sent to prison for the crime of illegal possession of morphia, and he was not cured. The drug was cut off at once, and those who know anything of the morphia craving will realise what that means. On the day of his release, he succeeded in buying the drug without difficulty. Again, ought we doctors to applaud the fixing of the stigma of imprisonment on a patient; ought we not rather to endeavour, as we do for the insane, to lead the authorities to see that stigmas are good for nobody, and that patients will do better if treated without them.

To seduce a person into taking morphia is a grave moral offence, and is rightly punishable by law; but in what sense, legal or moral, is morphia addiction an offence. This man had not led anyone into the morphia habit, and I am unable to agree with you in your dictum that "The case shows the administration of the law in the best interests of the accused."

I am, Sir, yours faithfully,

T. A. ROSS.

Swaylands, Penshurst, Kent, August 21st, 1929.

CHORDOTOMY IN THE TREATMENT OF OSTEOARTHRITIS OF THE HIP.

To the Editor of THE LANCET.

SIR,—I was much impressed by Mr. Bankart's admirable paper in your issue of August 24th (p. 378) on the treatment of this condition by division of the spino-thalamic tracts. Before deciding to carry out the operation myself, however, I should like to learn from Mr. Bankart a little more detail. For example, how does he recognise the part of the spinal cord requiring section, and how does he divide it? In my edition of "Cunningham's Anatomy" (which I admit is dated 1900) it is stated that "as the spino-thalamic tract ascends in the cord its fibres are not gathered into a compact strand, but are more or less loosely scattered in the lateral column." Does Mr. Bankart divide as much as one-fourth of the spinal cord, and how does he guard against the danger of producing paralysis?

One other point: Mr. Bankart does not mention a method of treatment which is most useful in these cases—namely, giving the patient a pair of crutches. If the case be one in which there is no pain when the patient [illegible] recumbent [illegible] entire[illegible] prevent the [illegible] is up an[illegible]. Strange to [illegible]nce of [illegible] in this [illegible] appears to favour the production of ankylosis, and when this has become sound all pain in the hip vanishes and the crutches can be discarded. Though this may take years the cure of the pain is certain.

I am, Sir, yours faithfully,
PAUL BERNARD ROTH.
Welbeck-street, W., August 24th, 1929.

To the Editor of THE LANCET.

SIR,—The operation of chordotomy clearly has come to stay, and there is no difficulty in enumerating the conditions in which for the relief of paroxysms or everlasting pain the operation will now probably be performed. The skill of the surgeon with his full and bloodless exposure makes the operation appear easy enough. Good nursing, as a rule, does the rest. But it is the physician who probably will continue to shoulder the prime responsibility. With experience of antero-lateral tract section and of medio-longitudinal section (suggested first, I believe, by Dr. J. G. Greenfield) I think that the latter operation is more easily performed than the former; also it appears to be based on a sounder anatomy. The anterior spinal artery is not injured by the skilled surgeon. It is important that the decision to operate shall be made long before the patient is worn out by his pain, by drugs, or by time. I have under observation at the moment a man on whom complete medio-longitudinal chordotomy (traumatic spina bifida) was performed a few weeks ago through four segments of his thoracic cord for the relief of crises. He appears to have therefrom no impairment of sensibility whatever to thermal stimuli.

I am, Sir, yours faithfully,
HILDRED CARLILL.
Harley-street, W., August 24th, 1929.

THE NEW VACCINATION ORDER.

To the Editor of THE LANCET.

SIR,—In regard to the new Vaccination Order, I recall that the most successful vaccinations I ever witnessed were performed by a former colleague of mine, the late Arthur Caesar, public vaccinator for the Eastern District Hamlet of Mile End Old Town. With the lower part of the cutting edge of a broad spear-headed lancet held almost flat to the skin, by a gentle incising movement he slightly lifted the epidermis forming, as it were, a valve shutting in the lymph. He never scratched with the point, scarcely drew blood, was nearly always successful, and very little inflammation followed the operation.

I am, Sir, yours faithfully,
FREDK. WM. ALEXANDER,
At one time Public Vaccinator, Western District Hamlet of Mile End Old Town; formerly M.O.H., Metropolitan Borough of Poplar.
Teddington, August 27th, 1929.

ANTIDYSENTERY BACTERIOPHAGE.

To the Editor of THE LANCET.

SIR,— As the author of the paper "Antidysentery Bacteriophage in the Treatment of Bacillary Dysentery" published in THE LANCET of August 10th, may I be permitted to reply to some of the points of criticism raised in your leading article on the subject in the same issue.

The impression created by your article in regard to my clinical results in the treatment of dysentery with bacteriophage is, that there was an initial "maximum beneficial effect" in just over 50 per cent. of the cases treated. This calculation and the expression of it can only be arrived at if we take a phrase from its context and ignore the rest. It thus represents only half, and, as may be agreed, the less encouraging half of the facts. In my "severest possible analysis" of the results, I was able to show that there were in all only 17 results that could be considered as failures, leaving 45 successes, which represents "a minimum percentage success for the treatment of 72·6." As I believe, I made sufficiently clear, this calculation is based on a reasoned interpretation of the facts, and it is the only one valuable. To it, I would add my considered judgment that "the general result of phage treatment for bacillary dysentery appears very much in its favour" as is borne out by the fact that more than "70 per cent. of the cases showed a well-defined and rapid improvement."

It is unfortunate that, through lack of space, you had to sacrifice the Table of "Clinical Records" accompanying my paper, since you appear to cast some doubt on the subsequent recovery of the cases in which the treatment was even most successful. This table would, I think, have enabled you and your readers to appreciate better the course of events from initial improvement to recovery. The word "recovery" is, I know, a very mobile one in medicine, but if there is any need to be more exacting about it in phage-cured dysentery than in other diseases, everything is in favour of the dysentery-cured patient.

As to your statement that in many cases of bacillary dysentery "the infection may be self-limiting" so that "recovery may occur without any specific treatment," I presume you mean here recovery by saline or other purgation treatment. In that case, reference to the third paragraph, p. 274, of my paper will provide a reasonable explanation of the "recovery" of the majority of such cases. In my opinion these cases are mostly phage "cures." Any doubt in regard to this may be dispelled by a persistent examination for the presence of phage of a number of acute dysentery stools—the patients being on no specific treatment whatever—when sooner or later phage will be found appearing among the recovery patients. These, then, are recoveries due to specific phage development. Such investigations underlie the phrase "other considerations," which perhaps escaped you, in the same paragraph.

This leads me to comment also upon the following remarks in your article:—

> "Only rigidly controlled parallel series of treated and non-treated cases will give information of real and lasting value," dysentery being "by no means always a serious and progressive malady." And again, "Since the evidence of the value of this treatment is anyhow not so convincing as to make it inhuman to withhold it from any sufferer, it would be a real service to therapeutics if those who, like Dr. Compton, have access to an unlimited number of cases of bacillary dysentery would treat alternate cases with the *bacteriophage* and the others by any one of the *approval methods* (italics mine), giving in each case a detailed bacteriological examination before and during treatment and chronicalling the clinical course. Only by such an investigation can the question be solved which ten years of scattered observation and uncontrolled reports, suggestive though they may be, have still left unanswered."

What does this mean? Are you here proposing saline treatment versus phage treatment alone or, on the other hand, serum treatment plus saline (a recognised approval method) versus phage alone? That the suggestion is for one of these methods is clear, I think, from your further remarks that in my cases:—

> "The ordinary saline treatment was carried on coincidently with the specific measures. Such a result, taken at its face value, appears to be excellent, but it is a constantly recurring lesson in medicine that face value results are not safe guides to the value of medicaments."

Let us consider the methods that at present hold the field. In the state of our knowledge to-day there appears to me to be fundamentally a choice of three: (1) saline alone; (2) antidysentery serum plus saline; (3) antidysentery bacteriophage plus saline. Saline I have included in all, because this is classical; and with reason; for, whatever lesions the microbes of bacillary dysentery may provoke, it is essential to combat the toxæmia of the disease resulting from the liberated bacterial endotoxins. That, I take it, is the chief raison d'être of sodium sulphate by mouth, or, in the graver cases, physiological saline subcutaneously. Concerning the first of these methods, saline treatment, as there is nothing specific about this, it is obvious that when "cure" results there is reason to suspect the intervention, as already sufficiently insisted upon, of endogenous specific phage; d'Herelle has suggested that the origin of such phage may be symbiotically contaminated coliform bacilli. As concerns the second method, serum therapy, saline is always prescribed as a means of keeping the large bowel well flushed out and thus combating toxæmia. Yet does not the antiserum itself contain endotoxin neutralising antibodies? It is supposed to. Surely, then, if any specific treatment might lend itself to dispense with coincident saline treatment it would be this. But it does not. Why then, coming to the third method, should the patient not have the benefit of saline treatment also when phage therapy is adopted? Here I consider salines by mouth more than ever necessary, at least initially, because the attack of the phage on the offending bacilli means, theoretically at least, the liberation of endotoxin in relatively important amounts.

In view of all this, I am bound to consider your suggestion in regard to "controlled parallel series," treating "alternate cases with the bacteriophage and the others by any one of the approval methods," as entirely beside the point. Present-day knowledge in no way justifies such an experiment.

I am, Sir, yours faithfully,
Alexandria, August 23rd, 1929. A. COMPTON.

SUBJECTIVE PHENOMENA AND COLOUR VISION.

To the Editor of THE LANCET.

SIR,—All visual phenomena are subjective as is well realised by the physiologist and medical man. For instance, if all men and women were totally colour-blind there would be no such thing as colour or if everyone, like a percentage of men, saw only three colours in the spectrum red, green, and violet there would be no such colour as yellow. In a recent book a well-known physicist makes the following statement, "When we are dealing with something definite and tangible such as a colour," but a colour is not definite and tangible. Again, many physicists treat the old theories of colour vision as if they were demonstrations in mathematics—that is, any set of facts is put into mathematical form in correspondence with the theory. If another set of facts be taken an entirely different mathematical arrangement is given. Each mathematical arrangement may be correct but both cannot be true, any more than a man could have his left ear absent, deformed, and normal all at the same time.

The visual phenomena to be described are seen best as soon after awaking in the morning as possible. If the reader find that he cannot immediately see any of the phenomena described or even fail after repeated trials—though this is not at all likely—he should select one of the most intelligent men or women of his acquaintance, and having described the conditions of the experiment, without giving any clue to the phenomena to be observed, ask his friend what he sees in the requisite conditions. When his friend has described the phenomena which follow he will probably have no difficulty in seeing them himself. If on awaking in the morning the reader will look at a window or windows, preferably more than one, then immediately close his eyes and cover them with a pillow, he will see a very clear-cut positive after-image of the windows and adjacent wall. All the light parts will be light and the dark parts dark. If the eyes be kept quite still it will be noticed that the light parts gradually approach the centre of the field of vision and finally disappear with a movement exactly like that of a whirlpool. If, however, when the eyes have been covered they be moved rapidly from side to side the central dark parts of the after-image will be obliterated and the light parts form themselves into a light blur. Now this experiment is very significant, it proves conclusively that the photo-chemical stimulus in vision is movable in the retina. The cause of this movement is undoubtedly the contraction of the muscles of the eye causing unequal pressure on different portions of the retina.

Now observe the effect of moving material on the centre of the retina. On opening one eye on awaking in the morning and looking at the ceiling the central portion is seen as an irregular, circular, rhomboidal, or star-shaped black spot. On closing the eye again a bluish-violet circle appears at the periphery or middle of the field of vision, contracts, and then after breaking up into a star-shaped figure and becoming brighter disappears, to be followed by another contracting circle. If the eye be opened when the star figure has formed in the centre it will appear as a bright rose-coloured star, much brighter than any other part of the field of vision. If, however, we wait till the star has broken up and disappeared before opening the eye, it will be found that only a black spot is seen in the centre. Helmholtz, though he saw the foveal region, sometimes dark and sometimes bright, states that he was never able to reproduce the latter condition voluntarily though the above shows how it may be done, and that he could not explain the facts. This experiment shows conclusively that the foveal region is sensitised from the periphery.

Currents seen in the field of vision are not due to the circulation. These currents may be seen in numerous ways. The following is an easy method of seeing them. If one eye be partially covered with an opaque disc, whilst both eyes are directed forwards in a not too brightly illuminated room and special attention be paid to the covered eye an appearance of whirling currents will be seen with this eye. These currents appear to be directed towards the centre, and have a very similar appearance to a whirlpool. On closing both eyes all the portion in which the whirling currents are seen appears as dull purple. These currents cannot be due to blood-vessels, because we know that the centre of the retina, corresponding to the point where the greatest movement is seen, is free from vessels. The appearance is also very different from that of the movement of blood in vessels. The experiment succeeds best if the eyes have been previously exposed to a fairly bright light. An opaque disc in a spectacle frame suffices admirably, a certain amount of light being allowed to enter the eye from the periphery. Ferree[1] finds, and I agree with him, that the streams carry with them the visual quality, colour, and brightness of the background from which they come. Ferree considers that eye movement is the chief or sole factor in the formation and direction of these currents, but I see them quite clearly with my eye quite still, and the whirling in the centre is not appreciably different when the eye is moved from one point to another. The masterly paper by Ferree should be read by anyone interested in the subject of vision. The illustrations are very good.

Numerous other subjective phenomena have been described by me[2] and by Purkinje, and all the facts strongly support the theory of vision which I gave in 1889—namely, that the cones are the sole terminal perceptive elements, the rods being concerned with the formation and distribution of the visual purple. Apart from the numerous facts against the duplicity theory, which supposes that the rods are percipient elements for perception in a dim light, it will be found that it is supported almost entirely by misstatements—namely (1) that certain animals have only cones and others have only rods; (2) that the periphery of the retina is colour-blind; (3) that the eye is totally colour-blind in dark adaptation; (4) that the Purkinje phenomenon and the recurrent image are not found with the fovea.

With regard to these I offer the following criticisms. (1) Though I have examined numerous collections I have never been able to find any animal with only rods or only cones, neither have I found anyone who has seen such a retina. The tortoise is the most quoted; it is stated to have only cones. The rods and cones in the retina of the tortoise are as clearly defined and distinct as in the human retina.

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[1] Amer. Jour. Psychol., 1908, 484.
[2] The Physiology of Vision, London, 1920.

(2) The periphery of the retina is not colour-blind, when colours of sufficient intensity are used. The reader can test this for himself with a doctor's red lamp. He will find he can see it as red to the extreme periphery.

(3) In dark adaptation the eye is not totally colour-blind. Further, there is no scotoma or blind area corresponding to the rod-free portion of the macula which is equal to a visual angle of about three degrees.

(4) The Purkinje phenomena and recurrent image are found with the fovea. Hess showed not only that the recurrent image was found with the fovea, but also that it was bent outwards at this region as it would be if the visual purple had to flow into the fovea. Helmholtz and Nagel stated that there was no evidence that the rods were percipient elements.

This letter summarises a communication read last July before the Association Française pour l'Avancement des Sciences at their Congress in Havre, and will, I hope, interest a medical audience.

I am, Sir, yours faithfully,
F. W. EDRIDGE-GREEN,
Special Examiner and Adviser to the Board of Trade on Colour Vision and Eyesight.
Willesden Green, August 12th, 1929.

DISINFECTANT PACKETS.

To the Editor of THE LANCET.

SIR,—In the report of the meeting of the fourth Imperial Social Hygiene Congress in your issue of July 20th (p. 140) you quote Mrs. Rolfe as having given certain figures "for what they were worth." May I suggest that their value is not greater than zero? The statistical genius which sets five army corps with a gonorrhœal incidence-rate of 18·70 per 1000 as a control to five army corps with an incidence-rate of 10·92 per 1000 does not deserve to be noticed, and the phrase, "difference in favour of the men not provided with packets," whether yours or Mrs. Rolfe's, can be based on nothing but desire.

I am, Sir, yours faithfully.
J. ROSSLYN EARP.
Denver, Colorado, August 16th, 1929.

Obituary.

EDWARD ERSKINE HENDERSON, M.B. CAMB., F.R.C.S. ENG.

THE sudden death of Edward Henderson occurred while on a fishing holiday in Ireland. The eldest son of the late Dr. Edward Henderson of Shanghai, Edward Erskine Henderson was born in China in 1870. He was educated at Harrow, St. John's College, Cambridge, and Guy's Hospital. Having taken the M.B. in 1895, he was house surgeon at Guy's to Mr. Golding Bird, and obstetric assistant to Dr. Peter Horrocks. On leaving Guy's he married and went out to join his father's firm, but he did not stay long in the East. While there, he held the post of assistant surgeon to the Shanghai Hospital. He came home in 1898 and began working for the F.R.C.S. He was also enrolled as a student at Moorfields Hospital, working with Sir John Tweedy and Mr. William Lang, and later with Mr. Lang and Mr. Lawford. He was clinical assistant at Moorfields for 15 years. For many years he held the post of ophthalmic surgeon to the Queen Mary's Hospital for the East End and was at one time assistant surgeon to the South London Ophthalmic Hospital, but increasing deafness spoiled his chances of other appointments, and professionally he was best known as an efficient editor of ophthalmic journals. He joined the editorial staff of the *Ophthalmic Review* in 1909 and in the next year was chosen editor; he carried this journal through critical times until it was amalgamated with the Royal London Ophthalmic Hospital *Reports* and the *Ophthalmoscope* in the *British Journal of Ophthalmology* in 1917. He was sub-editor to the late Sydney Stephenson till 1923 and editor in-chief thence onward till his death. With Prof. E. H. Starling he was the author of a valuable research on the factors which determine the formation of the intraocular fluid; and he assisted the late R. H. Clarke in the latter's experimental work on the minute anatomy of the central nervous system.

Henderson was a most versatile man; his manipulative dexterity showed itself not only in operations but in the beautiful work in wood and ivory which he did on the lathe. He was a good sportsman in every sense of the word; a first-class shot with the pistol, he competed regularly at Bisley in the years before the war. He was well read, and disliked colloquialism and slang. His eldest son was killed in battle in 1918. Much sympathy will be felt with his widow and children in their bereavement.

RAPHAEL BELILIOS, M.D., F.R.C.S. EDIN.

THE death occurred on June 19th, at Shanghai, of Dr. Raphael Belilios, from complications following an operation for an acute appendicitis.

Born in 1873, Dr. Belilios was the elder son of the late A. R. Belilios, J.P., and received his medical education at Edinburgh, where he graduated M.B., Ch.B., in 1901. He later took the M.D. with honours and the D.T.M. (Lond.) and became F.R.C.S. Edin. After a short period of practice at Muswell Hill while continuing his special study of the eye, Dr. Belilios emigrated to Hong-Kong where he soon established a large general practice. He held appointments as lecturer and examiner in anatomy and physiology in the Hong-Kong School of Medicine. Deciding to devote himself entirely to ophthalmology, he moved to Shanghai in 1912 and became one of the foremost authorities on the eye in the Far East, his reputation extending to Europe. Patients from all parts of China came to Shanghai to consult him, while Eastern potentates sent escorts for him when they required his services. Dr. Belilios became lecturer and later professor of ophthalmology in the St. John's University of Shanghai and ophthalmic surgeon to St. Luke's Hospital. On the arrival of the British Defence Force in 1927 he was appointed consulting oculist to the corps.

Dr. B. H. S. Aylward, Port Health Officer, Woosing, Shanghai, writes: "I first met Belilios in 1897 at Edinburgh, when he was reading for his second professional, and we soon became close friends. He and his wife who survives him lived near to the Royal Infirmary, and many were the pleasant evenings his circle of close friends spent there. His wife was an accomplished musician, and used to encourage us in our attempts to sing grand opera. Belilios himself had a pleasant tenor voice. He was a keen fisherman, but his principal hobby was conjuring, at which he was expert; possibly the training of his hand by conjuring at Edinburgh had something to do with his dexterity as an operator. Belilios was the most generous of men, in word and deed. He was a brilliant worker and never lost his enthusiasm."

THOMAS WILLIAM BUCKLEY, M.D. DURH., M.R.C.S. ENG.

Dr. T. W. Buckley, who died on August 8th, was born at Betley, Staffs, in 1859. He received his medical education at St. Thomas's Hospital and Owens College, and qualified L.S.A. in 1882, and M.R.C.S. Eng. in 1883. He took the M.D. of Durham University in 1900. He acted for a time as assistant to his uncle, Dr. Thomas Morton, and later was assistant house surgeon at the Staffordshire County Infirmary and surgeon on one of the vessels of the Ocean S.S. Company. In 1888 he bought a practice at Thrapston, Northants, and in partnership with the late Dr. J. W. Gainer, worked over a huge rural district for 20 years. He was M.O.H. of the district and J.P. for Northamptonshire. On the outbreak of war, Dr. Buckley immediately volunteered for service abroad. Refused at first on account of his age, he received a commission in 1915, and was sent to a military hospital at Shoreham. In 1915, having been promoted to the rank of major, he acted for a year as Assistant Commandant and Officer Commanding the R.A.M.C. detachment at Princess Christian Military Hospital, Englefield Green. In 1916 he was appointed to No. 2 Special Medical Board, Caxton Hall, ultimately becoming its President. The work was very heavy, involving visits of inspection to hospitals in and round London, and many hours of writing reports, as well as the routine work of the Board. Dr. Buckley was not demobilised till 1919, and never quite recovered from the strain of the war years. He spent the rest of his life very quietly in the little village of Clopton, a few miles from the centre of his old practice. Fond of reading and of country life, he was never at a loss for occupation. Dr. Buckley was modest about his own attainments, which were considerable. He had a keen sense of humour, and could tell many interesting stories of his experiences. He leaves a widow, son, and two daughters, one of the latter being a medical woman.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates satisfied the examiners in the undermentioned subjects :—

Surgery.—P. S. Balachandran, Middlesex Hosp.; K. C. Bhattacharyya, Calcutta and St. Thomas's Hosp.; A. Clark, Glasgow and London Hosp.; R. J. Kagan, St. Mary's Hosp.; N. H. Kettlewell, Bristol; J. M. Lees, Guy's Hosp.; J. E. Moody, St. Mary's Hosp.; C. Parthasarthe, Birmingham; A. Somerville, Sheffield; and A. W. B. Wiggins, Sheffield.

Medicine.—K. C. Bhattacharyya, Calcutta and St. Thomas's Hosp.; P. D. Kapur, Glasgow; N. H. Kettlewell, Bristol; H. H. Lakin, Birmingham and London Hosp.; J. M. Lees, Guy's Hosp.; A. Liberis, St. Bartholomew's Hosp.; W. McDermott, London Hosp.; R. Norrie, St. Andrew's; E. J. O'Loughlin, Birmingham; and A. W. Tam, Singapore.

Forensic Medicine.—K. C. Bhattacharyya, Calcutta and St. Thomas's Hosp.; W. T. Ellis, Charing Cross Hosp.; B. L. Fishout, Cardiff and Manchester; W. M. Hamer, Manchester and Charing Cross Hosp.; J. M. Lees, Guy's Hosp.; C. A. Munro, Glasgow; E. J. O'Loughlin, Birmingham; and S. Ramadas, St. George's Hosp.

Midwifery.—J. Britanischski, Berlin and London Hosp.; R. Gilmore, Manchester; W. St. A. Hendricks, St. Mary's Hosp.; C. Hortop and J. M. Lees, Guy's Hosp.; A. R. Madden, St. Mary's Hosp.; A. Somerville, Sheffield; and F. A. Yarde, St. Mary's Hosp.

The Diploma of the Society was granted to the following Candidates, entitling them to practise medicine, surgery, and midwifery: B. L. Fishout, N. H. Kettlewell, H. H. Lakin, J. M. Lees, C. Parthasarthe, and A. W. Tam.

INDUSTRIAL WELFARE SOCIETY.—At the tenth annual lecture conference to be held at Balliol College, Oxford, from Sept. 13th to 17th, the afternoon session on Monday will be devoted to industrial health. Dame Louise McIlroy will address a special session for women at which Dr. Margaret Hossell will preside, and Dr. D. A. Coles will take the chair at a special session for men on Health Problems in Industry. On the previous Sunday evening Mr. D. R. Wilson is lecturing on Fatigue Research and its Practical Application in the Factory.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—This institution, which has its out-patient department in Leicester-square, and receives in-patients at 202, Uxbridge-road, last year treated 214 in-patients, whose average stay was 42 days, and 10,528 new out-patients. The annual report records that the receipts from donations fell by £100, following a fall of £600 in the previous year, and the Board of Management express "grave fears" for the future unless larger financial help is forthcoming. There were 2180 laboratory examinations and 875 patients were treated in the X ray department.

TRELOAR CRIPPLES' HOSPITAL.—The Alton hospital, founded by Sir William Treloar, comes of age this month, and there is to be a dinner at the London Mansion House on Oct. 22nd to celebrate the occasion. The opportunity will be taken to make an appeal for £100,000, the estimated cost of new buildings. The present buildings are the wooden structures of the Princess Louise Military Hospital, erected for the wounded in the South African war, and now worn out. The trustees find that the cost of repair and maintenance exceeds the interest on the cost of rebuilding. The hospital was originally designed for 200 patients; and to-day at Alton and Hayling Island the number of crippled children under treatment is 405.

SOCIETY FOR THE STUDY OF INEBRIETY.—The thirteenth Norman Kerr Memorial Lecture will be delivered by Sir Josiah Stamp, G.B.E., LL.D., D.Sc., on Tuesday, Oct. 8th, at 4 P.M., in the Great Hall of the B.M.A. House, Tavistock-Square, London, W.C.1., the subject being Alcohol as an Economic Factor.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL.—On August 23rd Princess Mary opened this new hospital which has been built at a cost of £42,000.

HOSPITAL DINNERS.—The annual old students' dinner of St. Bartholomew's Hospital will be held in the Great Hall of the Hospital on Tuesday, Oct. 1st, at 7 for 7.30 P.M., Sir Frederick Andrewes in the chair.—The annual dinner of St. George's Hospital Medical School will take place on the same day, 7.15 for 7.45 P.M., at the Hyde Park Hotel, Knightsbridge, when Mr. D. Cotes-Preedy, K.C., will preside.

WESTMINSTER OPHTHALMIC HOSPITAL.—According to the annual report, the new hospital, which was opened exactly a year ago, "is far from being completely equipped, and is not yet in full working order." At the end of the year only 42 beds contained in two wards had been opened. Henceforward a much larger income will be needed to meet an expenditure which must necessarily increase considerably, and the committee appeal for a revenue of £20,000 a year.

YORKSHIRE HOSPITALS AND MOTORING ACCIDENTS. The *Yorkshire Evening Post* publishes the results of an inquiry into the cost and the degree of pressure upon the hospitals of that county caused by motoring accidents. In the first six months of the present year 660 victims of such casualties were treated at Leeds Infirmary, of whom 252 were admitted. They cost £1977, of which £170 was repaid by patients; £75 of this was a thank-offering from one patient. Last year Bradford Infirmary received £24 towards the £1174 spent upon 137 in- and 220 out-patients. In the year ended in April last some 600 cases were treated in the casualty ward of Hull Royal Infirmary, and 125 in-patients cost £931, of which £85 was repaid. The annual report of Doncaster Royal Infirmary states that last year 3808 casualty patients were treated, and that the wards are so constantly filled with motoring accident cases that it is impossible to deal with the long waiting list of local persons requiring operations.

METROPOLITAN DISTRICT NURSING ASSOCIATION.—This institution employs 19 trained nurses for the sick poor of Central London, who last year paid over 50,000 visits and, in addition, saw nearly 40,000 patients at clinics, dispensaries, and treatment centres in Westminster, Finsbury, Holborn, and St. Pancras. During the severe epidemic of measles in the spring 440 cases of that disease were referred to the Association, of which more than one-half had complications requiring skilled nursing; only five of these acute cases died. The 144 maternity cases all did well. The Association, which was founded by Florence Nightingale and others in 1875, last year spent £3160 of an income of £3930.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—On Tuesday in last week the first sod was cut for the new buildings that are to be erected in Goldhawk-road, Hammersmith. Provision is being made for 358 beds, but the isolation block is to be erected first, with 30 beds for cases of puerperal sepsis, a disease for the investigation of which a special laboratory is being provided, with a staff of bacteriologists, doctors, and nurses placed in a house adapted for the purpose and connected by a covered way with the isolation block. Princess Mary is to lay the foundation-stone on Nov. 4th, but the removal from Marylebone-road will be gradual, since the present 80 beds will be more than quadrupled when the scheme is complete and the money available. The beginning is being made with the money raised by the National Mother-saving Campaign launched by the hospital two years ago. The site has some fine trees which, as far as possible, are being preserved.

DONATIONS AND BEQUESTS.—Dr. Robert Hamilton, of Leeds-road, Harrogate, left over £3000 to charities, including £250 each to the Bradford Royal Infirmary, the Bradford Children's Hospital, the Bradford Royal Eye and Ear Hospital, the District Nursing Association; and £200 each to Dr. Barnardo's Homes, the National Children's Institution, and the Bradford Institution for the Blind. The testator also gave £100 each to Harrogate Infirmary, Harrogate Hospital, Harrogate Home for Incurables, the Royal Medical College, Epsom, Victoria Children's Convalescent Fund, Royal Albert Asylum, Lancaster, and four other institutions.—Mr. Emile John Frank Hardenberg, M.R.C.S., L.R.C.P., of Frederick-road, Chingford, left £2500 to the London Orphan School, Watford, and £1000 to Guy's Hospital.

Appointments.

EDMOND, HENRY, M.B. Birm., D.P.H., has been appointed Tuberculosis Officer for Wigan.

UNDERWOOD, E. A., M.B., Ch.B.Glasg., D.P.H., Deputy Medical Officer of Health for Rotherham.

Certifying Surgeons under the Factory and Workshop Acts: BOOTH, W. N., M.B., B.S.Durh. (Harlow and Parndon District of Essex); EVANS, J. P., L.R.C.P. Lond., M.R.C.S., (Colwyn Bay); and SUNDERLAND, E. B., L.R.C.P. Lond., M.R.C.S. (Haverhill District of Suffolk).

Vacancies.

further information refer to the advertisement columns.

ock Hospital, Connaught-road, E.—M.O. At rate of £110.

ts' Hospital, 91, Finchley-road, N.W.—Jun. H.S. Also st. H.S. At rate of £150 and £100 respectively.

o, Manchester, Crossley Maternity Hospital.—Half-time M.O. at rate of £50.

nder-Lyne District Infirmary.—H.S. At rate of £150.

ely Hospital.—2 H.S.'s. Each at rate of £150.

Carnarvonshire and Anglesey Infirmary.—H.S. £200.

al United Hospital.—H.S. At rate of £150.

on Urban District Council.—Part-time Asst. M.O. £325.

al General Hospital.—Cas. S. £100.

m and Midland Eye Hospital, Church-street.—H.S.

Ear and Throat Hospital.—Third H.S. At rate of

and East Lancashire Royal Infirmary.—Res. H.P. Also 4th H.S. £130.

Hospital, Wandsworth Common, S.W.—H.S. At rate

gh Hospital, Derby-road.—Hon. Laryngologist and Also Jun. M.O. At rate of £125.

al Eye and Ear Hospital.—Jun. H.S. £120.

al Hospital.—H.S. to Special Departments. At rate

Royal Victoria and West Hants Hospital.—Two Each at rate of £120.

—H.S. At rate of £150.

enbrooke's Hospital.—Res. Anæsthetist. At rate Also H.P. and H.S. Each at rate of £130.

pworth Village Settlement.—H.P. At rate of

Throat, Nose, and Ear Hospital, Gray's Inn-road, n. Chief Clinical Assts.

ness Tuberculosis Colony, Barrowmore Hall, Great Asst. M.O. £250.

al West Sussex Hospital.—Hon. Asst. Orthopædic

Maternity Hospital, City-road, E.C.—Asst. Res. ate of £80.

spital, Greenwich.—H.P. and H.S. Each at

cess Alice Memorial Hospital.—Jun. H.S. At

orial Hospital, Shrewsbury-road, E.—Res. M.O. 00.

pital for Children, &c., St. [illegible] *, E.*—Res. Cas.O. 25.

on and Exeter [illegible]—H.P. Also Asst. H.S. 30 and £1[illegible]ely.

[illegible] *ng Home,* 237, *Fulham-road,* At rate of £250.

[illegible] *Hospital.*—Sen. H.S. £150.

ren, Great Ormond-street, W.C.—Asst. search Fellow. £130. Also H.S. and H.P. of £100.

nd Association, Simla.—Bacteriologist. Also ler. Each Rs. 1500 per mensem. M.O. Rs. 1500 per mensem.

Norfolk and Lynn Hospital.—Sen. H. S. At rate of £150 and £100 respectively.

omen.—Hon. Surgeon.

gton Infirmary.—Res. M.O. £250.

1, 91, Dean-street, W.—H.S. At rate of £200.

Suffolk Hospital.—H.S. £150.

Sanatorium.—Asst. M.O. £350.

Hospital for Infectious Diseases.—Jun. M.O.

Hospital.—Jun. H.S. £120.

Royal Hospital.—Two H.S.'s. Also Cas. e of £125.

mary.—Jun. Asst. M.O. for Radiological 2nd Surg. Reg. £150.

Ophthalmic and Aural Hospital.—Aural 200.

thing Hospital.—H.S. At rate of £100.

cil.—Asst. County M.O.H. £750.

Greenwich-road, S.E.—H.P. At rate of

Hospital.—H.P., H.S., and Asst. H.S. 0.

monton, N.—2nd Asst. S. £500.

Nottingham General Hospital.—H.P. Also 2nd Cas. O. Each at rate of £150.

Otago and Dunedin University Hospital, New Zealand.—Sen. Res. M.O. £500.

Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Radiologist.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £80.

Radcliffe-on-Trent, Notts County Mental Hospital.—Jun. Asst. M.O. £350.

Rotherham Hospital.—H.S. £180.

Royal Chest Hospital, City-road, E.C.—Res. M.O. At rate of £150 Also Out-patient M.O. and H.P. Each at rate of £100.

Royal National Orthopædic Hospital, 243, Great Portland-street, W.—H.S. £150.

Royal National Orthopædic Hospital, Country Branch, Middlesex—H.S. £150.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Talgarth, Breconshire, South Wales Sanatorium.—Sen. Asst. M.O. £350.

Torquay, Torbay Hospital.—H.P. £175.

Walsall General Hospital.—Res. Surg. O. At rate of £200.

Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.

West London Hospital, Hammersmith.—One H.P.; two H.S.'s; one Aural and Ophthalmic H.S.'s; Res. Asst. Cas. O., Males; also Res. Asst. Surg.

Weston-super-Mare General Hospital.—Res. H.S. £130.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Tunbridge Wells (Kent).

Births, Marriages, and Deaths.

BIRTHS.

BRADFORD.—On August 28th, at Goodrington, South Devon, the wife of Ernest Cordley Bradford, M.A., M.B., B.Chir. Camb., of Laneside, Horsham, Sussex, of a son.

LEAKEY.—On August 21st, at Toro, Uganda, the wife of R. A. B. Leakey, L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg., of a son.

OLDERSHAW.—On Sept. 3rd, at 15, Weymouth-street, Portland-place, W.1., to Olive, wife of Martin Oldershaw, M.D. Lond., F.R.C.S. Eng.—a son.

SAVEGE.—On August 24th, at a nursing home, Stonehaven, N.B., the wife of Major J. M. Savege, R.A.M.C., M.B., Ch.B. Aberd., of a daughter.

MARRIAGES.

BARNES—BERTHON.—On August 25th, at the Subdeanery Church, Chichester, John Francis Lorel Barnes, M.R.C.S. Eng., L.R.C.P. Lond., of Thame, Oxon., to Anna Etheldreda Margaret, only daughter of the late Captain Leonard Berthon, 9th Royal Warwicks Regt., and Mrs. Berthon, of Selsey, Sussex.

MURRAY—THOMAS.—On August 27th, at Holy Trinity Church, Exmouth, John Douglas Ridout Murray, M.B., B.Chir., F.R.C.S., to Evelyn Leslie (Mollie), only daughter of Mr. and Mrs. Lewis Thomas, of Chessington, Exmouth.

TOWNEND—WEST.—On August 24th, at St. Peter's Church, South Croydon, Roy D. M. Townend, M.R.C.S. Eng., L.R.C.P. Lond., to Eleanor L. Clayton, M.R.C.S. Eng., L.R.C.P. Lond., only daughter of Mr. and Mrs. William West, of South Croydon.

DEATHS.

BELL.—On August 16th, quite suddenly, at his residence, Dogflud, Farnham, Surrey, Dr. William Ker Bell (Captain, R.A.M.C.), formerly of Shaldon, South Devon.

CAREY.—On August 29th, suddenly, at Church-square, Basingstoke, Frank Russell Carey, L.D.S. R.C.S. Eng.

HENDERSON.—On August 23rd, at Belleek, Ireland, Edward Erskine Henderson, M.B., B.Ch. Camb., F.R.C.S., of Thackham, Hartley Wintney, Hants.

KISCH.—On August 27th, at Westbourne-terrace, W., Albert Kisch, M.R.C.S. Eng., L.S.A., aged 86.

MACKINNON.—On Tuesday, August 20th, at Davaar, Cirencester, Charles MacKinnon, M.A., M.B., C.M., aged 71.

MORGAN.—On August 26th, Jerome William Morgan, L.R.C.P.I., L.R.C.S.I., L.M., Lieut.-Colonel, A.M.S. (retired), aged 85.

PATTERSON.—On August 31st, in London, Robert Lloyd Patterson, L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg., of Castle-street, Hereford.

POWELL.—On August 31st, at Brighton, after an operation for appendicitis, Walter Erichsen Powell, M.R.C.S., L.R.C.P., aged 34.

WOOLLATT.—On August 13th, the result of an accident near St. Malo, Percy Charles Woollatt, M.D., F.R.C.S., aged 51.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

JEAN PAUL MARAT.

THE value of submitting persons famed in history to the illuminating scrutiny of trained psychologists is now accepted. Many facts which previously baffled the historian are thus made clear, and the true factors which underly the policies of princes, statesmen, and nations are brought to light. It does not follow that theories based on evidence surveyed at long range are necessarily correct, but that insight into the reason for abnormal conduct is more likely to be reached by those who have experience in assessing them. We welcome, therefore, a study of the life of Jean Paul Marat, from the standpoint of a psychiatrist physician. Dr. Charles W. Burr, of Philadelphia (Annals of Medical History, 1929). Marat was born in 1743 and murdered by Charlotte Corday in 1793 at the age of 50 years. Little is known about his family history, and our only picture of his childhood is painted in Marat's own reminiscences, which are histrionic and bombastic in the extreme. Marat, according to himself, was an ideal youth with a passion for fame, an exceptional education, and a horror of injustice and oppression. He describes himself as "reflective at fifteen and a thinker at twenty-one." Dr. Burr justly remarks that such sentences suggest the illusions of memory which are so pronounced a feature of paranoid personalities. About the age of 17 Marat left home with the idea of becoming a physician. He studied at Toulouse, Bordeaux, Paris, and London. In 1765 or thereabouts he started to practice medicine in Church-street, London, where he remained for about 12 years. In 1775 he was granted a medical doctorate by the University of St. Andrews. During his residence in London he commenced writing. Among his works were "An Essay on the Human Soul," the "Discoveries of M. Marat on Fire, Electricity and Light," and an "Essay on Gleets"—he claimed to be able to cure any case of gleet. In the "Essay on the Human Soul" Marat concludes that the meninges were the seat of the soul; and the organs of thought, memory, and will. A political book entitled the "Chains of Slavery" was published by him in 1774; in this work "the clandestine and villainous attempts of princes to ruin liberty are pointed out and the dreadful scenes of despotism disclosed." There was some difficulty in getting the book published, and Marat developed ideas of persecution and conspiracy for he decided that the English Government wished to prevent the circulation of the book. He therefore "disappeared" to Holland and turned up almost at once in the North of England, where he paid a round of visits to certain patriotic societies. The style in which this book is written, together with Marat's curious conduct certainly suggest paranoid trends of thought. The work abounds in phrases beloved of the eccentric demagogues who still flourish at the Marble Arch, and who declaim against tyranny, despotism, the sins of the rich, and the guilt of kings. It is probable that Marat's pages did receive some notice from authority, but there is no evidence to substantiate his fears of personal violence or the necessity for flight. Dr. Burr rightly insists that such beliefs and conduct suggest to a psychiatrist delusional ideas on the part of Marat.

Leaving England in 1777 Marat became physician to the Garde du Corps in the household of the Comte d'Artois. There followed a period in which he wrote much on scientific subjects. Dr. Burr tells us that none of these writings possess any particular merit, but Marat himself thought very highly of them. Again we have evidence of ideas of persecution. Marat felt that his work was decried by "envious cowards," and we hear of him proclaiming that the envious philosophers of France successfully prevented the publication of one of his works. From his post as physician to the Artois household Marat came to practice medicine in Paris, urged to do so, he tells us, "by the many sick persons who were despaired of by their physicians and to whom I had restored health." He boasts that his success was prodigious until he excited the envy of the doctors of the Faculty, who, he was convinced, held frequent meetings to consider the best means of slandering him and thus ruining his practice. Again the notion of persecution is followed by a change of occupation, this time to politics and to the editing of a paper, *The Friend of the People*.

There is no need to recite at length the political creed of Marat. The people in his view were those without property or occupation. They alone had the right to govern. His opponents were abused in his writings and speeches in scurrilous and offensive terms. During his last few years Marat led a life of seclusion, constantly fearing attack by his enemies, especially sudden death by assassination or poisoning. These fears were probably not without some justification, but he seems to have become obsessed with feelings of persecution, and lived preaching murder and anarchy as if every man's hand was against him. In 1790 he proposed to the Assembly that "eight hundred gibbets ought to be erected in the Tuileries to hang all traitors," and declared that 270,000 persons would have to suffer death in order to free France from her oppressors. It is of interest that for five or six years before his murder Marat suffered from a skin complaint which caused a painful pruritus. Dr. Burr quotes Dr. Graham Little as holding that the skin lesion was probably a dermatitis herpetiformis. It is known that the itching was relieved by sitting in a bath of hot water, and it was while in his bath that he was murdered.

Dr. Burr sums up the life of Marat as a slowly-growing insanity, in which delusions of suspicion and persecution were prominent from an early age. Towards the close of his years Marat conceived himself as a political genius, with intuitive powers and comprehension. His speeches and writings were prolific, and bear the stamp of egoism and grandiose self-satisfaction. There is much to be said for Dr. Burr's view that Marat was a paranoiac. He was undoubtedly a man of paranoid outlook on life, for he found persecution everywhere, and made the frequent changes of residence and occupation which are often associated with this type of personality. But it is nowhere suggested in Dr. Burr's review that Marat's insanity illustrates the fixed, organised, and systematised delusional state which makes up the paranoia of the text-book descriptions. All will agree to Marat's eccentricity, and to his occasional insane conduct and delusional ideas. There is no need to split hairs over Marat's clinical pigeon hole, but Dr. Burr does not solve the deeper personality problems raised by the life of this paranoid physician and revolutionist.

PAINFUL FIBROSITIC NODULES.

To the Editor of THE LANCET.

SIR,—Is there any satisfactory treatment for the nodules which persist after repeated attacks of fibrositis? My back muscles are studded with them, their cause having been abscessed teeth, long since removed. Most are painless, and beyond being centres of infection are of no account. But one, quite half an inch in length, is so placed in the right trapezius that lying on the right side causes pain which wakens at night, and without sleep a doctor cannot work. I have been at two spas, and the only treatment advised by the specialists, in addition to baths and the waters, has been heavy massage. This is painful and futile.

Can any of your readers report on some of the more modern methods. Is ionisation useful, or high frequency? Has X ray therapy been tried, or radium? I have seen radium dissolve a keloid. Might it not dissolve what is obviously a scar in the fibrous tissue of the muscle? Fibrositic nodules are extremely common. When the cause has been removed surely there must be some satisfactory method of treating them.

I am, Sir, yours faithfully,

August 20th, 1929. M.B., B.CH.

OPHTHALMOLOGY FOR THE LAYMAN.

THE object of a little book recently published[1] is to teach the layman something about the elementary anatomy and physiology of the eye and its more common diseases, in order that he m[illegible] [illegible]operate with the physician in matters of treatment. T[illegible]od chosen is to devote separate chapters to the ail[illegible] [illegible]idental respectively to childhood, adult life, and dis[illegible] giving a brief summary of several diseases and the[illegible] treatment in each chapter. Much of this matter [illegible] have been omitted without loss if greater stress had been [illegible] on those symptoms which point to the necessity of expert advice. Among these are commencing squint in infants, the beginnings of myopia in school-children, headaches at all ages, and failing sight in adults, which may be due to the onset of cataract when delay is harmless, or to a chronic glaucoma when delay is dangerous, or may simply point to the need of glasses. As it stands the book is too much like a very elementary text-book and is not always accurate, for example, in the section on the anatomy and physiology of the retina. It would be better to omit those points which cannot be clearly explained and to concentrate on the subjects likely to prove of practical service. Even in its present form the book will meet the demand of those people who want to know something about the various diseases of the eye with which they are liable to be overtaken or of which they hear in relation to their friends. This demand is quite legitimate though its gratification may occasionally lead to uninstructed criticism rather than to coöperation with the family doctor.

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[1] Your Eyes and Their Care. By Edgar S. Thomson, M.D., Surgeon-Director, Manhattan Eye, Ear and Throat Hospital, New York. New York and London: D. Appleton and Co. 1929. Pp. 175. 5s.

THE N.S.P.C.C.

IT comes as a shock to be reminded that 40 years ago no child in the home who had not reached the age of ten years was under the protection of the Crown, and that no one who wronged him could be brought into the presence of the law. It was not until 1889 that the Prevention of Cruelty to and Protection of Children Act was passed, and the Metropolitan and City Police authorities gave instruction that all cases of cruelty to children reported to them should be handed over to the National Society for the Prevention of Cruelty to Children to be dealt with by the Society. Since then much has been done for the emancipation of the child, but the forty-fifth annual report of the N.S.P.C.C. shows that much remains to do. In 1928–29 40,541 cases were reported, under the following headings: neglect and advice sought, 34,362; manslaughter, 1; abandonment, 78; exposure, 455; ill-treatment and assault, 3146; begging, 205; corruption of morals, 316; other wrongs, 1978. These figures show an excess of nearly 1000 cases over the previous year's total, but this is probably due to the wider response of the public to the Society's appeal that cases should be reported to it, and to a wider public knowledge of the Society's object in seeing that every child in the land shall live an endurable life. *It is satisfactory to note that under the heading of* "corruption of morals" the figures for 1928–29 show a reduction, though a small one, of 14 when compared with the figures for 1927–28. Increased confidence in the Society is shown by the fact that there is a notable increase in the number of instances in which parents have sought advice. In the report of the Medical Officer, Dr. L. D. Saunders, emphasis is laid upon the need for after-care where medical treatment has been found necessary. Four more inspectors have been added to the staff during the year. The Society's Central Offices are at Victory House, Leicester-square, London, W.C. 2.

THE TREATMENT OF ECZEMA.

IT is recognised that there are many factors which may help to produce the clinical manifestations called "eczema." They include, for instance, disturbances of the alimentary and endocrine functions, and metabolic disorders, such as gout, obesity, and hyperglycæmia. But the actual cause of the eruption is still obscure, and treatment remains correspondingly empirical.

Of the internal remedies at present in use C. Bruck[1] will find general agreement in condemning arsenic, except in such cases as are anæmic. A similar if less drastic criticism is applicable to yeast, ichthyol, and sulphur, although the waters of certain sulphur spas are sometimes valuable, possibly because of their relief of constipation and hepatic torpor, or by a tendency to counter acidosis. Following Kreibich's work on the nerve relationships of eczema, modern dermatology aims at reducing the excitability of the nervous paths, including the sympathetic, and often does this with some success by intravenous injection of sodium bromide, or, recently, by giving magnesium bromide intramuscularly. In this connexion Bruck finds *the internal administration of antipyrin and pyramidon* useful in acute cases, and he has observed that antipyrin ointments have a soothing effect locally, applied in 5–10 per cent. cum eucerin aqua base. Care must be taken not to apply this ointment over too large an area, although so far no ill-effects from absorption have been noted, even in children.

There is no specific dietary for eczema, but proper regulation of the intake in cases of obesity, gout, and hyperglycæmia is, of course, often beneficial. When the patient is undernourished, the cutaneous condition will sometimes improve if cream and butter in excess of the normal intake are added to the diet. Relative acidosis or alkalosis of the blood suggests possible lines of approach in the neurodermatitis type of eczematous manifestation, and in the exudative diathesis which is associated in some cases. Ehrmann claims successes for treatment of neurodermatitis by giving hydrochloric acid by mouth—a method based on his finding that a relatively large proportion of cases show hypochlorhydria. In children with the exudative diathesis and eczema Scheer recommends acidification of the milk, and good results are sometimes obtainable by adding a solution of 20 c.cm. acid. hydrochlor. dil. in 50–150 c.cm. of distilled water to half a litre of milk. The milk must be scalded and cooled before the weak acid solution is added. In cases of relative acidosis, in which the seborrhœic eczemata can be grouped, small doses of atophan followed by a mixture containing sod. bicar. and mag. carb. ust. seem to assist the local applications.

All in all the bulk of modern opinion favours the view that a combination of treatments gives better results than mere application of the well-tried ointments and lotions.

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[1] Derm. Woch., 1929, p. 262.

APPETISING PREPARATIONS.

Messrs. Frank Cooper, Ltd., of Victoria Buildings, Oxford send samples of their "Oxford" marmalade, mint jelly, and horseradish cream. The marmalade, which is well known everywhere, was first made on a small scale from a domestic recipe and had its main consumption in Oxford, but for many years it has been manufactured on a commercial scale in response to wide demand. Made without any objectionable preservatives it has the Seville orange flavour. The firm send samples also of a mint jelly to be used as a substitute for mint sauce, and a horseradish cream made of freshly grown horseradish and real cream. These latter relishes to food are usually liked only by those who also have a very distinct idea of how they should be made, so that to hit off a popular taste will be something of a triumph.

THE "HYGIENIC" LECTURE BOARD.

Dr. S. T. Beggs, Medical Officer of Health for the Borough of Middleton, Manchester, has called our attention to the "Hygienic" Lecture Board, which is intended to take the place of the ordinary blackboard. The writing is done on a paper surface which is rolled up and down on, or from side to side of, the lecture board by means of a hand crank. Obviously this method of exhibiting diagrams and notes is more hygienic than that of the usual blackboard and chalk method, while much time is saved by reason of the fact that the diagrams can be permanently preserved and exhibited as required. The paper is written upon by special black or coloured crayons, which do not soil its surface when rolled and unrolled; it is supplied in lengths of 20 yards by 30 inches wide, on a cardboard tube, and the board can be illuminated by an electric bulb and reflector attached to a flexible arm. The apparatus can be fixed to a wall of the lecture room or used on a portable easel. The makers are Messrs. J. Halden and Co., Ltd., 8, Albert-square, Manchester.

AURAL DISEASE AND BATHING.

IN an annotation on this subject[1] a plugging material was referred to made of wool-fibre and plasticine which is sold by chemists as a satisfactory means of preventing the entry of water into the ear. Messrs. Frank Eyles of 8, Western-road, Brighton, Sussex, have sent us samples of ear plugs manufactured for this purpose, which are very carefully prepared by hand, the long fibred medicated cotton wool being thoroughly amalgamated with the plasticine in order to ensure that no disintegration of the plug occurs when it is being extracted from the ear The plugs serve a useful purpose.

THE PRE-SCHOOL CHILD.

THE thesis set out in a recent addition to the "To-day and to-morrow" series,[2] which already includes more than 80 volumes, is that, under present conditions, the home is not the ideal place, nor are parents the ideal people, for the major part of child-rearing. The smallness of the modern home and the absence of domestic help lead to a situation, especially after the arrival of the first-born, in which man and wife have to seek their pleasures separately, and family life is broken from the start. The effect on the child of limited space and lack of garden is a serious handicap to early activity. Allied to the problem of the cramped house or flat is that "special creation of the present age," the only child, a child upon whom the mother tends to lavish all the love which was meant to be shared by many, with the result that, in Mr. Lewis's telling phrase, "mother love becomes smother love." *The solution proposed* is an extension of nursery schools on a national scale for all classes. Mr. Lewis considers "that the nursery school is as essential to the mental slums of Golders Green as to the more material slums of Deptford." While lauding America for the enthusiasm with which she has set about providing for her pre-school children, he criticises the tendency to use nursery schools as research laboratories. There is no justification, he says, in creating the abnormal to study the abnormal, *neither should the child be sacrificed to make a student's* degree day. The book consists of five chapters and an introduction, such matters as play, discipline, and the duties of parenthood being dealt with in an unusually fresh and stimulating way. Mr. Lewis is happy alike in his matter and his manner, and has produced an informative and readable book.

The Deshell Laboratories, Ltd., manufacturers of Petrolagar, have changed the name of their company to Petrolagar Laboratories, Ltd., but have not changed their management or address.

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[1] THE LANCET, July 27th, p. 182.

[2] Romulus or the Future of the Child. By Robert T. Lewis, B.A. London: Kegan, Paul, Trench, Trübner and Co., Ltd., 1929. Pp. 95. 2s. 6d.

A Contribution
TO THE STUDY OF THE MATERNAL DEATH-RATE.

BY G. F. GIBBERD, M.S. LOND., F.R.C.S. ENG.,
OBSTETRIC REGISTRAR, GUY'S HOSPITAL.

THIS study is based on a comparison of the midwifery in the Guy's Hospital Maternity District as it is to-day and as it was 60 years ago. We know fairly accurately how midwifery was done at Guy's in the days of Galabin and Braxton Hicks. We know how much (or how little) attention was then paid to the prevention of sepsis. We know that there was never any antenatal work. We are fortunate in having an accurate and detailed analysis of the cases that were delivered under these conditions, with a full account of the results obtained. By comparing these results with those of the present day upon a similar group of patients, living under similar conditions, in roughly the same area, and knowing accurately, as we do, the modern methods in use, we may get some valuable information as to how far recent changes in practice have benefited the modern mother. Further, we may discover the faults still to be remedied in our efforts to reduce the present mortality-rate.

MIDWIFERY AT GUY'S IN 1870.

The following account is copied from the report by Galabin published in Guy's Hospital Reports in 1876.[1]

> The district . . . lies within a radius of about a mile from the hospital, and patients are attended at their own homes by the students. A certain number of these, who have already attended a course of lectures on midwifery, are appointed extern obstetric attendants for each month. They reside close to the hospital, and are expected to abstain from visiting the post-mortem and dissecting rooms while they are attending midwifery cases. Two senior students, who have obtained a legal qualification to practise, are appointed resident obstetric assistants and hold office each for one month as junior and one month as senior. They live within the walls of the hospital, and are ready at all times to assist the junior students. The assistant obstetric physician is sent for to superintend all cases in which any obstetric operation is performed.

In the 12 years from October, 1863, to September, 1875, the total number of women delivered was 23,501. There were 106 fatal cases, giving a maternal mortality-rate of 4·4 per 1000. If this figure is compared with the present-day mortality-rate for the country as a whole, we might conclude that the "advances" in midwifery during recent years have led to no decrease in the dangers associated with childbirth. But such a conclusion is not necessarily true, since the comparison is unfair. A much more comparable series is that of the 21,423 "district" cases delivered in the ten years 1910 to 1928 inclusive. This number includes all cases domiciled in the Guy's Hospital district and delivered by the hospital, whether the actual delivery took place in the patient's own home or in hospital. It is difficult to obtain figures of an average practice carried out by a hospital service, since if only patients delivered on the district are considered there will be an unduly low incidence of abnormalities, because the majority of difficult cases will not be delivered in their own homes. If, on the other hand, only patients delivered in hospital are considered, there will, of course, be an undue proportion of difficult cases. By grouping patients according to the area in which they are ordinarily resident we can to some extent eliminate selection. Since the Guy's Hospital district is comparatively small and served by the hospital largely to the exclusion of other practitioners and institutions, these 21,423 district cases can be taken as a fairly representative sample of the general population, in which factors tending to selection have been to a great extent overcome. The only patients excluded are those who were ordinarily resident outside the geographical area of the maternity district.

The 21,423 cases under consideration therefore form a group of average women, as nearly as possible comparable to the group of 23,501 women delivered between 1863 and 1875. In this group (1910–18) there were 22 maternal deaths, giving a maternal mortality-rate of 1·03 per 1000. Thus the maternal mortality-rate in the practice of the Guy's Hospital maternity district during the past ten years is about one-quarter what it was 60 years ago, and this in spite of the fact that obstetric interference is now very much more common. Unfortunately there are no detailed analyses available for recent years before 1928 of the various obstetric abnormalities and operations, but the practice in the Guy's Hospital maternity district has changed but little in the last ten years, and an analysis of the 1670 cases delivered in 1928 may be taken as representing fairly accurately the methods in use during the 1919–28 period.

OBSTETRIC INTERFERENCE.

The following table shows how much more frequently major obstetric interference is resorted to now than it was 60 years ago. The figures for the 1863–75 period have been compiled from Galabin's report published in 1876.[1] The figures for 1928 have been obtained from the Report of the Maternity Department of Guy's Hospital for 1928.[2]

Table I. shows the percentage of cases in which interference was resorted to.

TABLE I.

Nature of operation.	12 years 1863–1875.	Year 1928.
	Per cent.	Per cent.
Forceps	0·51	4·6
Version	0·45	0·3
Craniotomy..	0·07	0·18
Cæsarean section	Nil.	1·3
Manual removal of placenta ..	0·32	0·18
Instrumental induction of labour	Nil.	2·4
Total obstetric interference ..	1·35	8·86

It is very unlikely that the enormous increase in obstetric interference can be due to any comparable increase in the incidence of obstetric abnormalities. The only possible explanation for the striking difference is that to-day interference is considered proper where formerly it was not. In 1928 the proportion of Cæsarean sections to total deliveries was as great as the proportion of all obstetric operations to total deliveries 60 years ago; in spite of this craniotomy was performed twice as frequently in 1928 as in the former period. Moreover, the forceps rate is now nearly ten times what it was in 1870, and version (which in the days of Galabin and Braxton Hicks was a relatively common method of delivery in difficult cases) is only slightly less common in the present day practice of Guy's Hospital.

What is the meaning of this change in our methods? It is sometimes explained on the grounds of modern impatience and meddlesomeness. If only the obstetrician, it is sometimes said, would exercise his patience more and his art less, natural delivery would be a much more common event, and natural delivery must be the best thing for the patient. This line of reasoning generally concludes with the aphorism that the best way to reduce the frequency of the tragedies of labour is to leave to Nature what Nature ordained. Such an argument has been used so often, and when applied to indiscriminate interference is so obviously true that we must not be carried away by its extreme application. To say feebly that we are not impatient and meddlesome is an assertion that we cannot expect to be accepted without proof; but, in so far as such a thing is capable of proof, we have some statistical evidence in a comparison of the frequency with which the placenta was removed manually. This operation is sometimes, but only rarely, an absolute necessity, and the frequency with which it is performed may be to some extent an index of the impatience and meddlesomeness of the obstetrician, since it is not performed out of consideration for any physical suffering on the part of the patient. In 1870, during a time when interference generally was far less frequent than it is to-day, the placenta was removed manually almost twice as often as it is to-day. This at least suggests that midwifery now is conducted with no less patience than it was 60 years ago.

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[1] Report of Guy's Hospital Lying-in Charity, Guy's Hospital Reports, 1876, xxi. (3rd Series), 285.

[2] Clinical Report of Maternity Department, ibid., 1929, lxxix. 277.

There can therefore be only one explanation for the increase in obstetric interference, and that is that our standards of what we regard as "tolerable suffering" have changed since Galabin's time. This is a natural consequence of changes in social conditions in the same period. These two changes go hand in hand, and to condemn the one as a curse, while accepting the other as a blessing, is merely a peevish outcry against the inevitable. The increase in obstetric interference has come to stay, just as our improvements in the standard of living have come to stay, and any attempt to tackle the problem of maternal mortality by "back to Nature" methods is doomed to fail at its very inception—doomed by the impossibility of forcing it upon our patients, rather than by any unwillingness on the part of the accoucheur. Even if it could be adopted it still remains to be shown that it would result in any reduction in the mortality-rate. The figures quoted show that in multiplying the frequency of interference by six, we have divided the maternal death-rate by four, but it does not follow that by doubling the present interference rate we should again halve the mortality-rate. We must find the amount of interference that will give the minimum mortality. The general outcry against obstetric interference is certainly justified when that interference is excessive, but we must not expect—indeed we cannot wish—that it should be so seldom resorted to as it was 60 years ago. The solution to the problem of maternal mortality will not come from drastic changes in the accepted modern technique of conducting labour. Indeed, the present technique and the present-day willingness to interfere are the result of true advances in the practice of obstetrics, a response to the demands of women to be relieved of some of the intolerable suffering to which they were submitted three generations ago. With them come, not an increased mortality, but a death-rate reduced to one-quarter of the original figure.

AVOIDABLE COMPLICATIONS.

The part played by antenatal work in reducing the mortality is difficult to assess, but an index of its value can be obtained by comparing, in the two series, the number of deaths which follow complications that can be avoided by efficient antenatal work. The most important are: *(a)* disproportion, *(b)* malpresentation, *(c)* toxæmias of pregnancy, and *(d)* serious intercurrent diseases. The deaths ultimately due to these causes have been set out in Table II.

Disproportion is now responsible for far less deaths than formerly, and this improvement must be due, in part at least, to the fact that antenatal supervision has forewarned us and enabled us to deal more safely with such cases. Part of the improvement is, of course, due to improved technique—for example, the substitution of Cæsarean section for a difficult craniotomy—but even so, Cæsarean section is safe only in so far as it has been foreseen at the antenatal clinic and performed before it has become a dangerous operation late in labour. Malpresentation was ultimately responsible for only about half as many maternal deaths as it was 60 years ago, and here again antenatal care must be held responsible for the improvement. Comparative figures on the toxæmias of pregnancy are notoriously fallacious, since the frequency and severity of eclampsia seems to vary within wide limits in different places, and also possibly in different periods, but in spite of this the reduction in the death-rate from eclampsia in the more recent series is probably significant, and can be taken as still further proof of the value of antenatal work. Apart from fulminating cases, which sometimes occur quite soon after examination has revealed a normal blood pressure and urine, there is no doubt that antenatal care, if efficiently carried out, can greatly reduce the incidence of eclampsia.

TABLE II.—*Death-rates per 1000 Deliveries in Cases of Disproportion, Malpresentation, Toxæmia, and Intercurrent Disease.*

1863–1875 (23,591 cases).		1919–1928 (21,423 cases).	
Disproportion—		Disproportion—	
Forceps	5	Cæsarean section	3
Version	2	Craniotomy ..	1
Craniotomy ..	6		4 = 0·19*
Ruptured uterus	5		
	18 = 0·76*		
Malpresentation—		Malpresentation—	
Version	1	Ruptured uterus	1 = 0·046*
Ruptured uterus	1		
	2 = 0·08*		
Eclampsia	7 = 0·29*	Eclampsia	1
		Other toxæmias ..	2
			3 = 0·14*
Intercurrent diseases—		Intercurrent diseases—	
Phthisis	1	Phthisis	1
Heart disease ..	5	Heart disease ..	3
Tumour of brain	1	Hyperthyroidism	1
Purpura	1		
	8 = 0·32*		5 = 0·24*

* Per 1000.

There can be no doubt that the care of the general health during pregnancy forms a very important part of antenatal supervision, and although no very [illegible] decrease in the number of deaths from intercurrent [illegible] be demonstrated in these series, the benefits of antenatal care in this direction are probably far greater than analysis seems to suggest. *The fact remains, however, that where pregnancy* complicates, or is complicated by, some serious intercurrent disease which of itself is likely to cause death, antenatal care has not been rewarded by any very great decrease in the death-rate.

SEPSIS.

The part played in the reduction of maternal mortality by changes in our outlook on sepsis during the last 60 years is well brought out in Table III.

TABLE III.—*Death-rates per 1000 Deliveries from Sepsis.*

1863–1875 (23,591 cases).		1919–1928 (21,423 cases).	
Sepsis following normal labour	26	Sepsis following normal labour	1 = 0·046*
Sepsis following P.P.H.	6		
	32 = 1·31*		
Sepsis following obstetric operations—		Sepsis following obstetric operations—	
Version, malpresentation ..	3	Cæsarean section	2 = 0·09*
Version, placenta prævia	1		
Forceps	1		
Craniotomy ..	3		
Manual removal of placenta ..	2		
	10 = 0·42*		
Total deaths from sepsis ..	42 = 1·73*		3 = 0·14*

* Per 1000.

In studying the death-rate from sepsis it is important to distinguish between spontaneous deliveries in which sepsis supervened and cases where the infection followed major obstetric interference. The factors contributing to infection in these two groups are probably different, and an estimate of the efficacy with which the various factors have been dealt during recent years can best be obtained by considering each group separately.

In natural delivery, trauma and perhaps also direct inoculation by the hands of the attendant are probably not the most important factors predisposing to the sepsis. If we try to find some explanation for the fact that the death-rate from sepsis following natural delivery was 30 times as great in the 1863–75 series as in the 1919–28 series, we are tempted to attribute it to more efficient prevention of cross infection in recent years. In the present practice of Guy's Hospital, isolation of "district" cases is comparatively easy, since patients with pyrexia are effectively isolated in their own homes and, if admission to hospital is thought necessary, the patient is taken into the septic ward, which is situated in a block of buildings far removed from the maternity ward. The student who has delivered such a patient is easily suspended from duty if necessary and has not, as a rule, been in contact with more than one or two patients before his case of sepsis has become manifest. Thus, except for these one or two contacts, isolation is efficient even before the first manifestation of sepsis. The danger of cross infection is, however, less easily dealt with among ward cases, but here again it is only very rarely that an infected case—i.e., a patient in whom repeated attempts at delivery have been made outside the hospital—is admitted. Such a patient is potentially infected and is therefore a potential danger to all the other patients in the hospital ward, and the danger is all the more insidious in that she may show no signs of her infection until a day or two after she has mixed with other patients in the ward. At Guy's Hospital the majority of patients who live outside the "district" and who are delivered in the hospital have been looked after during pregnancy by the hospital. Emergencies from outside practitioners are seldom admitted. This limitation of the hospital service is more than compensated for by the relative freedom from serious sepsis in the maternity ward.

The attitude taken towards isolation 60 years ago can be judged from the following extract from Galabin's report of 1876.

> . . . it is satisfactory to record that there is no instance in which contagion seemed to have been communicated by the attendant from one patient to another. It is usual to suspend an extern from his duties for a few days if symptoms occur in any patient attended by him which are thought to indicate any special risk of infection. In the case of the resident obstetric assistants, who are not generally in such close attendance upon the patients, reliance is placed upon antiseptic ablutions and change of clothing. The nearest approach to an epidemic was in November and December, 1874, when there were four deaths from puerperal septicæmia among patients delivered within four weeks. All four, however, were attended by different gentlemen, and no communication whatever could be traced between them.

It is seen that the precautions then, although not so strict as those of to-day, were nevertheless on the same general lines. It is true that nowadays four deaths from septicæmia in four weeks would be regarded as more than an "approach to an epidemic," and the more searching inquiries that would be made to-day would probably have revealed some common contact. But the extract from Galabin's report is quoted to show that he was fully alive to the importance of the principle of isolation, and we must assume that his ideas were as faithfully carried out as are similar (though more stringent) ideas to-day. Thus, while there has been an enormous decrease since 1870 in the number of deaths from sepsis following natural delivery, it is difficult to attribute all this improvement to more efficient isolation of contacts, since the broad principles of isolation were enforced 60 years ago. The influence of trauma and of gross contamination at the time of delivery should not be very different in the two series, since we are dealing only with natural deliveries.

The one factor that is different in the two series is the general condition of the mother. With antenatal care, as a rule, the general health of the average mother is probably far better to-day than it was in Galabin's time. The opportunities that we now have of ensuring proper and sufficient food and adequate general treatment are far greater than in former years. Furthermore, in Galabin's report a delivery is classed as natural so long as it was not effected by version, forceps, or craniotomy, and many cases under this heading must have been exhausted by a labour so prolonged as to leave the patient quite unfit to deal with an infection even of low virulence. It has already been pointed out that the forceps rate is now ten times what it was 60 years ago and, so far from causing an increased death-rate from sepsis, it seems quite likely that this very interference is responsible for the decrease, because it has saved many women from the exhaustion that would have followed a more prolonged labour ending in a "natural" delivery. Increased obstetric interference carried out with proper regard to the principles of asepsis and antisepsis may be regarded as a large factor in the reduction of the septic death-rate in the 1919–28 series.

The relative safety attendant upon present-day obstetric interference is further borne out by reference to the septic deaths in cases where the delivery was not spontaneous. In spite of the increased frequency of interference in the 1919–28 series there was a very great reduction in the deaths in this group. This improvement is partly due to the fact that severe trauma after obstetric operations is far less common to-day than formerly, since difficult craniotomies and high forceps deliveries are avoided wherever possible by the induction of premature labour or by Cæsarean section. The greatest factor, however, in rendering obstetric interference relatively safe must be the changes in operative technique. In the light of the results recorded here it would seem safe to conclude that so long as the facilities for good aseptic and antiseptic technique are available and are fully used, the modern tendency to increase the amount of obstetric interference is not merely justifiable but definitely beneficial.

ANTEPARTUM AND POSTPARTUM HÆMORRHAGE.

Modern practice has carried with it practically no decrease in the death-rate from accidental hæmorrhage. In all the fatal cases in the 1919–28 series (Table IV.) the hæmorrhage was of the concealed type. Three of the patients were delivered by Cæsarean section, and in one the condition was treated by plugging the vagina.

TABLE IV.—*Death-rates per 1000 Deliveries in Cases of Antepartum Hæmorrhage.*

—	1863–1875 (23,591 cases).	1919–1928 (21,423 cases).
Accidental hæmorrhage	5 = 0·21 per 1000	4 = 0·19 per 1000
Placenta prævia ..	6 = 0·25 "	2 = 0·09 "

The relatively large number of deaths from this cause may be taken as an indictment against the method of treatment adopted at Guy's Hospital, and, although no fixed line of treatment can be said to be practised, Cæsarean section has been performed frequently in the more serious cases of concealed accidental hæmorrhage during recent years. This can hardly, however, be held responsible for the unfortunate results, since they were roughly the same in Galabin's series, in which more conservative measures were invariably taken. The difficulty is that the fatal result is frequently due to an associated toxæmia of great severity and often of sudden onset. The modern methods of treating blood loss by transfusion are so effective that it is disappointing to find no improvement where these methods have been employed. The reason is probably that patients with concealed accidental hæmorrhage die nowadays not so much from hæmorrhage (which can be treated effectively) as from profound toxæmia. This belief is born out by clinical experience and by post-mortem findings.

The death-rate from placenta prævia shows a definite improvement in the recent series. This is partly due to the fact that antenatal supervision has at times enabled us to detect, or at least to suspect, the condition before the patient has been weakened by a serious hæmorrhage, but most of the improvement is probably attributable to our improved methods of combating blood loss.

Postpartum hæmorrhage now very rarely causes death, as is shown in Table V.

TABLE V.—*Death-rate per 1000 Deliveries from Postpartum Hæmorrhage.*

1863–1875 (23,501 cases).	
Postpartum hæmorrhage	12
Syncope after slight hæmorrhage	1
Inversion of uterus with hæmorrhage ..	1
Total	14 = 0·59 per 1000
1919–1928 (21,423 cases).	
Spontaneous rupture of uterus with hæmorrhage	1
Inversion of uterus with hæmorrhage ..	1
Total	2 = 0·09 per 1000

This very striking improvement affords still further evidence of the valuable help given by modern methods of treating hæmorrhage.

CONCLUSIONS.

Two series of cases have been compared with reference to the maternal mortality-rate. The difference between the two series is mainly that the one is an example of midwifery practice 60 years ago, and the other of modern practice. In all other respects the two groups are as nearly as possible identical, and any differences between them are to be attributed to inevitable changes in social conditions. By limiting the cases to patients domiciled in a compact "district," the distortion usually present in "in-patient" figures has been eliminated, and by including all cases who, though domiciled in the "district," were nevertheless delivered in hospital, the distortion usually present in "out-patient" figures has also been avoided. The series can, therefore, be regarded as a fair average sample of the general population, at least among the particular social class exemplified by the residents in the Guy's Hospital "district."

The maternal mortality-rate in the last 60 years has fallen from 4·4 per 1000 to 1·03 per 1000, and this improvement can be traced directly to changes in obstetric methods. These changes in practice have resulted in an increase in the amount of interference, but even so the total interference rate at the present time is less than 9 per cent. It is contended that the increased interference up to this point is justified by the results obtained and that it may be an important factor in diminishing the death-rate by eliminating those cases of profound obstetric exhaustion that must have occurred 60 years ago. It is to our improved aseptic and antiseptic technique that we must attribute the fact that, in spite of the much greater frequency of interference, the danger of subsequent sepsis has been very much reduced. Amongst cases of spontaneous labour the conscientious use of a simple antiseptic technique and strict attention to the principles of isolation have practically abolished sepsis as a cause of death.

Antenatal care has shown its value most dramatically in reducing the death-rate in cases of disproportion and malpresentation, and also in making eclampsia a rare disease. But it has done more than this: it has given us the opportunity to look after the general health of the patient during pregnancy so that she is better able to face the risks of labour and the puerperium.

The use of intravenous saline or gum saline or of blood transfusion has contributed largely to the reduction in the death-rate from postpartum hæmorrhage and placenta prævia, but concealed accidental hæmorrhage accounts for practically as many deaths as it did in former years, and the cause of death in these cases seems to be a profound toxæmia which we cannot treat. In spite of the enormous amount of study that has been spent on the toxæmias of pregnancy since Galabin's time our treatment for this condition, once it has developed (whether in association with accidental hæmorrhage or as eclampsia), is as ineffective as ever it was. Apart from the experience gained from periodical swings of the pendulum from radical to conservative lines of treatment we have nothing of fundamental importance to add to the treatment of 60 years ago. We have succeeded in preventing eclampsia to a great extent, but we must not therefore imagine that we have advanced in our treatment of the condition once it has arisen. Under present conditions of practice an occasional case of fulminating eclampsia or of concealed accidental hæmorrhage will occur in spite of reasonable antenatal care, and it is in the treatment of such cases that modern methods have proved so disappointing. To prevent a disease is certainly better than to treat it, but until we can prevent every case of severe toxæmia there is still a real need for efficient treatment.

The death-rate from intercurrent diseases was 0·32 per 1000 in the 1863–75 series, and 0·24 per 1000 in the 1919–28 series, showing that antenatal care has been unable greatly to benefit the pregnant woman who is already seriously ill with some other disease. This is to be expected, since in these cases we cannot look upon childbearing as anything more than a contributory factor in causing death, and we cannot expect antenatal treatment to cure the primary disease. The close approximation of the figures in the two groups is interesting in view of the question of the reliability of national mortality figures. How far do such figures include deaths from intercurrent disease? It is suggested that 0·3 per 1000 may be taken as a true measure of the deaths from non-obstetrical causes in an average unselected practice, and if this is so it is obvious that these cases become a serious factor only when the total mortality-rate is very low.

Investigations

INTO THE

BLASTOGENIC PRINCIPLE IN FOWL SARCOMA,

AND THEIR SIGNIFICANCE IN THE THEORY OF THE ORIGIN OF MALIGNANT TUMOURS.

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BETWEEN 1926 and 1929 I published a series of papers [1] [2] [3] describing some investigations on Peyton Rous's fowl sarcoma These were undertaken with the support of the German Central Committee for Cancer Research and the Fund in Aid of German Science.* My first investigations were based on the work of Gye and Barnard [4] [5] whose technique I learned in London, and on the assumption of Rous and Murphy [6] that these tumours are caused by a filtrable virus. The Rous fowl sarcoma is now admitted to be a true malignant tumour both morphologically and pathologically. As is well known, it differs from other malignant tumours since it is possible to produce tumours of the same kind in healthy fowls by means of filtrates alone, without the inoculation of cells. A single injection of 1·0 c.cm. of a sterile and cell-free Berkefeld filtrate into the pectoral muscle of a healthy *fowl produces tumours which appear microscopically* to be true tumours; they infiltrate the healthy tissue without causing any great inflammatory reaction, and give rise to typical metastases in other organs, such as the lungs, liver, and heart.

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* I am particularly indebted to Prof. M. Busch of the State Department of Health, who supervised the pathological and anatomical part of the work and prepared microscopic and macroscopic sections.

The fact that the filtrate now and again contains a cell has recently been made by Teutschländer, Nakahara, and other authors[8] [9] a reason for believing that the tumours might be caused by isolated cells or parts of cells injected with the filtrate. I have succeeded, however, in proving that tumours can be evoked by the injection of counted cell suspensions containing a relatively large number of cells, but not by suspensions containing a small number. When a suspension containing only a few cells (for example 4000–10,000) is injected into the breast of a fowl on both sides, on one side by itself and on the other with an unheated cell-free filtrate or one that has been heated to 50° C. for a quarter of an hour, a tumour appears only on the side on which the filtrate was injected. The same result followed the injection of the filtrate without the suspension. This proves that the tumour could not have been produced by isolated cells in the filtrate.

I arrived at the same conclusion as a result of some experiments which I undertook to see whether tumours could be produced by injecting the blood, spleen, and egg-yolk of tumour-bearing birds, in many of which there was no histological evidence of metastasis in the organ from which the injected substance was taken, or indeed in any part of the body. My findings agree with those of Rous and Murphy, Bürger, Busch, Pentimalli,[10] Llambias and Brachetto Brian.

I have also investigated the question of whether or not Gye and Barnard are right in assuming that the cause of the Rous sarcoma is an unspecific "virus," together with a chemical "specific factor." The results which I obtained agree with those of Harkins, Schamberg, Kollmer, Kast, Flu, Sternberg, and others, and show that the "specific factor," a chloroform-killed filtrate, is alone responsible. The various attempts which have been made to cultivate the virus, with all kinds of aerobic and anaerobic cultures, have been uniformly unsuccessful. Nevertheless, a Rous tumour has twice been produced with suspensions cultivated in bouillon at 37° C. and then rapidly centrifuged, even in weak dilution. This dilution contained some ordinary Gram-positive rod-shaped organisms which I believe to have adsorbed the activating principle of the *tumour into their* outer surfaces. Fujinami and Inamoto report a similar observation in which the organisms were staphylococci, and which is especially interesting in view of the occasional success of Blumenthal and his colleagues in cultivating tumour-activating microbes from human cancers.

Chemical Experiments.

After my failure to cultivate the virus I turned my attention more along chemical lines. It is possible by precipitating the euglobulin with carbon dioxide to divide the diluted filtrate into two fractions. By analogy with complement-splitting, I describe the one as the euglobulin fraction, and the other, less accurately, as the albumin fraction. I obtained four positive results with the globulin fractions of various filtrates, and only two with the albumin. Baker and McIntosh, Harde,[11] Sugiura,[12] and Benedict have also worked along these lines, have established that the pH value of the agent never rises above 10·0 nor falls below 3·8, that acid filtrates are less effective than alkaline, and that the time taken by a filtrate to act depends upon the quantity of the agent present. Trypsin stimulated growth (Baker and McIntosh), a fact which suggests that fermentative processes underlie the generation of Rous sarcoma. Sugiura and Benedict, who precipitated the globulin with ammonium sulphate, could produce tumours only with the globulin fraction, and found practically all the nitrogen content of the filtrate in the precipitated globulin. In conformity with Teutschlander and *the other workers quoted, we found that 50°–52° C.* was the critical temperature for the efficiency of the filtrate, and also that the time factor and the efficacy of the injected substance depended very largely upon its quantity. I therefore proceeded systematically to investigate the fermentative nature and chemico-physical properties of the "agent," and to test for it and demonstrate its existence by the current methods. The carbon dioxide introduced to precipitate the globulin had already been proved innocuous, and it was now demonstrated that a tumour could be produced after chlorine had been passed through the filtrate. Seven filtrates through which hydrogen had been passed and eight through which oxygen had been passed yielded three and one positive results respectively on inoculation. The fact that it was more effective under anaerobic than aerobic conditions showed in this respect a close analogy to Warburg's anaerobic glycolysis.

I then attempted to isolate the agent by adsorption, the possibility of which had been suggested by my own experiments in the transmission of bacteria, by those of Pentimalli on the transmission of healthy embryonic cells, and by those of Carrell on normal macrophages. I therefore tried to isolate the ferment by Willstätter's well-known method, using variously charged adsorbents. In these experiments I was admirably assisted by Dr. Ernst Mislowitzer, of the Chemical Branch of the Pathological Institute, who placed his great experience in this field unreservedly at my disposal. Acting on his advice, we chose casein as the mildest of all the adsorbents. Adsorption was demonstrated by inoculation tests in six out of thirteen filtrates. On animal charcoal it occurred twice in five attempts, and on infusorial earth and kaolin three times out of five. Since the work was completed we have learnt that Lewis and Andervont[14] in America and Sebastiano[15] in Turin have also reported on adsorption experiments with organic and inorganic adsorbents. These authors attempt to explain their findings from the bacteriological aspect by drawing an analogy with the adsorption of various kinds of true filtrable virus. Believing, however, that the agent is like a ferment, we followed Willstätter's method and tried to isolate the blastogenic principle by washing it out of the adsorbent with phosphates on aluminium hydroxide, succeeding in six attempts out of ten.

It appeared to me that in order to form a correct opinion of the nature of the agent, it was necessary to *estimate its size. The adsorption experiments* had shown that a filtrate was often rendered ineffective by filtration through candles on account of adsorption; I therefore used gauged de Haen filters, membrane filters and "ultrafilters" (Bechhold's collodion filter). In these experiments the agent passed twice out of eight times through a medium membrane filter gauged to pass bacteria, and once out of seven times through a fine one. The inoculation test was positive, however, even after filtration, both through a rapid and a medium ultrafilter, the times being one to five and ten to fifty minutes respectively. The medium ultrafilter holds back benzopurpurin, but passes albumin; and the largest pores will let through particles of about 10 μμ diameter. Finer filters, such as the fine ultrafilter with a time of 100–500 minutes, and the finest ultrafilter have, however, not yet passed the blastogenic principle, so that its size must be about that of the albumin molecule. These filtration tests indicate that it is less likely to be a living virus than a chemical substance. Their results therefore confirm and amplify those of the adsorption and "elution" experiments.

Discussion.

There remains to be considered the application of these results to tumour research as a whole. The Rous fowl sarcoma is the only malignant tumour yet discovered that can be transmitted with certainty by means of cell-free filtrates. It is probable, however, that a number of other mammalian tumours are capable of cell-free transmission. Blumenthal and his colleagues have succeeded in producing tumours in normal animals by injecting the spleen or blood of tumour-bearing rats and mice, and similar results have been achieved by Rhoda Erdmann with filtrates of Jensen's rat tumour. Kritchewski produced a tumour in a rat by injecting substance from a human melanotic sarcoma, and transmitted the tumour by means of sand filtrates and cystic fluid containing blood. None of these results, however, can yet be reproduced with anything like the same certainty and regularity as the cell-free transmission of Rous's fowl sarcoma, which is the only tumour of which the active principle can yet be separated with certainty from the cells. Most of the authorities who have worked with Rous's sarcoma have abandoned the view that the agent is a living virus. The belief in a virus which can lead of its own accord to the growth of a specific malignant tumour when introduced once into the body runs counter to the experience of all clinical and pathological research on tumours. On the contrary, clinical experience of tumours proves with certainty that they can be initiated in the human body by the following stimuli:—

1. Thermal—e.g., cancer of the abdominal skin caused by the "kangri."
2. Physical—e.g., cancer of the skin after X ray and radium applications.
3. Mechanical—e.g., traumatic sarcoma.
4. Chemical—e.g., aniline and paraffin cancer and the pulmonary lympho-sarcoma of the Schneeberg cobalt miners.
5. Parasitic—e.g., cancer of the bladder, due to bilharziasis; cancer of the tongue following syphilitic leucoplakia; and probably cancer of the gall-bladder and ducts in chronic streptococcal infection and cholelithiasis.

Experimental and animal pathology have also provided numerous examples of these various possible causes of malignant tumours. Briefly, a few of the best known are the spiropteric cancer of the stomach in rats, discovered by Fibiger; carcinoma following "kalkbein" of fowls; the production by Yamagiwa and his colleagues of carcinoma in mice by painting with tar over long periods, and the production of cancer in rats and in the ears of rabbits, and on fowls by Choldin; tumours produced with scarlet red by B. Fischer—and the results of inoculation or cell culture, combined with applications of tar and arsenious acid, reported by Carrell and Albert Fischer.

All these examples prove that malignant tumours can be evoked by the most varied causes. It is surely a mere complication to assume the existence of a second exogenous factor, such as a living virus, in addition to all this host of other causes. What we do not know, however, is the nature of the internal process which makes the malignant tumour grow in normal tissue or out of it. If we have succeeded in making it probable that the blastogenic principle isolated from the tumours of fowl sarcoma is not a living virus but a chemical agent or a ferment, it becomes possible to find a place for these tumours in the general theoretical fabric of neoplasmology. Up to the present, this is the only tumour in which the blastogenic principle has indubitably been isolated from the cells. Further research will doubtless be directed towards confirming these results and ascertaining whether they hold good for other malignant tumours. If, by the use of these or other methods, we can discover the nature of the chemicals or ferments which can be isolated from the growths and which stimulate the cells to tumour formation, we may find out that principle of the cause and development of tumours which underlies all the multifarious exciting factors.

Summary.

The tumour-producing agent ("blastogenic principle") of Rous fowl sarcoma filtrates can be separated from the tumour cells and isolated by the usual methods of ferment isolation.

A chemical or ferment theory of the "blastogenic principle" harmonises better with the facts of clinical and experimental investigation than does the hypothesis of a living virus.

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DIAGNOSTIC VALUE OF THE ESTIMATION OF BLOOD CHOLESTEROL IN CHOLELITHIASIS.

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ST. THOMAS'S MEDICAL SCHOOL.

THIS investigation was undertaken to assess the diagnostic value of an estimation of the amount of cholesterol in the blood in cases of supposed cholelithiasis. Before investigating patients known to be suffering from this condition it is obviously essential to decide what can be considered as normal, and to define the limits of the normal, especially as there is considerable variation in the figures given by different authorities both for the mean value and the range of value.

In selecting a method for determining the amount of cholesterol one was chosen in which the quantity of blood withdrawn from the patient was large enough to ensure accuracy, but not so large that one or more withdrawals might impair the general condition, and was, comparatively speaking, easily and quickly carried out. The method was that advocated by Myers in his book,[1] and described originally in papers by Gorham and Myers,[2] and Myers and Wardell.[3] It had the disadvantage of being colorimetric and, therefore, open to an inevitable margin of error.

The estimation is carried out after obtaining the Liebermann-Burchard reaction for cholesterol in the fluid to be estimated. The only absolute method of estimating cholesterol is the gravimetric method of Windaus, after precipitation of the cholesterol in combination with digitonin. It is costly and tedious, and requires larger quantities of blood than are practicable in clinical work. Colorimetric estimation of cholesterol after obtaining the Salkowski reaction has no advantage over the other colorimetric method. For Myers' method 1 c.cm. of blood or serum is required, and a calculation is made to determine the number of grammes of cholesterol per 100 c.cm.

The figures for normal subjects given by various workers using different methods are as follows:—

Autenreith and Funk,[4] in a classical paper upon which much subsequent work has been based, give a normal range in whole blood of 0·140–0·160. They estimate against a standard green colour in an Autenreith comparator after obtaining the Liebermann reaction in the unknown. They hint that, as the method is a colorimetric one, it can only be considered accurate to the second place of decimals. Hanes,[5] using a very similar method, gives for serum a range of 0·110–0·183 with an average of 0·148. Grigaud,[6] estimating four normals, gives for whole blood 0·160–0·165 and for plasma 0·168–0·175, and Chauffard, Laroche, and Grigaud[7] for whole blood 0·160–0·180. Bacmeister and Havers[8] give for whole blood 0·110–0·180. Bloor,[9] using a special method of extraction, gives values for whole blood of 0·190–0·260, and for plasma of 0·170–0·240. Most other workers regard these figures as definitely too high. Gorham and Myers,[2] extracting dried blood, found a range of 0·180–0·190, with an average for 14 cases of 0·150. All these workers were using the Liebermann colour reaction. Weston and Kent,[10] using the Salkowski reaction, give a range of 0·117–0·297, with an average for 52 subjects of 0·182. Gardner,[11] using the digitonin method, gives for serum an average of 0·169 in 48 subjects.

In determining the values for blood or plasma three or four estimations were carried out on each specimen, necessitating the withdrawal of from 8 to 6 c.cm of blood. Considerable discrepancies were found, and certain modifications were introduced into the method. Similar unsatisfactory results obtained by Myers's method have been recorded by Ling.[12] The stages of the method were investigated and the following conclusions reached. It appeared to be immaterial whether the mixing of the blood or serum with plaster-of-Paris was carried out roughly with a glass rod or intimately in a pestle and mortar. After extraction for half an hour, it was still possible in many cases by further extraction to find remaining cholesterol capable of estimation, and it was found necessary to extract for one and a half hours.

The amounts of reacting substances were doubled, but the proportions kept unchanged. As there was considerable evolution of heat during the reaction, the mixture was stirred with a glass rod first until the vigour of the reaction had subsided, and then further mixed by inversion.

Determination was carried out in a colorimeter having cups with fused glass bottoms. This is essential, as the acid chloroform mixture destroys the cement used in the ordinary type of cup. For each estimation ten readings were taken.

In this manner an appreciable time was taken over one determination, and it was found that the intensity of the colour was increasing progressively. Investigation was made, therefore, on the rate of development of the intensity of colour in a standard solution of pure cholesterol after addition of acetic anhydride and pure sulphuric acid compared against a stable standard solution of naphthol green. It was found that it takes 45 minutes for the maximum intensity to develop.

This is a very important point, and one to which insufficient attention has been directed. Myers advises reading after ten minutes, but it is of interest to note that Grigaud[13] states that half an hour is the ideal time, while Autenreith and Funk advise 20 minutes.[4] The rate of development shows no variation within the ordinary range of room temperature, and this accords with the findings of the rate of development of the Salkowski reaction as recorded by Weston and Kent.[10] Bright sunlight should be avoided, but it is unnecessary to keep the reagents in the dark.

In subsequent work a standard solution of cholesterol was always used, as solutions of naphthol green have a yellow-green tinge, as opposed to the blue-green of the Liebermann reaction, and make matching of the colour very difficult. The reaction given by pure

TABLE I.

Age.	Sex.	Blood.					Plasma.					Remarks.
		Samples.	Highest.	Lowest.	Difference.	Mean value.	Samples.	Highest.	Lowest.	Difference.	Mean value.	
58	M.	4	0·120	0·116	0·004	0·119	—	—	—	—	—	Urethral stricture.
40	M.	2	0·178	0·174	0·004	0·176	—	—	—	—	—	Inguinal hernia.
25	M.	3	0·156	0·154	0·002	0·155	2	0·133	0·131	0·002	0·132	" "
21	M.	2	0·102	0·098	0·004	0·100	2	0·092	0·090	0·002	0·091	Torn semilunar cartilage.
51	M.	2	0·169	0·163	0·006	0·166	2	0·146	0·138	0·008	0·142	Urethral stricture.
18	M.	2	0·206	0·200	0·006	0·203	2	0·184	0·179	0·005	0·182	Hydrocele.
32	M.	2	0·150	0·149	0·001	0·150	2	0·153	0·151	0·002	0·152	Torn semilunar cartilage.
56	F.	2	0·146	0·144	0·002	0·142	—	—	—	—	—	Carcinoma of liver.
50	M.	—	—	—	—	—	2	0·143	0·139	0·004	0·141	Inguinal hernia.
		Average	..	..	.. ..	0·151	..	..	..	..	0·142	—

TABLE II.

Age.	Sex.	Blood.					Plasma.				
		Samples.	Highest.	Lowest.	Difference.	Mean value.	Samples.	Highest.	Lowest.	Difference.	Mean value.
72	F.	—	—	—	—	—	2	0·285	0·275	0·01	0·280
66	F.	—	—	—	—	—	2	0·216	0·210	0·006	0·213
43	F.	—	—	—	—	—	2	0·306	0·305	0·001	0·306
45	F.	—	—	—	—	—	2	0·145	0·144	0·001	0·145
50	M.	—	—	—	—	—	2	0·210	0·205	0·005	0·207
45	F.	2	0·143	0·139	0·004	0·141	2	0·152	0·143	0·009	0·148
50	F.	2	0·216	0·210	0·006	0·214	2	0·225	0·217	0·008	0·221
42	F.	2	0·107	0·106	0·001	0·106	2	0·130	0·126	0·004	0·128
49	F.	2	0·213	0·205	0·008	0·210	2	0·200	0·191	0·009	0·194
53	F.	4	0·129	0·126	0·003	0·128	—	—	—	—	—
48	M.	2	0·215	0·205	0·01	0·210	—	—	—	—	—
50	M.	2	0·283	0·273	0·01	0·278	—	—	—	—	—
44	F.	2	0·166	0·160	0·006	0·159	—	—	—	—	—
57	F.	2	0·168	0·165	0·003	0·166	—	—	—	—	—
		Average	..	..	..	0·179	..	..	..	..	0·204

that a number of other mammalian tumours are capable of cell-free transmission. Blumenthal and his colleagues have succeeded in producing tumours in normal animals by injecting the spleen or blood of tumour-bearing rats and mice, and similar results have been achieved by Rhoda Erdmann with filtrates of Jensen's rat tumour. Kritchewski produced a tumour in a rat by injecting substance from a human melanotic sarcoma, and transmitted the tumour by means of sand filtrates and cystic fluid containing blood. None of these results, however, can yet be reproduced with anything like the same certainty and regularity as the cell-free transmission of Rous's fowl sarcoma, which is the only tumour of which the active principle can yet be separated with certainty from the cells. Most of the authorities who have worked with Rous's sarcoma have abandoned the view that the agent is a living virus. The belief in a virus which can lead of its own accord to the growth of a specific malignant tumour when introduced once into the body runs counter to the experience of all clinical and pathological research on tumours. On the contrary, clinical experience of tumours proves with certainty that they can be initiated in the human body by the following stimuli :—

1. Thermal—e.g., cancer of the abdominal skin caused by the "kangri."
2. Physical—e.g., cancer of the skin after X ray and radium applications.
3. Mechanical—e.g., traumatic sarcoma.
4. Chemical—e.g., aniline and paraffin cancer and the pulmonary lympho-sarcoma of the Schneeberg cobalt miners.
5. *Parasitic—e.g., cancer of the bladder, due to bilharziasis*; cancer of the tongue following syphilitic leucoplakia; and probably cancer of the gall-bladder and ducts in chronic streptococcal infection and cholelithiasis.

Experimental and animal pathology have also provided numerous examples of these various possible causes of malignant tumours. Briefly, a few of the best known are the spiropteric cancer of the stomach in rats, discovered by Fibiger; carcinoma following "kalkbein" of fowls; the production by Yamagiwa and his colleagues of carcinoma in mice by painting with tar over long periods, and the production of cancer in rats and in the ears of rabbits, and on fowls by Choldin; tumours produced with scarlet red by B. Fischer—and the results of inoculation or cell culture, combined with applications of tar and arsenious acid, reported by Carrell and Albert Fischer.

All these examples prove that malignant tumours can be evoked by the most varied causes. It is surely a mere complication to assume the existence of a second exogenous factor, such as a living virus, in addition to all this host of other causes. What we do not know, however, is the nature of the internal process which makes the malignant tumour grow in normal tissue or out of it. If we have succeeded in making it probable that the blastogenic principle isolated from the tumours of fowl sarcoma is not a living virus but a chemical agent or a ferment, it becomes possible to find a place for these tumours in the general theoretical fabric of neoplasmology. Up to the present, this is the only tumour in which the blastogenic principle has indubitably been isolated from the cells. Further research will doubtless be directed towards confirming these results and ascertaining whether they hold good for other malignant tumours. If, by the use of these or other methods, we can discover the nature of the chemicals or ferments which can be isolated from the growths and which stimulate the cells to tumour formation, we may find out that principle of the cause and development of tumours which underlies all the multifarious exciting factors.

Summary.

The tumour-producing agent ("blastogenic principle") of Rous fowl sarcoma filtrates can be separated from the tumour cells and isolated by the usual methods of ferment isolation.

A chemical or ferment theory of the "blastogenic principle" harmonises better with the facts of clinical and experimental investigation than does the hypothesis of a living virus.

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DIAGNOSTIC VALUE OF THE ESTIMATION OF

BLOOD CHOLESTEROL IN CHOLELITHIASIS.

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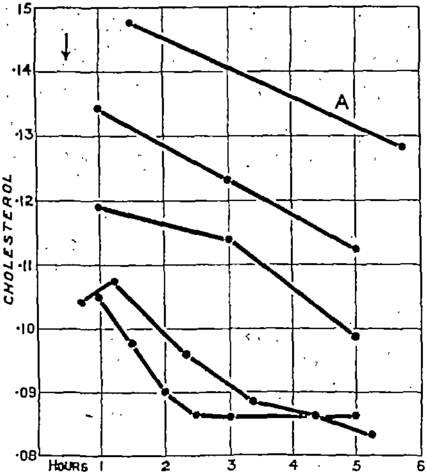
THIS investigation was undertaken to assess the diagnostic value of an estimation of the amount of cholesterol in the blood in cases of supposed cholelithiasis. Before investigating patients known to be suffering from this condition it is obviously essential to decide what can be considered as normal, and to define the limits of the normal, especially as there is considerable variation in the figures given by different authorities both for the mean value and the range of value.

In selecting a method for determining the amount of cholesterol one was chosen in which the quantity of blood withdrawn from the patient was large enough to ensure accuracy, but not so large that one or more withdrawals might impair the general condition, and was, comparatively speaking, easily and quickly carried out. The method was that advocated by Myers in his book,[1] and described originally in papers by Gorham and Myers,[2] and Myers and Wardell.[3] It had the disadvantage of being colorimetric and, therefore, open to an inevitable margin of error.

The estimation is carried out after obtaining the Liebermann-Burchard reaction for cholesterol in the fluid to be estimated. The only absolute method of estimating cholesterol is the gravimetric method of Windaus, after precipitation of the cholesterol in combination with digitonin. It is costly and tedious, and requires larger quantities of blood than are practicable in clinical work. Colorimetric estimation of cholesterol after obtaining the Salkowski reaction has no advantage over the other colorimetric method. For Myers' method 1 c.cm. of blood or serum is required, and a calculation is made to determine the number of grammes of cholesterol per 100 c.cm.

The figures for normal subjects given by various workers using different methods are as follows :—

Autenreith and Funk,[4] in a classical paper upon which much subsequent work has been based, give a normal range in whole blood of 0·140–0·100. They estimate against a fall occurs, whilst Mahler,[21] using Leiboff's[22] modification of Myers' method, found that there was a constant rise with ether anæsthesia of an hour's duration. It must be pointed out, however, that this method consists of one estimation on 0·25 c.cm. of blood, and the increases recorded are small. In Table III. are shown figures for whole blood and plasma in cases subjected to ether anæsthesia for periods varying from 45 to 120 minutes. The changes appear to be definitely in the direction of a fall, in one case well marked.



Blood cholesterol in cats under ether anæsthesia. Anæsthetic started at point indicated by arrow.

This point was further investigated in cats over long periods of ether anæsthesia. The blood cholesterol value in the cat is 0·100–0·150, and appears, in contrast to the human subject, to vary with the size of the animal. The specimens of blood were obtained from the femoral vein. The results are shown in the Figure. Part of this fall in the cat might be explained by dilution of the blood with cholesterol-poor fluid to maintain the blood volume against the repeated withdrawal of relatively large quantities (3–6 c.cm.) of blood, the total blood volume of the cat being about 140 c.cm. That it is not entirely due to this is shown by the experiment marked A, made on two estimations only, one taken one hour, and the second five and a half hours after the commencement of anæsthesia. In no case was a fall produced by anæsthesia sufficient to explain that found after the relief and drainage of a case of obstructive jaundice.

Summary.

1. A modification in the technique for estimating the amount of cholesterol in the blood is described. 2. The normal range of value is shown to be greater than is usually realised. 3. Although the average value is raised in subjects suffering from cholelithiasis, estimation on an individual case is useless as a means of diagnosis. 4. The whole blood cholesterol is very markedly raised in the severer degrees of obstructive jaundice, the rise disappearing when the jaundice is relieved by biliary drainage. 5. Ether anæsthesia tends to produce a fall in the blood cholesterol, but this can be responsible for only a small part of the fall after biliary drainage. 6. The blood cholesterol tends to maintain a constant level in any normal human subject.

This work was carried out during my tenure of a research scholarship at St. Thomas's Medical School, and I am indebted to my colleagues for access to cases under their charge.

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THE CAUSATION AND TREATMENT OF DISPLACED MANDIBULAR CARTILAGE.

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THE temporo-mandibular joint, although a somewhat complex structure, is nevertheless very stable and dislocation of the joint itself or of its meniscus or fibrocartilage is uncommon.

Displacement of the mandibular cartilage is a rare accident and this is probably due mainly to the shape and attachments of this meniscus. The fibrocartilage is a dome-like structure very closely applied to the convexity of the mandibular condyle. As far as thickness is concerned it is irregular, being very much thicker in its centre and anteriorly (see Fig. 1); between these two thickenings there is a distinct depression. The posterior part of the cartilage is very thin and passes well down over the posterior surface of the condyle and fuses behind with the capsule. I have examined over 50 specimens of the mandibular fibrocartilage in the anatomical department at King's College and in the post-mortem department at King's College Hospital and all conform to the description I have given. This description is, however, at variance with the descriptions given in the current standard text-books of anatomy, the most common description being that the interarticular fibrocartilage is an oval plate thinnest at the centre, where it is occasionally perforated, and thickest posteriorly. I have never seen a perforated interarticular fibrocartilage in this joint in either young or old subjects. The anatomical description to which most of the text-books conform must have been handed down for generations and nobody has troubled to investigate the matter and verify the commonly accepted description. Most text-books of anatomy contain quite good sectional diagrams of this joint which, to the most casual reader, are obviously at variance with the text description.

The temporo-mandibular joint is divided by the fibrocartilaginous disc into two cavities [illegible] provided

An attempt has been made in Tables II. and III. to investigate any relationship which may exist between various types of hæmolytic streptococci and the clinical aspects of the disease in the Ilford series of cases.

TABLE II.—*Incidence of Early Severity of Disease According to Type of Hæmolytic Streptococcus.*

Type ..	I.	II.	III.	IV.	Inagg. hæm. strep.
Pyrexia duration in hours*	41·1	41·5	38·8	20·9	35·2
No. of cases vomiting ..	13 (60 %)	18 (56 %)	8 (53 %)	5 (35 %)	44 (46 %)
Early adenitis	5 (20 %)	5 (15 %)	3 (20 %)	2 (13 %)	21 (22 %)

* Average (from time of administration of serum).

TABLE III.—*Type of Hæmolytic Streptococcus in 182 Cases of Scarlet Fever with Complications.*

Type.. ..	I.	II.	III.	IV.	Inagg. hæm. strep.
Complicated cases ..	6	10	6	4	32
Rhinitis	2	2	3	1	9
Adenitis	2	8	3	1	18
Otitis	1	2	1	—	11
Tonsillitis	—	1	1	—	3
Suppurative adenitis	—	1	—	—	—
Relapse	1	—	—	—	1
Mastoiditis	—	—	—	—	—
Nephritis	—	1	1	—	1
Abscess	1	—	—	—	—
Vaginitis	—	—	—	1	—
Rheumatism ..	—	—	—	1	2
Albuminuria ..	—	—	—	—	1

This table is exclusive of complications found to be due to a different type of hæmolytic streptococcus to that found in the primary infection.

Tables II. and III. indicate that types 1, 2, and 3 resemble each other in producing the most severe initial symptoms of scarlet fever, type 4 the mildest, while the inagglutinable group occupies an intermediate position. Type 2 appears to be the most likely to produce complications, type 4 the least, type 3 more than type 1. The inagglutinable group varies from frequent to low incidence of complications. These results confirm those of Gunn. When, however, it is remembered that 53·9 per cent. of the hæmolytic streptococci in our series, and 34 per cent. in Gunn's series were not typeable, it is obvious that it is unsound to base any final conclusion on these figures. In addition, it should be noted (1) that the numbers dealt with are small, and (2) that more complications would be present if those due to a different type of organism to that in the primary infection were included. In 24 cases where hæmolytic streptococci were found in the throat on admission, they were found also in the complication. The hæmolytic streptococcus in the primary infection and in the complication were apparently the same in 14 complicated cases, although in six of the cases the streptococcus, either from the fauces on admission or from the complication, was not typeable. The complications which occurred in the 14 cases were: relapse (1); rhinitis (3); abscesses (3); puerperal fever (1); otitis (6); mastoiditis (7). The streptococcus in the primary infection and in the complication was apparently different in ten complicated cases, although it will be noted that in a number of cases the streptococcus in the complication was not typeable.

The results given in Table IV. appear to show that some complications in scarlet fever are due to reinfection with a different type of hæmolytic streptococcus to that in the primary infection. Although cross-infection with septic complications has been known for many years as an administrative problem in isolation hospitals, it is not clear that either our results or those of Gunn definitely demonstrate that such infection is always due to a streptococcus of a different type from that in the primary infection.

The inagglutinable group of hæmolytic streptococci appears to be made up of: (1) strains of hæmolytic streptococci which do not agglutinate with the type sera under any conditions, and (2) hæmolytic streptococci which under certain conditions lose or acquire the power to agglutinate the type sera. For instance, in ten cases in our series it was found that inagglutinable strains of hæmolytic streptococci on repeated subculture yielded an organism agglutinable with one of the four type sera. This fact prevents any dogmatic deductions being drawn from any statistics as to incidence of type, severity of type, or incidence of complications in relation to type. Where complications have been shown to be due to a different type of hæmolytic streptococcus, one must omit all cases belonging to the inagglutinable group, for the strain may have changed in the same patient from a typeable to a non-typeable strain, or vice versa. Although four distinct types can be differentiated by serological means, before these types are accepted as being of clinical value, further investigation is required as to (1) antigenic overlapping, and (2) interconvertability of the four types.

TABLE IV.

Type at onset of attack.	Complication.		Type at onset of attack.	Complication.	
	Nature of.	Type.		Nature of.	Type.
I.	Tonsillitis.	Inag.	III.	Rhinitis.	II.
II.	”	IV.	III. & Inag.	”	Inag.
III.	”	Inag.	IV.	”	II.
I.	Rhinitis	”	IV.	”	Inag.
II.	”	”	II.	Vaginitis.	I. & Inag.

In considering the question of complications being produced by reinfection with a different type of hæmolytic streptococcus, one has to consider also the possibility of the original infection being caused by more than one type of hæmolytic streptococcus, although only one type has been found by the methods used. The same problem exists as in the investigation of the virulence of diphtheria bacilli, where non-virulent and virulent colonies may be present. If the investigator happens only to subculture the one type of colony, an erroneous result is obtained.

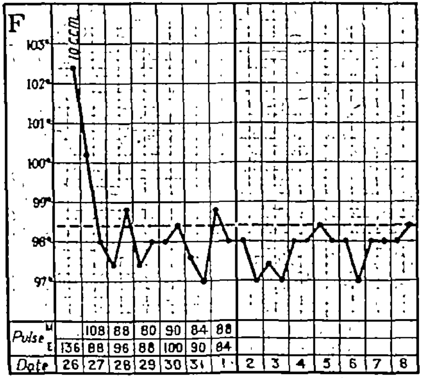
Gunn[6] has stated that in a series of non-serum treated cases, failure to acquire complete immunity was never found in patients infected by hæmolytic streptococci of the types 1, 2, and 3. We found that, including all sizes of reaction, cases which were infected with types 1, 2, or 3 gave the least number of positive Dick results during convalescence, and those with type 4 the greatest number. We analysed the results of the bacteriological examination of 29 cases admitted from 14 families. These showed type 2 in three families, type 4 in one family and inagglutinable streptococci in four families, while in six families, one or more members showed one of the four types, while the other member had an inagglutinable strain.

Gunn and Griffith[7] have stated that, although 55 patients in their series were discharged from hospital "carrying" hæmolytic streptococci, as far as could be ascertained none of these gave rise to any return cases. In the Ilford cases, however, hæmolytic streptococci were found in five patients, examined at various periods from 11 to 21 days after their discharge from hospital, who had given rise to eight return cases in their own families. Of these five patients, three showed inagglutinable streptococci, one showed type 2, and one type 3, while the fifth showed a mixture of inagglutinable streptococci with type 4. We were only able to obtain positive results in three of the return cases. (In one of these, the infecting case had inagglutinable streptococci, while the two return cases both had inagglutinable streptococci. In the other case, while the infecting case had inagglutinable streptococci, the return case showed type 2 hæmolytic streptococci.)

Effects of Serum Treatment.

Since April, 1926, all cases of scarlet fever admitted to the Ilford Isolation Hospital have been treated with scarlatinal antitoxic serum. Every case was given antitoxin as a routine measure because: (1) as scarlet fever antitoxin is a specific remedy it should be of value in every case of disease due to the specific organism, and (2) mild cases of scarlet fever may yet develop severe complications, and it is only by administering the serum to all cases that such complications may be avoided.

The series which we describe comprises 670 consecutive admissions. Only concentrated serum was used, and the routine dose was 10 c.cm., injected intramuscularly. Repeated doses were given in 7 per cent. of cases. Intravenous administration was not used as a routine measure because it was considered unjustifiable to expose young children to a possible fatal therapeutic risk in a disease which at the present time is usually non-fatal. Our policy in this respect is confirmed by Toomey and Dolch,[8] who had three deaths with anaphylactic symptoms out of 40 patients injected intravenously, and also by the series of 404 cases treated intravenously by Banks and Mackenzie,[9] where one death with anaphylactic symptoms resulted. We are of the opinion that intravenous therapy should be reserved for toxic cases. In our cases the intramuscular administration of serum was attended by no ill-effects.



Temperature chart of a female patient aged 27, admitted to hospital with scarlet fever on first day of rash, showing critical fall of temperature after injection of 10·0 c.cm. of antiscarlatinal serum. In this case the infecting organism was a streptococcus of type 2.

A serum rash occurred in 24·5 per cent. of the cases. It caused very little inconvenience, and was usually accompanied by no rise in temperature. No other symptoms of serum sickness were observed. Of 27 cases desensitised owing to a previous history of administration of serum, 14 developed a serum rash with no other symptoms. In all our cases we administered calcium salts, as suggested by Rolleston,[10] and although it is impossible to give any statistical evidence, our opinion is that they reduced the incidence of severe serum sickness. (We observed, for instance, in the diphtheria ward that when the administration of calcium salts was discontinued for a time, serum rashes were much more severe and accompanied by more constitutional disturbance.) The effect on the patient of the administration of the serum was in all cases very marked. The temperature fell to normal by crisis in over 60 per cent.; in some cases it tended to be unsettled after the fall. There was a rapid improvement in the subjective condition and relief of the faucial congestion. There appeared to be no relationship between the day of the disease on which the serum was given and the effect on the pyrexia. Toxæmia is combated by antitoxin whether the serum is given on the first or the fifth day of the disease, but antitoxin will not repair the damage done to the tissues before administration.

It is extremely difficult to produce any satisfactory evidence of the value of scarlatinal antitoxic serum as a routine measure in all cases, as at the present time this disease is so mild. Other writers have attempted to assess it by stating (1) that the length of stay in the hospital can be shortened, (2) that the incidence of complications can be considerably reduced, and (3) that septic complications can be avoided. As the temperature becomes normal 24 to 36 hours after administration of the serum, a large proportion of the cases could be discharged within a fortnight or less, and if this were done (as by Banks and Mackenzie),[9] the number of complications which would occur in hospital would be very considerably reduced. Unless, however, all the cases were systematically followed up for some weeks after their discharge from hospital, no true indication of the number of complications could be obtained. The early discharge of patients suffering from scarlet fever has the advantage of minimising the risks of cross-infection, and all complications arising from this cause. In our own series, mild uncomplicated cases were usually discharged after 28 days, while complicated cases averaged a stay in hospital of seven to eight weeks. It is impossible to quote any figures which would be of use in illustrating the value of scarlatinal antitoxic serum in reducing the length of stay in hospital, as many mild non-serum treated cases of scarlet fever which are uncomplicated could be discharged after 28 days or even before. We can only give the opinion that with the routine use of antiscarlatinal serum the number of such patients is considerably increased.

In assessing the incidence of complications, the selection of "control" cases is most important, and constitutes a very difficult and almost an insoluble problem. Alternate cases used as controls are open to the objection that the control may be milder or more severe than the treated case. A chosen series of cases for many years is also of no value, as the type may be milder and the complications different in different years. A good example of the variation of one complication in different epidemics is given by the late C. B. Ker.[11] In 15,210 cases comprising three series, the percentage incidence of nephritis was 11·0, 5·04, and 8·75 respectively. Tables IVA. and V. show the variation in the incidence of complications in our own cases, (*a*) taking the first 500 and comparing them with the following 170, and (*b*) comparing the first 18 months with the second 13 months.

TABLE IVA.—*Serum-treated Cases.*

First 500 cases	(per cent.)	Following 170 cases (per cent.)
Adenitis ..	.. 13·2	10·0
Otitis ..	.. 5·6	7·0
Nephritis	.. 1·5	0·58
Relapse ..	.. 4·8	—

TABLE V.—*Serum-treated Cases.*

April to Sept., 1927. 18 months.		Sept., 1927, to Oct., 1928. 13 months.
No. of cases	301.	No. of cases 369.
	per cent.	per cent.
Adenitis	7·6	10·2
Otitis	4·0	7·6
Mastoiditis..	0	1·3
Albuminuria (including nephritis)	3·3	3·3
Nephritis	2·3	2·15
Rheumatism	1·6	1·9
Relapse	4·3	2·7
Total ..	23·1	35·15

In a review of the literature on this subject, J. A. Toomey[12] very rightly attacks the whole question of inadequate control, and emphasises the importance of the great factor of variability in scarlet fever. It is not possible to include all the incidental, accidental, and variable factors necessary to select true "control" cases in scarlet fever. Such an accidental factor as crowding of wards in epidemics, leading to an increase in the number of complications, does not appear in published statistics relating to complications. At the Ilford Isolation Hospital during the period under review, 33 per cent. of the cases developed complications, as shown in Table VI.

TABLE VI.—*Complications in 670 Serum-treated Cases of Scarlet Fever.*

Nature of complications.	Cases and per cent.	Nature of complications.	Cases and per cent.
Adenitis	83 (12·4)	Suppurative adenitis	5 (0·7)
Albuminuria: Total (including nephritis)	22 (3·29)	Mastoiditis	5 (0·7)
Nephritis	15 (2·2)	Pneumonia and broncho-pneumonia	2 (0·3)
Otitis..	40 (6·0)	Pharyngeal abscess..	1 (0·15)
Rheumatism ..	12 (1·8)	Bronchitis	2 (0·3)
Relapse	23 (3·2)	Pyelitis	1 (0·15)
Rhinitis	58 (8·7)	Abscesses	2 (0·3)
Tonsillitis— Total	19 (2·8)	Peritonitis (and puerperal sepsis) ..	1 (0·15)
Suppurative ..	6 (0·9)	Vaginitis	3 (0·45)
Paronychia	28 (4·2)		

Mortality = 0·45 per cent. (exclusive of 1 case of puerperal fever).

Day of disease = day of rash.

Table exclusive of rhinitis, adenitis, and albuminuria at onset, and of complications following relapse.

Only one toxic case was treated and, although improvement was manifested for a time after large doses of scarlet fever antitoxin (180 c.cm. being given within three days) the patient succumbed from lobar pneumonia. A second death occurred in a woman admitted suffering from scarlet fever and puerperal fever. Inagglutinable hæmolytic streptococci were present in the throat and uterine cervix. The patient died after an operation for peritonitis.

Friedemann and Deicher[13] found hæmolytic streptococci in the pus of septic complications but not in the desquamation nor in the urine. Our own results confirm this, as hæmolytic streptococci were found in the nose, throat, and in the pus of septic complications, but not in the urine in cases of nephritis. It will be noted that, although antitoxic serum was administered on admission, yet suppurative complications occurred. These included 40 cases of otitis media, 6 of suppurative tonsillitis, 4 of suppurative adenitis, 1 of suppurative adenitis followed by pharyngeal abscess, 2 of other abscesses, 3 of vaginitis, 28 of onychia, and 5 of mastoiditis. The cases of mastoiditis we have grouped in Table VII., and have included 4 cases of mastoiditis which occurred in 1929.

TABLE VII.

Day of adminis. of antitoxin.	Dose of antitoxin.	Day of onset of otitis.	Dick test.	Day of onset of mastoiditis.	Type of hæm. strep.		
					Fauces on admission.	Pus from ear.	Pus from mastoid.
2	10	7	Neg.	14	Inag.	Neg.	Neg.
16	15	16	Pos.	30	III.	III.	III.
2	20	6	,,	35	Inag.	Inag.	Neg.
1	10	39	,,	54	,,	,,	Inag.
2	10	1	Neg.	51	Neg.	Neg.	Neg.
2 to 5	60	4	,,	5	III.	Staph.	III.
2 to 3	30	4	,,	5	II.	II.	II.
1	10	32	,,	35	I.	I.	I.
2	10	14	,,	42	III., I., & II.	Neg.	Inag.

It will be observed from this table: (1) that the early administration of serum did not prevent the development of otitis media nor of mastoiditis; (2) that repeated doses of serum did not prevent the early onset of mastoiditis; (3) that the Dick test was negative six times out of nine when mastoiditis developed; (it was also negative six times out of seven at the onset of otitis media); (4) that the type of hæmolytic streptococcus when found was the same in the throat, ear, and mastoid. Apparently, therefore, routine treatment of cases of scarlet fever with antitoxin will not prevent suppurative complications. It is probable that in such cases the streptococcus has invaded the tissue and the antibacterial action of the serum is not sufficient to combat it. Ten of the 15 cases of nephritis occurred within the usual period, the second to the fourth week, while five were met with later. Thus the appearance of this complication is not delayed by treatment with antitoxin. Two cases of nephritis following relapses are not included in the total. Nephritis was rarely accompanied by pyrexia unless another complication was present at the same time—for example, adenitis. Œdema was limited to the eyelids. Neither diet, period of rest in bed, nor initial severity of the disease could be designated as causes of the nephritis. Incidentally, there appears to be no reason why scarlet fever patients should not receive adequate diet and get up as soon as their local and general conditions permit. It is doubtful whether repeated doses of serum would prevent nephritis. All we can say is that only one case out of over 200 has developed this complication since repeated doses of serum were used more widely. The Dick test was usually negative at the time of the clinical manifestation of the kidney condition, showing that uncombated toxæmia was not occurring in the body at that time. The following questions arise: when and how are the kidneys damaged? why are some cases singled out? and why does the incidence of nephritis vary so much in different years? It seems that in some individuals either (1) the glomeruli of the kidneys are very susceptible to damage by scarlet fever toxin, or (2) they are unable to secrete toxin at the ordinary rate, or (3) their kidney cells are unable to recover from toxic action, or (4) there is another factor present in addition to the initial toxæmia—e.g., acidosis. This is believed to be the cause of the condition by Berry[15] and Carter.[16] An acute recrudescence of nephritis in hospital appears to be rare.

Case No. 55/28, aged 6¼ years, was admitted on the first day of a typical scarlet fever ordinary attack. 10 c.cm. of antitoxin were given and type 3 *S. scarlatinæ* found in faucial swab. On the 8th day he developed cervical adenitis, on the 13th day tonsillitis, and on the 14th day nephritis, which cleared up after 12 days. On the 60th day the patient was up in ward; on the 70th day he had rhinitis with a *S. scarlatinæ*, type 2. On the 83rd day he developed nephritis, but with no streptococci in the urine. He recovered.

Immunity in Convalescence.

We have previously expressed our view on the effect of scarlatinal serum in increasing the number of Dick-positive reactors during convalescence in scarlet fever.[17] This has since been confirmed by Brown.[18] We also considered this question in relation to the incidence of relapses. Table IV. shows that, whereas in the first 500 cases in which no special precautions were taken the relapse rate was 4·6 per cent., no relapse occurred in the last 170 cases when the precautions mentioned in our previous article were taken. As in the cases described by Griffith and Gunn,[7] the relapses occurred in Dick-positive cases. Unfortunately in only one of the relapses were we able to obtain hæmolytic streptococci in the fauces, both in the primary infection and in the relapse, and in this case the organism, in both instances, was inagglutinable.

D. S. Sutherland[19] has reported on the value of the active immunisation with scarlet fever toxin of Dick-positive reactors convalescent from scarlet fever. This method was tried by us in 56 cases which gave a Dick-positive result at the end of the third week of disease. Of these cases one showed hæmolytic streptococci on admission to hospital and three had mixed types of streptococci; of the remaining 53, 26 (49 per cent.)

were converted from Dick-positive to Dick-negative reactors before their discharge. The average dosage of scarlet fever prophylactic employed was 500, 1000, 2000, 2500, 3750, and 5000 units at weekly intervals. Some of the cases remained in hospital only two weeks from the time of the first dose. These might have been converted if they had had the full course. Nineteen cases were converted to negative after one dose in seven days; one case after two doses in 14 days; three cases after fourteen doses in 21 days, and of the remaining three cases, one was converted after nine doses in 70 days. (This was a case of mastoiditis which had been operated upon.) The Dick-positive reaction became fainter with succeeding doses of the prophylactic. The classification of the cases according to the type of organism concerned is given in the following table.

Type.	I.	II.	III.	IV.	Inag.	Total.
Converted.. ..	3	4	1	1	17	26
Not converted ..	2	2	1	3	19	27

Little can be deduced from this table owing to the small figures, but the cases infected with type 4 appear to be less readily rendered immune than those infected by other types. Twenty-one of the cases had or developed complications; 47·9 per cent. of these were converted. Two of type 4 complicated cases were not converted. We have formed the opinion that, although it is possible to convert convalescent patients who are Dick-positive reactors to Dick-negative reactors by a course of injections of scarlatinal toxin, yet the proportion of cases so converted within a short period of time is insufficient to be of administrative value—that is, it is not of value for the prevention of reinfection during the further stay in hospital. We consider that the more practical method is either to isolate such cases or to immunise them passively after desensitisation with antiscarlatinal serum.

The Effect of Serum Treatment on Complications.

Although we do not suggest that it is in any way an adequate control, we have compared in Table VIII. the percentage of complications in 517 consecutive cases admitted during 1922–25 with our present series.

TABLE VIII.—*Ilford Isolation Hospital.*

—	April, 1926–October, 1928.	1922–1925.
	Serum-treated 670 cases (per cent.)	Non-serum treated 517 cases (per cent.)
Adenitis	12·4	21·8
Albuminuria ..	3·20	8·7
Otitis	6·0	9·7
Rheumatism ..	1·8	5·8
Total percentage..	23·40	46·0

The control is of some value in that our present series consists of cases occurring during an epidemic period when scarlet fever was of a severer type than in the preceding three years. It will be noticed that the reduction in the incidence of complications is most marked in rheumatism, a toxic condition, and least marked in otitis, a septic condition. After a careful scrutiny of the 223 complicated cases we have not been able to establish the thesis that the day of disease on which serum is given influences the incidence and day of onset of complications in scarlet fever. This work does not support the view advanced by McLachlan and Hunter,[10] Scott,[11] and Craig,[12] that the earlier the serum is given the less the incidence of complications. In our opinion there are other factors determining whether a case will be a complicated one or not. Possibly it is not a question of "days" after the appearance of the rash, but the period prior to the exanthem or at its actual onset when the streptococcus is enabled to penetrate before antibacterial resistance is developed. Table IX. is an analysis of the complications with the day on which the serum was given and the number of times the complication occurred.

TABLE IX.

Day serum given.	Suppurative adenitis.	Rhinitis.	Otitis.	Nephritis.		Rheumatism.		Relapse.	Tonsillitis.	Supp. tons.	Onychia.	Mastoiditis.	Pneumonia.	Pharyngeal abscess.
				2–4 weeks.	Later.	Early.	Late.							
1st	3	10	12	3	—	2	3	3	3	—	8	1	1	1
2nd	—	21	13	—	1	2	—	13	6	1	10	3	1	—
3rd	1	9	7	4	—	—	1	4	3	3	6	—	—	—
4th	1	5	2	1	1	2	2	3	1	1	1	—	—	—
5th and over.	—	4	6	2	3	—	—	—	2	1	3	1	—	—

A suggestion has been made that complications in cases of scarlet fever are delayed and not prevented by the use of scarlatinal antitoxin.[14] The administrative procedure as regards routine day of discharge from hospital will influence the number of delayed complications. In some hospitals all clean cases are discharged at the end of four weeks or before; in others not until the sixth week. Therefore any complication arising in hospital in a previously uncomplicated case after the twenty-eighth day might be classified as a delayed complication. McLachlan and Hunter[10] in serum-treated cases have recorded 3·75 per cent. with complications (excluding debility) occurring primarily after discharge from hospital; in addition, 6·6 per cent. recurring after discharge from hospital, a total of 10·35 per cent.

In a series of 500 non-serum treated cases followed up at Bristol, 12 per cent. of cases suffered from complications after discharge from hospital.[14] The fallacy in collections of figures of this kind is that—apart from cases actually seen by a medical practitioner after discharge—the report is based on the history given by patients or parents. Even so, our series of serum-treated cases does not compare unfavourably with non-serum treated ones. 557 of the serum-treated cases discharged from the Ilford Isolation Hospital were investigated (313 by medical officers and 244 by sanitary inspectors). 10 per cent. of the cases developed complications after discharge, of which 2 per cent. were recurrences of conditions arising in hospital.

Number of Times Complications Occurred.

Rhinitis	21	Pleurisy	1
Otitis	11	Heart	3
Rheumatism	7	Chorea	1
Nephritis	4	Onychia	2
Adenitis	2		

After relapses in hospital two cases had recurrence of rhinitis; one developed a primary otitis and one a primary otitis and nephritis, one endocarditis, and one rheumatic fever after discharge. The figures exclude anæmia and debility.

Results and Conclusions.

1. Out of 265 cases, 191 or 70 per cent., on admission showed hæmolytic streptococci in their fauces.

2. Of the hæmolytic streptococci in the above series, 46·1 per cent. of the cases could be classified under one of Griffiths' groups, the remaining 53·9 per cent. being inagglutinable with the type sera. Certain of these strains became agglutinable on repeated subculture.

3. In view of the large percentage of inagglutinable hæmolytic streptococci, it is impossible accurately to correlate the type of streptococcus with the clinical type of scarlet fever. As far as our present knowledge

goes, however, type 4 appears to be the least virulent, and type 2 the most virulent of the typeable streptococci.

4. In 24 complications a hæmolytic streptococcus was found both in the fauces and at the site of the complication; in ten cases the type was different in the latter to the former. This appears to indicate cross-infection with a different type of streptococcus. In view of the presence of inagglutinable strains of streptococci and the possibility of an original mixed infection, no dogmatic statement can be made at present.

5. The results of routine treatment of cases of scarlet fever with antiscarlatinal serum are good, but do not compare with the use of antidiphtheritic serum in diphtheria. Our experience does not bear out the statement of Toomey and Dolch[8] that serum sickness is usually more severe than the disease itself. Such evidence as we have at our disposal indicates that antiscarlatinal serum markedly reduced the number of toxic complications. It also reduces the number of septic complications, but not so markedly. It does not delay the onset of complications.

6. Modern investigations show (*a*) that there is a considerable proportion of Dick-positive reactors in convalescent scarlet fever patients, (*b*) that the number is increased in cases treated with antiscarlatinal serum, (*c*) that there is a certain amount of evidence that cross-infection with different types of hæmolytic streptococci occurs, (*d*) that hæmolytic streptococci persist longer in the throats of patients nursed in hospital than they do in cases nursed at home.[23] We are of the opinion that the present system of nursing scarlet fever patients in general wards will ultimately have to be discontinued, and, if such patients have to be removed to hospital, they will require to be treated in cubicle wards at least until their immunity and—when our knowledge is a little more advanced—their type of infection can be accurately determined.

7. The active immunisation of convalescent scarlet fever patients who are Dick-positive with scarlatinal toxin is not a satisfactory solution of the administrative problem of dealing with such cases.

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QUEEN'S HOSPITAL FOR CHILDREN.—This hospital of 134 beds last year received 1818 in-patients. Their average stay was 24 days and their cost £11 1*s.*; the 32,708 new out-patients cost 5*s.* 8*d.* each. The Bexhill Home received 183 in-patients at a cost of £18 14*s.* 10*d.* each. The hospital has an arrangement with the London County Council for the dental treatment of school-children, and is one of the largest centres in London for such cases. Towards the income of £33,514 patients contributed £5927, but there was a deficit of £722.

Clinical and Laboratory Notes.

DIAGNOSIS AND TREATMENT OF ANÆMIA IN SCHOOL-CHILDREN.

WITH SPECIAL REFERENCE TO THE HÆMOGLOBIN CONTENT OF THE BLOOD.

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THIS investigation was begun in January, 1928. At first nothing more was done than to record on the medical card of each child the hæmoglobin content of the blood on admission and on discharge from the open-air school. The great majority of children admitted to this open-air school belong to that group of subnormal physical health usually labelled "malnutrition and anæmia," or "pretuberculous," and there are thus few definite physical signs other than pallor, perhaps palpable cervical glands, and anatomical unfitness in weight or build, together with a history either of recurrent illness, often vague in character, or of living or having lived in association with a relative suffering from tuberculosis. Often a combination of these facts is reported.

To estimate the hæmoglobin von Fleischl's hæmometer was used. In order to compare the figures with those of other investigators the apparatus was tested against Haldane's hæmoglobinometer, which appears to be the most commonly employed, but which could not be used in this experiment as there is no coal-gas at the school. Ten persons were tested by both methods and, excluding three cases where there was recognisable technical error—viz., in completely filling the Haldane capillary tube—the results were: four cases gave identical readings; two cases gave readings 2½ per cent. higher with von Fleischl's apparatus; and one case gave a reading 1¼ per cent. higher with von Fleischl's apparatus.

If a reading on von Fleischl's apparatus were (e.g.) above 50 but below 55 it was called 52½. Thus the results indicate that the two methods give closely related values. A dark room and an electric lamp of the same power were always used with von Fleischl's apparatus.

The Normal Hæmoglobin Percentage.

Some difficulty is felt in deciding what the normal percentage of hæmoglobin is in a "healthy" child. S. C. Dyke[1] has stated that "whatever method of estimating hæmoglobin is used the percentage in normal people (evidently adults) is below 100." He goes on to say that 80 to 105 may be regarded as being within normal limits, 60 to 80 as showing anæmia, and that figures below 60 indicate need for treatment.

In the course of the present inquiry the hæmoglobin was estimated in 45 children who were said to be "well"—i.e., they were not receiving medical attention and were attending regularly an elementary school in the centre of the town. Table I. gives the figures in this control group and in the first group of 55 children examined at the open-air school. The latter when tested had already been in the open-air

TABLE I.

Hæmoglobin (per cent.).	Control group (No.).	45 children (per cent.).	Open-air school group (No.).	55 children (per cent.).
Below 40	0	—	0	—
40– 50	1	2·2	1	1·8
51– 60	3	6·6	10	18·0
61– 70	11	24·4	23	41·8
71– 80	12	26·6	11	20·0
81– 90	13	28·8	8	14·5
91–100	3	6·6	0	—
101–105	2	4·4	0	—
106–110	0	—	1	1·8
111–115	0	—	1	1·8
116–120	0	—	0	—
Total	45	99·6	55	99·7

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[1] Dyke, S. C.: THE LANCET, 1928, ii., 936.

school for about three months. Both groups are composed of approximately equal numbers of boys and girls, and the ages are similar.

This table shows that in the control group the majority (36 children) give hæmoglobin estimations between 61 per cent. and 90 per cent., while in the open-air school group the majority of the children (44) give estimations between 51 per cent. and 80 per cent. —i.e., the subnormal group of children have hæmoglobin values about 10 per cent. lower than those of the healthy children. Again it is evident that whereas in the control group 32·2 per cent. of the children give readings of 70 per cent. or lower and 66·4 per cent. higher readings, almost exactly the reverse is true for the open-air school-children, since 61·6 per cent. of these children give readings of 70 per cent. or lower and 38·1 per cent. only give higher readings. This suggests that the line of demarcation between health and ill-health might be placed at about 70 per cent.

Results of Attendance at Open-air School.

By Easter, 1929—at the end of four terms during which this work has been carried out—it was observed that between 50 and 60 per cent. of all the children admitted to the open-air school gave a higher hæmoglobin value, whatever their original figure, when tested before discharge from the school. Table II. gives the details for the first 55 children who were discharged; they are the same children as in the first table.

TABLE II.

Hæmoglobin estimation.	No. of children.	Per cent.
Increased	31	56·3
Unchanged	6	10·9
Decreased	18	32·7
Total	55	99·9

This percentage of improvement remained fairly constant for the children who were discharged each term, although the time spent in the school varied in individual cases by as much as one year. It is a day open-air school where the children remain from 9 A.M. until 4.30 P.M. in winter and 5.30 P.M. in summer; dinner and tea are provided, also milk at 10.15 A.M. It should be noted that all the children improve in physical fitness as judged by improved general appearance and increased muscle tone, appetite, weight, and activity.

Result of Administering Iron.

As the result of dissatisfaction with the relatively low improvement rate in the children's hæmoglobin values, it was decided to administer iron, following the lines of the work done by Dr. Helen Mackay,[1] adopting provisionally as normal the figures 80 per cent. to 105 per cent. The children to whom iron was to be given were selected as follows: Eighteen children were picked out by the school nurse as not having improved in general condition, in her opinion, in spite of fairly regular attendance for between 6 and 12 months. All but 4 of these gave hæmoglobin figures under 80 per cent., but 11 (61 per cent.) gave a higher reading than on admission, thus falling in with the improvement percentage found each term in the children discharged. The 14 children with hæmoglobin values below 80 per cent. were given iron, and are known as the "special" treated group. Of 82 other children in the school at that time, 51 had hæmoglobin values under 80 per cent.; the first 25 in alphabetical order of this 51 were given iron and the remaining 26 were not given iron, in order to form a control group. In all, 39 children received iron.

The mixture given was iron and ammonium citrate in chloroform water. The selected children were given two doses daily after meals, those over 10 years of age receiving a total of grs. 15 daily and those under 10 a total of grs. 7½ daily. This medicine was given five days weekly for ten weeks. There were a few complaints of constipation but none of indigestion. Clinically there was no striking improvement in the colour of skin or mucous membrane.

The results, which are surprising in view of Dr. Mackay's work, are given in Table III. Only 33 of the original 39 who were given iron were available for the final estimation, and the control group also became smaller in number owing, in both groups, to absence from school during the period of experiment.

TABLE III.

Hæmoglobin estimation.	"Special" treated group.		Unselected treated group.		Control group.	
	No.	Per cent.	No.	Per cent.	No.	Per cent.
Increased	1	8·3	6	28·5	5	29·4
Unchanged	4	33·3	3	14·3	4	23·5
Decreased	7	58·3	12	57·1	8	47·1
Total	12	99·9	21	99·9	17	100·0

The numbers are small but clearly indicate that iron administered as described has had no significant effect on the hæmoglobin content of the blood in subnormal children, most of whom are pallid and debilitated, are described by clinical observers as "anæmic," and give a confirmatory reading on von Fleischl's hæmometer. This result contrasts strikingly with the observation that between 50 and 60 per cent. of the children admitted to the open-air school give a higher hæmoglobin estimation on discharge than on admission without being given an iron tonic.

Summary.

1. Hæmoglobin estimations were made in children on admission and on discharge from an open-air school.
2. The apparatus used to estimate the hæmoglobin was von Fleischl's hæmometer, which was compared with Haldane's hæmoglobinometer, and the difference in the figures given by the two instruments was found to be small.
3. A number of healthy children were tested to try to find the "normal" hæmoglobin value in children.
4. It was observed that between 50 and 60 per cent. of the children gave higher hæmoglobin readings on discharge than on admission to the open-air school.
5. Iron was administered in an attempt to obtain a higher number of increased hæmoglobin estimations. The effect was negligible.

These observations were made and published with the approval of Dr. R. M. F. Picken, medical officer of health.

THE ACTION OF EPHEDRINE IN RELIEVING CERTAIN PAINFUL ACCOMPANIMENTS OF LEPROSY AND LEPRA REACTION.

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THE treatment of leprosy does not end with the administration of some product of hydnocarpus oil, but must take within its scope the treatment of numerous complicating factors. These complications are frequently more trying than the disease itself. It is here that ephedrine has been found useful.

The first use of ephedrine with which I wish to deal is its employment for the relief of the painful complications of lepra reaction. These are mainly, 1. Nerve pain. 2. Painful swellings of soft tissues. 3. Joint pains and headache. In previous communications to medical journals,[1,2,3] the power of ephedrine to relieve such distressing symptoms has already been demonstrated. The following illustrations afford further confirmatory evidence.

CASE 1.—An Indian male, aged 20. Advanced skin leprosy (B_2–B_3 Muir's classification). Complained of headache and pain all over the body; this was associated with fever ranging from 101°–103° F., and also with the eruption of fresh nodules on both arms. Ephedrine gr. ½ by mouth was given. Within 15 minutes pain and headache were relieved. As fever had persisted for three days 0·02 g. potassium antimony tartrate was given every other day for one week, and the temperature gradually came down to normal.

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[1] Mackay, H. M. M.: Arch. Dis. Child., 1928, iii., 117.

CASE 2.—An Indian male, aged 35. (Mixed case, $B_2.A_2$.) Complained of much fever, nerve and joint pain; gr. ¼ ephedrine in 1 drachm of water was administered. Within 15 minutes patient said the pain "had been miraculously relieved." Again pot. antim. tart. 0·02 g. was administered, and on second injection temperature returned to normal. On previous occasions patient stated he "had to suffer six weeks of fever."

CASE 3.—A male, aged 14. (B_3.) Complained of local swelling and pain on right side of face associated with fever coming on 12 hours after injection of 4 c.cm. Alepol. Ephedrine gr. ¼ in 4 c.cm. of saline was injected subcutaneously. Pain disappeared almost at once and swelling subsided within 24 hours.

These cases once again illustrate that this drug has a powerful effect in alleviating some of the complications of lepra reaction. Chronic leprosy, however, brings certain painful sequelæ in its train. Therefore it was considered worth while to give ephedrine a trial. The conditions in which the drug was tried were: 1. Nerve pain of a persistent character unaccompanied by fever. 2. Burning and gnawing pains in joints of bones. The former type of pain is probably due to pressure of the contracting fibrous tissue in the nerve sheath, and therefore any relief can only be expected to be transient. The severe bone pains which occur are probably of a trophic nature. The following illustrate the result of ephedrine in such cases:—

CASE 4.—A Hindu female. (Mixed $A_1.B_1$.) Complained of constant gnawing pain in the internal cutaneous nerve of the forearm. The nerve was felt as a thick fibrous cord for about 4 inches, below the elbow. Ephedrine hydrochloride had been given orally with no relief. Half a grain of the drug in 4 c.cm. of saline was then injected underneath and along the course of the nerve. Pain diminished within half an hour, and the patient was comfortable for the next three days. About a week later pain recurred and the injection was repeated, again giving temporary relief. As the pain continued to recur, and because the nerve was so thick, an operation was considered necessary. Under a local anæsthetic about 4 inches of the medial cutaneous nerve of the forearm was exposed and freed from its sheath. The wound was then closed without drainage. The wound healed by first intention and gave permanent relief from pain up to the time of writing.

CASE 5.—A female. Advanced skin type, aged 30. (B_2.) Complained of gnawing pains along the course of the peroneal nerve, until the patient stated that she was unable to sleep. On March 3rd, 1929, gr. ½ was given orally with no relief. On March 5th gr. ½ ephedrine in 4 c.cm. saline was given subcutaneously along the course of the peroneal nerve. Pain diminished to a great extent in 20 minutes, and did not recur until March 26th. On this occasion the injection was repeated and again gave some relief. An operation would in all probability give permanent relief if patient would consent.

CASE 6.—Hindu male, aged 35. Advanced mixed case. ($B_2.A_2$.) Complained of very severe burning pains in hands and feet. Ephedrine gr. ¼ orally gave no relief. Half a grain in 4 c.cm. saline subcutaneously gave relief within half an hour and pain did not recur for several days. On a repetition of the injection pain was again relieved.

CASE 7.—Hindu male, aged 45. Advanced nerve case (A_1–A_2.) Complained of aching in bones of dorsum of foot and hand; bones were markedly tender to pressure. As the patient was strong and healthy it was decided to inject ephedrine intravenously. Because all veins except those in the dorsum of the foot had become blocked the drug was injected into this situation. Relief was marked within 15 minutes, and the tenderness and pressure disappeared. The heart's action was markedly increased in force, but not so greatly in frequency, and a systolic bruit appeared which disappeared in half an hour when the action of the drug passed away.

Conclusions.

From this short series of cases it can be concluded that ephedrine by mouth gives almost instantaneous relief in nerve pains, &c., that accompany leper fever. I could not confirm Green's[2] conclusion that it influenced the pyrexia. For apart from pot. antim. tart. I noticed no effect, and concluded that it was this drug that controlled the fever.

In pains which accompany chronic leprosy ephedrine given subcutaneously, or, if the patient is strong and healthy, intravenously, is worth a trial. For nerve pain of the type described, operation must be eventually resorted to. For bone and joint pain which is so distressing then ephedrine appears to give temporary relief, and therefore is worthy of a trial.

I have to thank Prof. B. E. Read, of Peking, for further supplies of ephedrine hydrochloride, without which this investigation could not have been undertaken.

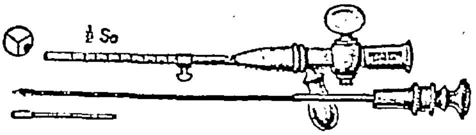
References.

1. Muir, E., and Chatterjee, S. P.: Indian Med. Gaz., 1929, lxiii., 198.
2. Green, R.: Trans. Roy. Soc. Trop. Med. and Hyg., xxii., No. 4, January, 1929.
3. Cochrane, R., and Mittra, P.: China Med. Jour., 1928, xlii., 697.

New Inventions.

A PNEUMOTHORAX INDUCTION TROCAR AND CANNULA.

IN the induction of pneumothorax with the Riviere trocar and cannula it is necessary to push the instrument down as far as the parietal pleura, withdraw the trocar, and then push the blunt cannula through the membrane into the potential pleural space. This method is advocated in order to avoid damage to the underlying lung. In practice we have found that it is unsatisfactory because considerable pressure is required to push the cannula through the membrane; the parietal pleura tends to be stripped off the ribs and there is a possibility of damage to the pleura and subsequent pleural shock. Further, if the pleura is not sufficiently anæsthetised the procedure causes a considerable degree of pain. We have found that the best way to use the Riviere induction needle is to penetrate the parietal pleura with the sharp trocar which is then withdrawn. If the end of the cannula is in the pleural space, the manometer shows wide negative respiratory fluctuations. If not, the trocar has to be reinserted and further search for the pleural space ensues. The disadvantages of this method are: (1) if the end of the trocar projects much beyond the end of the cannula there is a possibility of piercing the lung; and (2) it is necessary to withdraw the trocar in order to see the manometric fluctuations. In order to overcome these difficulties, we have modified the Riviere induction trocar, as will be seen from the figure: (a) The point of the trocar is made to project as little as possible beyond the end of the cannula. (b) The trocar is grooved from its point to where the shaft is seen to be narrowed. The narrowing of the shaft is continued as far as where it corresponds to the cannula's side projection to which is attached the rubber tubing going to the manometer and the air reservoir. (c) The cannula does not have the lateral aperture which is a feature of the Riviere needle. The result of these modifications is that there is a continuous air space from the point of the needle to the manometer. Manometric fluctuations are set up as soon as the point of the needle enters the pleural space. The very short point of the needle practically precludes the possibility of damage to the lung. If necessary, air can be injected without withdrawing the trocar. The abolition of the lateral aperture does away with the possibility of air being injected at the same time into the tissues of the chest wall.



The instrument has been made for us by Messrs. Down Brothers, St. Thomas's-street, London.

A. I. GRANVILLE MCLAUGHLIN, M.B.
A. J. DIX-PERKIN, M.B.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 501.)

SECTION OF NEUROLOGY.

THE EPILEPSIES.

Dr. JUDSON BURY (Manchester) presiding, Dr. S. A. KINNIER WILSON (London) opened the discussion with a paper entitled Some Aspects of the Problem of the Epilepsies. He said he was under no delusion as to the complexity and intricacy of the subject. Were epilepsy not so involved a problem it would long ago have received at least a working interpretation, but the truth was that the condition defeated us on many grounds; its ætiology was heterogeneous, its semiology was indeterminate, its pathology dubious, and its therapeutics empirical. For the purposes of the discussion he could only single out one or two aspects to which attention might be usefully directed. They had been chosen intentionally as best calculated to indicate the range of the problem connected with the epilepsies.

1. *Clinical Features of Epileptic States.*

The first difficulty arose from the clinical polymorphism of epileptic phenomena. A major epileptic fit, when seen, was readily diagnosed, but the epileptic state was by no means confined to major seizures. Motor, sensory, psychical, and visceral variants all existed. We had also to consider the pre-seizure and post-seizure disorders. In taking a wide and psychogenic view of the question, the *following points were to be remembered: (1) The* epileptic aura was a sensation and thus a symptom belonging to the psychical series; it was something in consciousness. Herpl had long ago emphasised the hallucinatory nature of the phenomenon. (2) Interruption of the stream of consciousness might or might not accompany epileptic manifestations. Absolute unconsciousness might supervene without aura, but many fits ran their course with conservation of consciousness. (3) The motor condition of the fit usually consisted of convulsive movements. On the other hand, the whole of the motor phenomena might consist in mere flickers of a finger and thumb, quivering facial contractions, or a momentary spasm—even the absence of movement. (4) The sensory elements of a seizure, apart from the aura symptoms, constituted the whole attack. In many instances the aura was not followed by an attack. (5) The visceral components included circulatory, respiratory, vasomotor, rectal, renal, vagal, pupillary, and other phenomena. (6) Post-seizure manifestations embraced varied sets of opposites, from sleep to fugues, stupor to combativeness, speedy recovery to prolonged fatigue. All these phenomena emphasised the heterogeneous nature of epileptic manifestations.

2. *Inheritance of Epilepsy.*

Twenty-one years of practice and hospital experience had convinced Dr. Wilson that the hereditary factor was persistently overrated and the personal, or constitutional factor, underrated. The number of cases in which no hereditary element could be traced far exceeded that in which such a factor seemed responsible. Statistics were quoted by Dr. Wilson to support this contention. He considered that it was impossible to draw any other conclusion than that direct heredity was of little moment in comparison with other inducing factors.

3. *Experimental Production of Convulsions.*

On the experimental side, normal animals could be made to develop convulsions with ease and certainty. Whatever the provenance of laboratory animals, they were also potentially capable of developing epilepsy. Study of methods revealed two main technical procedures for the production of convulsive states. These might be classed as (1) humoral, and (2) neural. These might act separately or interrelatedly.

(1) The *humoral* factor might be defined comprehensively as that component in the production of experimental epilepsy which consists in alteration of the body fluids and biochemical constituents, either mechanically or in connexion with exogenous or endogenous noxæ. Certain general conclusions recently arrived at by Lennox and Cobb showed that: (1) acidosis tended to inhibit, and alkalosis to augment seizures; (2) an increased tension of oxygen in the tissues tended to inhibit and a decreased tension to augment seizures; (3) œdema of the brain tended to increase, and dehydration to diminish seizures. Although these generalities merited attention the modes of action of the various factors had not been satisfactorily determined, and the separateness of their functions was not established. In other words, we were not in a position to say that the mechanical and the toxic components were always in essence contrasted or in their effect mutually and invariably independent.

As for the *neural* mechanism, it had been known for years that direct excitation of neural centres could result in the development of unilateral or generalised epileptic attacks.

4. *Occurrence of Convulsions in Pathological States.*

If the deductions of the experimentalist in respect of epileptic determinants were to prove of value they must be capable of substantiation from the clinical side—that is to say, there must be evidence that these, or some or other of these, played a part in the production of epileptic syndromes under pathological circumstances. Taking neural conditions first, we recognised a large number of diverse organic cerebral states in which epilepsy in one or other form made its appearance: (1) Cerebral tumours; (2) cerebral infections and toxic infections—e.g., encephalitis, syphilis; (3) cerebral toxic degenerations or scleroses (disseminated sclerosis, &c.); (4) cerebral trauma; (5) certain varieties of congenital and heredo-familial disease.

Humoral and vascular cerebral pathological conditions were: (1) disease of blood-vessels (thrombosis, arterio-sclerosis, &c.); (2) disorder of cerebral circulation (heart-block, anæmia, &c.); (3) disorder of cerebro-spinal fluid (hydrocephalus).

5. *Mechanism of Production of the Epileptic Seizure.*

The information garnered from the preceding sections could be summarised as implying the existence of three or four determinants for the production of epileptic phenomena.

1. *Mechanical Determinant.*—It had for many years been suspected, and often argued, that some connexion existed between the epileptic state and increase in amount and pressure of cerebro-spinal fluid; and the view had often been expressed that a relation could be established between the occurrence of the latter and failure in fluid absorption owing to arachnitis or other pathological local condition. Dandy, Fay, and Foerster had shown the existence of enlarged subarachnoid spaces more especially over the vertex and fronto-parietal regions; while, pathologically, subarachnoid collections of fluid, local œdemas, and such-like conditions had often been seen. Fay had recently added to our knowledge of this particular mechanism by his examination of the Pacchionian bodies in chronic epileptic brains, and had found various stages of sclerosis, calcification, atrophy, failure of development, and other abnormalities in these organs in epileptic subjects.

2. *Vascular Determinant.*—The consensus of opinion held that cerebral and general pallor or anæmia was more or less constantly visible to the eye just as the seizure commenced. This circulatory derangement or disorder was confirmed by the frequent observation of failure of the peripheral pulse at the outset, and the rarer one of constriction of retinal arteries at the

same moment. In 1903 the circulatory steps were epitomised by Hare as follows: (1) vasoconstriction; (2) cardiac inhibition (vagal); (3) sudden cerebral anæmia, causing unconsciousness and tonic spasm; (4) recommencement of the heart-beat causing rise of pressure, returning cerebral circulation, relaxation of tonic spasm, and clonic convulsions; (5) Re-establishment of blood pressure and cerebral circulation; cessation of convulsions. What was the proximate cause of the sudden initial vascular constriction? And where did it start? To the former question no satisfactory answer was as yet forthcoming. We did not know whether the vasomotor change began in the vasomotor centre of the bulb, or locally in the cerebral cortex, or distally, by way of reflex influence on the medulla or cortex.

3. *Humoral Determinant.*—The humoral or physiochemical determinant had received an immense amount of attention in recent times. Briefly, it must be considered as established that a number of conditions (hyperventilation, injections of various chemical substances, anoxæmia variously produced) caused experimentally a marked fall of O_2 tension in the tissues and were calculated to give rise to convulsions. "Contraction of cerebral vessels" remained unexplained. Lennox and Cobb, it was satisfactory to observe, were aware of the hiatus, for they admitted that "these processes are only contributory; they may be effective only in persons with a tendency to seizures, and with those having some pathology either in the brain, the body, or the emotional life."

4. *Neuronic Determinant.*—We were, therefore, brought back to the position which for some was still unassailed, that the essence of all epileptic semiology, major or minor, pre-seizure or post-seizure, psychical or visceral, was neuronic derangement, and that this derangement was of neuronic derivation. Nervous tissue could be, and was often enough, influenced by mechanical, vascular, and humoral agencies; but the secret of epilepsy—the core of the problem—resided in the qualities of the neural mechanisms exhibiting discharge.

The following considerations must be given due weight:—

1. The action of convulsants such as absinthe, producing fits in a normal animal, was much facilitated if the animal underwent any cerebral injury.
2. Single humoral or vascular factors, by themselves, were often insufficient to produce fits.
3. Only a small percentage of cases with head injuries and with histories of infective and other conditions reacted with fits.
4. The development of epilepsy in some organic brain states was in favour of a neural factor, seeing that no evidence of vascular or humoral anomalies was forthcoming in them.
5. A "susceptibility" or "tendency" could scarcely be ruled out in cases of direct heredity and of epilepsy in homologous twins.
6. The clinical occurrence of so-called reflex epilepsy strongly suggested a pure neural reaction.

It was therefore impossible to find one single common factor for the totality of epileptic manifestations, unless the significance of some inherent nervous factor, some functional propensity, was allowed. The only trouble was that at present we could not gauge "susceptibility" by reference to objective criteria.

6. *Influence on Epileptic Semiology of Other Intercurrent Affections.*

This, perhaps, deserved more attention than had hitherto been accorded it. As long ago as 1882 it was noticed by Bourneville and Bonnaire during an epidemic of measles in epileptics and idiots at the Bicêtre that while the intercurrent affection lasted fits were much decreased in force and frequency, and similar observations were recorded by Seglas.

So far as Dr. Wilson had discovered no attempt had been made by Gowers or any of the other authors mentioned to explain the way in which this influence may be, theoretically, exerted. According to Hare, however, it was the pyrexia which was of significance, for it involved general vascular relaxation, and he argued that vasodilatation was similarly of value in cutting short attacks of both asthma and migraine. Whatever the explanation, it might yet turn out to be of importance from a pathogenic and a therapeutic standpoint that epileptic manifestations were sometimes controlled by Nature's own methods.

Myoclonic and Traumatic Epilepsy.

Dr. J. J. L. MUSKENS (Amsterdam) considered that it was possible to recognise at least two definite clinical entities among the many forms and variations that epilepsy might present.

1. *Myoclonic Epilepsy.*—The condition of myoclonic epilepsy consisted of the syndrome of headache, myoclonic jerks, and myoclonic fits—i.e., fits tantamount to genuine epileptic fits—whether these symptoms appeared in rapid succession or only after a lapse of years. In some cases headache might be the only symptom followed after some years, as many as ten, by myoclonic jerks, while again, after a lapse of years, "fits" appeared. In some cases the development of the complete clinical picture was more rapid, while in others the symptoms were not all present or varied greatly in severity. It was not until work involving the experimental administration of drugs such as camphor bromide demonstrated in the cat and the dog the close relationship between the tactile and acoustic myoclonic reflex and the complete epileptic fit. In the lower animals, as in man, the myoclonic jerks and epileptic fits merged into one another, while in both there appeared the same time of selection for the appearance of fits—viz., the time of transition from sleep to wakefulness, or from wakefulness to sleep. Among some 3000 epileptics Dr. Muskens had found several cases in which simple syncope was frequent just before the appearance of the fit, and transitional states between syncope and seizure were occasionally met with.

2. *Traumatic Epilepsy in Civilian Practice.*—From this class were excluded all cases in which there was merely a history of head injury but tangible trace of such either on X ray examination or as shown by the presence of a scar. Parents and friends often recalled some head injury in an endeavour to account for the seizures. Probably only 1 in every 200 cases of epilepsy was an instance of true traumatic epilepsy. In myoclonic epilepsy of long standing the motor cortex became hyperexcitable and even in traumatic epilepsy symptoms of the "genuine" disorder (e.g., myoclonic jerks) might develop. An important question was the type of patient that developed traumatic epilepsy after a cranial injury. From a careful analysis of cases, Dr. Muskens considered that persons suffering from gastro-intestinal disturbances had a predisposition to epilepsy. The arrest of fits he believed to depend mainly on the combination of general or hygienic treatment in "genuine" epilepsy with appropriate surgical treatment in traumatic epilepsy. Exact and careful regulation of life as regards food, drink, exercise, rest, fresh air, and habit of life was necessary; and care must be taken to avoid gastro-intestinal disturbance, especially constipation. Dr. Muskens desired to protest against the custom of classifying epileptics as (1) those who reacted to luminal or bromide, and (2) those who did not. Early and incipient cases, he considered, should not be given drugs as in many cases the disorder might be checked by a definite and exact hygienic mode of life.

Epilepsy a Cerebral Disease.

Dr. Gordon Holmes (London) regretted the selection of the title "epilepsies," as he considered that the same pathological basis underlay all types of epilepsy. Epilepsy was essentially a cerebral disease and the main factor was a liability of the grey matter of the brain to discharge or react by an epileptic seizure under the influence of physiological or pathological factors. The view that epilepsy was merely a "metabolic dyscrasia" was, he considered, an hypothesis unsupported by any scientific demonstration. The absence of anatomical changes causally related to epilepsy was one of the main difficulties in understanding its nature, but the work of Foerster, Penfield, Fay, and others on the nature of local lesions that produced epileptic seizures promised to throw light on its pathology. On the other hand, it must not be forgotten that an organ might be normal in structure and abnormal in function. The most promising approach was through the systematic study of Jacksonian or local epilepsy. The positive and negative phenomena observed in local epilepsy might be seen in both the major and minor forms of the so-called idiopathic disease. Was the occurrence of the actual attack related to any definite cause? Probably the most important of these were the metabolic changes referred to by Dr. Wilson, but as far as he (Dr. Holmes) could see, the only trustworthy results were those of Lennox and Cobb—that alkalosis, anoxæmia, and excessive hydration predisposed to attacks, but they played probably only a subsidiary part by influencing the nutrition and functional activity of nervous elements predisposed to epileptic discharge.

Experimental Investigations with Thujone.

Dr. W. **RUSSELL BRAIN** (London) described certain experimental investigations with thujone—the convulsant constituent of absinthe—that he had carried *out it conjunction* with Dr. Riddoch. The thujone convulsion in the normal cat was a stereotyped reaction, with loss of consciousness, tonic and clonic elements, and involuntary micturition broods resembling an epileptic attack in man. In cats with a localised unilateral cortical lesion produced by cauterisation, the most striking feature of the thujone convulsion was a loss or reduction of the clonic element upon that side of the body opposite to the cortical lesion. The convulsions seen in the animal deprived of both cerebral hemispheres (the thalamus preparation) differed strikingly from those of the intact animal. Instead of clonic and tonic elements, there was seen a predominance of locomotor activity—running, crawling, and leaping associated with vigorous righting reactions. In the "decerebrate animal" (the upper portion of the mid-brain being removed as well as the cerebral hemispheres) the fits were predominantly tonic or postural in character, the commonest being an intensification of the prevailing extensor hypertonia. When the entire nervous system except the spinal cord was removed, the fits consisted of a riot of spinal activities—stepping, scratching, and excretory postures and movements following each other in rapid succession. When the spinal cord itself was transected in the dorsal reflex, the only response in the hind legs was increased reflex activity.

Dr. Brain regarded the majority of epileptics as possessing a constitutional predisposition to convulsions and many also exhibited a cerebral lesion which acted as a trigger to the charge. At one extreme there were *doubtless cerebral lesions gross enough to* cause convulsions in normal persons, and at the other a constitutional predisposition so marked that no trigger was required. Certain facts were accumulating regarding the hypothetical predisposition. Dr. Brain thought that the following facts were established: (1) The average blood cholesterol was lower in epileptics than in normal persons. (2) It was exceptionally low during status epilepticus and serial epilepsy. (3) It tended to be unstable in the neighbourhood of a fit. (4) In a number of cases it had been observed to precede a fit. There was also considerable evidence of some form of liver deficiency in epilepsy.

Three Classes of Epileptics.

Dr. **DONALD CORE** (Manchester) distinguished three classes of epileptic patients: (1) Persons otherwise normal who were liable to have isolated fits that symptomatically were epileptic. Such patient might never have more than one or two such attacks even in the entire absence of treatment. (2) Emotionally uncontrolled, nervous, worrying, introspective young men, patients who were continually on the verge of hyperthyroidism with its associated vasomotor instability. In these individuals the attacks were liable to occur in more or less well-defined settings—after trivial illness, slight accidents, periods of psychical stress, &c. They worried over their attacks and often enough in the free intervals they were more troubled by their non-epileptic psychical symptoms. (3) Those who showed no impairment of emotional control but rather tended towards mental dullness which varied from slight stupidity to a definite dementia. These patients were not worried by their condition unless the attacks were unusually frequent and there may be a family history of epilepsy. From the standpoint of treatment these three groups were poles apart, and what might be a proper line to follow in one might be disastrous in the others.

The first group required no treatment at all and the less they were brought into a medical atmosphere the better. Those of the second group required emphatic reassurance that the occasional occurrence of an epileptic attack had in their case no serious significance. As far as possible they should have their thoughts directed to the morbid effect of worry in their lives rather than the effect of the attacks. They should be encouraged to live their customary lives and to avoid any restriction of their pleasures and enjoyments. Such sedative treatment as might be prescribed need not be continued for any length of time. To a certain extent the same principles of treatment applied to the third group of cases but in these drug treatment was of greater though not of the greatest importance. The most important element of treatment was to prevent the patient from looking upon himself as an outcast. If the mental dullness was such as to prevent even the semblance of a useful life in home surroundings, then he should be sent into an epileptic colony where it was normal to be epileptic and where he had a certain definite routine of life.

The Emotional Factor.

Dr. E. L. **FOX** (Plymouth) mentioned the importance of recognising the psychogenic origin of idiopathic epilepsy; he considered that in studying the history of cases of epilepsy the close analogy of the emotional characteristics of the epileptic with those of the hysteric was almost invariably forthcoming. He instanced cases in which repression was apparently an important factor in the causation of epilepsy and in which the attacks ceased on the repressed incident being recalled. Dr. Fox advocated the endeavour to raise the level of the emotional standards in all epileptics so that they could more readily resist the attacks.

Sphenoidal Sinusitis and Epilepsy.

Dr. F. A. **PICKWORTH** (Birmingham) demonstrated slides of a series of four cases of epilepsy of differing duration, all of which showed evidences of sphenoidal sinusitis and *infection of the pituitary gland.* He drew attention to the large proportion of epileptics in mental hospitals, and brought forward evidence indicating that epilepsy, as well as insanity, might be due (1) to an extension of sepsis from an infected sphenoidal sinus along the course of the carotid artery producing the minute focal areas of brain necrosis found in epileptics, and (2) extension through the pituitary gland to the area of the brain immediately above it which subserves vital metabolic processes especially affected in epilepsy. He emphasised the necessity of a careful examination, hitherto much neglected, of the sphenoidal sinus and pituitary gland in necropsies of epileptics.

Diet in Epilepsy.

Dr. **TYLOR FOX** (Lingfield) briefly outlined his experience of the ketogenic diet in five cases of epilepsy. He had found this, as had American observers, to be most effective in cases of petit mal.

He expressed the hope that others who were experimenting with the diet would publish their results.

Dr. A. MACDOUGALL (Manchester) spoke of his experiences at the David Lewis Epileptic Colony as regards the general character and temperament of epileptics.

The PRESIDENT referred to the well-known influence of intercurrent maladies on epilepsy, especially the amelioration, suspension, and even cessation of seizures following measles and other diseases. If the cardinal factor in the pathology of epilepsy was an instability of the cerebral neurones, then the cessation of fits indicated that the neural mechanisms had become more stable. It seemed probable that such restoration was the result of biochemical changes rather than of vascular or other extraneural factors. Following this line of thought—viz., that there was present a perverted metabolism—the question of diet needed further investigation. Various diets had been tried and the beneficial effect of fasting in some cases had led to the adoption of a ketogenic diet. Dr. Bury had been much impressed by the results of the lævulose-tolerance test in epilepsy—indicating some definite liver deficiency, and also by the investigations on blood cholesterol. Reflecting on the pathological changes in the liver in pernicious anæmia and the wonderful results of liver treatment in that disease, the President ventured to suggest that it would be worth while supplementing the diet of epileptic patients with minced liver.

SECTION OF VENEREAL DISEASE.

LESIONS OF LATENT SYPHILIS.

Colonel W. COATES, *President of the Section*, opened the session with an address on the history of venereal disease, and the ideals which were to be aimed at in modern treatment. The section was then addressed by Prof. A. S. WARTHIN (Michigan). He said he had made a study dating from 1906 of the histological lesions of latent syphilis in relation to the presence in these lesions of the *Spirochæta pallida*. He first used the Levaditi method of staining, but later, with the aid of Dr. Starry, he perfected the Warthin-Starry method which reduced the time of staining and resulted in a greater percentage of positive spirochæte findings. His material was derived from necropsies conducted on patients drawn from the whole State of Michigan, who were chiefly of the lower middle classes in the small towns and rural districts. The percentage of syphilis in this material he found to be very high, varying in different years from 30 to 60 per cent.

According to Prof. Warthin's observations, in the *leptomeninges* the lesions of latent syphilis occur very frequently, though varying in intensity, and are usually found over the sulci of the parietal and frontal lobes. The more active lesions show localised areas of a mild proliferative process with slight infiltration of monocytes, plasma, and lymphoid cells, the milder lesions being of a more sharply localised character. Every stage of severity is found from the slight fibrosis of the meninges to the typical form of syphilitic meningitis. In the brain localised perivascular infiltrations occur, mostly in the frontal and parietal lobes; they are usually few in number and vary in intensity. Otherwise it may be said that the latent syphilitic has lesions identical with those of the paretic. In both the meninges and the brain the incidence of these lesions is greater in the male than in the female.

In Prof. Warthin's experience the *heart* of every male latent syphilitic shows latent lesions varying from small areas of infiltration to the more diffuse areas of interstitial myocarditis. Though the incidence of these cardiac lesions of latent syphilis in women is small, in some women the more severe forms of syphilitic myocarditis do occur. The part of the heart usually involved in latent syphilis is the septum and the anterior and posterior walls of the left ventricle, near the apex. The lesions are intramuscular rather than perivascular and of a diffuse character. A characteristic feature is the increase of nuclei beneath the endocardium, the cells lying in two to five rows closely crowded together. Œdema of the stroma is found, being the more marked with the more active lesions. Fibrosis of the stroma results, with fatty degeneration and atrophy of the muscle fibres, though between the patches of infiltration hypertrophic muscle fibres are often seen. The aortic valve alone is commonly involved, and this through the vasa vasorum. Macroscopically, the heart of the latent syphilitic usually shows dilatation of the left or both ventricles; there is usually no valvular lesion, except in younger subjects in whom latent syphilis appears to predispose to bacterial endocarditis. In life these cases of latent cardiac syphilis show signs of myocardial insufficiency, and the common clinical diagnosis is that of "rheumatic heart." The condition is progressive and cardiac death is frequent in the male.

Latent active lesions are to be found in the *aorta* of all male, and in the majority of female, syphilitics. The lesion is essentially a disease of the vasa vasorum, which become thickened and obliterated; the term "mesaortitis" is a misnomer. This results in a slow infarction of the intima and part of the media, with sclerosis and atrophy of the muscle and degeneration of the elastic tissue. The syphilitic character of these lesions can only be determined by microscopical examination. Syphilis of the aorta exists in three forms: with aneurysm, with aortic insufficiency, and with lesions of the vasa vasorum alone. The latter is the most common; it may be symptomless, or give the syndromes of aortalgia, or even angina pectoris. Aneurysms are generally produced by local weakening of the walls due to miliary gummata along the vasa vasorum. Spirochætes in small groups can be demonstrated by the improved starch-gelatin modification of the Warthin-Starry method.

In both sexes the *liver* is usually the seat of latent syphilitic lesions. They consist of infiltrations of the periportal tissue, leading to fibrosis and some hepatitis. All stages of severity exist up to the severest form of cirrhosis (hepar lobatum), which latter condition is more frequent in women than in men. The percentage of liver involvement appears to be on the increase, particularly in the cases which have received modern arsenical treatment. Spirochætes are more difficult to demonstrate in the liver than in any other organ, usually being found only in small numbers and in the active areas of infiltration.

Lesions of latent syphilis are common in the *pancreas* though usually mild; they take the form of an interstitial pancreatitis not arising from the ducts. The intralobular stroma is increased and the islands may become fibroid. He has found this condition the most common cause of diabetes in his diabetic cases.

In the *adrenals* latent syphilitic lesions are more severe in women than in men. In the majority of cases they do not produce signs of adrenal insufficiency, yet they may be severe enough to cause marked atrophy and fibrosis, giving a typical clinical picture of Addison's disease. The spirochætes are easily shown in the cellular infiltrations, but in small numbers.

The *testis* of every latent syphilitic shows sooner or later patches of interstitial orchitis, with atrophy of the germinal epithelium and fibrosis of the basement membrane of the tubules. An early loss of spermatogenetic function occurs in the majority of cases.

Prof. Warthin has never found a syphilitic lesion in either the *ovaries* or the *Fallopian tubes*. The spirochæte has been demonstrated in the ovary in congenital, but never in acquired, syphilis. This suggests a local tissue immunity of the organ. Lesions have been found in the endometrium of the *uterus*, extending into the uterine wall.

It is true, he said, that the latent syphilitic presents a high percentage of *pulmonary fibrosis*. Only rarely, however, can the spirochæte be demonstrated or gummata shown to be present. He had only encountered 15 cases in which the presence of pulmonary syphilis was positively proved, the majority of these cases being associated with gummatous lesions, the remainder being cases of Ayerza's disease.

In conclusion, Prof. Warthin pointed out that the lesion of latent syphilis repeats the essential pathology of the hard chancre and of the secondary and tertiary lesions of active syphilis, being predominantly vascular and perivascular, and the infiltrations being derived from the proliferation of cells in situ. He had never seen at necropsy a case of perfectly healed syphilis, a statement which was as true of cases treated in the modern manner as of cases treated by the old mercurial method; the more evident difference was the greater frequency of chronic hepatitis in cases treated by the arsenical method. What the treatment did accomplish in either case was the more rapid reduction of the average active case to a state of latency. The latency of the infection might last throughout the individual's life or at any time exacerbations might take place, and the disease rise above the clinical horizon; what determines these exacerbations was yet to be learnt. Whether a five years' period of treatment would finally rid the body of spirochætes he could not say, for no more than three years' treatment had been given to the cases from which he derived his material.

Discussion.

The discussion was opened by Sir HUMPHRY ROLLESTON, who commented on the magnificent slides which Dr. Warthin had exhibited. He asked whether the spirochætes in the slides had been proved to be the *S. pallida*. The incidence of latent syphilis would appear to be very high. Could a patient never be deemed free from syphilis until the pathologist's verdict at necropsy had been obtained? If both early and late treatment were given, could not these cases be prevented from becoming latent? What was the relation of the Wassermann reaction to latent syphilis?

Colonel L. W. HARRISON appealed for a more optimistic view than that presented by Prof. Warthin. He wondered if Dr. Warthin's cases were drawn from a highly syphilised population where old methods of treatment had been in vogue. He could not agree that the arsenical preparations were merely immunising agents; he considered them to be definitely spirochæticidal, as instanced by the rapid disappearance of certain specific lesions after even one dose of intravenous arsenic. He further understood that tissue transplantation from infected animals after they had received early arsenical treatment did not transmit the disease. He was strongly of the opinion that arsenobenzol was useful in the treatment of cardiovascular lesions, when it was skilfully exhibited.

Prof. G. LORRAIN SMITH asked whether Dr. Warthin had examined the skeletal muscles of his cases. Did the *S. pallida* act on the organism by means of a toxin or by the effects of local tissue reaction—for example, the perivascular changes?

Dr. DAVID NABARRO said that in 14 years at Great Ormond-street he had decided that the diagnosis of congenital syphilis was by no means simple. The signs were often latent, and diagnosis was particularly difficult after the first few weeks of life. He gave a comprehensive review of the clinical manifestations of congenital syphilis and showed X ray pictures revealing abnormalities in the skeleton which were not otherwise apparent.

Dr. DAVID LEES asked whether Prof. Warthin had examined any cases which had been treated with malaria. He agreed with Colonel Harrison that cardiac conditions benefited from careful treatment with arsenobenzol. Could Dr. Warthin explain the absence of the *S. pallida* in the ovaries and the tubes? He had observed that a positive W.R. generally became negative with the onset of the menopause. He further asked whether the *S. pallida* were alive or moribund in the sections which had been shown.

Dr. E. TYTLER BURKE thought that the results obtained by Dr. Warthin might be due to incomplete treatment. He was not satisfied that there had been early and persistent treatment. He thought that the amount of syphilis in this country was greatly underestimated; he put in a plea for the more adequate teaching of venereology in the medical schools and among post-graduates.

Dr. H. M. HANSCHELL stated that he had been staining slides by the Levaditi method and had found them unsatisfactory. In his experience syphilitics did not complain of early loss of sexual desire. He suggested that the word "*fenced*" be used instead of *latent* or *dormant*, indicating that the *S. pallida* in these cases was fenced by fibrosis from the drug. He recommended excision of the primary lesion (and even in some cases of accessible indurated lymphatic glands) where the condition did not clear up readily under the influence of arsenobenzol. He could not too strongly emphasise the importance of early and thorough treatment.

The PRESIDENT, in calling upon Prof. Warthin to reply, said that he had been reluctant to admit that cases of second primary infections could occur, though he had had cases which strongly suggested this phenomenon. Many years ago he had practised excision of the primary chancre, but he had come to the conclusion that this had no influence on the course of the disease.

Reply.

Prof. WARTHIN, in reply, stated that the spirochætes in question had been inoculated into rabbits with the production of typical syphilitic lesions. He reiterated that in all of his cases he had never seen a complete cure; there were latent lesions in all of them. Latent syphilis was really a high grade immunity. He concurred with the contention that arsenobenzol was spirochæticidal, but he would emphasise that its practical effect, along with other antisyphilitic remedies, was the production of immunity. He considered that a strongly positive W.R. indicated active syphilis, with certain exceptions, such as widespread malignant disease, chicken-pox, and miliary T.B. He considered that a negative W.R. was of no value whatever. He could not agree with Col. Harrison that he was a pessimist. He admitted that his cases were drawn from a highly syphilised community, but many of his cases had been treated for three years according to modern methods. He considered that it would only be useful to treat early cardiovascular conditions with arsenobenzol, since old lesions could not be cured. He had not examined the skeletal muscles of his cases. He believed that the *S. pallida* acted by local tissue reaction rather than by a toxin. He could not explain the local tissue immunity of the ovaries and tubes, though many theories had been put forward. To Dr. Lees he replied that a moribund spirochæte was always fragmentary. He did not think that extirpation of the primary chancre could make any difference to the progress of the disease. With reference to second primary infections, it was to be remembered that animals becoming immune to one strain of *S. pallida* could be infected with another strain. It was highly probable that the same results obtained in human beings.

A number of microscopical slides prepared by Prof. Warthin were open for inspection in the Pathological Museum.

SECTION OF ANÆSTHETICS.

Dr. A. L. FLEMMING (Bristol) presiding, Dr. H. P. FAIRLIE (Glasgow) read a paper on

Ethylene and Oxygen Anæsthesia.

He said that the proportion of ethylene gas to oxygen was usually about 88 per cent. ethylene to 12 per cent. oxygen, but varied according to the age and build of the patient, the condition of heart and lungs, and the nature of the operation, the oxygen percentage always being maintained at such a level as would prevent respiratory failure; more than a slight degree of cyanosis was regarded as a danger sign. If this point was remembered the anæsthetic was perfectly safe. Dr. Fairlie himself arranged for re-breathing, using the same apparatus for ethylene administration as for nitrous oxide and oxygen. As far as safety, rapid action, and immunity from ill effects were concerned ethylene and oxygen anæsthesia resembled nitrous oxide and oxygen. There were, however, two points of difference, the first being favourable to ethylene in that a deeper anæsthesia was obtained. In Dr. Fairlie's experience some cases did better with ethylene and oxygen anæsthesia than with a nitrous oxide anæsthesia. The second difference was the very disagreeable smell of ethylene gas, which affected the other occupants of the operating theatre more than the patient. He was in the habit of having his gas made up with oil of eucalyptus and had never had any complaints from the patient.

Dr. Fairlie reviewed the advantages of ethylene from the points of view of the patient, the surgeon, and the anæsthetist. The patient did not experience disagreeable sensations; he lost consciousness rapidly without showing resentment or excitement, and though vomiting occurred in about 75 per cent. of cases it was within a minute or two of the end of the administration. No unpleasant taste remained. The surgeon was satisfied with the anæsthetic in all cases except those in which much relaxation was required. The anæsthetist was provided with a safe anæsthetic with a large margin of safety, and had ample warning of any impending danger. Dr. Fairlie alluded to the inflammability of ethylene gas and the precautions necessary in using it.

The PRESIDENT asked for information on the margin of safety.

Dr. K. B. PINSON (Manchester) in his dental work had found ethylene successful in some patients where nitrous oxide had failed, and had been disappointed in the results in other patients. He advocated the use of ethylene in old and feeble patients and in those who were very ill. He suggested that its safety was due to the amount of oxygen employed, and did not consider the smell a contra-indication.

Dr. C. F. HADFIELD (London) referred to the work of Prof. H. B. Dixon and the intense importance to the anæsthetist of the flash point and ignition point of gases. The smell of ethylene gas was not due to impurities.

Dr. H. E. G. BOYLE (London) read a paper on

Gas and Oxygen in Midwifery.

He said that he had always regarded chloroform as a dangerous and toxic drug to give a woman at childbirth, and stressed the advantages of nitrous oxide and oxygen anæsthesia, which had been made familiar to him by Dr. Wesley Bourne of Montreal. He said that the patient was given nitrous oxide and oxygen with every pain and learned to ask for the mask, since the anæsthetic diminished the pain. Owing to the fact that the gas was non-toxic it could be given for a long time without harm to mother and child provided there was no cyanosis. The anæsthetist could greatly reduce the work of the obstetrician, since he need not send for him until about one hour before the child was born. Another advantage was that the patient could be completely anæsthetised if ether was added when the head was on the perineum; when the head was born the gas and ether were shut off and carbon dioxide and oxygen (1 in 6) given, with the result that the mother's respiration was increased and the child became a rosy pink and "gave tongue." The anæsthesia could be deepened again for the delivery of the placenta. Patients in his experience recovered consciousness very quickly. He cited as disadvantages the fact that a special anæsthetist who was familiar with the method had to be present, and that special apparatus had to be used; for these reasons also the cost was greater. His impression was that the pains were not slowed but were rather increased in frequency and in strength where plenty of oxygen was used, and patients were certainly less exhausted and recovered more quickly than when choloroform was used. He emphasised the importance of avoiding cyanosis.

In the discussion that followed Dr. R. C. MOTT (Burslem) said that he saw no objection to giving gas and oxygen throughout the labour. Dr. E. F. HILL (Manchester) objected to the method on the score of expense and suggested that labour pains should be mitigated by means of chloroform given with a Vernon-Harcourt inhaler.

Dr. F. P. DE CAUX (London) then read a contribution on

Glucose—Why, When, and How to use it.

as an antidote to the shock of operation and anæsthesia. He described the mechanism of its working according to Mr. J. McDonagh's theories. He advised the use of 15 to 20 units of insulin two hours after the injection of glucose.

He recommended that glucose should be given before a severe operation, when liver efficiency was suspected, when the basal metabolic rate was high, as in Graves's disease, and when the patient was emaciated or under-nourished. Glucose should always be given after operation when a blood transfusion was impossible and after any anæsthetic where the patient showed signs of shock; where glucose had not been given before; where the surgical manipulation had been rough; when more anæsthetic had been used than usual; and when there was a history of epilepsy.

A discussion followed in which Dr. FAIRLIE, Dr. HILL, and Dr. MOTT took part.

Dr. WINIFRED WOOD (Edinburgh) read a paper on

Rectal Ether Oil Anaesthesia, with Special Reference to Brain Surgery.

She had used in over 70 cases a modification of the technique devised by Dr. J. T. Gwathmey of New York, who had closely investigated the properties and the action of ether in oil. The safety of this type of anæsthesia was the reason for its employment in cases of bad surgical risk and she cited certain operations in which it had been chosen. She pointed out its application to severe and prolonged operations in brain surgery. The method had three advantages in brain surgery: (1) access to the patient's face was not necessary; (2) the dose of ether was smaller than in an inhalation anæsthesia; (3) by reason of the sleep-like quality of the anæsthesia the administrator was free to take observations on blood pressure, pulse, and respiration, which formed a valuable guide to the condition of the patient and to how far operation might proceed. She gave a brief account of the technique employed, pointing out that the procedure in general surgery and brain surgery was different owing to the fact that morphia was strongly contra-indicated in the latter. The anæsthesia produced by rectal ether was very light and might have to be supplemented by inhalation ether vapour in certain cases.

Dr. Wood discussed the action of rectal ether from the physiological aspect, referring to its slight effect on blood pressure even after many hours administration, and the relative absence of disturbance of the acid-base balance. Difficulties might arise from the pre-existing intracranial tension and the hæmorrhage during operation. With this type of anæsthesia there was generally a good convalescence with none of the complications usually ascribed to the anæsthetic. The long period of sleep after operation was an asset. Notes of brain operations on middle-aged and elderly patients which lasted from three and a half to six and a half hours were given to show the satisfactory condition of the patient during and after operation, even when hæmorrhage was so severe as to necessitate blood transfusion on the table.

Dr. S. THOMSON ROWLING (Leeds) read a paper on the

Scientific Administration of Anæsthetics

and demonstrated his modification of Clover's inhaler, along with the anæsthetic table which is designed to supply oxygen, nitrous oxide, and carbon dioxide in any percentage combination with or without chloroform vapour of definite strength. Describing the nervous, circulatory, and respiratory depressions that arise from anoxæmia, and in which apnœa plays a part, he stressed the importance of the use of oxygen and carbon dioxide together during an anæsthetic. He believed that all dangers of anæsthesia, operative and post-operative, could be prevented by the administration of an anæsthetic with this apparatus, which provided for a percentage of ether, oxygen, and carbon dioxide according to the patients' requirements. Dr. Rowling quoted cases to show the good results obtained.

Reviews and Notices of Books.

RECENT ADVANCES IN PULMONARY TUBERCULOSIS.

By L. S. T. BURRELL, M.A., M.D. Cantab., F.R.C.P. Lond., Senior Physician to the Royal Free Hospital; Physician to Brompton Hospital for Consumption and Diseases of the Chest. London: J. and A. Churchill. 1929. Pp. 217. 12*s.* 6*d.*

IN the preface of his book Dr. Burrell states that he has "tried to describe the recent increase in our knowledge of tuberculosis, and to separate the real advances in treatment from those methods which have no scientific basis, and enjoy but brief, though occasionally recurrent, phases of popularity." In this attempt he has been most successful, and his book will be read with profit not alone by those who are specially interested in diseases of the chest. It is illuminated throughout by a common sense not always exhibited by those who write on tuberculosis, and this is a virtue which will be appreciated by the general practitioner. In discussing scientific theories, Dr. Burrell knows how to compress his matter without losing the interest of his reader, and his explanations are always lucid. A chapter on radiology is illustrated by a series of skiagrams provided by Dr. Stanley Melville. These are well produced and should demonstrate the supreme value of this means of diagnosis to those whose opportunities for studying radiograms are limited. Seven of the 12 chapters are devoted to the treatment of pulmonary tuberculosis and its complications. Adequate nourishment, rest, and fresh air remain the most generally effective methods for combating the disease, and Dr. Burrell's grasp of essentials is well illustrated in his references to these. Modern methods of treatment are designed to supplement and not to supersede treatment on sanatorium lines. The uses and limitations of sanocrysin are well summarised in a short chapter which is followed by one fully describing artificial pneumothorax. In the next edition of the book the sections on operative treatment by thoracoplasty and other surgical methods might be expanded, since recent advances in thoracic surgery are noteworthy.

HANDBOOK OF PHYSIOLOGY.

Eighteenth edition. By W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S., and R. J. S. McDOWALL, M.B., D.Sc., F.R.C.P. Ed. London: John Murray. Pp. 902. 18*s.*

THOUGH the young medical student may be content to borrow from a library a large tome on anatomy and supplement it by short dissecting manuals, he usually buys his first text-book of physiology. It is therefore this work which he opens eagerly in the first evenings of October, feeling that by getting ahead of his lectures he can prepare himself to enjoy them and to take notice rather than notes of the spoken instruction. It must be confessed that his first reaction is generally one of disappointment. In the elementary form in which they are presented to the medical student, chemistry, physics, and biology seem fairly concrete and established sciences. Of the gross and minute structure of the body, too, more is apparently known with precision than he can ever hope to acquire in two years' of study. In physiology, however, when he seeks information on subjects which may interest him—for example, the meaning of sleep, the exact functions of the liver which are deranged in a "bilious attack," the mechanism of secretion of urine—he finds that these phenomena are still largely in the realm of theory. He begins to wonder how he is going to grapple with the subject, for there is nothing more difficult to remember, and especially to reproduce, than an argument involving the examination of many theories mutually contradictory and each founded on experiments which in themselves seem reasonably conclusive. It is no wonder that the student turns to the dissecting room for relief, though the relief may change to despair when he persistently fails to discover those cutaneous nerves which in the pictures protrude so convincingly through the superficial fascia. He has to learn that his days of simple acceptance of facts imparted by a teacher are over and his duty henceforward will be critically to examine and then to assimilate such knowledge as has been gained painfully by observation and experiment. It is largely through the medium of his first text-book that his attitude to physiology and ultimately to medicine will be formed, and to strike the mean between too much simplification, which will only postpone the difficulties, and too much complexity, has been the task successfully accomplished during many years of active teaching by Prof. Halliburton. It is thus a pleasure to see that this Handbook of Physiology has been reissued after four years in a renewed form. In the preparation of this eighteenth edition Prof. Halliburton has had the collaboration of Prof. McDowall who succeeded him in the chair of physiology at King's College, London. Prof. McDowall has contributed several new chapters and has rewritten others. That on the nervous system has been brought up to date and an account of postural and conditioned reflexes has been included. Sections on the autonomic nervous system, speech, the control of the circulation, carriage of carbon dioxide, maintenance of body neutrality, the vitamins, ductless glands, and intermediate metabolism are also for the most part new, while recent work on the formation of blood and the bile, on the spleen, on the control of respiration, and on test-meals, has been added. To admit all this new material anatomical detail has been reduced, but essential anatomy and histology are retained. There are now more good text-books of physiology than there were 30 years ago when Prof. Halliburton first took charge of a work which had maintained its vitality for half a century, since it originally appeared in 1848 as Kirkes's Physiology. We seen no reason why this edition should not be as popular as its many predecessors, and we trust that Prof. Halliburton's name may for long be associated with its further progress.

AMERICAN CHEMICAL SOCIETY MONOGRAPHS.

Thyroxine. By EDWARD C. KENDALL, M.S., Ph.D., D.Sc. The Mayo Foundation, Rochester, Minnesota. New York: The Chemical Catalog Company, Inc. 1929. Pp. 265. $5.50.

Biochemistry of the Amino-Acids. By H. H. MITCHELL, Professor of Animal Nutrition, College of Agriculture, University of Illinois; and T. S. HAMILTON, Associate in Animal Nutrition of the College. Same publishers. 1929. Pp. 619. $9.50.

THE appearance of Kendall's book, which was announced some years ago, has been delayed in order that the author might first bring to a conclusion his work on the constitution of thyroxin. It is mainly concerned with the chemical nature of the thyroid gland and its secretion, and forms one of the monographs issued by the American Chemical Society. In the last few months of 1914 Dr. Kendall's persistence in pursuing a long and tedious series of researches was rewarded by the isolation of a substance [illegible]
named thyroxin. Since [illegible]
the whole gland are [illegible]
stance its isolation has

only of the internal secretions, but also of the nature and regulation of life-processes in general. Dr. Kendall says in the preface: thyroxin bridges the gap between living protoplasm and the expression of what may be called personality or temperament, and has a definite place in the study of normal and abnormal mental processes.

Since the discovery by E. Baumann in 1895 of the remarkable fact that iodine was a normal constituent of the thyroid gland, attempts have been made to find a reason for the presence of this element and to determining the chemical nature of the particular compound in which it is involved. Baumann showed that acid hydrolysis gave a substance which he called thyreo-iodin or iodothyrin, which contained a very large proportion, about 10 per cent., of iodine, and which had the same action as desiccated thyroid when given to patients suffering from either hypothyroidism or from goitre. A few years later, in 1907, Nürnberg showed that the two amino-acids, tyrosine and tryptophane, were essential constituents of iodothyrin. Nürnberg used the process of digestion with barium hydroxide in the preparation of his material, and therefore in two important points he anticipated the results which Kendall and C. R. Harington were later able to achieve. Unfortunately, Nürnberg discarded the insoluble fraction resulting from the digestion, and it was this fraction, as Kendall showed later, that contained the thyroxin. The advances made in the next few years were slight, and it was not until 1914 that Kendall's researches led to the isolation of the crystalline substance from sheeps' thyroid. The author's early experiments make fascinating reading. After three years' steady work seven grammes of the compound had been accumulated from a vast quantity of the gland substance. The crystalline structure and the physical and chemical properties were described, and several derivatives were prepared. Acting on the belief that the compound was a derivative of indole, possibly from an iodised tryptophane precursor, Kendall and Osterberg suggested a probable formula which the work of Harington during the last four years has shown to be incorrect. Great credit must be given to Kendall for the modest manner in which he refers to this work. Harington, in a series of monumental researches, has shown beyond doubt that the constitution of thyroxin is really that of an iodised derivative of tyrosine and not of indole or tryptophane. The difficulty of the problem was bound up with the presence of the iodine in the organic molecule; Harington described in 1906 how he first reduced thyroxin, thus preparing the iodine-free parent substance which was eminently suitable for chemical work. In this way it was first definitely established that the iodine free compound, and hence probably thyroxin itself, was a derivative of tyrosine. Harington then synthesised the iodine-free compound, and a year later, working with G. Barger, published the synthesis of the tetra-iodo compound and proved that this substance was chemically identical with thyroxin, and also increased the basal metabolic rate to the same extent. By a remarkable coincidence Dakin had also discovered that thyroxin may be made to yield tyrosine, but on hearing of Harington's much more complete results he withdrew his manuscript from the press.

These recent advances are of such interest that they have properly occupied a great deal of the space available of this book, though they constitute only a portion of its contents. The remainder deals adequately with the influence of the thyroid gland on hypothyroidism, on the metabolism of carbohydrate nitrogen, phosphorus and calcium and on the distribution of water, on the nervous system on growth, and on the basal metabolic rate. Other sections describe the standardisation of the hormone and its influence on amphibian metamorphosis. The concluding chapters of the book describe the relation between the histological appearance and the activity of the gland, some clinical aspects of thyroid disease, and finally the effect of thyroxin on some biological oxidations. The bibliography contains 541 references.

Prof. Mitchell's work is one of the same series of monographs. The biochemistry of the amino-acids is complicated, and the authors have set themselves a difficult task. In the first place, it is not easy to draw a line between the pure chemistry and the biochemistry of the amino-acids, and wherever an author attempts to draw this line he is liable to criticism. For instance, although in the first chapter the chemical properties of the amino-acids are described in fair detail, there is practically no indication of the synthetic work that has been done in building them up into peptides. The sketchy account of this important achievement is unsatisfactory, though admittedly an adequate presentment would have taken up much space. The next chapter, dealing with the determination of amino-acids in proteins, gives a full and critical description of all the best known methods employed, with an exhaustive review of the literature of the subject. This is followed by an equally detailed section on the individual amino-acids; a series of tables give the amino-acid content of different proteins as determined by various methods, a reference being given to each figure quoted. The fourth chapter, on the liberation of the amino-acids in the intestinal tract, is followed by three chapters devoted to amino-acid metabolism. Their specific dynamic effect is next considered, and the final chapter of the book deals with the value of proteins from the point of view of nutrition.

A fine piece of work and a valuable contribution to biochemical literature.

BOOKS FOR NURSES.

Gynæcology for Nurses. Fifth edition. By COMYNS BERKELEY, M.A., M.D., M.C. Cantab., F.R.C.P. Lond., F.R.C.S. Eng., Gynæcological and Obstetric Surgeon to the Middlesex Hospital, &c. London: Faber and Faber, Ltd. 1929. Pp. 426. *7s. 6d.*

FOR nearly twenty years this has been one of the most popular text-books for nurses in the English language. The fifth edition has been extensively revised, and in parts rewritten; the author notes that revision has been greatly aided by suggestions sent by sister tutors throughout the country. New matter has been added with reference to X rays, radium, blood transfusion, and the modern methods of treating syphilis. The book owes its popularity to its simplicity, its clearness, and its dogmatic teaching. The author never forgets that he is writing for nurses and not for medical students.

The Nurses' Handbook of Hygiene. Second edition. By L. E. H. WHITBY, M.A., M.D. Cantab., M.R.C.P. Lond., D.P.H., Assistant Pathologist, Middlesex Hospital. Same Publishers. 1929. Pp. 163. *4s. 6d.*

THE second edition of this handbook, while it occupies approximately its former bulk, has been brought up to date in most of its sections, particularly in relation to vitamins and food preservatives. It suffers from the defects common to books which attempt to cover a very wide range of subjects in an elementary fashion. For instance, ventilation is discussed at considerable length without reference to the katathermometer, although the estimation of carbon dioxide is given as a measure of ventilation; standards for metallic impurity of water are mentioned, but the importance of chlorine and ammonia is only noted in general terms. The designation "Grade A. Certified," in relation to milk, does not exist. The connexion of summer diarrhœa, diphtheria, and typhoid fever with contamination of the atmosphere of houses by sewer air would not now be generally accepted. The author's views on the milk problem are of interest; his suggestion that milk from tubercle free herds should always be boiled will not meet with general acceptance. These points are noted because, on the whole, the book is a useful guide, and nurses will find therein most of the information on hygiene which they will need for examination purposes.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 14, 1929.

A NATIONAL MATERNITY SERVICE SCHEME.

IN reviewing the vital statistics for 1928 last week we had to record that the maternal death-rate for that year (4·42 per 1000 live births) offered little scope for optimism, being the worst on record since 1911. A more hopeful outlook for the future is to be anticipated since the adoption by the British Medical Association of a scheme for a National Maternity Service which is based on sound lines and may lead to important legislation. It is proposed to utilise the services of general practitioners and midwives with as little additional machinery and institutional accommodation as possible, and it could therefore be brought into action in a reasonable period of time with the minimum dislocation of existing conditions of practice. The principles on which this scheme, which was outlined in THE LANCET of July 27th (p. 195), is based are that normal maternity cases can be safely treated at home, and that mortality and morbidity can be greatly reduced by proper care and supervision during the antenatal, natal, and postnatal periods. The cost of the scheme, calculated at £2,100,000, could be met on a compulsory national insurance basis, which would include at once all women entitled to maternity benefit; others in a similar economic position could be brought in by further administrative action, leaving only the small percentage working on their own account to come in on a voluntary basis. The additional contribution to meet the services outlined is reckoned at 0·4*d.* a week from the employer and insured person, made up to 0·9*d.* by the State. Against this could be set some saving to the State and local authorities in the shape of fees paid to doctors called in by midwives and lessened costs of clinics. A medical practitioner and midwife would be provided for all pregnant women under the insurance scheme. Antenatal care would be shared by both, the midwife keeping the patient under close supervision. The doctor would examine her at least once, determining whether her labour can be left to the midwife, and would respond to the call of the midwife throughout pregnancy, labour, and lying-in, if required. The doctor would see every patient and, if necessary, make a pelvic examination, before she returns to work. Additional material and service allowed for in the cost include payment for hospital accommodation for cases unsuited to delivery in their own homes, sterilised dressings, ambulance facilities, and another practitioner when required for consultation or administration of anæsthesia.

A system of this kind, by which attendance on the normal is left to the midwife with medical supervision and assistance in the case of abnormality, has been widely advocated as the one most likely to lead to a lower maternal death-rate. Briefly, the reasons given in support of it are that mortality is lowest in those countries where such a system prevails—e.g., Scandinavian countries, Holland, Italy; that the best results in this country are obtained under this system, as in the midwifery service of the Queen's Institute, hospital and other maternity districts; that as soon as it is recognised that the first object in midwifery is to maintain the normal throughout childbearing it is needless to use the more highly trained medical services for attendance—often prolonged—on natural labour, if a midwife with a doctor on call will suffice. The British Medical Association has now accepted this view, has brought out a scheme embodying the methods of institutional practice, and has shown how the change can be effected by improving and using in a different manner the existing machinery. That the scheme brought forward by the Council was adopted by the representative meeting with only minor emendations after a brisk discussion justifies the agitation on maternal mortality, for five years ago acceptance of the scheme now outlined would have been almost unthinkable. That there would be difficulties and disappointments in its initial stages is certain, for the results obtained in hospital districts cannot be expected at first, since institutions have a tradition behind them as well as a carefully selected and skilled personnel. Even if the patients attended by the Queen's Institute are in some degree a selected group, the results obtained by its midwives with medical aid provided by local practitioners are sufficient to show that the system of working is itself the most important factor, and one would expect that a national service of the kind envisaged by the Association's memorandum would soon approximate to the Queen's Institute figures. One question that must be left unanswered is how the insured women would behave under it. Would they demand more of the medical services than the scheme has provided for? Previous experience of women under the National Health Insurance Act suggests doubts as to the possibility of making any accurate estimate.

In a paper that appears elsewhere in this issue, Mr. GIBBERD gives figures from Guy's Hospital district which point in the same direction as those from the Queen's Institute and the institutional district practices in London, Liverpool, and Scotland, quoted in the appendix to the Association's memorandum. Though in Guy's Hospital district attendance is divided between medical students and midwives the system of working is the same. In order to make his cases an average sample of the general population and render his figures more comparable with the national, Mr. GIBBERD has included all patients domiciled in the area of the hospital, whether delivered at home or transferred to hospital. He omits, however, to draw attention to the fact that his figures are not strictly comparable to the national figures, because his are based on 1000 deliveries and the national ones on 1000 live births, and his figures exclude deaths due to early abortions and other conditions in pregnancy not falling under the ordinary work of a maternity district. These points, however, in no way invalidate his interesting comparison of the two periods under review, and he is able to show what the national returns have been unable to show, and that is a remarkable drop in the maternal death-rate. In the last ten years the rate was but a quarter of what it was sixty years ago, 1·03 in place of 4·4 per 1000 deliveries. His figures regarding the amount of interference in the two periods are of great value, though, unfortunately, those of the recent period are confined to the cases in one year only (1928) and may thus differ considerably from the average. The percentage of Cæsarean sections suggests an error that would be lessened somewhat if a greater number of years had been averaged. It works out at 1·3, the same as the total interference in the early series. Over one abdominal delivery in an average sample of 100 obstetric cases would certainly be excessive. By careful antenatal supervision the percentage of obstetric interference in all cases in 1928 was under seven, and the forceps rate under five. Small though it was it was five-fold what obtained in the earlier period, and Mr. GIBBERD considers that this greater interference eliminated the cases of profound exhaustion in the earlier series, and with an improved technique lessened the incidence of sepsis. His comparison of the results attained in various obstetric complications is particularly instructive as showing where treatment to-day has advanced and where it has stood still. The facilities for the removal and reception of serious cases indoors must have been improved in the sixty years and also be a factor in producing better results. His paper is a valuable contribution to the maternal mortality discussion and forms a happy augury for its reduction once some such national scheme as that of the British Medical Association is put into operation. We trust that the Association will now set to work on the task of translating its scheme into legislation.

MEDICAL EDUCATION IN U.S.A.

HIGH ideals, boundless energy, and vast wealth have, in the last 20 years, completely revolutionised medical education in the United States. ABRAHAM FLEXNER'S report of 1910 crystallised the situation and was quickly followed by the extrusion of most of the incompetent and fraudulent institutions—about one-half of the whole number—and by an extraordinary increase in the equipment and efficiency of those which were left. Many of the best medical schools in the world are now in the United States. So deliberately have these changes been planned and so quickly have they been brought about that they are easily within the academic life of an individual; they can be seen from the beginning and hence form at the moment the chief object of interest for those engaged with the medical curriculum and with the methods and results of teaching. Statistical tables and graphs in the annual educational number of the *Journal of American Medical Association*, which has just reached us, illustrate the progress which is being made. It continues to be true that the number of persons who apply for admission to the medical schools is considerably in excess of the accommodation. Each good school admits a definite number of new students each year. Taking all the schools together about 60 per cent. of the applicants are accepted. In England we can, at present, only envy any school which starts with students so highly selected. The selection is continued in the subsequent years; unsatisfactory performance and laziness are rebuked once and then expelled, the loafer and the chronic are unknown. Substantial progress has also been made at the other end of the curriculum. A university degree in medicine carries with it no right to practise. For this, qualification by one of the State licensing boards is necessary. Since the Federal Government has no control over education, and since it cannot infringe any of the privileges of the State legislatures, there is no official method by which the procedures and standards of the various States can be correlated and brought into reasonable agreement with one another. But an unofficial body—"the National Board of Medical Examiners of the United States"—emanating in 1915 from Dr. W. L. RODMAN and the American Medical Association, has gone far to supply the deficiency. It holds examinations in many of the chief medical schools and grants a diploma which has so quickly established its reputation that already it is accepted by the licensing authorities of 37 States in lieu of their own examinations. It will no doubt secure the desirable end that practitioners qualified anywhere in the States can practise anywhere in the States, and not as at present only in their home State, and that the standard for qualification will be everywhere the same.

A further achievement worthy of notice is the physical realisation of an intimate coöperation between the university, the laboratory sciences, and the wards which many reformers have desired. The Rockefeller Institute has published an illustrated account of the new Vanderbilt University School of Medicine, at Nashville, Tennessee, which has been erected at a cost of something more than 1½ million pounds. In the first place, the whole school and hospital are topographically and actually part and parcel of the university; in the second place, the science departments, from anatomy and biochemistry onwards, are in the same building as the wards. The school of nursing is next door. The clinical staff includes part-time as well as whole-time teachers. It has been urged in some quarters for years past that, if the teaching of medicine is to reach a university standard, the university ought to control the wards as it does the dissecting rooms. The difficulty in doing this has been mainly financial, and the various arrangements whereby students have the run of hospitals not under university control have generally worked well enough. Recent events in Cardiff, however, have given a signal example of the dangers of the common method, and no doubt the Vanderbilt plan is preferable if someone will find the money; the cost at Nashville is about £75,000 a year for 208 beds. The housing of all departments under the same roof is certainly no less important if coöperation rather than individuality is aimed at. A common luncheon room can do a great deal to bring the laboratories and the wards together, and in the Vanderbilt school the science departments occupy the lower floors of the same blocks as carry the wards above. Theoretically, therefore, the new school seems to be a distinct advance. There is, however, at present, at any rate, one substantial criticism to make. The school admits 50 students each year and 208 beds seem quite an inadequate allowance for practical clinical teaching; there must surely be an undue proportion of theory to practice. In pathology, too, practical experience must be sadly defective. Large and important parts of pathological anatomy can be learned only in one way—on the fresh dead body. And as only about half the deaths come to autopsy, it is difficult to see how the students learn the subject which is the basis of so much of their clinical work. We should be glad to hear that the Vanderbilt school had seen the necessity and found the money to double their beds.

CREMATION AND PUBLIC SAFETY.

IT was inevitable that the series of inquests and exhumations in connexion with the late Mr. DUFF and his family should create a certain misgiving or disquietude which would find public expression. In a letter recently published in the *Times* Mr. ERNEST H. COOK, D.Sc., offers some not unreasonable comments and suggestions. He remarks in the first place that the system of disposing of the dead by cremation is one which is commending itself to an increasing number of thoughtful people on the score of communal hygiene and public health; yet, if the victims in the recent cases where foul play is suspected had been cremated, the supposed crimes would have gone entirely undetected. The files of the Director of Public Prosecutions probably contain similar instances, and it is doubtful whether the Home Office will feel disposed to view with equanimity the possibility that poisoners and others can at present escape the consequences of their misdeeds. The existing safeguards under the Cremation Rules have been regarded as adequate; there must be a sworn application from an executor or near relation who must declare that he knows no cause why cremation should not take place. There must also be two medical certificates, one from the practitioner who attended the deceased and another from a medical referee. The question is whether there should not be also a thorough post-mortem examination and chemical analysis, though, even if these additional precautions are added, mistakes may occur. Dr. Cook considers that in Mr. Duff's case, if cremation had been applied for, it would almost certainly have been granted. This, however, is by no means sure; there were puzzling symptoms about Mr. Duff's death to which his medical attendant drew attention and which removed the case from the absolutely normal; it should be possible so to frame and carry out the regulations that cremation can never be sanctioned in any case of doubt.

A second point is made by Dr. Cook with regard to judicial autopsies. No analyst, he says, can safely claim never to have made a mistake. Moreover, the analyst's task is deliberately made harder by the absence of information which might be useful to him. The coroner's officer delivers to him one or more jars containing portions of organs with the request that these shall be tested "for poisons." Our strong national desire not to prejudice a possible defendant has resulted in the practice of giving the analyst no indication of the symptoms and no aid either in ruling out one particular poison or in concentrating upon the search for traces of another. The analyst who, if fitted at all to assist in the administration of justice, would hardly allow himself to be unduly influenced by such information, is thus unfairly handicapped. Dr. Cook suggests that recourse might be had to the plan adopted in proceedings under the Food and Drugs (Adulteration) Act. In those proceedings an inspector divides the purchased article into three parts; one of these is sent to the public analyst, a second to the tradesman, and a third is retained for analysis in case of dispute. Dr. Cook holds that it is anomalous to require less careful corroboration on charges of murder than when a man is prosecuted merely for adding boric acid to milk. With his suggestions for reinforcing and confirming the evidence in murder cases and for eliminating the chance of mistake there will be general agreement. They make, however, too little allowance perhaps for the natural feelings of relatives to whom the body of the deceased is something sacred. Public opinion may tolerate interference with a dead body in the effort to detect and punish the foul crime of the poisoner; it may be reluctant to contemplate such interference as a mere preliminary to cremation in a normal case. We have given up—though not so very long ago—the barbarity of drawing and quartering the bodies of our criminals: the average citizen is probably unprepared for what (however mistakenly) he might regard as similar treatment of the bodies of the innocent.

Annotations.

"Ne quid nimis."

MASS SUGGESTION AS A CLINICAL METHOD.

Although the subject is of fundamental importance we are still far from generally accepted conceptions of the influence of mental processes upon bodily functions. In the *Münchener Medizinische Wochenschrift* of August 9th Dr. Alfred Brauchle, advocating the use of suggestion therapy by the general practitioner, offers a theory of vitalism involving the conception of an organic unconscious. This is a mind-like principle existing in hydra, the germ-cell, or man, whose action is to unify the separate bodily functions, and it is the organic unconscious that we stimulate by non-specific therapy such as the injection of foreign protein or the use of sun baths. It can be stimulated, on the other hand, by way of the mental subconscious, and Dr. Brauchle quotes several workers who have shown the influence of hypnotic suggestion in neutralising the effect of drugs upon the functions of the vegetative system. His therapy consists in elaborating to a group of patients the theory here briefly outlined and then, with the patients in a state of relaxation, using the formulæ made popular by the late Mr. Coué. He gives a table covering the results of three years' work in the Hydropathic Institute of Berlin University, and believes that his results justify the claim that the Coué method is the most useful form of psychotherapy for the general practitioner, who can by this means treat many of his patients psychotherapeutically at a cost of two or three hours a week. As a practical way of dealing with the nervous troubles that bulk so largely in ordinary practice this method has the advantage of simplicity, but its theoretical basis is questionable. Dr. Brauchle's vitalistic theory prepares the patient for the reception of the healing suggestion; its intrinsic validity seems immaterial, and any theory acceptable to the audience would probably act equally well. Essential to all such methods is the induction of belief, and, though Dr. Brauchle's enthusiastic belief in his own theory is plain, yet there are many of us who could not feel its truth even if our lives depended upon the feeling. A weightier objection to simple methods of this nature is the risk of being content with the explanation involved in them. Dr. Brauchle notes, indeed, that the mental subconscious preserves forgotten and suppressed memories, experiences, and dreams, and produces disturbers of the peace that can operate as lasting causes of illness; but he makes no further use of what modern psychopathology has taught about the intricate causes of minor mental disturbances, and leaves his readers to believe that in suggestion we have an efficient and sufficient means of handling these troubles. Suggestive treatment, based upon the most varied theories, has had its successes as far back as the history of medicine goes; it may still have a part to play but no longer occupies the whole of the psychopathological stage.

PERNICIOUS ANÆMIA.

Dr. C. Price-Jones[1] has returned to the study of the red cell diameters in anæmia and the construction of the curves which bear his name, by going back to the beginning and performing the laborious and very useful service of determining the range of normal variation by measuring 500 red cells in each of 100 healthy persons. The general average is 7·20 μ, and anything between 6·69 μ and 7·72 μ seems to be compatible with health. A few cases of frank pernicious anæmia come within these limits—5 out of 50 in the series he quotes—and he points out that a high variability of the diameters is an even more constant character of pernicious anæmia than an excessive mean diameter, though of course hæmorrhagic anæmias, in which the diameters are too small, also have a variability greater than normal. Diagnostically a high coefficient of variation with a diameter of 7·5 µ or more would put a case in the pernicious anæmia class. The effect of treatment must be gauged in the light of the range of healthy variation. He gives the data for 12 cases treated with liver extract until the anæmia was cured and the symptoms had disappeared. In nine cases the mean diameter came back within the normal range, but with one exception none became as small as the normal mean. One patient whom liver treatment restored to an active working life despite well-marked cord degeneration, still had a mean diameter as high as 7·9 µ. Similarly, some but not all of the coefficients of variation became normal. Taking one criterion with another the red cells actually became " normal " in only six of the 12 patients. This is perhaps what might be expected if liver cures symptoms without removing the cause of the disease.

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[1] Jour. of Path. and Bact., 1929, xxxii., 479.

MEASLES IN LONDON.

A REPORT by the school medical officer, Dr. F. N. Kay Menzies, recently issued by the Education Committee of the London County Council, gives interesting details of the behaviour of measles. Lately epidemics have occurred regularly in London at intervals of 18 months, and have lasted about six months. The disease is notifiable in two metropolitan boroughs (Paddington and Fulham), and as regards the first case in a household in seven others (Greenwich, Hampstead, Lambeth, St. Pancras, Southwark, Battersea, and Finsbury). But even if it were notifiable generally, many cases would escape notification owing to parents wrongly regarding measles as a trivial complaint.

The cases coming to the knowledge of the school authorities during the last three epidemics were: (1923–24) 41,261, (1925–26) 39,387, and (1927–28) 41,477. As measles is especially a disease of pre-school (2–5 years) age, it is estimated there were about 100,000 cases during each epidemic. The districts in which the school population were least affected were Poplar, Stepney, Bethnal Green, Southwark, Chelsea, and Westminster, owing to the fact that in the congested and poorer areas the children suffer from measles before they reach school age. The deaths during the last epidemic numbered 1357, as compared with 1034 in the previous epidemic of 1925–26. The report shows that methods of prevention, such as school closure and exclusion of susceptibles on the receipt of reports of the first cases, have failed, and that immunisation is not as yet practicable. Since 1921 a scheme has been in force, the aim of which is, by coöperation between the school and the borough authorities, to get hold of the cases early and by timely succour to prevent or secure early treatment for the complications which are the chief cause of death and permenent injury. Under this scheme efforts are made to educate the parents that measles is not a trivial disease, and to provide home nursing and removal to hospital from unsuitable homes at the earliest possible moment, and especially to concentrate efforts on overcrowded and insanitary areas, where the effects of measles are notoriously disastrous. The success of the scheme appears to depend on the closeness of coöperation between the school and the borough agencies, and it is mentioned, for example, that in Wandsworth promptitude has been secured by direct consultation between the school nurses and the borough health visitors, with an apparent effect in diminishing the mortality. Sixteen of the 28 borough medical officers of health consider the scheme valuable, and in Deptford the earlier information obtained as to cases has enabled compulsory notification to be discontinued.

The provision of hospital treatment has proved difficult. Under existing arrangements at the height of each epidemic there comes a time when selection of cases for admission must be exercised. The state of the home, and the age of the cases (measles being notoriously fatal under 2 years) are among the guiding factors. Admission to hospital after broncho-pneumonia has begun must be prompt to be of any use at all. The M.A.B. records show that during the last epidemic 8729 patients were admitted, and that of these 626, or 7 per cent., died. Of the patients admitted suffering from complications, 31·7 per cent. died, whereas of those who were free from complications on admission only 1·9 per cent. died. Broncho-pneumonia was the cause of 542 of the 626 deaths. Of the 8729 admissions, 1042 had broncho-pneumonia when admitted, and 107 more developed it within the first day. The next epidemic is due towards the end of 1929, and some of the lessons from past experience are: that more use should be made of the local knowledge of the health visitors and school nurses in order that waste of time by unnecessary visitation may be avoided, and that the needed succour may reach its objective promptly. It is also urged that the school nurses be relieved of clerical duties, such as tabulation of lists, so that they may have more time for actual visiting, and that an endeavour be made to secure even closer coöperation between school nurses and health visitors.

THE BLOOD LIPOIDS IN PSYCHOTIC PATIENTS.

A CAREFUL piece of biochemical research in which the results obtained from psychotic patients are criticised and analysed by statistical methods has recently been published by Sven Stenberg from the Psychiatric Clinic, Konradsberg Hospital, Stockholm.[1] The range of variation both in normal controls and in psychotic patients has been estimated and allowed for, and since the exact limits of the experimental error of the method used have been ascertained, the conclusions reached by the author carry conviction. In a preliminary review of the literature, Dr. Stenberg shows how little of the published work on the subject fulfils the necessary conditions, and that the variations in results are thus explained. He points out that while different methods of estimation will give discrepant results, yet each, if used alike on controls and patients, and if studied by proper statistical methods, provides material from which valid conclusions may be drawn. The method adopted by him was the micromethod of Bang as modified by G. Blix, determining the total quantity of cholesterin separately and also together with the total fatty acids. While the method has been thought unreliable by some workers, he finds that the errors are eliminated by careful technique after practice, and calculates the standard error to be negligible in comparison with the variations found in different individuals and in the same individual under different conditions. In the normal controls he finds a striking individual constancy, but a considerable range of variation between individuals, the total fatty acids, but not the cholesterin, being higher in women than in men. In the manic-depressive group of cases the total cholesterin is greater than in normal persons and also greater than during remissions. In the dementia præcox group the early cases are differentiated from those of over a year's duration; in the former the total cholesterin was found higher than in normal and remittent cases. In the latter the group taken as a whole shows no significant difference from the normal group. This result is due to the cancelling out of two subgroups; the emotionally dulled cases gave values lower than the normal, while the emotionally heightened ones were higher than the normal, an intermediate group giving approximately normal ranges of values. The general conclusion reached was that a change in cholesterin content of the blood is to be correlated with emotional disturbance, though the exact nature of this correlation has yet to be discovered. The total fatty acids give less definite results, but generally follow the same course as the cholesterin. The author suggests that the effect of insulin both on blood lipoids and on the emotional state is a line of investigation that might prove fruitful.

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[1] Psychosis and Blood Lipoids. Quantitative Variations of Total Cholesterin and Total Fatty Acids in the Blood in Manic Depressive Psychosis and Dementia Præcox. Stockholm: P. A. Norstedt. 1929. Reprinted from Acta Medica Scandinavica.

ARTIFICIAL LIGHT IN TUBERCULOSIS.

ARRANGEMENTS were made by the London County Council in 1926 to put into operation an experimental scheme which would enable the metropolitan borough councils to utilise the approved facilities for artificial light treatment provided at certain hospitals and centres in London. We learn from the Council's recent annual report that this experimental scheme was tried in 1927 and continued throughout the year 1928. It appears, however, from reports received from the tuberculosis officers of the 19 boroughs that little use has been made of the scheme, an average of only six cases during a period of about nine months having been recommended from each of the boroughs taking part in the scheme. The reports of these officers are said to have disclosed practically no evidence of benefit having been derived by the patients from this form of treatment. The experience of 1928 confirms the view that good results are obtained only when light treatment is given as an additional method of treatment under suitable conditions in residential institutions in the country. The London County Council has therefore decided to proceed no further with the scheme, but rather to bring to the notice of the borough councils the importance of ensuring that all cases of active tuberculosis, whether pulmonary or non-pulmonary, particularly in the early and remediable stages, should be recommended for residential treatment at the earliest possible moment.

A STATISTICAL STUDY OF HEART DISEASE IN CHILDREN.

STATISTICAL methods have not hitherto found much favour in the study of heart disease on account of the difficulty of obtaining sufficient accurate data for statistical analysis. The Heart Committee of the New York Tuberculosis and Health Association is endeavouring to overcome this difficulty by adopting a uniform nomenclature and standardising so far as possible the descriptive terms used in case-taking. The committee hopes thereby to render the observations in different clinics more strictly comparable one with another, both history and physical examination being recorded in a uniform fashion on forms which have been carefully thought out for the purpose. Their work is now beginning to bear fruit, and the third of a series of statistical studies dealing in this instance with heart disease in children has recently been published.[1] It is based on an analysis of the case-histories of 500 children observed in a clinic under the same medical supervision during a period of ten years, 38 per cent. of the cases having been kept continuously under observation for more than three years.

In this series 50 per cent. of the children were between the ages of 6 and 10 at the time they were first seen, and 62 per cent. were over 11 years of age at the end of the period under review. Seventy-nine per cent. of the whole series gave a rheumatic history and of these three-quarters developed organic heart disease, the remainder being provisionally classified as "potential cardiacs." In the affected cases the heart lesion generally became manifest within 12 months of the onset of the rheumatic infection, and in point of fact was probably synchronous with it. In 50 per cent. of the rheumatic cases in this series the first infection occurred between the ages of 6 and 9, the average age of onset being 7·3 years. It appears that about the age of 12 a certain degree of immunity begins to develop, older children being less liable to infection, and the writers point out the importance of bearing this fact in mind when attempting to evaluate the results of therapeutic measures. Relapses occurred in 73 per cent. of the cases studied, and were most common within three years of infection. This figure, however, is probably an underestimate of the true incidence of relapses, for many of the cases in which no relapse was noted were under observation for only a short period of time. In the age-groups between 3 and 9, comprising 234 cases, the first relapse took place within one year of the onset in about 50 per cent. of cases, while in the smaller group where the first attack occurred after the ninth year, the percentage of cases in which the first relapse occurred within 12 months was 72 per cent. The writers suggest that the onset of puberty may possibly be a factor in predisposing to early relapse in these cases. Twelve per cent. of the children died, the most common age of death being between the eleventh and fourteenth years; 88 per cent. of the deaths were attributed to rheumatic heart disease. The writers are strongly of opinion that "growing pains" are of no less significance than chorea or polyarthritis as a manifestation of rheumatic infection, but they do not consider that any of the extracardiac manifestations of rheumatism can be regarded as giving an indication of the degree of heart involvement. Rheumatic nodules occurred in 60 patients, appearing most frequently at the end of periods of acute infection; 20 of these children died. With regard to valvular lesions, it is interesting to note that of 157 children, who appeared to have only mitral regurgitation on admission, 48 eventually developed stenosis; in 34 of these the stenosis took three years or more to develop.

The crippled hearts which result from rheumatic infection in childhood constitute one of the most tragic pictures in the wards of our great hospitals. Their future seems so hopeless, and it is encouraging to learn from the American analysis that so far as the functional results are concerned the outlook is on the whole quite good, for in 70 per cent. of the present series there was little or no impairment of the exercise tolerance. This justifies the belief that although we are still far from being able to prevent rheumatic infection, we can at least hope to limit its most serious sequelæ. The object of the New York Committee is to collect a sufficiently large mass of information concerning heart disease in order to be able to treat it statistically. There are bound to be differences of opinion as to the value of the results so obtained; but provided the data are reliable and sufficient care is taken to limit the inquiry to simple issues, from which complicating factors can be definitely excluded, information of real value will be obtained. While it may not be right to speak of definite "laws" in biology in the sense in which the word is used in physics or chemistry, we may at any rate hope by work of this kind to ascertain the general tendency of rheumatic disease and the extent of variation in individual cases.

FAT AS AN ESSENTIAL ARTICLE OF DIET.

SINCE the discovery of the fat-soluble vitamins there has been a tendency to regard fat as being an unimportant dietary constituent, capable of substitution by carbohydrate, when once those vitamins of which fats are the ordinary vehicle have been adequately supplied from some other source. J. C. Drummond[1] in 1921 reared and bred young rats on a fat-free diet, supplying the fat-soluble vitamins as the unsaponifiable fraction of cod-liver oil. The subject has been attacked again recently by G. O. Burr in conjunction with H. M. Evans[2] (1928) and with M. M. Burr[3] (1929); in their experiments the growth of rats was checked and lesions developed when fat was completely excluded from the diet. Growth was promoted and the lesions were prevented or cured by the addition daily of 10 drops of lard or other fat, or of the fatty acids from lard, but not by the addition of glycerol or of the unsaponifiable fraction from lard. The Burrs go so far as to describe the condition produced as "a new deficiency disease produced by the rigid exclusion of fat from the diet." The symptoms described, of which an annulated and necrotic condition of the tail is particularly characteristic, are not unlike those which occur in pellagra of the rat, caused by an insufficiency of vitamin B 2, but the Burrs are emphatic that increase of the supply of the B-vitamins by means of ether-extracted yeast had no effect upon the syndrome. They do not, however, make it clear that ether extraction might cause yeast to be deficient in vitamin B 2. H. M. Evans and S. Lepkowsky[4] (1929) have come to the conclusion that the inclusion of large amounts of fat in the diet of rats has a very important effect upon the body's requirements of vitamin B 1. They describe the phenomenon as "the sparing action of fat on the antineuritic vitamin B" and show that even when there is no vitamin B 1 in the diet, vitamin B 2 being provided in the form of autoclaved yeast, the rat can survive if the diet contains as much as 50 per cent. of fat; if small but still insufficient amounts of vitamin B 1 are given to the rat, the amount of fat which will produce normal growth is less than 50 per cent. The "sparing" action is considered by Evans and Lepkowsky to apply only to vitamin B 1, for when the latter was given, as an alcoholic extract of rice bran, and vitamin B 2 was withheld, the weight curves of the rats are interpreted as showing that the addition of fat had little beneficial effect. In our view the weight curves do not quite bear out the interpretation that the saving action of fat applies only to vitamin B 1, for there is a very marked improvement in them when fat is added to the diet deficient in vitamin B 2. There is thus in both these sets of observations certain common ground for suspecting that the B-vitamins are involved in explaining the part played by the fat. Inclusion of fat in the diet might operate on the organism in many other ways than straightforwardly as a correction of a simple deficiency of fatty acids. The biological study of the B-vitamins is set about with the most thorny difficulties, such as are introduced by the habit of coprophagy and the phenomenon of refection, and it is perhaps rather hasty to interpret these observations on rats as evidence of a new deficiency disease.

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[1] Amer. Heart Jour., 1928, iv., 101.

[1] Drummond, J. C., and Coward K. H.: THE LANCET, 1921, ii., 698.

[2] Evans, H. M., and Burr, G. O.: Proc. Soc. Exp. Biol. and Med., 1928, xxv., 390.

[3] Burr, G. O., and Burr, M. M.: Jour. Biol. Chem., 1929, lxxxii., 345.

PAROXYSMAL SNEEZING.

THE average text-book of medicine has little to say about sneezing, beyond the vague statement that a sneeze is an involuntary reflex respiratory act. Yet the sneeze is a symptom of many disorders from hay-fever to the common cold; it may be the first sign of measles or only the result of stimulation of the optic nerve by a bright light. The Greeks and Romans considered the sneeze as a definite omen from the gods and it was one of the common everyday phenomena, which if it occurred at a moment of special import could be interpreted as presaging the future. There are many allusions to sneezing in classical literature, but it is a line from a popular refrain well known to a former generation "He sneezed so hard with the whooping-cough" which is most relevant to the case recently described by Dr. Alan Moncrieff and Dr. R. C. Lightwood.[5] A little girl began an attack of whooping-cough in the ordinary way at the end of January, 1929. At the beginning of March she ceased to whoop and began to sneeze instead. Her sneezing attacks occurred about ten times a day and each attack caused great distress and incontinence of urine. She had suffered from these attacks for three weeks when she developed the broncho-pneumonia which led to her admission into hospital. There the paroxysms of sneezing continued, although she did not cough or whoop. The paroxysm consisted of a rapid series of "expiratory sneezes" resulting in the expulsion through the nose of large quantities of tenacious muco-pus. At the end of the paroxysm the patient drew in her breath and lay back cyanosed and exhausted. As the broncho-pneumonia got better a slight whoop developed and for a time she had both whooping and sneezing attacks. At the end of six weeks from the onset of the pneumonia the whoop had disappeared, although occasional mild sneezing attacks continued. Bacteriological examination of the muco-pus discharged from the nose in one of the paroxysms demonstrated the presence of Gram-negative bacilli of the pertussis type. This variation in the normal course of whooping-cough was apparently well known to the physicians of many years ago, for there is an allusion to it in an interesting treatise on the disease by Dr. Thomas Watt, of Glasgow, published in 1813. Several continental authors refer to the condition which has also been described by J. P. C. Griffiths and A. G. Mitchell, and by J. D. Rolleston. Szegö, of Budapest, suggested in 1900 that such sneezing attacks made it probable that the spasmodic features of pertussis had a central origin. More recent writers have mentioned other equivalents of the whoop in pertussis and the list includes paroxysmal hiccough and paroxysmal yawning. Dr. Moncrieff and Dr. Lightwood give a short review of the literature of the subject and note that adults with apparently intractable coryza may really be suffering from whooping-cough and may infect children. Apart from their rare appearance in whooping-cough, true paroxysms of sneezing are mainly associated with anaphylactic disorders such as hay-fever; when they develop suddenly in children not sensitive to pollen, the possibility of whooping-cough should be considered.

STERILISATION OF THE UNFIT.

WHILE those most intimately concerned with the care of the mentally defective in this country continue steadily to oppose sterilisation as an auxiliary measure to the more important segregation, a number of interested people continue to press its claims. They are encouraged by the results of American experiments, which have caused the majority of social workers and medical men concerned with the problem of amentia in the United States to advocate a carefully safeguarded authority for sterilising suitable cases. Dr. K. B. Aikman returns to the subject in the *Edinburgh Review* for July. He begins by attacking the doctrine of the equality of man, and goes on to deplore the racial suicide of the middle classes. He does not believe that the peculiar qualities of these classes can be perpetuated for the nation by constant recruitment from lower strata. He attributes the "suicide" to a complex of many factors: increasing density of population with increasing competition, calling for longer training for learned professions and technical occupations, and hence later marriages and a greater cost of launching children into the world, while the earning power of the manual labourer is at its highest when his physical growth is complete. A higher standard of living, a reduced value of money, and an increasingly materialistic outlook have led to the reduction of families, which has been facilitated by modern methods of birth control. Coincidently with this decrease in the middle-class population there has been an actual increase in that of the poorer classes, for every new triumph of hygiene has produced its first results among the poor. The decrease in the infant mortality-rate is a reflection of the number of lives saved to the working-class population, and Dr. Aikman would temper our self-congratulation on this achievement because it is based on statistics which pay no heed to quality. He finds cause for anxiety in all directions: the recruiting figures of 1917–18, the lack of fit emigrants, the ill-health of school-children, and the amount of time lost through sickness among the insured population. He finds the increase in the number of insane and mentally defective persons most disquieting. The difficulties in the way of remedy appear to him to be purely ethical; we are not able to increase the death-rate by failing to encourage the survival of the less fit, and all we can do is to fail to encourage the arrival of the less fit. He claims that measures designed primarily to increase the number of better citizens should be directed broadly to the assistance of those sections of the community which contain the greatest proportion of desirable characteristics. Since persons handicapped by disease and antisocial qualities will always tend to gravitate to the worst paid employments and most slovenly surroundings, the poorest classes must always contain a large proportion of the least desirable citizens. In view of this fact, and of the fact that the main bulk of the people lie close to the average of any given quality, and that it is impracticable for everybody to have as many children as is physically possible, a slight increase in fertility of the fairly large numbers who are just above the mean and a slight decrease in the equally large population which is just below the mean will do more for the race than trebling a few highly superior families. The legislation at which Dr. Aikman would aim must accord with the dictates of humanity, must increase the fertility of the middle classes, and must avoid the selection of individual beneficiaries by bureaucrats. Numerous economic measures have been tried or suggested; all of them are capable both of good and of harm and all have proved disappointing in practice. Economic measures alone cannot solve the problem. The solution must depend on the recognition of responsibility. In this country we have no law requiring that persons discharged from mental institutions should even be warned that their weakness may be transmissible, and indeed it is common enough for defective girls to be discharged by magistrates on condition that they marry. The only way out of our parlous situation seems to Dr. Aikman to be the sterilisation of persons who are well enough to be discharged from mental institutions but who are certain or highly likely to produce defective offspring. He grants that segregation is an ideal measure, but regards it as wholly impracticable if only on the ground of expense. He considers that legislation to check procreation by the unfit should have an educational influence on the general public out of all proportion to the number of individuals actually affected. In answer to the criticism that this interferes with the liberty of the subject, he points out that this question must be considered from the point of view of the greatest happiness of the greatest number, and, in Dean Inge's words, "by far the greatest number are not yet in existence."

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[4] Evans, H. M., and Lepkowsky, S.: Jour. Biol. Chem., 1929, lxxxiii., 269.

[5] Paroxysmal Sneezing in Whooping-cough, Arch. Dis. Child., August, 1929, p. 240.

BENEFACTORS OF MANKIND.

THE *Manchester Guardian* has recently held a competition to choose six persons who might lay claim to the distinction of being called the greatest benefactors of mankind, Lister being the type suggested, and therefore excluded from the list. The six representing the votes polled were:—

1. Pasteur.
2. J. Y. Simpson.
3. Mme. Curie.
4. Rontgen.
5. Jenner.
6. Ross.

The readers of the *Manchester Guardian* are well known to be the most intelligent group of citizens in this country, and it is gratifying to find that they set such a high value on the relief of pain and suffering. It is also interesting to note that they put this particular interpretation on "benefactor," though this may be due to the suggestion made in the setting of the competition that Lister was a good example. On this view a "benefactor" is one who makes life more tolerable. The concise Oxford Dictionary says "person who has given one friendly aid," which is compatible with the view that the best benefactors of mankind are those who have enlarged human life, more especially in the intellectual and spiritual spheres. Of the chosen six, Curie alone would satisfy this criterion, and she comes third, probably because radium is good for cancer, and not because its discovery is one of the great events in our understanding of the natural world. Darwin would come here too, though he was suggested by only a few of those who sent in lists. The problem set is, of course, insoluble, as most interesting problems are. But whatever the answer which is most nearly right, it is encouraging to see medicine so highly thought of.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.

THE sixth annual meeting of the Society will take place at Budapest from Oct. 13th–18th, under the patronage of the Archduke Dr. François Joseph and members of the Government. Medical discussions on the 14th and 15th will deal with the Action of Hypertonic Waters and the Use of Baths and Waters in Cardiovascular Affections. A meeting of the Ligue Internationale contre le Rhumatisme will be held on the 16th to consider the Relation between Acute and Chronic Rhumatism in the Various Countries and the Hæmatology and Serology of Rheumatism. The Society will be entertained by the Prime Minister, the City of Budapest, and by the Balneological Society of Hungary. Excursions will be made to the "Bitter Water" springs, the bathing establishments, Lake Balaton, and other places of interest. At the conclusion of the meeting the party are invited to visit Vienna to view the hospitals and clinics and the establishments at Baden. Special reductions in cost are offered to the Society and their friends. The English party will leave London on Friday, Oct. 11th, and a few vacancies are available for medical men or women who are interested in hydrology. Particulars on application to the Hon. Secretary of the Society, 130, Marylebone-road, London, N.W.1.

FACIAL ERYSIPELAS.

IN a contribution to the *Jour. Amer. Med. Assoc.* of August 10th Dr. David Seegal and Dr. Beatrice Seegal have analysed a series of 281 cases of facial erysipelas admitted to the wards of the Massachusetts General Hospital between the years 1870 and 1927 into nine somewhat arbitrary categories. Their results are illustrated by graphs of value to the statistician or to an epidemiologist, if of little interest to the practitioner. In their summary of conclusions the following points are worthy of note. The months of greatest frequency were from May to December, when, though this may be a coincidence, sore-throats due to the *Streptococcus hæmolyticus* are most frequent. Thirty-eight of the cases (13·5 per cent.) occurred in the hospital personnel; of these, 22 were nurses, 12 were members of the domestic staff, 3 were laundry workers, and 1 was a physician. The inference seems to be that these cases were the result of actual contact, direct or indirect. Forty-eight per cent. of the 281 cases occurred in patients after admission to hospital; about half this number were medical patients, the rest surgical, in whom slightly more than half had recently undergone some facial operation. The temperature was usually high during the first two days of the disease, and in about three-quarters of the total number of cases reached 104°–105° F. at some period of the evolution of the attack. The untreated case left to its natural course sometimes terminates abruptly by crisis in from 4–7 days. The mortality in the series was 10·6 per cent. This figure includes patients who were suffering from some other serious disease at the same time. When these are excluded the percentage of deaths works out at only 5. As is generally known, the prognosis is most serious at the two extremes of life.

This analysis, extending over 60 years, is interesting, but it is doubtful if the conclusions reached are of much practical importance at the present time. All modern observers will agree that true fulminating and terminal cases, such as were doubtless common before the days of antisepsis, are exceedingly rare in our day. Whether this is due to the diminished virulence of streptococci, to which the mildness of present-day scarlet fever is attributed by some epidemiologists, is of theoretical interest. It is significant, however, that the dermatologist sees a considerable number of mild cases of a relapsing type, and it would be worth while to ascertain if these, when added to the number of cases falling into the true acute group, would bring the total number of cases of erysipelas occurring in the periods 1875–1885 and 1919–1929, in a given hospital, to approximately the same total figure. Protein shock treatment has given a very much better outlook to all cases of erysipelas. Experience seems to indicate that a specific serum is not more potent than any foreign protein capable of producing the chain of phenomena we term shock, and that it is therefore unnecessary to jeopardise convalescence by injecting horse serum when milk protein will have the same therapeutic effect. In cases of the subacute relapsing type on the face, if the focus of the infection is not discovered and treated, continual recurrences with ultimate local complications, such as lymphangitis and a form of intractable elephantiasis, are to be feared. Unfortunately, the utmost diligence and patience sometimes fail to reveal a focus, and it is in these cases that the prognosis as regards complete restoration is unsatisfactory.

SEXUAL REFORM CONGRESS.

THE Third International Congress of the World League for Sexual Reform, which is being held at the Wigmore Hall, London, during the present week, opened on Sunday evening in the presence of about 120 members with an address of welcome from one of the Presidents, Dr. Magnus Hirschfeld, of Berlin, the hon. treasurer, Mrs. Dora Russell, and the hon. secretary, Dr. Norman Haire. Dr. Hirschfeld recalled the last occasion when he spoke in London, at the International Medical Congress of 1913, when the meeting was interrupted by suffragettes. Much of the progress for sexual reform since made he attributed to the political emancipation of women which had taken place in this and other countries. It was, he said, only during the present century that sexual science was winning for itself an independent position among the natural sciences. Sexual biology was still in its infancy, and much of what had been written on the subject had been dictated by points of view other than purely scientific. Sex abnormality was, he said, a fact which must be reckoned with, and should neither be over- nor under-estimated. One point he wished himself to emphasise at the outset of the Congress was that men and women whose sexual temperament diverged from the normal should neither marry nor have children. Mrs. Russell also recognised the fruitful effect of woman's political emancipation on her economic and sexual equality. Scientific investigation of sex problems would not in itself affect conduct, but was a necessary preliminary to other measures. While she hoped that a congress in London would bring publicity to the movement, she felt that its most substantial advantage would result from the free discussion between men and women of subjects which concerned them both equally. Dr. Haire set out briefly the objects of the League, the first of which is *a political, economic, and* sexual equality of men and women, which included the liberation of marriage and especially divorce from the present tyranny of Church and State, the control of conception so that procreation may be undertaken only with a due sense of responsibility, and a rational attitude towards sexually abnormal persons. Many of the aims are common to other spheres of social activity, but it is a thesis of the League that only those sexual acts should be considered criminal which infringe the sexual rights of another person. In the programme of the Congress, which is a very full one, a whole day is allotted to the vexed question of sex and censorship, to which a number of distinguished literary men are contributing.

THE EFFICIENCY OF CARDIAC MASSAGE.

THE observations of the coroner in a recent case in which heart massage restored the circulation after failure during anæsthesia raise the important question of the time at which this extreme measure should be employed. The fact that effective cardiac massage cannot be applied to the adult without opening the abdomen makes it obviously desirable to employ this form of resuscitation only as a last resort unless the abdomen has already been opened during the operation. At the same time if it is to be used with any benefit certain time limits must not be overstepped. It is generally held that artificial respiration should have been efficiently employed for fully five minutes before cardiac massage is attempted. There are now quite a large number of cases on record in which restoration of the circulation was attributed either to cardiac massage or to intracardiac injection of adrenalin. It is not certain in all these recorded cases that properly carried out artificial respiration would not have been successful, even without direct stimulation of the heart muscle. The ultimate prognosis in these patients depends on the power of recovery of the brain cells, which are those most readily damaged by stoppage of the circulation. It is generally held that the cortical cells cannot be revived after about 15 minutes of circulatory deprivation. Dr. T. Lumsden notes (see p. 585) that in his experiments on cats the cerebrum never revived if the circulation had entirely ceased for five minutes. In the well-known case at Guy's, in which a child ultimately recovered after weeks of illness indicating the cerebral damage that had been sustained, it was reckoned on good evidence that 13 minutes elapsed between the collapse during anæsthesia and the moment when cardiac massage restored the circulation. Prof. J. A. Gunn, whose investigations into the condition of arrested circulation have been valuable, recommends that in performing cardiac massage the compression should be gradual and the relaxation abrupt, that the rate should be less than half the normal heart-rate, and that there should be interruptions at short intervals to allow spontaneous beats to develop. Prof. Gunn also recommends an intravenous injection of atropine after the heart has restarted as the best means of averting secondary stoppage from excessive vagal action which has been responsible for death *after* the primary circulatory failure has been corrected.

WE regret to announce the death of Mr. Charles Alexander Morton, emeritus professor of surgery in Bristol University and consulting surgeon to the Bristol General Hospital. His death occurred on Sept. 7th in Switzerland, where he was on holiday.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—The Members' Congress will be held in London on Oct. 15th to 19th, all the lectures except the lantern lectures being given in the Great Hall of the B.M.A. House, Tavistock-square. Sir Henry Gauvain will give the first lantern lecture on The Treatment of Tuberculous Cripples: Sun and Sea Bathing, at 11 A.M. on Oct. 15th, at the Central Hall, Westminster, and the other lectures to be given at this hall include one by Mr. Naughton Dunn on Principles in the Treatment of Common Deformities at the same time on Oct. 17th, and one by Dr. A. F. Hurst on Asthma at 6.30 P.M. on Oct. 17th. Other lectures will be by Mr. H. Chapple on Twilight Sleep, Dr. Cicely M. Peake on Rheumatism in Children, Dr. Justina Wilson on Diathermy, Mr. P. Jenner Verrall on Low Backache, and Dr. G. J. Langley on Cardiac Insufficiency. Sir Cooper Perry will preside at the annual general meeting on the 19th, and the first annual dinner of the Society is to be held at the Café Royal, Regent-street, on Wednesday, Oct. 16th, at 7.45 P.M.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLIII.—SIGNIFICANCE OF THE ACID-BASE BALANCE IN THE BLOOD.

PART II.*—DIAGNOSIS OF ACIDOSIS, ALKALOSIS, AND KETOSIS.

Acidosis.

WE have agreed to use the term acidosis for a condition in which the bicarbonate concentration of the body fluids is reduced by retention of acid or loss of base. The obvious method of detecting such a condition is to measure the plasma or blood bicarbonate. We have, however, to remember that the plasma or blood bicarbonate may be reduced in order to raise the cH towards normal when the free carbonic acid concentration has been reduced by overbreathing (type 1 (*b*)). In many cases there is no doubt as to which condition is present—for example, in diabetic ketosis in which we know that an excess of acids is being formed—but in other cases the answer is not obvious. For example, a moderate reduction of plasma bicarbonate, down to about 45 is found in anæsthesia; abnormal acid formation or retention sufficient to account for such a reduction has not been demonstrated, and it was at one time widely maintained that this reduction was the result of compensation for hyperpnœa. However, in these cases the range of pH is found to be below normal—that is, cH is above normal—which leaves no doubt that the reduction of c(NaHCO$_3$) is primary. In cases of doubt, therefore, it is necessary to measure the pH of the blood as well as the bicarbonate.

Measurements of plasma or blood bicarbonate present several difficulties owing to changes in the blood on exposure to air or on standing, and it is advisable that the sample of blood should be taken by someone familiar with the technique; still greater precautions are required even for rough pH measurements.

As shown in Table II. last week there is always some compensatory reduction of free H$_2$CO$_3$ in acidosis, although the attempts at compensation may fail to bring the pH back to normal. If there is no interference with the respiratory exchange the alveolar air is in equilibrium with the plasma, so that the CO$_2$ tension in the alveolar air is proportional to the amount of CO$_2$ dissolved as H$_2$CO$_3$. Consequently the CO$_2$ tension in the alveolar air is reduced in acidosis; but, since the CO$_2$ tension is only reduced proportionally to the bicarbonate when the acidosis is fully compensated, it does not give such a good measure of the degree of acid retention as does the plasma bicarbonate. Also the patient's coöperation is needed in obtaining samples of alveolar air, which may be an insuperable objection. For these reasons estimation of the plasma bicarbonate is usually preferred. As set out in Table II. the amount of CO$_2$ per 100 c.cm. of normal plasma is 55 to 65 c.cm., while in conditions of acidosis it varies from 14 to 45.

Sellard's Test.—After taking 5 grammes of NaHCO$_3$ by the mouth a normal person usually excretes alkaline urine; but in acidosis the urine remains strongly acid (acid to methyl red) until enough NaHCO$_3$ has been taken to bring the plasma bicarbonate up to normal, which may require some 60 grammes. This gives a method of measuring the degree of an acidosis (Sellard's test) which is, however, rarely used.

Acidosis may be produced by any acid that is not poisonous in small concentration; the type most commonly seen among hospital patients is that due to retention of phosphoric and sulphuric acid in severe renal impairment. Such an acidosis usually occurs in cases of chronic nephritis with nitrogen retention as they approach the common end of all cases of this type, and may reach a severe degree as shown in Table II. of Paper I. The lowest pH recorded in man, 6·7, was found shortly before death in a patient with nephritis.

Alkalosis.

Failure of compensation, with consequent rise of pH, is usual in alkalosis, and the symptoms then are similar to those that occur in voluntary hyperpnœa and at high altitudes before accommodation is gained. Headache, dizziness, disturbed sleep, and a sense of weakness occur with the slighter degrees of elevation of pH; with more advanced degree, drowsiness, coma, tetany, and even general convulsions.

Alkalosis does not, like acidosis, occur in normal persons, and does not occur so often as a result of disease. It is caused by loss of hydrochloric acid in vomiting, particularly in the profuse vomiting that occurs with high intestinal obstruction or dilatation of the stomach due to other causes, and probably contributes to the extreme collapse in these conditions. On the other hand, alkalosis is more likely than acidosis to result from therapeutic measures, since the local effects of acids discourage their administration in large doses, the potential acids ammonium chloride and calcium chloride are unpleasant to take, while sodium bicarbonate which appears innocuous may be given in large quantities. When alkalis are given as a treatment for acidosis they should be stopped when the urine ceases to be strongly acid; it is best to use the indicator methyl red, which gives a red colour with a strongly acid urine (pH under 5·5).

Alkalosis can be detected and measured only by estimation of the plasma or blood bicarbonate, preferably with estimation of the pH as well. The CO$_2$ may rise to well over 100 c.cm. per 100 c.cm. of plasma. When large doses of alkalis are given, for example, in the treatment of pyloric ulcer, it is advisable to check the effect by plasma bicarbonate estimations; should this not be possible, it is necessary to watch for the symptoms of alkalosis—headache, nausea, weakness, and drowsiness.

The condition *alkalæmia*, an increase of the pH of the blood, can only be diagnosed with certainty by an actual estimation of the blood pH. So-called

TABLE III.—*Showing Results of Tests in Ketosis of Various Degrees of Severity.*

—	pH.	Bicarbonate c.cm. of CO$_2$ per 100 c.cm.		Acetone grammes per 100 c.cm. of blood.	Alveolar air.		Sellard's test. Grammes NaHCO$_3$.	24 hrs.: Urine.		
		Plasma.	Blood.		CO$_2$ tension mm. Hg.	CO$_2$ %.		FeCl$_3$ reaction.	NH$_3$ nitrogen grammes.	Acetone bodies as acetone. grammes.
Normal	7·30–7·45	55–65	46–64	0	38–49	5·0–6·4	5	0	0·14–1·1	0
Moderate	7·35	46	39	0·04	33	4·3	30	+	1·5	6
Medium	7·27	35	30	0·07	26	3·4	50	++	3·5	16
Severe (very drowsy) .	7·15	25	22	0·09	20	2·6	65	+++	5·5	25
Very severe (coma) ..	7·0	12	10	0·13	14	1·85	—	++++	—	—

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* Part I. appeared last week.

renal asthma is a condition of this type; the hyperpnœa is not brought on by acidosis but by an interference with the blood-supply to the respiratory centre, and occurs particularly in hyperpiesia.

Ketosis.

Ketosis, the appearance of acetone bodies in the urine, occurs particularly when the ratio of carbohydrate metabolised to fat metabolised is low; as in diabetes mellitus, starvation, and when the proportion of carbohydrate to fat in the diet is much reduced. It also occurs in fevers, especially in children, and to moderate degree in various other conditions, not uncommonly in normal pregnancy, and frequently in alkalæmia. It is undesirable that the term acidosis should be used for the appearance of acetone bodies in the urine, since this appearance need not be accompanied by any reduction of plasma or blood bicarbonate, and excessive formation or retention of acids may occur quite independently of the acetone bodies; also acetone bodies may appear in the urine in a patient with alkalosis. This is not merely a matter of nomenclature; Prof. A. E. Ellis has recorded the case of a drowsy patient in whose urine acetone bodies were found; the diagnosis of acidosis was made, and she was given sodium bicarbonate; as the ketosis became worse and the patient more drowsy, the sodium bicarbonate was repeated in heroic doses until she became comatose, developed tetany, and died. Shortly before death her plasma bicarbonate was found to be very high. It is very probable that this patient was suffering from alkalosis from the beginning.

Rothera's Reaction.

Ketosis is usually diagnosed by the detection of acetone and aceto-acetic acid in the urine. It is unfortunate that there is no qualitative test for β-hydroxybutyric acid, which is excreted in larger quantities than acetone and aceto-acetic acid in the more severe degrees of ketosis. The test that should invariably be used is Rothera's nitroprusside reaction, which is given by both acetone and aceto-acetic acid. The ferric chloride reaction which is given by aceto-acetic acid is also given by many other substances, particularly salicylic acid and its derivatives, such as aspirin. When present in small quantities the colours given by these substances are indistinguishable from that given by acetoa-cetic acid, and the methods for differentiating them are unsatisfactory. It is therefore advisable not to use the ferric chloride test unless the nitroprusside reaction is positive, and then to draw no conclusions if there is any likelihood that the patient has taken any such compound as aspirin.

In order to estimate the severity of a ketosis we may first estimate the amount of acetone bodies excreted in the urine. The straightforward estimation of the total acetone bodies is a long process not suitable for daily repetition. The depth of colour of the nitroprusside reaction gives some indication; if the colour is only pink the degree of ketosis is slight. The most popular index is the strength of the ferric chloride reaction. As might be expected the results are not very satisfactory, since the substance measured by this reaction is not the principal one excreted when the ketosis is severe. A definite reaction indicates that a large amount of acetone bodies (over 6 g. in 24 hours) is being excreted and a strong reaction that the amount is excessive; but a large amount may be excreted with no ferric chloride reaction.

An indirect estimate of the amount of acetone bodies in the urine can be obtained from the amount of ammonia in the urine, which is increased when the total amount of any acids excreted is increased; the parallelism between ammonia and acetone body excretion is particularly good. It is, of course, essential that the patient should not be receiving alkalis at the time, and that the urine should be collected with some preservative such as toluol, to prevent the formation of ammonia from urea by bacteria.

When substantially the whole of the 24 hours' urine cannot be collected, it is not possible to draw any conclusion from the ammonia concentration; some help may be given by the ratio of ammonia nitrogen to urea nitrogen; this ratio is normally about 1/30, and rises as the acid excretion rises; but it must not be forgotten that this ratio also falls when the protein intake is reduced, and no conclusions should be drawn unless the ratio is about 1/10; in extreme cases it may rise to unity.

Table III. gives examples of various degrees of ketosis. The amount of acetone bodies retained in the body fluids is of more importance than the amount that is being excreted harmlessly in the urine. A moderate amount may be excreted without any appreciable retention, and patients vary greatly in the relation between amounts excreted and amounts retained. The straightforward estimation of acetone bodies in blood is too long for repeated use. If the patient is not taking alkalis the plasma bicarbonate will give an indication of the degree of retention and has been largely used; but the bicarbonate reduction is not necessarily proportionate to the amount of acetone bodies, as other acids besides β-hydroxybutyric and aceto-acetic may be formed.

As a rough quantitative measure the nitroprusside reaction may be applied to the filtrate obtained in the *Folin-Wu method of sugar estimation*; a pink colour developing in about 15 minutes shows an excess of acetone bodies. This test might well be used more generally.

JOHN R. MARRACK, D.S.O., M.D. Camb.,
Chemical Pathologist to the London Hospital.

DONATIONS AND BEQUESTS.—Mr. Mark Firth, of Carlton-park, Northampton, left £1000 to Firth's Almshouses, Sheffield, and £100 each to the Royal Infirmary, Sheffield, the Royal Hospital, Sheffield, the Jessop Hospital for Women, Sheffield, the Free Hospital for Sick Children, Sheffield, and the Kettering Hospital, —The late Miss Marianne Hamilton, of Maclog Cottage, Beaumaris, Anglesey, left, among other bequests, £1200 to the Royal Alexandra Convalescent Home, Rhyl; £1000 each to the Anglesey and Carnarvonshire Infirmary, the Society for the Prevention of Cruelty to Animals, Dr. Barnardo's Homes, the Mission to Lepers, the Church of England Zenana Missionary Society, the Oldham Deaf and Dumb Institution, and the Oldham Home Teaching for the Blind; and £500 to the Beaumaris and District Nursing Association. The residue will be divided between the Royal United Kingdom Beneficent Society, the Oldham Royal Infirmary, Henshaw's Bluecoat School, Oldham, and the Northern Hospital for Incurables, Mauldeth, Manchester.—Mr. Charles Wellington Polkinghorne, of The Terrace, The Hoe, Plymouth, left £500 each to the South Devon and East Cornwall Hospital and the Royal Albert Hospital.—The Governors of the Manchester Royal Infirmary have received a legacy of £5898 from the late Mrs. M. A. Gratrix, and one of £1000 from the late Mr. Edwin Ogden.—On the decease of a legatee, Mr. William Malin, J.P., of Overdale, Derby, left £600 to the Derbyshire Royal Infirmary for the endowment of a cot in memory of his son. Mrs. Virginia Schilizzi, of Paris and of Athens, and Highgate, London, left £1000 to King Edward's Hospital Fund for London, and £500 each to Westminster Hospital and the Grosvenor Hospital for Women and Children, Vincent-square, London, S.W.—Mr. George Brookfield, of Queen's Drive, Mossley Hill, Liverpool, left £500 each to the Child Welfare Association, Liverpool Hospital for Diseases of the Heart, Liverpool Children's Hospital, and the Boys' Home and Refuge, Liverpool. One-half of his residuary estate is to be divided between the Liverpool Royal Infirmary, the Liverpool Hahnemann Hospital, the George Walker Memorial Hospital, and the Liverpool Central Relief Society.—Mr. Frank Walker, of Normanton-road, Derby, left £500 each to the Derbyshire Royal Infirmary, the Derby and Derbyshire Hospital for Sick Children, and the British Empire Cancer Research Society.—Mr. Thomas Lewis, of Haslingden-drive, Bradford, left £150 to the Leeds General Infirmary "as a grateful appreciation of the successful serious operation performed upon me by Dr. Littlewood at the infirmary" and £150 to the Bradford Royal Infirmary.—Mr. Joseph Cottrell, of Rugeley, Staffs, left, on the death of his wife, £1000 to the Derbyshire Royal Infirmary for the endowment of two beds in his name and £1000 to the Stafford General Infirmary for the endowment of two beds in his name.

Special Articles.

ON THE VALUE OF TONSILLECTOMY

IN THE PREVENTION OF ACUTE RHEUMATISM, RHEUMATIC CARDITIS, AND CHOREA.

BY N. GRAY HILL, *M.C.*, M.B. LOND., D.P.H.,
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IT is very widely held that the tonsils are the portal of entry of the hypothetical causal organism of rheumatic fever, and Poynton's declaration "I am convinced by clinical and experimental evidence that the tonsils are the site of access; statistics will not shake me in this belief," clearly defines the attitude of a number of medical men who have had wide experience of the rheumatic disease. Further, it is commonly claimed that the tonsils of rheumatic children are unhealthy and show evidence of chronic or subacute inflammation.

The theory that the infection enters by the tonsils is difficult either to prove or disprove. Until a definite organism can be incriminated, satisfactory experimental evidence cannot be obtained, and it must be remembered that although a fairly strong case has been made out by certain investigators against various streptococci, no organism is as yet generally accepted by the bacteriologists as the specific organism. The statement that the tonsils of rheumatic children are in a worse condition that those of their healthy brethren may be true, but unhealthy children tend to have unhealthy tonsils and a fundamental relationship between the tonsil and the disease from which the child suffers is not thereby proved. At the Bath Conference on Rheumatism Wilfred Vining stated that in his experience tonsillitis and sore-throats are as commonly met with among non-rheumatic as among rheumatic patients, and MacSweeney published figures, collected while examining school-children in Cardiff, that suggest that the alleged association between enlarged and septic tonsils and acute rheumatism does not exist. Boas and Schwartz, in a paper on the modes of infection in rheumatic fever, regard the tonsils as playing a relatively minor rôle as a source of infection, and other workers, both in this country and in America, have shown that there is not such a marked difference between the tonsils of rheumatic children and others as to warrant the dogmatic statement that the tonsils of rheumatic children are hypertrophied and either acutely or chronically inflamed.

Some Published Investigations.

But even if the tonsils were the common portal of entry it is questionable if the permanent closure of a gate after an enemy has entered will save the city. Schichhold, in a paper published in Munich in 1910, claimed that the removal of the tonsils would cure an attack of rheumatic fever and prevent recurrences, and this hypothesis has been accepted by many. Robey and Freedman endorsed it. They concluded from their investigation of 454 cases that complete enucleation is the best preventive treatment for rheumatic fever and endocarditis, and considered that tonsillectomy should be performed when there is a history of sore-throats, even when the tonsils appear normal, and when the tonsils appear diseased, even though sore-throats are absent. They refer to the beneficial results they obtained by tonsillectomy conducted during the height of an attack of acute rheumatism. Kerley, writing in February, 1929, asserts that the tonsils should be immediately removed from a patient suspected of having rheumatism, regardless of whether they appear healthy or not. Reginald Miller is of opinion that tonsillectomy is of great value in preventing arthritis and all forms of carditis, but that it leaves chorea totally uncontrolled. This suggestion is also supported by the findings of the Medical Research Council. In its report it is stated that it is curious to note the preponderance of attacks of chorea over other forms of rheumatic manifestations in 60 persons whose tonsils had been removed; 36 of these developed a first attack of rheumatism some time after the removal of the tonsils and had it in the form of chorea only, four others had chorea as well as other manifestations. A. P. Thomson states that tonsillectomy is advised in all children admitted to the rheumatic hospital at Baskerville unless definitely contra-indicated, and he holds that the value of early and complete tonsillectomy in the prevention of rheumatic heart disease is definitely established.

As opposed to this view we have the statement made by Poynton at the discussion on rheumatic infection in children at the B.M.A. meeting in Bath in 1925. He said: "I know that skilled enucleation will not *prevent a first attack of rheumatism and acute* carditis of extreme severity occurring years later, and I know also that an acute and crippling attack of carditis may directly follow removal of the tonsils in the rheumatic." Wilfred Vining, dealing with debilitated and pre-rheumatic children said: "I have seen children whose debilitated state seems to date from the removal of their tonsils and adenoids, and a recent review of cases has increased my belief that the routine removal of the tonsils and adenoids is a mistake," and in his paper given at the Bath Conference he referred to children he had had under his personal observation who developed the first attack of rheumatism after the tonsils and adenoids had been removed. Hunt and Osman reviewed the after-histories of 144 rheumatic children treated at Guy's Hospital, 66 of whom had had their tonsils enucleated, and they concluded that the operation did not diminish the liability to rheumatic infection and that to operate upon apparently healthy tonsils was quite unjustifiable and could not be too strongly condemned. Among the rheumatic children investigated by MacSweeney in 12 cases the removal of the tonsils was antecedent to the first attack of rheumatism, and yet six of these children developed endocarditis. Dr. May Wilson and others kept careful records of 413 rheumatic children that were under their observation between the years 1916 and 1927, some of the cases being under observation all through this ten-year period. 247 were subjected to tonsillectomy, and the results as judged by the occurrence and recurrence of manifestations of infection after operation lead to the conclusion that tonsillectomy is not advisable as a routine therapeutic measure for the prevention of rheumatic heart disease, and that advocates of the operation do not base their claims on conclusive data.

Author's Inquiry into After-histories.

During the last two and a half years over 400 rheumatic children have been under treatment at Queen Mary's Hospital, Carshalton. With the help of Miss Mary Allan, M.A., I have made a résumé of the histories and case-notes of all these patients and the records of their progress after discharge for a certain number of the children who have been under the supervision of the London County Council. In Table I. are recorded certain facts referring to the first 300 rheumatic children admitted to this hospital, who had had no operative interference with their tonsils.

TABLE I.—*300 Non-tonsillectomised Cases.*

			Per cent.
Developed endocarditis	176	—	58·7
" chorea	103	—	34·3
" both endocarditis and chorea ..	57	—	19·0
" other rheumatic signs	235	—	78·3
Deaths	17	—	5·67

In Table II. is set out information about the cases that appear to have had their tonsils removed in a satisfactory manner either before the onset or during the very early stages of the rheumatic disease.

TABLE II.—*50 Tonsillectomised Cases.*

		Per cent.
Developed endocarditis	29	= 58
„ chorea	16	= 32
„ both endocarditis and chorea	8	= 16
„ other rheumatic signs	40	= 80
Deaths	2	= 4

Over 60 cases have had to be excluded from the above tables either because the tonsils were incompletely removed or because the operation was carried out after endocarditis was established and the influence of the operation could not be fairly judged. The very variable behaviour of every case makes it very difficult to record in any simple way the complications and clinical course of rheumatism in the child. In the Metropolitan Asylums Board report of 1928–29 short case-notes of many of the patients here referred to are given, but this method is somewhat cumbersome, and it is hoped that the tables will be sufficient to indicate that tonsillectomy, even when carried out in a satisfactory manner during the early stages of the disease, does not appear to have any great influence on the behaviour of rheumatism and is no safeguard against either carditis or chorea.

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THE STATE OF THE PUBLIC HEALTH.[1]

THE Annual Report of the Chief Medical Officer of the Ministry of Health for 1928, of which a preliminary review was published in THE LANCET of August 31st (p. 480), is, as usual, packed with information set out in a way which cannot fail to interest.

Sir George Newman poses six questions to which every State and every local authority must seek the answer; the State or authority which knows the most economic and effective answer will excel. These questions are: How is an imperial race to be reared? How are children to be nurtured so as to grow up into healthy and productive adults? How are healthy men and women to retain their physical and mental health, and grow in grace, knowledge, and capacity? How are the sick and diseased to be treated in such a way as to enable them to return, healed as soon as possible, to the ranks of workers and breadwinners? How, in the last resort, is disease to be prevented? How are dysgenic forces (which are undermining racial health) to be defeated, and human existence controlled? To find the answer is, he says, among the supreme tasks of government in every country; it is a problem of permeating the whole art of government with the established knowledge of science and inspiring it with humanism, a biological process which demands all the faculties and powers of man's body and mind for its accomplishment. "Preventive medicine means the organisation of human nurture. Nothing is more certain than the fact that the physical advancement and health of mankind is dependent, not upon a 'doctor's stunt,' here, or a 'sanitary institution' there, but upon the whole social environment and evolution of the people." He lays down four basic principles as foundation for a national system of preventive medicine. First there must be ascertainment and accurate registration, for without statistics we cannot even begin to measure the value of methods or results. Secondly, there must be a standard of health and physiology, and we must understand the relation of man's whole environment to the normal physiology of his body, and to departures from its standards. Thirdly, we must have an ever-increasing knowledge of the nature, character, and incidence of disease, the social factors which modify it, and its mode of spread, treatment, and prevention. Fourthly and lastly, there must be national organisation. The proof of the validity of the medical ideal is essential to its wide adoption; its acceptance depends upon the assent of the people, its application calls for public money, and its administrtion for public representatives.

Maternal Welfare.

The year 1928 was marked by considerable increase of interest in the problems that concern mother and child, and the Ministry of Health is to be congratulated on the success of its efforts to awaken the profession and the general public to the need for a more complete and adequate maternity service. The maternal death-rate has shown no substantial reduction since 1911, and although this static position may be more apparent than real, it emphasises the need for continued effort. Puerperal sepsis accounted for 1184 of the 2920 maternal deaths, and this figure must be regarded as a certain understatement of the deaths due to puerperal infection. It seems to be generally conceded that every pregnant woman should have ante- and post-natal examination by a medical practitioner, the attendance of a qualified midwife during labour, and the services of a doctor if any abnormality arises. A scheme of this sort would, it is hoped, abolish the "handy woman," and secure coöperation rather than competition between doctor and midwife. The number of antenatal clinics approved by the Ministry increased during the year, but their standard of efficiency unfortunately is not always as high as it should be. Obviously attendance at an unsatisfactory antenatal clinic may be a positive danger, and the Maternal Mortality Committee have prepared a memorandum setting forth the principles and organisation required to bring an antenatal centre to the minimum standard of adequacy. This memorandum, which was summarised in THE LANCET of August 10th, p. 295, is printed in the Report, and will, it is hoped, be studied carefully by all authorities.

There is still a shortage of maternity beds; at the end of April, 1929, there were 2480 beds recognised by the Ministry. The Report takes a conservative attitude towards the recommendation that every baby should be born in a hospital of some kind. While hoping that there will soon be enough beds to supply every woman who wants one, the Ministry feels that for a long time to come the great majority of births will take place in private houses, and that the improvement of domestic midwifery is therefore its first concern. Moreover, without an extremely high standard of treatment, and a lively appreciation of the risks of puerperal infection, the congregating of a number of parturient women in one place paves the way to an outbreak of sepsis, which could never occur if the patients were segregated in their own homes. The Report gives, as a warning, an account of some outbreaks of puerperal fever in maternity homes, and emphasises the importance of searching for unwitting carriers of hæmolytic streptococci in the nasopharynx. It is hoped that the reorganisation of space under the Local Government Act may allow for the formation of larger and better-equipped maternity units. Now that motor transport is available all over the country, one unit can serve a very large area, and small maternity homes can be linked administratively with the large centres. Although the training of medical students has greatly improved during the last decade, it is by no means universally satisfactory, and there is practically no provision for post-graduate work in midwifery. The Report urges obstetric specialists to pay special attention to this aspect of the problem.

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[1] Annual Report of the Chief Medical Officer of the Ministry of Health for 1928–29. H.M. Stationery Office. Pp. 295. 3s.

A committee was appointed in the summer of 1928 to consider the training of midwives, and the conditions of their work. Their report will be published shortly.

The committee on maternal mortality, appointed at the same time, is a standing committee to survey the whole field of obstetric practice, and from time to time to make suggestions to the Ministry. It has three subcommittees—clinical, public health, and research. Its first duty was to advise on the investigation into maternal deaths, and two medical assessors were appointed for this purpose. The response made to the request for investigation has been very satisfactory; up to the end of last June English medical officers of health had sent in 282 reports for 1928, and 869 reports for 1929.

Infant and Child Welfare.

On April 1st, 1929, there were 2522 recognised infant welfare centres in England, an increase of 91 during the year. There are 4131 whole or part-time visitors. The new regulations making an approved certificate a condition of the Ministry's approval came into force on April 1st, 1928, and caused a certain amount of difficulty in filling vacancies. There are many more students training this year than last, but local authorities are urged to facilitate schemes for training, and to arrange attractive conditions for service. There are the same number of beds for infants as last year, and there are now 98 day-nurseries and 104 homes for unmarried mothers and their babies, 95 of which receive grants. The mothers stay about six months in the homes, which provide accommodation for 1480 women and 1340 babies. The Ministry also recognises 34 residential homes for orphaned or illegitimate babies. Arrangements have recently been made at Chailey for the reception of babies suffering from malnutrition and similar ailments; the results have been very satisfactory.

The Report remarks that the infant mortality-rate will not continue to fall unless more and more means of securing infant health are discovered and applied. The Health Committee of the League of Nations set up a committee to consider infant welfare, and under their ægis a year's investigation was made into stillbirths and neonatal deaths in selected districts in Germany, Austria, France, Holland, Norway, Italy, and England. Very much the same returns were obtained from all these areas. Everywhere the great majority of deaths fall into three groups: (1) stillbirths and neonatal deaths due to prematurity and obstetric trauma; (2) gastro-intestinal diseases; (3) respiratory diseases.

The second group is the most preventable, and can be reduced to a negligible factor in districts where care is taken. The first group accounts for about two-thirds of all infant deaths, and is not showing any appreciable diminution. Our means and methods of preventing respiratory disease are by no means adequate, and call urgently for improvement.

The time has undoubtedly arrived for a very special effort to discover and deal with the defects and diseases of children between one and five years of age. More facilities are needed, and more attempts should be made to persuade parents to take advantage of them. The most critical period is probably that of weaning and just after; the mother has neither time nor knowledge to see that the difficult process of transition from babyhood to childhood is mitigated. Frequent visits to a consultation centre are most desirable for the infant, but by no means essential for the older child, and what is needed is some scheme which will help the mother to make the best use of her own resources, and to supplement these resources when necessary. In 1924 an investigation into the health of pre-school children was initiated, with the help of medical officers of health and voluntary centres. A number of children in three groups have now been kept under observation for three years, and nearly 2000 case sheets are available for statistical investigation. The three groups were: (1) average unselected children attending a centre; (2) "catarrhal" children attending a centre; (3) two or more children in the same family. The results of an investigation at Guy's Hospital into the causes of catarrh are summarised. It was found that 1016 catarrhs were suffered by 370 children, and the greatest proportion (an average of 3·1 per child) occurred in the second year of life. The resistance during the first year is ascribed partly to breast-feeding but primarily to fresh air. The infant can be left out of doors most of the day, but the toddler needs constant supervision, and is often taken out only when the mother goes shopping. In the third and fourth years the children can be allowed out by themselves. The correlation between the amount of fresh air and the average number of catarrhs per child is very striking. Children who were grouped as having a good deal of fresh air showed an average of 1·82; those who had a moderate amount of 3·11; while those who had little air were small, pale, waxy babies, with soft limbs, protuberant abdomens and snuffling noses, or fretful toddlers with thick lips, narrow chests, poor muscles, bad appetites, and disturbed sleep, and showed an average of five colds per child.

The Insurance Medical Service.

The post-war years have formed a period of steady development of efficiency and growing mutual confidence. The Report points out once again that the "panel doctor"—sometimes criticised as though he were some strange genus—is only an ordinary general practitioner, who has chosen to devote part of his time to general practice among insured persons. The great majority of doctors in England and Wales are panel doctors, and the treatment they give their insured patients does not differ from that which they give to their private patients. The Report also explains how insurance practice can be carried out with less clerical work than is normally necessary in a well-conducted practice. The number of insured persons entitled to medical benefit in 1928 was 14,814,000, more than one-third of the total population. The number of insurance practitioners was 15,276, and the number of prescriptions dispensed by 9088 chemists was 54,455,557. Exclusive of administrative expenses, the cost of medical benefit was £9,073,080, of which about £2,241,780 were spent on medicines and appliances. The extraordinary rarity of serious complaints throughout such an immense service, which is run without any system of clinical inspection, is a striking testimony to the high standard of professional conduct which Sir George Newman believes to be "an outstanding feature of British general medical practice." During 1928, an important extension was made in the coöperation of the medical profession on the "disciplinary" side of the service. When a practitioner is adjudged by an Insurance Committee to have failed to fulfil his obligations, either party may appeal to the Ministry of Health. In considering these appeals, the Minister is now advised by a committee consisting of the Chief Medical Officer and two other medical officers of the Ministry, and three doctors selected from a panel nominated by the Insurance Acts Committee of the British Medical Association. Moreover, any officer who is appointed to hear an appeal has sitting with him a practitioner selected from this panel. During 1928, the practitioner was exonerated in most of the 209 cases of complaint investigated. Remuneration was withheld in 42 cases only, and no formal representations were made that a practitioner should no longer remain on the list. Remuneration was also withheld from eight practitioners who had failed to keep medical records, and from five who had failed to supply the regional medical officer with necessary information. It is hoped that the cost of prescribing may be reduced by the preparation of a single formulary for use throughout the country, and this formulary has now been prepared by a special subcommittee. Practitioners will also very soon be supplied with a quarterly statement of the principal statistics of his own prescribing, with a comparison of the cost per prescription per person with the average cost incurred by all the practitioners in the area.

There have been several conferences to consider the steady increase in the number of claims for benefit, and various changes in the certification rules are under discussion. It has been agreed that a common form of notice should be used for all patients who are referred to a regional medical officer, and that the source of reference should not be stated, so that patients will not know if the doctor has referred them as doubtful; that the certificates issued to doctors should be consecutively numbered, so that it is possible to ascertain the number of certificates issued by each practitioner; that statistics should be prepared of the number of patients referred to the regional medical officer by each practitioner, and of the proportion of them who consequently cease to draw benefit, and that any doctor who appears from these figures to be exercising insufficient care in certification should be approached in the matter, and that if his explanations appear unsatisfactory, the Minister should refer the matter to the panel committee for disciplinary action.

The attempt to provide post-graduate facilities met with indifferent success, and only 89 practitioners attended courses of instruction during the year. Additional efforts are being made to increase the number in 1929. More and more cases are being referred to the Regional Medical Staff, which now consists of 59 officers, eight additional deputy regional medical officers having been appointed.

By the National Health Insurance Act, 1928, two new benefits were provided: payment for medical or surgical advice or treatment outside the scope of any other benefit, and payment to approved charitable institutions for treatment outside the scope of ordinary benefit, both additions being under a special ad hoc scheme. The sum of £2,500,000 was allocated to dental benefit during 1928, and about £400,000 to ophthalmic benefit. The Regional Dental Service began its work in March, 1927, and 27,084 cases were referred to it during 1928. Two additional regional officers and 20 part-time referees were appointed.

NATIONAL VETERINARY MEDICAL ASSOCIATION.

ANNUAL MEETING AT AYR.

Dr. O. Charnock Bradley, Principal of the Royal (Dick) Veterinary College, Edinburgh, presided at the annual meeting of the Association held last week at Ayr, when delegates were present to the number of about 200, including representatives of the United States, Canada, Australia, New Zealand, and Japan. Dr. Bradley surveyed the great developments taking place in every phase of veterinary science and practice, especially the growth of animal research. In the seven years since he last presided over the Association, an Institute of Animal Pathology, under Prof. J. B. Buxton, had arisen at Cambridge, and an Animal Diseases Research Association in Scotland, with an Institute of its own. At the same time there had been a rapid and remarkable increase in the number of public appointments, the veterinary staff of the Ministry of Agriculture had been augmented, most important of all was the growth of an army of county and municipal veterinary officers The country was beginning to realise the importance of veterinary science in the protection of the health of the people. Dr. Bradley described the efforts to build up an adequate veterinary service in the colonies and dominions, where the supply was below the demand. The recommendations of Lord Lovat's committee were likely to have a profound effect on veterinary education generally. He expected that the report would induce more men of university standing to enter the veterinary profession. Uneasiness as to bovine tuberculosis was growing, and he thought the time had come to form a consensus of practical economic and academic opinion as a comprehensive basis for future action.

Carriers of Foot-and-Mouth Disease.

Mr. J. O. Powley, M.R.C.V.S., of the Ministry of Agriculture, made some striking suggestions about the sources of foot-and-mouth disease. In a recent outbreak investigated by the Ministry, lesions were found on the feet of rats. The Research Committee is pushing this point to a finish, but the viability of the virus and its easy destruction are two factors of difficulty. Feeding pigs, poultry, and cattle with crushed, imported marrow-bones has resulted in outbreaks, and presents another channel of inquiry. About 50 to 60 per cent. of the bone for making bone-meal came from South America. It was always fresh and, therefore, always dangerous. There had been reports of human beings suffering from this disease; but he knew of no steps taken to verify the diagnosis. Foot-and mouth disease is still full of unresolved problems; fortunately the incidence on human beings is small, and the "slaughter" method is practicable with animals. But something more scientific is wanted and expected.

Tuberculin Testing.

Prof. Buxton described the methods of applying the tuberculin test to herds, giving facts which, after all these years, are disconcerting. He considers that the double intradermal method gives almost 100 per cent. accuracy. The subcutaneous method is notoriously unreliable. Everyone must agree that the tuberculin itself should be standardised for animal testing as it is, under the Therapeutic Substances Regulations, for human application. Until this is done, reliable results can hardly be expected. The Medical Research Council has already surveyed the field. Obviously, too, the skill needed for carrying through the test is underestimated.

Mineral Requirements of Farm Animals.

Dr. J. B. Orr, director of the Rowett Institute for Research in Animal Nutrition, said that of the non-energy-yielding constituents, those required in largest amounts were calcium and phosphorus. They not only formed the main elements in the skeletal structures, but were present as essential components of every living cell. Pigs on a diet deficient in calcium developed symptoms resembling tetany in children, a condition in which the blood-calcium had been shown to be definitely below normal. The evidence which could be brought forward in support of the hypothesis that deficiencies of calcium and phosphorus in the food led to decreased resistance to certain diseases was much too meagre to enable them to draw any conclusions. It was sufficient, however, to stimulate further investigation. The bearing of diet on resistance to infectious disease was a research problem for human as well as for animal preventive medicine; but the most enlightening work had been done on farm animals. The field for observation was much wider in the animal world. The ideal combination for research would be team-work between the veterinary clinicians and the physiologists.

Prof. J. Russell Greig, of the Royal (Dick) College, said that the presence of calcium in the organs was of prime importance against toxins. Stiffness in race horses after the severe exercise of galloping was due to the calcium being rendered non-available. On recent evidence he had no hesitation in saying that calcium deficiency was the cause of milk-fever in cows, and he suggested that the heavy losses through sterility might be associated with the same cause.

Calcium and phosphorus metabolism are already occupying the energies of many investigators. It is pre-eminently a case for the collaboration Dr. Orr suggests. Given the adequacy or deficiency of calcium and phosphorus, the controlling factor is still to seek, just as in the case of the blood-sugar. But full advantage should and will be taken of the facilities available at institutes for animal research like the Rowett.

The next annual meeting of the Association will be held in London, before the opening of the International Veterinary Congress there, in August, 1930.

MEDICINE AND THE LAW.

Drugging the Truth out of Suspects.

A FEW days ago fresh reference appeared in an evening newspaper to the possibility of obtaining evidence in criminal trials by administering drugs to a prospective witness and thereby throwing him off his guard and enabling admissions to be extracted from him while he was at a disadvantage. This idea of applying to the detection of the criminal an experience acquired in obstetrical practice has already been discussed in THE LANCET more than once. In 1922[1] mention was made of a paper read by Dr. E. House, of Ferris, Texas, before the State Medical Association of Texas on the Use of Scopolamine in Criminology. An extraordinary attempt to turn this method to account was described in our pages a year ago when[2] "a heavy injection of hyoscine hydrobromide" was reported to have been administered to a suspected murderer in Hawaii. The Royal Commission (presided over by Lord Lee) on Police Powers and Procedure quoted our account of the Hawaii incident in its report last March in connexion with a discussion of so-called "Third Degree" methods of extracting evidence. The etymology of the expression "Third Degree" is a little obscure. According to an American authority the "First Degree" occurs when the officer of the law puts inquiries upon arrest, the "Second Degree" when the arrested person is taken to the place of confinement, and the "Third Degree" when that person has been taken into private quarters and there interrogated closely as to his movements or as to the bloodstains upon his clothing, &c. As was stated in our columns a year ago the system of extracting evidence with a hypodermic injection is so utterly alien to the British methods of police and criminal procedure that its adoption in this country is unthinkable. We have evolved an elaborate formula for warning an accused person that what he says in answers to police questions may be taken down in writing and used against him. This system of giving a "caution" is entirely inconsistent with any idea of catching a man off his guard. It has sometimes been suggested in criminal trials on behalf of the accused that the police have extracted some information from him by acting contrary to the spirit, if not also to the letter, of the prescribed procedure. Where such an abuse has occurred, there is no doubt that English juries will have seen to it that the interests of the accused do not suffer thereby. The Lee Commission was convinced that a criminal court does want to know what an accused person has said upon arrest or upon the charge being read over to him. The Commission sought to ensure that no such statement should be used at trial unless the accused had obviously been willing to make a statement and unless the statement was accurately recorded. The Commission recommended, therefore, that an accused person, expressing a wish to make a voluntary statement, should be cautioned (i.e., should be warned that he is not obliged to make any statement, but that, if he does, it may be given in evidence), should be offered writing materials, and should be left to write it without being overlooked, questioned, or prompted. If he declines to write the statement himself then—the Commission suggested—he should, as a new and additional safeguard, be required to write out in his own hand a request to the following effect:—

"I, A. B., having been cautioned that I am not bound to say anything, and that what I say will be given in evidence, wish to make a statement, which I have asked Sergeant C. D. to write down for me."

Such a request, it was recommended, should be signed by the accused person, who should add the time and date of its being written. His statement should then be taken down by the police officer in long-hand as nearly as possible in the actual words used, with a special precaution limiting the asking of questions by the police to remove ambiguities. Further, the accused should be given ample time to read and re-read his statement with a view to correction—ample time meaning several hours or even next day; and any prisoner who wishes to make a statement should, if he desires, be entitled to have his legal adviser present and to be supplied with a copy of what he has said.

These recommendations require no statutory confirmation; they merely set up a standard of fair play in administrative procedure; they do not greatly differ from the practice already operative in many of our police forces. The breadth and reasonableness of them show how impossible it is for our criminal methods to tolerate any idea of drugging the truth out of an accused person.

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[1] See THE LANCET, 1922, ii., 1082, 1100.

[2] See THE LANCET, 1928, ii., 990.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Influence of Caffeine on Fertility.

Prof. H. Stieve, of Halle University, writing to the *Medizinische Welt*, reports on experiments made by him on the influence of caffeine on the procreative capacity. Using rabbits of the Russian species he made three series of experiments; in one he gave caffeine to male rabbits and then mated them with female rabbits; in another group he gave caffeine to females only and not to their mates; and in the third he gave caffeine to female rabbits who had previously been impregnated by non-caffeinised male rabbits. In the first series a quantity of 0·025 g. for each kilogramme of body-weight had no influence on the sexual impulse even if given daily for a period of six months; but of 71 young rabbits born at the proper time 54 (76 per cent.) died within the first week. Male rabbits may, however, become accustomed to the caffeine, since among rabbits receiving 0·1 g. daily all but one out of 42 young remained alive. Female rabbits are more sensitive to the drug than male ones, since in the second series 72 per cent. of the young died or were born dead. In the third series, where the females were given caffeine during pregnancy, only 72 per cent. of the expected litter were born. Of the surviving male brood some showed early disappearance of the sexual impulse. Prof. Stieve concluded that caffeine has a toxic effect on the generative glands. In females dying from chronic caffeine poisoning degeneration of the ovaries was found, while in males the formation of semen was found to have ceased. As far as man is concerned such large quantities in relation to weight as given in these experiments are never consumed. A daily consumption of 4–5 large cups of strong coffee would be less than a tenth of the quantity which poisons rabbits. But as the human species is much more sensitive to caffeine than are rabbits, the author is of opinion that regular consumption of strong coffee has a deleterious effect on the generative capacity even if it does not prejudice the general health. He believes that a part of the undesired sterility observed in many civilised nations is due to the injury done to the generative glands by caffeine together with other toxic substances. Since mental strain is liable to prejudice the sexual impulse and since brain-workers are inclined to drink strong coffee, the cumulative effect may produce sterility.

Cost of Foodstuffs.

The Hamburg Statistical Office has made an interesting research into the cost of food of an average family of the lower middle classes. They distributed household account books to 300 Hamburg families of teachers, lower grade civil servants, employees, and skilled workmen who had agreed to record daily in the appropriate columns the money expended during a year on foodstuffs. It was recorded that the nutrient value of the food was on an average adequate.

The protein foods in the form of fish, meat, cheese, and bread amounted to roughly 74·6 per cent. of the total purchase, and must be regarded as lavish according to modern views. Fat was consumed per head in a quantity of 106 g. instead of the 60–70 g. which are adequate. Of vegetables only 404 g. were taken daily instead of the 500 g. which must be regarded as satisfactory, for the cost of vegetables is not small. Every family spent on an average 347 marks for 148 kg. meat, while only 39 kg. of fish were used at a cost of 38·5 marks. This is the more astonishing, as Hamburg is situated near the sea, and the cost of 10 g. of protein in form of fish is only 5·7 pfennigs, while meat of the same nutrient value would cost 11·7 pfennigs. The Hamburg Statistical Office states that by a larger consumption of fish the importation of meat from abroad would be considerably reduced.

Prophylaxis of Diphtheria.

Immunisation of children has been going on briskly in Berlin since 1926, when an epidemic of diphtheria occurred in a rather severe form. According to a report of the Municipal Health Office, more than 100,000 children have been protected. Two kinds of prophylactic were used, the Hoechst and the Behring antitoxin. The younger the children were the better was the injection endured. Apart from the local reaction, some children showed a general reaction which consisted in an increase of temperature for 2–3 days and sometimes a rash. Very few undesirable phenomena were recorded; a paresis of the arm of a girl was reported by her mother, but could not be detected some hours later and was thus probably of a hysterical character. A boy showed swelling of the axillary glands with a passing albuminuria, and another boy had a swelling of the cervical glands with a temperature of 40° C. and hæmorrhagic diarrhœa. All these children recovered and no permanent harm was done. The morbidity of the immunised children was only one-third of the general morbidity of diphtheria. The report insists on the need for two or three inoculations, with an interval of two or three weeks between each.

Birth Injuries.

Dr. Vogel, of Leningrad, has been investigating the importance of injuries received by infants during delivery. He has communicated a full statistical report to the *Monatsschrift für Geburtshülfe* on all the deliveries in the Leningrad Maternity Hospital from 1908 to 1927. In 34 per cent. of all the deaths of infants during delivery cerebral hæmorrhage was found at autopsy and hæmorrhage of the abdominal organs in 8 per cent. of the rest, so that hæmorrhage was found in 42 per cent. Injury was the cause of death in 50 per cent. of the still-births or premature births. Injuries are especially dangerous to fœtuses with lessened resistance; in breech presentations the proportion of mortality due to injury is still higher. The prophylaxis of injuries must consist in a reduction of operations, conservative treatment being in the interest of the child as well as of the mother. The author concludes from his investigations that delivery lasting even as long as 24–48 hours gives better chances of survival than operations.

Abuse of Medical Publications.

The Syndicate of the German Medical Press utters a warning against the indiscriminate recommendation of new drugs and compounds. The committee have long ago taken measures against that nuisance so that their columns are now open only to reports founded on personal experience. Certain publishers, however, not belonging to the Syndicate, find means of recommending drugs and compounds to the profession in an unfair way. A publishing firm, for example, advertises a filing system where certain drugs are inserted with indications for their use if the producer pays a sum varying from 200 marks upwards. Another firm publishes an annual for patent medicines which, according to the prospectus, is sent free of charge to every German medical man. A medical man who runs a risk of prosecution is the editor of a therapeutic manual who sends circular letters to the pharmaceutical factories asking them whether they are willing to have their products mentioned in the manual and if so if they are willing to pay for an insertion which will not be in the form of an advertisement. The medical profession is warned against such insidious advertisement.

Accident Insurance of Medical Staff.

The recent amendment of the State Accident Insurance Laws extends the clauses of that law to the staffs of hospitals, clinics, medical laboratories, and to every person employed by a medical man as assistant (qualified or otherwise), attendant, or servant. Every medical man employing such persons is regarded as an employer under the Act and must have his personnel registered for insurance purposes. Hospitals and the medical profession form a State insurance body after the pattern of the long-existing industrial employers' associations, which have to treat and to indemnify the injured. The contributions will be low and will be collected from the individual member of the profession by the medical chamber together with the other contributions payable to the chamber.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Dr. Colin Mackenzie's Knighthood.

THE conferment of a knighthood on Dr. Colin Mackenzie has been accorded the whole-hearted approval of medical and scientific circles in Australia. Sir Colin Mackenzie has devoted the greater part of his life to an intensive study of the anatomy of the unique fauna of Australia, especially the marsupials. The anatomical structure of these mammalian curiosities presents an unequalled but diminishing opportunity for studying human embryology from the functional standpoint. Work of practical value has already been done on uterine support; the problem of the double uterus; the anatomical relationships of the ureter and genital ducts; the comparative anatomy of the mandible, the central nervous system, the colon, the great omentum, lesser sac, and appendix vermiformis. The marsupials offer an excellent field for the study of postural changes. After a brilliant career as an orthopædic surgeon, Sir Colin retired from practice in 1924 to give the whole of his time to the study of indigenous animals. He founded the Australian Institute of Anatomical Research, which controls a large reservation of native fauna in the mountainous district of Healesville, near Melbourne. His own unique collection of macroscopic and microscopic preparations—for which he recently refused an offer of £100,000—has been presented to the Commonwealth. Since the foundation of the national capital at Canberra, plans have been prepared for an Australian Institute of Anatomy, to be built at a cost of £110,000, on a site of eight acres. Associated with this institute will be a reservation of 80 acres, occupying a peninsula of the Molongolo River, where native fauna can be studied in the natural state. Canberra is destined to become the anatomical centre of the Pacific, and, from the point of view of specimens, the Australian Institute will rank second only to the Hunterian Museum of the Royal College of Surgeons of England. It is fitting that Sir Colin has now been appointed its director.

Medical Education in Victoria.

Prof. R. J. A. Berry, Dean of the Faculty of Medicine at the University of Melbourne, in a report recently submitted to the Premier of Victoria, criticises the conditions of medical education at the Melbourne University. He urges the necessity for the pre-medical general cultural education of students, for a more careful selection of candidates for the medical course, involving an entrance examination, and he considers that there is grave danger of immaturity under present conditions. Prof. Berry disapproves of the administration of the University Council which he describes as a "non-medical body of elderly men." He objects to their reviewing proposals by authorities on medical education, and he asks for increased powers of spending the money allotted to the faculty of medicine. The Council have responded to his criticism by expressing sympathy with his proposals for reform.

New South Wales Hospital Bill.

The problem of financing the hospitals of New South Wales has been the despair of their managing boards and has over-taxed the resources of the Treasury. In an endeavour to place the hospitals on a sounder basis, a Hospitals Bill has been introduced to the State Parliament. Consideration was given to the proposal to conduct a Government lottery for the benefit of the hospitals (as is already being done in Queensland) but this idea was shelved. The introduction of an amusement tax for hospital purposes was considered impracticable. The imposition of a hospitals tax was not favoured by the State Parliament. In the first place, taxation is already heavy enough, and secondly, there was a fear that nationalisation would dry up voluntary contributions and lead to a more extensive use of the hospitals by those who could afford to pay for private treatment. It is now proposed to divide the State into hospital districts and to constitute a hospitals board consisting of a chairman, two medical men, two representatives of metropolitan and country interests, and a woman member. New South Wales has been fortunate in securing the services of Mr. R. J. Love, until recently the secretary of the Victorian Charities Board, who has just returned from a study of hospitals of Great Britain and America. The board will coördinate the activities of public hospitals with a view to greater efficiency and economy in operation, will allot the subsidies in proportion to the size and needs of the hospitals, and will exercise stricter control over payments by patients who can afford them. Schemes of industrial contributions will be encouraged.

In the discussion which the Bill evoked in Parliament some interesting figures were brought to light. In 1906 there were 20 hospitals in the metropolitan area and 114 in the country. In 1926 that number had grown to 27 in the metropolitan area and 134 in the country. The number of in-patients per year for those years had been 84,800 and 116,636 respectively. The population had increased by 50 per cent., but the number of in-patients had increased by 215 per cent. The advent of motor traffic caused a considerable increase of serious cases; in many hospitals from 10 to 12 per cent. of the patients are there as a result of motor accidents, and they remain in hospital for long periods. More than 60 per cent. of the expenditure at the Sydney Hospital is on account of wages. New South Wales is making an attempt to grapple with a problem which is increasing the world over in magnitude and complexity.

ST. THOMAS'S HOSPITAL.—In his annual report Sir Arthur Stanley, the treasurer, states that, after long and careful consideration, a scheme has been evolved for the erection of an out-patient department on the site opposite the hospital purchased ten years ago. This scheme, he says, "will make St. Thomas's the finest hospital in Europe." He said that the plan which, in its entirety, includes the new medical school, had met with the whole-hearted support of the medical and surgical officers. The accommodation for paying patients in St. Thomas's Home—20 beds for each sex—is inadequate. The medical and surgical staff have represented that 80 or 100 beds would not be too many, and it is hoped that in the near future it may be possible to build such a home on the Paris-street site. Of the 593 beds in the hospital 569 were occupied on the average. There were 11,074 in-patients who stayed 18 days and cost £11 6*s.* 1½*d.* each. There were just under 100,000 new out-patients who cost 12*s.* 6*d.* each. The expenditure was £188,590, which exceeded the income by £3616.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of three county borough health resorts, a borough, and a cathedral city:—

Name of district and estimated (R. G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Brighton C.B. (148,800)	13·5	12·9	0·91	1·09	1·4	2·7	51/27	39	2·5
Eastbourne C.B. (58,500)	12·4	11·5	0·90	1·74	1·0	2·1	43/30	15	1·4
Hastings C.B. (62,600)	12·0	15·0*	0·93	2·00	2·3	3·9	51/24	23	4·0
Swindon B. (61,110)	15·6	9·9	0·79	1·40	1·2	1·7	36/16	22	4·4
Worcester C. (52,650)	14·8	13·6	1·00	1·78	1·3	2·7	59/28	60	0·0

C. = City. C.B. = County Borough. B. = Borough.
* Standardised rate = 10·8.

Brighton.

Dr. Duncan Forbes reports that the borough was extended during the year to include Rottingdean, Ovingdean, a large part of Patcham, and a small part of Falmer. In the added areas many bungalows had been already erected with small regard to either sanitary conveniences or town-planning. The borough council have continued the arrangement made by the county council for the subsidisation of the two nurse-midwives for Rottingdean and Patcham, and with the aid of the residents a new district nursing association has been formed for Moulsecoomb. Dr. Forbes deplores the fact that children die unnecessarily from diphtheria because the family doctor is called in too late and the giving of antitoxin is delayed by waiting for the result of the bacterial examination. He pertinently asks why the examination of swabs in acute cases with exudate in children should not be discontinued. The insurance committee suggests that a rheumatic clinic should be established in Brighton.

There are still bad cases of overcrowding unrelieved. During 1928 the corporation completed 126 houses on the North Moulsecoomb estate and 60 in Whitehawk Valley. All the last-named houses are now occupied by tenants from bad property or from houses which were later occupied by tenants from bad property. The policy of the health committee was to rehouse at Whitehawk tenants from a condemned area, including some, which were not desirable, in the hope that given a chance they would improve with healthy surroundings. In 1927 a loan of £4000 was approved for the reconditioning of unsatisfactory houses purchased by the corporation. Up to May, 1929, about £3100 of this amount was spent over the purchase and reconditioning of 23 houses. On Jan. 1st, 1928, the Carlton Hill area was represented covering 3 acres and with a population of 775 adults and 228 children under 10. Brighton's difficulty is that the displaced tenants from the congested areas in the centre, who ought to be housed in the suburbs, cannot pay the increased rents and the bus fares in and out, and many of them are dirty and unsatisfactory tenants. The present scarcity of working-class houses makes a "move-round" difficult. The housing subcommittee desires to have only good tenants, and in any case the corporation could hardly rehouse bad tenants while there are good tenants living in conditions of overcrowding. The unfit houses cannot be closed and the landlords will not renovate them. Dr. Forbes puts forward as suggested remedies: that the council should consider the relief of overcrowding in sanitary as well as insanitary property in spite of the fact that the tenants cannot pay an economic rent; that a more elastic reconditioning scheme should be introduced; and that private citizens might be encouraged to form a voluntary association for the purchase and reconditioning of poor property.

During 1928 108 samples of milk were examined for tubercle and nine gave a positive result. In three cases cows were found and dealt with under the Order, but in six cases no infective cow was found.

Eastbourne.

Dr. W. G. Willoughby states that 56 subsidised houses were erected during the year, of which 46 were municipal. At the end of the year there were 986 applicants for houses, of whom 81 had a whole house, 127 were newcomers, and 130 lived outside the borough. Of the remaining 648 applicants, 115 had no child, 270 one child only, and 141 had at least three rooms each. Among the remaining 122 and the 270 with one child, there were probably about 200 instances where the council could have good tenants and remove uncomfortable existing conditions. Dr. Willoughby says that it is obviously necessary for the municipality to continue to build houses. At the close of the year only 15 of the huts were still occupied and these 15 tenants were to be provided with houses during the first quarter of 1929. The Municipal Maternity Home (14 beds) admitted 239 mothers for confinement, the total births in the borough being 726. The municipal midwife lives in the Home and attended 103 outside confinements as compared with 86 in the previous year. The antenatal work of the Home is an important development. After four years of comparative freedom from diphtheria there were 120 cases notified in 1928 with five deaths. The average notifications for the previous ten years were about 40.

Eastbourne's sunshine record (1991·8 hours) was the third highest in the United Kingdom (excluding the Channel and Scilly Islands); and the rainfall was 34·73 inches.

Hastings.

Dr. G. R. Bruce states that the chief item of interest among infectious diseases was the increased prevalence of diphtheria during the second half of the year. The peak of the incidence was in the fourth week of July with 21 notifications. The schools were not specially affected and most of the cases occurred in the populous central districts where visitors congregated. Throat swabbing indicated that the germ was widely distributed among contacts. The type of the disease was mild, there being only 2 deaths out of 133 notified cases. The orthopædic clinic at the Royal East Sussex Hospital, fully equipped and up to date in every way, was opened early in the year. At the end of the year there were 55 cases under treatment, 28 sent by the school medical, 19 by the maternity and child welfare, and 8 by the tuberculosis departments respectively. The chain of treatment appears to be complete, says Dr. Bruce, but one weak link is the difficulty in making parents understand the necessity for prolonged treatment and persistence in the exercises at home.

No subsidy houses were erected during the year and there are no municipal houses now in course of erection, although Dr. Bruce points out that there is still an unsatisfied demand for houses from families living in overcrowded rooms, basements, and small unsatisfactory houses, a considerable number of whom could not pay the rent of a council house. The first open-air school in Hastings was opened by Lord Eustace Percy on June 11th on a site previously lent by Miss Rance. The accommodation is for 25 delicate children from 5 to 9 years of age, and the education committee are considering the establishment of another similar school for the St. Leonards end of the borough. The sunshine record of Hastings was 1983 hours.

Swindon.

Dr. Dunstan Brewer reports that the borough was extended on Oct. 1st and that the Hurst municipal housing estate was included. The inhabitants of the area added had always attended the Swindon clinics and used the isolation hospital. The duties of the old Swindon and district hospital board have now been assumed by the town council and on Dec. 1st the borough took over the training school and extern midwifery department, which used to be run by the Wilts Nursing Association. The vast majority of Swindonians are reasonably comfortably housed. There are only four inhabitants per house, and if every unsatisfactory house in Swindon were swept away the population could be housed in the remainder without any overcrowding if the housing were arranged on a completely communistic basis. In practice, however, there is some overcrowding owing to the lack of lodgings for persons with families.

The great feature of the Swindon child welfare system is the continuous clinic at Eastcott Hill, where advice can be obtained every day and at all times. Ninety per cent. of the cases brought are false alarms, but the 10 per cent. represents life-saving. As an example of the value of this work, Dr. Brewer cites intussusception, which so soon becomes desperate. All stillbirths, of which there were 31 among Swindon residents, and all deaths of children under the age of 17, of which there were 66, are made the subject of investigation. This scrutiny of deaths of children has now been carried out for eight years and indicates that the mortality of childhood is now chiefly caused by measles and whooping-cough and their sequelæ. Full details of this investigation are included in the report. Dr. Brewer attributes the decrease in the neonatal deaths to antenatal supervision. The births in Swindon numbered 910, and there were 400 mothers in attendance at the antenatal clinic. In addition to the four deaths of mothers attributed by the Registrar-General to childbirth (making a rate of 4·4), there were two further deaths in connexion with pregnancy, one being from influenzal pneumonia and miscarriage and the other from gangrenous appendix. Most of the cases of ophthalmia neonatorum are treated at the municipal clinics and they are divided by Dr. Brewer into four classes:—

1. Gonococcus ophthalmia of two types, one developing within 72 hours and the other about 10 or 11 days after birth.
2. Blocking of the canaliculus. The discharge, in this case sterile, clears up after a small pellet has been pressed out of the lacrymal sac.
3. Severe ophthalmia due to the pneumococcus and other organisms. This type is indistinguishable from the gonococcal except that the cornea remains intact.
4. The fourth class includes cases associated with various micro-organisms.

Dr. Brewer gives a list of 136 cases of such ophthalmias and the organisms found during the last few years, of which 52 were due to the gonococcus. The report includes an interesting review of the epidemiology of the year. Dr. Brewer inclines to the view that tuberculosis is subject to the same general laws as are other parasitic reactions. He reiterates the view that pneumonia is of more consequence to the public health than any other factor. "If we know accurately what pneumonia is doing, we can tell the health of the community and forecast what is about to happen to it. Pneumonia, when implanted upon other infections or upon chronic disease, is the prime killer of man. From the numbers, but still more from the types, of pneumonia in Gorse Hill Hospital at any given time the health of Swindon for the immediate future can be determined with surprising accuracy."

Swindon was attacked by small-pox in 1928 having been free from this disease since 1923. In July a Swindon boy returned from South Wales suffering from an acute illness. A few spots developed and his four sisters became ill in turn, but it was not until Sept. 30th that the nature of the disease was recognised. The outbreak was divided into two periods, up to January, 1929, and from March, 1929, onwards. There was a connecting link between the two periods and the report of the whole outbreak is a matter for the next annual report. The workers in Wills' tobacco factory, who were protected by vaccination early in the epidemic, escaped entirely. The day of highest infectivity appeared to be the day before the spots appeared. Scarlet fever, Dr. Brewer points out, is at the present moment the least important of all human infections, but under local circumstances has to be isolated in hospital. An epidemic arose during the middle of the year and the only way of meeting it was to shorten the stay in hospital. About 90 per cent. (numbering 840) of the cases were treated in hospital. There were no deaths and few complications. Very few cases were detained in hospital more than 28 days and many were discharged in a shorter period than this. Nevertheless, the rate for "return" cases was lower than ever before in Swindon.

There were ten deaths from diabetes in 1928. Dr. Brewer thinks this disease is increasing, that it is becoming more a disease of females than of males, and that its incidence in childhood is increasing enormously, at all events, in Swindon.

Worcester.

Dr. Mabyn Read records an extensive outbreak of measles during the first four months of the year. There were more than 1200 elementary school-children attacked, of whom 751 were in the infants' departments. Of the 30 deaths there were two at the age-period 5 to 10, whilst the remainder occurred at the age-period under 5. The high death-rate at the 1 to 5 age-period shown in the above table was largely due to the epidemic, seeing that 27 of the 52 deaths at the 1 to 5 age-period were attributed to measles. There was no death due to childbirth during the year, and during the ten years 1918–27 there were 9002 births registered with a maternal death-rate of 2·11.

There is still urgent need for the building of more houses; 125 cases of gross overcrowding were met with and there were nearly 500 applicants for new houses listed at the end of the year. In two instances, involving 16 houses, the Housing (Rural Workers) Act, 1926, was utilised, the total grants by the local authority amounting to £590 6s. 8d. During January the Severn was in flood and the water very turbid. The water on the filter beds was frozen and the number of micro-organisms in the filtered water increased, but at no time was there more than one *B. coli* per 100 c.cm. Excepting in January *B. coli* was not found in 100 c.cm. The water in the pure water tank was treated with chlorine from Oct. 18th onwards with excellent results, which continued during February, 1929, when thick ice formed on the filter beds and had to be removed day by day.

Dr. Read records a careful effort to discover the origin of a tuberculous milk which failed. He and the veterinary surgeon took a sample of the mixed milk of 31 cows at a city cowshed, which proved to be tuberculous. The veterinary surgeon again visited the cowshed and took samples from two suspicious cows. Both were reported negative. The intradermal test was applied to all the cows and samples were taken from the six which reacted and again the results were negative. Finally the 21 cows were divided into seven groups and the seven samples so obtained were again certified to be free from tubercle bacilli.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Aver. E.S. attendance.	Routine inspections.	Special exams. and reinspections.	Percentage defects.
Gloucestershire	Not stated		13,119	7037	12·5
Nottinghamshire	53,164	46,328	10,000	22,480	27·24

E.S. = Elementary school.

Gloucestershire.

THE Gloucestershire Authority has no special schools of its own but some attempt is made to obtain accommodation in institutions belonging to others. All the completely blind and deaf children are now provided for, and Dr. J. Middleton Martin says that the committee is providing in its estimates for the education of one or two cripple children in a special school outside the county. At present there are 421 cripple children still in elementary schools. Treatment is undertaken at hospitals widely separate—for example, at Bath, Bristol, Cheltenham, Gloucester, Stroud, Stratford-on-Avon, and Chepstow. The committee has, however, established out-stations in cottage hospitals, nurses' homes, and special buildings. In 1920 it was thought that 51 out-stations would be needed, but since that date transport facilities have greatly increased so that the number required will probably be smaller. In the next three years 12 new out-stations will be established. Orthopædic cases are at present inspected by the orthopædic surgeon at the Cheltenham Hospital and at seven out-stations, and they are kept under supervision by the surgeon and by the orthopædic nurses who attend the out-stations weekly and also see as many cases as possible in their homes. Efforts are being made to interest the district nurses, who are also the school nurses, in this work, and it is hoped that they will be able to give increasing assistance in the supervision of remedial exercises and the care of appliances. There is a great need for proper education under special medical supervision and the difficulties in the way of providing it should not be insuperable. It is thought that some one person will be willing to help in the training of each cripple. It seems that the nurses who act as health visitors, school and district nurses have many duties to perform. Dr. Martin answers the objection that the district work must make it impossible for them to keep regular appointments at the schools by the statement that they have only defaulted on 15 occasions. The arrangement must improve coördination and prevent monotony, but it demands a staff fully adequate both in quality and in numbers. A sign of the efficient work done by the nurses is the distinct fall in percentage (from 16·8 in 1916 to 7·2 in 1928) of children infected with pediculi in their heads, the improvement being far more noticeable in the rural than in the urban districts. The fall is also much more marked in the older girls than in the entrants, which suggests that public opinion is having much influence in the schools but as yet little in the homes. The dental work in the past has been limited in scope; with an additional dentist and dental nurse considerable extension will be possible. An encouraging feature of progress is the rise in acceptances of dental treatment from 54 per cent. in 1922 to 74 per cent. in 1927–28.

In spite of the pressure of routine medical work it has been found possible to devote a little time to the anthropometric inquiry instituted by the Board of Education. The number of children examined was small, but the results indicate that the Gloucestershire children do not depart significantly from the average in height and weight for the whole country. Separate records kept for the children of the Forest of Dean show that they are slightly shorter than the others, the difference being possibly due to racial characters.

A special inquiry has been made into rheumatic heart disease in coöperation with adjacent counties. The research includes detailed information of the history and environment of the children, but it will be some time before a considered statement can be prepared. Preliminary examination of the records indicates a steady fall from 1921 onwards in the proportion of children affected when beginning school. Dr. Martin's general comment on the progress of school medicine in his area is that "useful as is the work already undertaken there is scope for development in various directions. Thus more centres are required for surgical examinations and intermediate treatment, especially in the southern part of the county, and provision for education simultaneously with treatment for children who cannot attend an elementary school." This is a very modest statement of the needs of the area. It is evident that good use is being made of the facilities and personnel available but that these need considerable extension.

Nottinghamshire.

Owing to the sudden death of Dr. T. E. Holmes, who "saw the School Medical Service grow from its infancy of small beginnings to its coming of age," the duty of presenting the twenty-first annual report has devolved upon Dr. A. C. Tibbits. He notes that two fundamental deficiencies mentioned in last year's report—the failure of many children to obtain spectacles and to accept dental treatment—are being dealt with on the principle of "spending more in order to waste less." Spectacles are now supplied without prepayment on the parent undertaking to repay by instalments, and expenditure is reduced by the fact that measuring for frames is done by the oculists themselves at the time of refraction. The result has been highly satisfactory, 65 per cent. of the children examined for glasses having obtained them this year, compared with 45 per cent. in 1927. Dental treatment is now given without the payment of the shilling fee when this is necessary, and much propaganda, including the display of a film, has been carried on; by these means 48 per cent. of those needing treatment have received it this year, compared with 35 per cent. in 1927. The staff of doctors and of nurses has been increased. Dr. Tibbits specifically mentions the need for accommodation for epileptics. There are no open-air schools in the county, though the number of delicate children suitable for open-air schools is given as 1303.

MENTAL HOSPITAL REPORTS.

Essex and Colchester Mental Hospitals at *Brentwood and Severalls* had, on Dec. 31st, 1928, respectively, 1745 and 1782 patients on their books. The increase at Severalls was chiefly due to transfers from Brentwood. The recovery-rate at Brentwood was 31·78 per cent. and the death-rate 8·85 per cent. Of the 94 men and 132 women discharged during the year, 172 were granted a preliminary period of trial. There was an outbreak of colitis in the spring affecting 44 women, but energetic measures cut short the epidemic, and there was only one death. Otherwise the general health was good. General paralytics are being treated by malaria with some success. A whole-time pathologist has been appointed (to serve the two hospitals), and the equipment of the laboratory is nearing completion. A new nurses' home is being erected, and plans have been prepared for a new laundry and boiler house. The hospital is being wired, and it is hoped that by the end of this year it will be supplied with electricity. During the summer 162 patients enjoyed all-day excursions to Thorpe Bay. During the year the farm and garden gave a good yield. Parole is largely granted; 434 patients are free within the grounds, and 59 outside the estate. A number of the younger female patients are taught hockey under the enthusiastic guidance of the matron, and some of them have shown a distinct aptitude for the game. Sixty-nine attendants and 38 nurses hold their R.M.P.A. certificate.

The recovery-rate at Severalls was 20·3 per cent. and the death-rate 8·1 per cent. An epidemic of typhoid during the summer attacked debilitated patients who were on a mince diet. The outbreak was believed to be due to an infection of the mince, but how this took place could not be shown. Early in the New Year a somewhat unusual outbreak of colitis occurred in one female ward, but there were remarkably few cases of influenza. Organised occupation rooms are now established for handicraft work, and evening classes are held in some of the wards. Regular gymnasium classes are held for both male and female patients, and to them the Medical Superintendent attributes the great diminution in outbreaks of violence and destructiveness. A new wing has been opened at the female hospital villa, and acute cases can now be segregated; a similar wing is badly needed on the male side. An ultra-violet ray treatment room has been equipped, and a new laboratory is to be built. Plans have been passed for a new wing on the nurses' home and an addition to the workers' villa. Fresh verandahs have been added during the year. Eighty-eight attendants and 30 nurses hold the R.M.P.A. certificate and five nurses have a general hospital training.

Hertfordshire County Mental Hospital at *Hill End, St. Albans*, had 1103 patients in its two blocks at Hill End and Arlesley on Dec. 31st, 1928. The recovery-rate was 30·4 per cent., an increase on the two preceding years. The death-rate was 7·19 per cent., including 11 deaths from tuberculosis and four from general paralysis. There is an urgent need for better accommodation. A number of men have been transferred to the Three Counties Hospital, and most of those remaining are sick, infirm, violent, epileptic, or of troublesome or defective habits. The congestion on the female side was only temporarily relieved by the completion of the new nurses' home. During the year 11 cases of dysentery, two of paratyphoid, and three of diphtheria occurred. Most of the cases were on the female side, where the overcrowding is most acute. General paralytics have been treated with tryparsamide, and suitable cases are, in future, to be inoculated with malaria. A physical drill class for male patients has been taken up with enthusiasm, and classes for raffia work and mat-making have been started in two wards. At the end of last year a canteen was opened, where patients can purchase goods by tallies. This has resulted in an increase in the amount of work done by the patients, especially in the sewing-rooms. One ward on each side is administered on the open-door principle, but only 16 patients are on full parole, and another 30 on parole within the grounds. A good deal of work has been done in the pathological laboratory, which is now well equipped. Two male and two female nurses obtained their R.M.P.A. certificate during the year, but no nurses sat for the State examinations. A mental deficiency institution is to be erected on a site in the Cell Barnes Estate, and plans are being prepared for an additional block at Hill End to accommodate 400 patients.

Cumberland and Westmorland Mental Hospital had 875 patients in residence at the end of last year. There is considerable difference between the day and night accommodation, and on the male side the hospital is overcrowded by day. The recovery-rate was 23·6 per cent. and the death-rate 7·7 per cent. The general health was good, and there was no epidemic except influenza, but the tuberculosis rate was high; 11 patients died of phthisis. All the patients discharged as recovered were allowed a preliminary period of trial. The number on parole is being gradually increased, as is also the privilege of going out for a day with nurses or friends. The chief need of the building is an up-to-date admission block for recoverable cases. Thirteen attendants and seven nurses are certificated or registered. Rather more enthusiasm for study is being shown, but there is still room for improvement.

Monmouthshire Mental Hospital at *Abergavenny* had 1209 patients on its books at the end of last year; this is one of the few mental hospitals in which, male patients outnumber female. The recovery-rate was 21·7 per cent., a figure which is much below the average for this institution, and which is attributable to the unfavourable type of admissions during the year. The death-rate was 5·2 per cent., the same as last year, and the lowest on record here. There was one case of enteric fever, a few cases of colitis, and a few of tuberculosis, but the general health was very good. The visiting surgeon was called in nine times and performed ten operations. The dentist visits weekly. All the patients are encouraged to occupy themselves in some useful way. Parole beyond the estate is given to 30 men and to 80 men and 21 women within the grounds. One ward on either side and the outlying houses and cottages are administered on the open-door principle. The laboratory is quite well equipped, and the visiting commissioners suggest the appointment of a trained laboratory assistant. They comment on the fact that there is no provision for ultra-violet ray treatment, or for cinema entertainment, and express doubt about the milk-supply. During the year 12 nurses passed their final examination.

Carmarthen, Cardigan and Pembroke Joint Counties Mental Hospital at *Carmarthen* had 651 patients on March 31st, 1929, an excess of 67 on the estimated bed space. The recovery-rate was 31·66 per cent. and the death-rate 9·14 per cent. The general health was not very satisfactory. There were 34 cases of influenza, 12 of diarrhœa, eight of tuberculosis, five of bacillary dysentery, and three of typhoid. The dentist attended weekly and treated 156 patients. The hospital is still without electric current, but the new drainage scheme and water-supply has been completed, and a new hot and cold water-supply is nearly finished. Other sanitary improvements at the farm have been effected. The dietary has been improved; butter is given in preference to margarine, but condensed milk is still used in tea and coffee. The visiting commissioner suggests the appointment of a laboratory assistant in order to bring the laboratory into activity. Great interest is taken in wireless, but more could be done to increase the patients' interest if the hospital had a cinematograph and a large motor conveyance. The farm accounts showed a loss of £117, but the profit on the garden was £216. Nine out of 11 candidates were successful in the preliminary examination for the R.M.P.A.

Glamorgan County Mental Hospital at *Bridgend* had 2032 patients on the registers at the end of 1928, an increase of 99 on the previous year, which has caused overcrowding. Fewer cases of general paralysis were admitted, but there were more chronic and congenital cases, and the prognosis was unfavourable in 65 per cent. The recovery-rate therefore dropped from 31·1 to 21·1 per cent. The death-rate of 7·8 per cent. is the lowest since 1879. Cause of death was verified by autopsy in 61·3 per cent. of cases. General health was good, except for 71 cases of influenza and three of dysentery. The visiting surgeon performed three operations and the visiting dentist 914 extractions. Although a room is set aside as a laboratory both at Angelton and at Parc Gwyllt, the commissioners do not consider that either of these rooms comply with the essentials of a laboratory. They stress the urgency of putting the laboratory in order and of appointing a laboratory assistant. Butter has been substituted for margarine, and tinned meat is now only used in emergency, but the commissioners think that more fruit and salads might be given. Cinema entertainments are held at both branches. Ten attendants and 16 nurses obtained their certificates; 57 per cent. of the men and 25 per cent. of the women are now certificated.

The Report of *Down County Mental Hospital, Downpatrick*, is illustrated by a number of photographs of the institution. There were 706 patients on the books on Dec. 31st, 1928. The recovery-rate was 30·0 per cent., a reduction on the previous year due to the very unfavourable character of the admissions. The death rate was 5.9 per cent., and autopsies were held on 21 of the 45 cases. The hospital is without electric current, which deprives the patients of several modern methods of treatment and enetrtainment. Over 100 men go outside the grounds daily, and 76 women are taken out once a week. The farm returned a profit as well as providing valuable occupation for the patients. There is no occupational therapy, but the Medical Superintendent records the impression made on him by a visit to the Dutch mental hospitals, where he found practically every patient employed. Fifty members of the staff hold the R.M.P.A. certificate, 12 having passed their final examinations during 1928. The medical staff are assisted by a visiting dentist and consultant physician, surgeon, and ophthalmologist.

MENTAL DEFECTIVES.

The Report of *Royal Eastern Counties Institution for the Mentally Defective* at *Colchester* is, as usual, abundantly illustrated by photographs of happy inmates at work and play. The Medical Superintendent makes the need for research the key-note of his report, and remarks how little foundation of proved fact there is on which to build theories of mental deficiency. The Littleton House School for mentally defective boys at Cambridge is to be attached to the Colchester Institution as a school branch. It is hoped that this will increase facilities for research. The Colchester Institution is to pay a rent to the trustees of the school, and the whole of the income accruing to the Trust is to be devoted to research. The particular type of research to be followed at any time is to be decided by a board of governors appointed by such bodies as the University of Cambridge, the Medical Research Council, the Board of Control, and the Board of Education. The very enlightened terms of this Trust are largely due to the owner of the property in which Littleton House is situated—Miss Ruth Darwin of the Board of Control.

Commenting on the advantage of sending out patients on licence, the Medical Superintendent quotes two cases of severe illness among girls living with foster-parents. Had they not been on licence, it would have been impossible to act with the promptitude necessary to save their lives. During 1928, 50 cases went out for the first time or on further trial, bringing the total to 118. Of these, two died and 23 had to return to the institution; 22 were working for wages in the care of friends, 14 were in living-in service, and 32 working at home or with foster-parents. Girls in service always spend their holidays at the seaside branch of the institution. While the year's work has been excellent, and several improvements have been made to the building, the report ends as usual in an urgent appeal for more funds to carry out necessary extensions. Applications for admission have to be refused almost daily. Two semi-detached houses and two cottages have been bought for the use of the staff, but the building of new villas has not yet been commenced. A new farm is to be added, and a house has been chosen at Witham, which, although it can only be a sub-branch, will at least accommodate 33 more adult patients. Bridge Home at Witham now houses 257 patients of the lowest grade. An idea of the work here is given by the statement of the Medical Superintendent that during the year the staff had to deal with 4749 wet beds, 1157 dirty beds, 1922 boys dirty in the day-time, and 2516 epileptic fits. The number of fits has been greatly reduced during the last few years by the use of luminal. The various shops all did excellent work and made good profit. The brush shop made 9123 brooms and brushes, and the shoe-shop made 300 pairs of new boots, as well as doing all the repairs for the branch—over 30,000 pairs. The School Guides and Brownies have now taken 300 second-class and proficiency badges, and although there is no compulsion every girl in the school belongs to the company or pack. The frontispiece of the report is a photograph of part of the company, which appeared—to everybody's immense delight—on the outside cover of "The Guide," the official organ of the Girl Guides Association. The scouts have already won 23 badges, and the team came out fourth on the list for the Ambulance Shield. Attempts are being made to get more boys working in the garden, as those who go out will probably have to earn their living on the land, and the Medical Superintendent feels that a boy can be kept too long doing simple handicrafts which he has completely mastered. The institution has now begun to act as a day school as it was obviously uneconomical for the local authority to open a day-centre with the Royal Eastern Counties Institution so near. There is very little illness among the children. One cold February day there were 20 patients in bed out of 1100 in residence. Nursing a mental defective, therefore, is chiefly a matter of being able to teach a child to keep clean and happily occupied, and the Medical Superintendent welcomes the extension of the R.M.P.A. examination to include proficiency in any one of four main sections of the work of a big modern institution. The death-rate was 1·74 per cent., which includes two deaths of patients who had been on leave of absence for a year or more. The tuberculosis death-rate was 0·58 per cent., a remarkable drop from 4·6 per cent., which was the average figure from 1859 to 1904. Since a general Schick test in 1925, and the immunisation of all susceptibles, there have been no cases of diphtheria.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 31st, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 131 (last week 139); scarlet fever, 1833; diphtheria, 850; enteric fever, 84; pneumonia, 522; puerperal fever, 64; puerperal pyrexia, 114; cerebro-spinal fever, 16; acute poliomyelitis, 24; encephalitis lethargica, 20; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 128. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 3rd–4th was as follows:—Small-pox, 165 under treatment, 8 under observation (last week 144 and 24 respectively); scarlet fever, 1335; diphtheria, 1405; enteric fever, 18; measles, 311; whooping-cough, 220; puerperal fever, 23 (plus 8 babies); encephalitis lethargica, 124; poliomyelitis, 1; "other diseases," 18. At St. Margaret's Hospital there were 13 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 20 (0) from measles, 6 (2) from scarlet fever, 22 (4) from whooping-cough, 19 (4) from diphtheria, 78 (10) from diarrhœa and enteritis under two years, and 18 (2) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (the fewness of which is gratifying) 8 were reported from Liverpool, 6 each from Birmingham and Hull, 5 from Sunderland, 3 each from Portsmouth, Southend-on-Sea, Leeds, and Gateshead. The deaths from enteric fever occurred at Southport and Cardiff.

The number of stillbirths notified during the week was 267, corresponding to a *rate* of 40 per 1000 total births, including 46 in London.

THE LONDON HOSPITAL.—The House Committee reports that last year the in-patients numbered 14,049 and stayed on the average 17·67 days. The out-patients numbered 70,962 and a further 25,966 persons suffering from minor ailments were dealt with in the receiving room. The income was £316,000 and the expenditure £276,000. In-patients cost £5 13*s.* 5*d.* each and out-patients 15*s.* 6*d.* The report for the quarter ending August 31st states that the radium department is now in working order. The radium is kept in a safe in a strong room, encased in 7¼ tons of lead. The gramme of radium which has been delivered is being used for the making of radon, but as more can be made than is actually required arrangements have been made for supplying it, at a charge, to other hospitals and to members of the staff for private cases. A second gramme will be delivered shortly in the form of needles.

Obituary.

SIR SEYMOUR SHARKEY, D.M. OXF., F.R.C.P. LOND.

THE death of Seymour John Sharkey at his home in London removes almost the last of a band of men to whom the school of St. Thomas's is indebted for its re-establishment in the honourable position it held prior to the temporary eclipse occasioned by its migration from Southwark to Lambeth.

SIR SEYMOUR SHARKEY.

Photo by Elliott & Fry.

Seymour, one of the three talented sons of Dr. E. P. Sharkey, an Irish medical man, was born in 1847. Educated at Christ's Hospital, he gained a classical scholarship at Jesus College, Oxford, of which College he was elected an honorary Fellow in later life. His inclinations passed at an early period from classical study to that of science, and he gained a first class in the honour school of natural science. He thus came under the influence of one of the masters of modern biological research, Prof. G. Rolleston, F.R.S. Sharkey became one of Rolleston's demonstrators, and this association without doubt remained a lasting influence both on his line of thought and his conception of what the life of a physician should be. His Oxford career ended with his election to a Radcliffe Travelling Fellowship in 1873, and his medical life commenced with experience gained in continental universities, particularly in Germany, followed by entrance at the school of St. Thomas's Hospital. After qualification in 1875 he became resident assistant physician to the hospital. At the termination of his period of office he was much shaken by the death, attributed to overwork, of one of his brothers, so much so that it was thought advisable by his friends that he should seek an absolute change of occupation and surroundings. Hence he spent some time travelling abroad, returning later to be elected assistant physician to the hospital. This episode is worthy of mention because it explains the rigid rule, maintained for the rest of his life, not to allow any consideration to compel him to see more than a certain number of patients daily or to interfere with his week-end relaxation.

Once elected on to the staff of his hospital Sharkey's energies were devoted largely to the work of the institution and to the furtherance of medical education. His teaching was well informed, sound, and effective, and many generations of students retain grateful memories of the help they received from him. He was certainly for a long period the most popular teacher in the school. The work of the hospital was performed with energy and precision. Visits were never missed, never commenced late, or terminated too early, and Sharkey gave confidence to the patients, to the juniors, and to the nursing staff; by all he was respected and indeed beloved. His interests were with medicine in general, but in his early days he acquired a reputation for special knowledge as a neurologist as a result of clinical observations connecting localised disease of the brain with definite symptoms and signs, and this work justified his later election as President of the Neurological Society. Admitted a Member of the Royal College of Physicians in 1879 he became a Fellow in 1885, and in the following year delivered the Goulstonian lectures, on Spasm in Chronic Nerve Disease, which were published in THE LANCET. His subsequent association with the Royal College of Physicians was intimate, for he acted as examiner and served the College as Censor for some years, becoming Senior Censor in 1912. In 1906 he delivered the Bradshaw lecture on "Rectal Alimentation" (THE LANCET, 1906, ii., 1203). He was knighted in 1914, but declined a second honour offered him for his services when he retired from office as medical referee to the Treasury.

Sharkey was above all things an enthusiast in clinical medicine. More than any other part of his work he loved teaching, and his pupils of all degrees, and over many generations, recognised and appreciated his efforts, though they sometimes smarted under his incisive tongue. He will be remembered with gratitude and affection in many parts of the world by a wide circle of those who profited by his teaching or were inspired by his example. Sir George Makins, for whose recollections of Sharkey's earlier career we are indebted, sends us the following personal note.

Sharkey's choice of St. Thomas's as his school was determined by the reputation of Charles Murchison as a clinical teacher, and his own method was no doubt founded on the lines adopted by Murchison. St. Thomas's, however, at that period was fortunate in the possession of a gifted clinical teacher of a more philosophic turn of mind, John Syer Bristowe, and it is probable that a just comparison between the methods of the two men preserved Sharkey from the superlative dogmatism which dominated Murchison's teaching. Murchison's method was perhaps ideal for candidates preparing for examination, Bristowe's for enlarging the man's horizon and creating a proper scepticism regarding certain received beliefs. With Murchison an answer was either right or wrong; Sharkey, while adopting Murchison's precision, was always open to argue the point, and in such discussions he delighted. His pupils had a certain fear of his sarcasm and were not always convinced by his reasoning. A characteristic example of his sense of fairness and right in the management of his school was exhibited shortly after his appointment to the assistant staff. At that time the entire sum derived from the fees of the students after the expenses of administration had been deducted was divided amongst the members of the senior staff. Sharkey and his immediate surgical colleague, Clutton, attacked this arrangement with great vigour, and it is of interest to recall that they only carried the day when on election to the senior staff they acquired sufficient influence to bring about a change by which they suffered personal loss.

No sketch of Sharkey would be complete without mention of two friends who materially influenced his habits and career. His association with H. H. Clutton commenced with their respective appointments as senior residents at St. Thomas's and persisted until Clutton's premature death. Until Clutton's marriage they lived together. There was little resemblance between the two men; Sharkey was of a philosophical turn of mind, Clutton eminently and severely practical, and this diversity perhaps explained the permanence of the association. The two men never wearied of discussing and arguing on any subject which interested them. Sharkey was one of the early physicians to welcome the aid of surgery, and a bedside consultation between the two men was a source of real pleasure to their respective classes. When a difference of opinion arose the two chiefs would attack each other with freedom and familiarity, and doubts as to who would be the winner enlivened the audience. His other most intimate friend was Sir George Savage, who was the companion of his hours of relaxation. They fished, played golf, and gardened together. Sharkey was an expert dry-fly fisher and could bring home trout when no one else could find or lure them.

Sharkey maintained a semblance of unchanging age until some six months before his death. He was never married, but he delighted to entertain in his charming home. It was as a host and also at the meetings of a small dining club, of which he remained a member to the end of his life, that his social talents showed to best advantage. In his last years he was to be found on most afternoons in the smoking room of the Athenæum reading and chatting with his friends. Sharkey's strict sense of honour, absence of any shadow of self-seeking, and conscientious fulfilment of the duties he undertook brought him many friends and gained for him the respect of all those with whom he was associated.

Dr. T. Dyke Acland writes: I first knew Sharkey when he was an undergraduate at Oxford. He was then, as he remained all his life, full of fun, active, energetic, and enthusiastic. He carried his vitality into his work as well as into his play. Wherever he was he gained for himself the affection and confidence of his teachers, friends, and fellow students. At Oxford he came under the influence of Sir Henry Acland, Sir J. Burdon Sanderson, and Prof. Rolleston, and remained on terms of intimate friendship with them all until their deaths. It was under the direction of the Regius professor that he commenced the practical work in a clinical laboratory which he later developed so successfully at St. Thomas's Hospital. Throughout his career Sharkey was always ready to help and advise those who were in difficulty, and though some found his manner brusque and his criticisms outspoken, he was recognised to be a wise counsellor whose opinions should not be lightly disregarded. Sharkey had a strong and vigorous personality. He spent his life doing that which he believed to be right, and spoke the truth from his heart.

FREDERICK FOORD CAIGER, M.D., F.R.C.P. LOND., D.P.H.

Dr. Foord Caiger died rather suddenly on Sept. 5th while on holiday in Scotland, and his death will leave a blank in the lives of a large circle of friends and colleagues who had found in him a wise clinician, an able administrator, and a loyal friend.

Frederick Foord Caiger was born in December, 1860, the son of Frederick Henry Caiger, F.R.I.B.A., architect to the Metropolitan and City Police. He was educated at Westminster School and St. Thomas's Hospital, where he was Mead medallist, and from which he qualified in medicine at London University in 1883, being awarded the gold medal in surgery and honours in other subjects. Three years later he took the M.D. Lond., and shortly after the D.P.H. Cambridge. He held three house appointments at St. Thomas's Hospital, and five years after qualifying entered the service of the Metropolitan Asylums Board as assistant medical officer at the Northern Fever Hospital, where his work was such as to lead to his appointment as medical superintendent of the South-Western Hospital, Stockwell, before he was 30 years old. This office he held continuously until October, 1926, when he retired from the service of the Board after an association of 30 years. For the last five years of this period he was chief medical officer of the whole infectious hospital service, and was called upon to guide the policy of the Board in such matters as the best allocation of beds among the various kinds of infectious fevers, the employment of the new immunity tests, and the early administration of antitoxin in diphtheria.

In 1921 Caiger was appointed emeritus physician to St. Thomas's Hospital. As a clinician and a teacher he then had a reputation, both within his own hospital and outside, which was second to none. He was clinical teacher in fevers to the R.A.M.C., and it was a tradition with St. Thomas's students that their fever course should be taken with him at the South-Western Hospital, where, unless application were made at the earliest possible moment, there was but little chance of getting on the list. His lectures were lucid and stimulating, and his clinical demonstrations first-rate. Caiger was always abreast of his subject, and readily adopted any innovation of value, be it for diagnosis, treatment, or prevention. But he never lost the sense of perspective, and we have many testimonies to the excellence of his advice and the soundness of his diagnosis. Although he never published a text-book on fevers, Caiger was much in request as a writer on his subject, and his contributions to Allchin's Manual, Quain's Dictionary, and Allbutt's System are well known. He was always ready to accede to the requests of local medical societies and of the Medical and Physical Society at St. Thomas's for an address on some topic of interest connected with his specialty. His interest did not lie only with the clinical side of medicine; like all good clinicians he recognised pathology as the basis of sound clinical advance, and it was on his advice that the Board in 1925 appointed a Director of Research and Pathological Services, and decided to establish two thoroughly equipped group laboratories. Caiger was the first chairman of the Scientific Advisory Committee set up by the Board, after consultation with the Medical Research Council, to advise on the extension of knowledge by research and the full and prompt application of available knowledge to fever practice. He was a member of the Antityphoid Inoculation Committee appointed by the Army Council in 1904 and played a large part in the long and difficult investigations involved in the preparation of their report. In his Bradshaw lecture, delivered the same year before the Royal College of Physicians of London, he gave a masterly survey of the treatment of enteric fever as then practised, registering his conclusion that any further advance in treatment must be sought in biological sources.

DR. FOORD CAIGER.

Photo by Elliott & Fry.

Caiger possessed in high degree the qualities required for successful administration and organisation, and these stood him in good stead when he was commissioned to open the Fountain Hospital during an exceptional incidence of scarlet fever in 1893, and six years later when 500 beds were provided at the Grove Fever Hospital to meet an unusually high seasonal rise of enteric fever. He took a personal interest in the welfare of the hospital staff generally and individually, and succeeded in gaining their loyalty and devotion and in no small degree their affection. It was largely owing to him that the Fever Nurses Association was founded. He was its hon. treasurer from the start and at one time its president. Caiger's relations with his fellow practitioners in his neighbourhood were cordial and intimate. At St. Thomas's it was to him that application was made for assistance in the thorny problems of accidental infections, and many a resident had reason to be thankful for his ready help and solicitous treatment. Local practitioners found him sympathetic with their difficulties and tactful with their mistakes. "We all learned," one of them writes, "to come to him, knowing full well that he at least would never make us feel that we had been grossly stupid or unobservant." "Among Caiger's charms," another writes, "was a natural and sympathetic consideration for everyone with whom he worked. The only way to make him bristle aggressively was to suggest some adverse criticism of his staff or of the Board to which he was loyalty itself. Any lack of consideration to a subordinate would promptly arouse his condemnation; at the same time he was magnanimous in his praise of any effort to do the right thing."

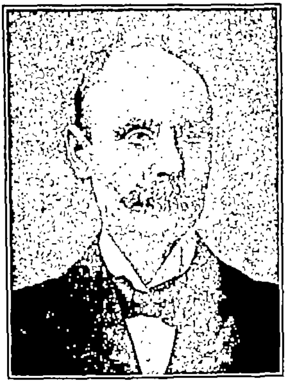
On his retirement from the Metropolitan Asylums Board three years ago, Caiger's help remained available to private practitioners in their clinical problems. He remained active on the Governing Body and Executive Committee of the Enham Village Centre for the curative treatment and training of disabled ex-Service men, to the organisation of which he had given much time and thought. Of his personal characteristics little more need be said than what has appeared in connexion with his professional work. His tastes were simple and he had a deep appreciation of natural beauties which made his companionship on foreign travel pleasant and stimulating. He was a good impromptu speaker, with just the right touch of hesitation in choosing the appropriate phrase or illustration which always came. He lived, as one of his friends puts it, every moment of his life to its fullest and best.

Dr. Caiger married in 1895 Madeline, daughter of Alexander Orr, a landed proprietor in Australia, who survives him. Their only son was killed on the Western front in November, 1916.

SIR JOHN CAMPBELL, M.D., M.CH., LL.D. R.U.I., F.R.C.S. ENG.

Sir John Campbell, who died on August 31st at his home in Craigavad, Belfast, was born in 1862, being a son of the Rev. Robert Campbell, of Templepatrick, Co. Antrim. He was educated at the Royal Belfast Academical Institution and at the Royal University of Ireland, and also studied in London and abroad. He took a degree in biology with first-class honours in 1883 before turning to medicine, when he gained a scholarship in therapeutics and pharmacology and the Coulter exhibition at the Belfast Royal Hospital. John Campbell qualified and proceeded to acquire the higher degrees in medicine and surgery in quick succession, becoming F.R.C.S. Eng. in 1891. He served as demonstrator of anatomy under the late Prof. Peter Redfern for five years, and for a time held the post of assistant surgeon to the Belfast Hospital for Sick Children. Later he took up gynæcology and obstetrics, and became consulting surgeon to the Maternity Hospital for Women. His name is chiefly associated with the Samaritan Hospital for Women, to which institution he was attached as surgeon, and later as senior surgeon for many years. He worked hard not only to establish the prestige of this hospital but to raise that of his specialty throughout Ireland, and succeeded well in this task. His publications included successful text-books as well as original articles. In 1909 John Campbell's services to medicine were recognised by the honorary degree of LL.D. of the Royal University of Ireland. When the Northern Parliament was formed in 1921, he was elected as one of the four Unionist Members for Queen's University, and he sat in the House until Parliament was dissolved this year. At the time of his death he was Chairman of Convocation. During the war John Campbell acted for a time as surgeon to No. 5 British Red Cross Hospital at Wimereux. He was knighted in 1925.

Prof. Andrew Fullerton writes: "The passing of John Campbell removes an outstanding figure from the community of Northern Ireland, where he has occupied a prominent position for a period of nearly 40 years. A man of great ability, wide culture, and transparent honesty, he commanded the admiration and respect of a large circle not only in his own country but far afield. His industry at the Samaritan Hospital and in practice, regardless of financial return, brought its reward, and in a few years he gained a reputation for ability, skill, and judgment which most men take long to attain. His success as a surgeon did not spoil him, and he remained the same modest, unassuming rock of common sense who had impressed his fellow students in his undergraduate days. Few medical men of his time have not at some period of their lives confided their troubles to him, and sought and obtained his sage advice. In the Parliament of Northern Ireland he proved himself a wise counsellor whose opinions carried weight with politicians of all sides.


SIR JOHN CAMPBELL.

"To the public, he was a man of few words, downright in his manner of expressing himself, and to all appearance stern and reserved. To the inner circle, however, he was a most charming companion. His education had been conducted on liberal lines and he had a mind well stored with information, but his strong sense of humour saved him from imparting more than would interest or entertain his listeners. A superficial observer might have thought him unsympathetic, but those of us who were intimate with him knew that he had a kind and sympathetic heart. He was greatly affected by his war experience. I remember when he first came to France, meeting him at the boat and taking him to visit some of the hospitals, to show him the kind of work he would be expected to do. At the end of the first days he felt the strain badly, but he carried on and did good work. His colleagues at No. 5 British Red Cross Hospital will hear with great regret of his death and will think of him with the kindest memories and with warm appreciation of his services."

PERCY CHARLES WOOLLATT,

F.R.C.S. EDIN., M.D. BRUX.

Mr. Percy Woollatt, who died recently as the result of a motor accident in Normandy, was younger son of the late Mr. S. P. Woollatt, J.P. for Hertfordshire. He took the conjoint qualification from the London Hospital in 1905, later adding the M.D. Brux. and the F.R.C.S. Edin., and entering the Indian Medical Service was stationed at Shiraz, where he had charge of the Indian Government Hospital, and was medical officer to the telegraph department. Later he was surgeon to the Imperial Hospital at Teheran, and his surgical skill became notorious throughout Persia, securing him a freedom of movement in a dangerous country which was denied to many of his colleagues. On the outbreak of war in 1914 he volunteered for service in the navy and was appointed to the Haslar Hospital. On his return to South Persia it was as surgical specialist to the Forces there until 1920, when he retired from foreign service and took up general practice at Hinckley, Leicestershire, with charge of the Cottage Hospital. Lately he was consulting surgeon in London. His elder son is a medical student.

DR. WALTER ERICHSEN (ERIC) POWELL, who died on August 31st, as the result of appendicitis, was in his 35th year. He was educated at Brighton College and Charing Cross Hospital, qualifying M.R.C.S. in 1917. He then joined the navy and was appointed to a "Q" boat in which he saw service in the Mediterranean. When the Armistice was declared he returned home to join his father, Dr. W. A. Powell, in practice at Brighton. He was anæsthetist at the Brighton Poor-law Infirmary, and deputy anæsthetist at the Throat and Ear Hospital. He also acted as deputy police surgeon. He leaves a widow, who was formerly a sister at Charing Cross Hospital, and six children.

Correspondence.

"Audi alteram partem."

ON RESTARTING THE HEART-BEAT.

To the Editor of THE LANCET.

SIR,—Experiments I carried out on cats six or seven years ago showed that the heart could be restarted (and could thereafter raise the blood pressure to 100 mm. Hg) even so long as an hour and sometimes two hours after it had ceased to beat (B.P. = 0). The method employed was intracardiac injection of adrenalin along with either artificial respiration or instillation of oxygen into an artery—generally the femoral, using the profunda femoris as a cannula. Spontaneous breathing was never resumed if the B.P. had been nil for over 15 minutes. If the heart had completely ceased beating for only 5–10 minutes, then natural respiration might reappear, but the cat (though it sometimes lived for 24 hours) was never normal, and in behaviour closely resembled a decerebrate animal.

From all my observations I concluded that if the circulation had entirely ceased (B.P. = 0) for five minutes, the cerebrum never revived. After ten minutes the central nervous system was dead down to the pons, after 15 minutes down to the calamus scriptorius. It seems therefore hopeless to look for complete recovery of all the faculties in man if the circulation has entirely ceased for even five minutes, and restarting the heart and continuing artificial respiration if the heart has ceased to beat for so long as 15 minutes is a useless waste of energy. In cases in which complete recovery has been reported at later periods, probably the circulation had not, in fact, entirely ceased.

The lesson to be learned from these facts is that cardiac massage, adrenalin injection, and artificial respiration must be applied at the earliest possible moment if valuable results are to be attained, and that they should be resorted to in all cases where the heart seems to be stopping before actual cessation has occurred.—I am, Sir, yours faithfully,

THOMAS LUMSDEN.

Lister Institute of Preventive Medicine, London, S.W.,
Sept. 7th, 1929.

CEREBRAL LOCALISATION.

To the Editor of THE LANCET.

SIR,—In a short notice in the last issue of THE LANCET of a book by Dr. R. Brugia, the reviewer seems to treat the ideas put forward by the author as something new, and asks pertinently: what is meant by "centre" and what by "localisation"? On the clinical side Marie, working at the same hospital as Broca but with a more extensive choice of subjects, proved that Broca's theory of localisation was untenable. His positions are set forth in the work of Dr. F. Moutier, "L'Aphasie de Broca." Prof. von Monakow in his "Über Lokalisation der Hirnfunktionen" arrived at conclusions concordant with those of Marie. Since then many authors, notably a school of Italian physicians, have further subjected Broca's theories to a destructive criticism.

In 1912 I published my "Psychology: A New System," in which on purely psychological grounds—borrowing from physiology only the hypothesis that the development of the brain has been "economic"—I made it clear that it could not be stated categorically that Broca's theory was right or wrong, for the whole conception that underlay his localisation was faulty. The demonstration that I offered found confirmation in Marie's observations, but it should be looked upon rather as giving the necessary underlying explanation of the results at which that great neurologist had arrived. The methods I employed were the developments of the elaborate analysis on which I based the entire system of my psychology; but an indication may be given which will show that Broca's theory of aphasia is inconsistent even with that of the "centres" involved. The analysis of any word, when its meaning is fully comprehended, would imply the activities of a series of "centres" corresponding to visual, aural, tactile, and muscular sensations, and this fact in turn implies connecting nerve paths sufficient to supply the necessary associations. Thus we find that remote though associated parts of the brain are in activity during each movement, however simple, of consecutive ideas, and this activity is not merely that of primary excitation but also of corresponding inhibitions. As Sir William Gowers remarked, the brain is not like a piano, but rather like an organ; I would say, it is more like an elaborate system of charged telegraph wires.

Now, to represent the matter strikingly, I submit that when our histology has been perfected and our physiological psychology further advanced, then, with delicate instruments, it would be possible, without touching the third left frontal convolution, to produce not only Broca's aphasia but a veritable assortment of aphasias. The proper image to be formed is not that of "centres," but of a complete system of interrelated activities. What has been called a centre is not a terminal station, but, to use von Monakow's expression, a gate.

I am, Sir, yours faithfully,

ARTHUR LYNCH.

Haverstock Hill, N.W., Sept. 6th, 1929.

EFFECT OF X RAYS ON BLOOD PLATELETS.

To the Editor of THE LANCET.

SIR,—In a paper by Dr. Samson Wright and Dr. H. A. Bulman, published in your issue of August 3rd (p. 217), on the Selective Action of X Rays on the Blood Cells of the Cat, some observations on the effect of irradiation with X rays on the blood platelets show a substantial agreement with similar observations on the effect of gamma rays from radium, published by us in 1922.[1] Instead of drawing attention to this agreement Dr. Samson Wright and Dr. Bulman give an incorrect account of our results and conclusions and state that their results are contrary to our experience In view of the importance of the subject and of the promise of a more detailed publication by them it may therefore be well to restate briefly our results.

We found in experiments on rats that exposure to gamma rays produces a thrombopenia. If the doses were moderate—i.e., sublethal—the number of platelets shows a rapid spontaneous recovery to the normal. Dr. Wright and Dr. Bulman found the same after exposure to X rays. If the dosage of gamma radiation was increased we found that the number of platelets did not rise again, an anæmia developed, and the animals died. In our experiments the animals died in the third week—later than in the experiments of Dr. Wright and Dr. Bulman. At death our animals exhibited signs of a general infection. Our experimental observations agree with the clinical observations that cases of pernicious anæmia have occurred among radium workers. In these human cases there has also been evidence of a general infection. Between the observations on rats with radium and on cats with X rays there is, therefore, complete agreement on the main point that large doses of irradiation produce a diminution in the number of platelets.

An apparent discrepancy is presented by the platelet counts of two cats in Dr. Wright and Dr. Bulman's series which died or were killed on the seventh and tenth day respectively. Both these animals were heavily infected but the platelet count was stated to be "normal." It was 1·5 millions in one animal, 0·75 million in the other. Dr. Wright and Dr. Bulman comment on these findings by saying that they are "contrary to the experience of Cramer, Drew, and Mottram with the rat, who found a marked decrease in the platelet count following gamma radiation in animals that died of intercurrent infections." On this point we wish to remark, first of all, that we did not make the statement in this form. We found a decrease in platelets following gamma radiation whether the animals died of intercurrent infections or whether they survived. Secondly, our animals died after a much longer period after exposure (17–20 days) than the cats of Dr. Wright and Dr. Bulman (7 and 10 days). Since in their surviving animals the onset of the thrombopenia did not begin until the twelfth day, the two cats with a count stated to be normal died before the thrombopenia had time to develop. Lastly, the authors state that the platelet count of normal cats in their series varied from 0·75 million to 5 millions. No such wide variations are found either in normal rats or in man. If this statement is correct it would suggest that cats are not the most suitable animals for the study of variations in the number of blood platelets.

We are, Sir, yours faithfully,

W. CRAMER,
J. C. MOTTRAM.

Imperial Cancer Research Fund, Radium Institute,
Sept. 6th, 1929.

DISINFECTANT PACKETS.

To the Editor of THE LANCET.

SIR,—Dr. Earp's letter in your issue of Sept. 7th (p. 530) has drawn my attention to a quotation in the report of my remarks at the Fourth Imperial Social Hygiene Congress (THE LANCET, 1929, ii., 140) which may give rise to a misunderstanding. In quoting the statistics mentioned I applied the expression "for what it is worth" to my remembrance of the figures, mentioning that I was speaking from memory, and promising to bring the original documents to the next session in order that those interested might verify the figures. Unfortunately, your necessarily abbreviated report of the proceedings has made it appear that I applied the expression "for what it is worth" to Prof. Queyrat's figures—which was far from my intention. These figures and others bearing on the same question, to which I would refer Dr. Earp, can be seen in *Mouvement Sanitaire* (1927, iii., 607–15), and in Prof. Queyrat's address before the Assembly of the Union Internationale contre le Peril Venerien, Nancy, 1928. (Texte des Rapports, p. 50.)

I am, Sir, yours faithfully,

S. NEVILLE ROLFE,
Secretary-General.

Carteret House, Carteret-street, London, S.W.,
Sept. 9th, 1929.

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[1] Proc. Roy. Soc., 1922, xciii., 449.

COUNTY MEDICAL OFFICERS OF HEALTH IN IRELAND.

THE *Department of Local Government and Public* Health of the Irish Free State is pressing for the appointment of county medical officers of health, and it is understood that four or five appointments will shortly be made. Our local correspondent informs us that several counties are still reluctant to take action. For example, the South Tipperary County Council and Board of Health have passed resolutions protesting against the proposed appointment of a county medical officer as expensive and unnecessary, having regard to the existing dispensary doctors. The Leitrim County Council has adjourned the consideration of the question on the grounds that the appointment is unnecessary. One member of this *council expressed the opinion that there was no sense* or reason in appointing a county medical officer of health when the children of the county were underfed and underclothed. Before they looked after the eyes and teeth of the children they should see that they were properly fed. It is clear that the country is still badly in need of education on the value of health to the community. Apart from the delay in making appointments Ireland's sanitary administration has to face another danger. The salaries offered for county medical officers of health are small, and are not likely to attract men of adequate experience. There is a grave danger that men with paper qualifications only, and without practical experience, may be appointed. Up to the present there has been no public health system in force in Ireland, so that Irish medical men have had little opportunity of gaining experience in their own country. The best hope of acquiring experienced administrative officers may be to attract candidates who have worked in England or elsewhere, but the salaries offered are not likely to achieve this result.

LABELLING OF POISONOUS SUBSTANCES.

ON August 10th, at Shoreham (Sussex) Petty Sessions, a grocer and provision merchant of Lancing was summoned for selling a certain quantity of carbolic disinfectant, containing not more than 3 per cent. of phenol, enclosed in a wrapper that was not distinctly labelled with the words "Poisonous, not to be taken," and did not have the name and address of defendant as the seller thereon. The defendant pleaded not guilty. Evidence of the purchase was given by a representative of the Pharmaceutical Society, who stated that *she drew the defendant's attention to the fact that his name should have been on the bottle and that he* agreed. She also pointed out that there were also no words to indicate that the contents were poisonous and were not to be taken. The defendant's solicitor produced a bottle and removing the wrapper asked witness if it did not say on the bottle, "Poisonous, not to be taken." Witness agreed, but said it contained no name and address of the seller. The Magistrate's Clerk: "Technically speaking, it should be on the wrapper." Defendant's solicitor said the section of the Pharmacy Act provided that it should not be lawful to sell any substance to which the section applied unless the box, bottle, vessel, wrapper, or cover in which it was contained was labelled with the name of the substance and the word "poisonous." Hence it was only necessary for one or the other to be so marked, and as the label appeared on the bottle the Act was complied with. He added that the bottle revealed the name of the seller—namely, the makers of the solution. The police superintendent pointed out that the Act meant by the seller the person making the sale. The sale was admitted. This lysol solution, said the defendant's solicitor, was barely poisonous, because it contained something less than 3 per cent. of carbolic, but apparently it came within the Order under the Act. Possibly his client had made a mistake in regard to not having his own name and address inscribed. The manufacturers of these substances, as a rule, warned the retailer at the time of purchase that the name of the retailer must be added when the substance was sold to the public. In this case no warning was received, and his client did not know that the substance fell under the Act. The defendant had been in business for 35 years without anything against him. There were no fewer than 965 Orders in Council affecting grocers, and for 35 years he had successfully steered through these 965 Orders in Council only to be held up through not putting his name on a paper wrapper. The police superintendent stated that defendant was a highly respectable tradesman, and that the proceedings were brought as a warning to others. The Justices dismissed the case on payment of costs.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. P. L. Gibson to *Pembroke*, for R.N. Hospital, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

Act. Comdr. R. P. Pim to *Excellent*, Surg.-Lts. A. R. Thomas to *Comus*, for training, and E. E. Henderson to *Vivid*, for R.N. Barracks, Devonport, for training.

Surg. Sub.-Lt. J. A. White promoted to Surg.-Lt.

Proby. Surg. Sub.-Lt. T. Colver to *Victory*, for R.N. Hospital, Haslar, for training.

J. K. Reid, Birkenhead, has been appointed Admiralty Surgeon and Agent for that district.

ROYAL ARMY MEDICAL CORPS.

Maj. N. Cantlie, M.C., half pay list, is restd. to the estabt., with precedence next below H. G. Winter, M.C.

Maj. H. H. Leeson, M.C., R.A.M.C., Res of Off., relinquishes his appt. under Art. 607 (b), Royal Warrant for Pay and Promotion, 1926, and resumes the rank of Lt.-Col.

Maj. (Qr.-Mr.) C. A. Figg, O.B.E., having attained the age for compulsory retirement, is placed on retd. pay.

TERRITORIAL ARMY.

Lt.-Col. (Bt.-Col.) F. Marsh (late R.A.M.C., T.F.), to be Hon. Col., R.A.M.C. Units, 48th (S. Midland) Div.

Lt. E. G. Oastler to be Capt.

W. H. D. Patterson and 2nd Lt. E. H. Brindle (late R. Scots) to be Lts.

ARMY DENTAL CORPS.

Lt. (on prob.) G. E. Nettleship is confirmed in his rank.

ROYAL AIR FORCE.

The undermentioned Flying Officers are granted permanent commissions in this rank: G. H. J. Williams, J. C. Neely J. Kemp.

Flying Officer J. M. Ritchie is promoted to the rank of Flight Lt.

Flying Officer A. C. Lysaght resigns his short service commission.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. J. D. Driberg is granted a commission in Class D.D.

Squadron Ldr. H. Harvey relinquishes his commission on completion of service and is permitted to retain his rank.

AUXILIARY AIR FORCE.

No. 601 County of London (Bomber) Squadron.—Flight Lt. J. D. Driberg resigns his commission on appoint*ment to the* Reserve of Air Force Officers.

Flight Lt. E. D. W. Reid is transferred from General Duties Branch.

INDIAN MEDICAL SERVICE.

Capts. D. P. McDonald, Amar Nath Sharma, and Naval Maneckji Pestonji Dotivala, M.C., to be Majs.

Temp. Lts. Karam Chand Virmani and Tolaram Bhojsing Pahlajani to be Temp. Capts.

Lt.-Col. J. K. S. Fleming retires.

Lts. E. G. Montgomery, G. F. Taylor, and Wajid Ali Khan to be Capts.

Lt. R. A. Haythornthwaite to be Capt. (prov.).

The undermentioned temp. officers are apptd. to permanent commns. as Lts.: Chandra Mani, Lakshman Dass, Prafulla Chandra Dutta, and Trilok Chand Puri.

Capts. to be Majs.: Kombar Ramaswamy Krishnaswami Iyenger, Madho Prasad, Girish Chandra Maitra, J. J. Rooney.

The following Capts. (prov.) are confirmed in their rank: Gurbaksh Singh Chawla, T. A. Malone, W. Scott, Bhagwant Singh Nat, V. A. Edge.

Lt.-Col. H. M. H. Melhuish, D.S.O. retires.

The *London Gazette* of Sept. 6th published under 14 paragraphs from the India Office the amended rules for the promotion and precedence of the Indian Medical Service contained in the Warrant of May 28th, 1918, and in such other Warrants granted since that date as are still in force.

COLONIAL MEDICAL SERVICES.

The following appointments are notified: R. E. Anderson, Medical Officer, Federated Malay States; Miss N. N. Lowther, Lady Medical Officer, Federated Malay States; L. E. Vine, Medical Officer, Federated Malay States; Miss C. D. Williams, Lady Medical Officer, Gold Coast; F. W. W. Fox, Medical Officer, Nigeria; F. Williams, Pathologist, Nigeria.

Appointments.

SCOTT, JOHN A., M.D. Liverp., D.P.H., has been appointed Medical Officer of Health for Shipley.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road E.—Surgeon. Also M.O. At rate of £110.

All Saints' Hospital for Genito-Urinary Diseases, Finchley-road, N.W.—Jun. H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Barrow-in-Furness County Borough.—Asst. M.O.H. and Asst. Tub. O. £600.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham Ear and Throat Hospital.—Third H.S. At rate of £150.

Birmingham and Midland Ear and Throat Hospital.—Asst. Surg. O. £200.

Blackburn and East Lancashire Royal Infirmary.—Res. H.P. £150. Also 4th H.S. £130.

Bournemouth, Royal Victoria and West Hants Hospital.—Two H.S.'s. Each at rate of £120.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Bristol City and County Mental Hospital.—2nd Asst. M.O. £500. Also 3rd Asst. M.O. £350.

Cape Town University.—Asst. Anatomist. £750.

Cardiff Royal Infirmary.—Gynæcological H.S. Also Ophthalmic H.S. At rate of £50 and £75 respectively.

Carlisle, Cumberland Infirmary.—H.P. £155.

Chelmsfield and Essex Hospital.—Res. M.O. At rate of £150.

Chichester Royal West Sussex Hospital.—Jun. H.S. £150.

Coventry City.—M.O.H. £1225.

Croydon General Hospital.—2nd Asst. for the Pathological and Bacteriological Laboratory. £3 10s. per week.

Cyprus, Pendayia Hospital.—Surgeon-Physician. £25 per month.

Dorchester, Dorset County Hospital.—H.S. At rate of £120.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Dublin University, School of Physic, Trinity College.—Montgomery Lecturer in Ophthalmology. £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200.

East London Hospital for Children, &c., Shadwell, E.—Res. Cas. O. At rate of £125.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Gloucester, Gloucestershire Royal Infirmary, &c.—Hon. S. to Ear, Nose and Throat Dept.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Grimsby County Borough and Port of.—Part-time Clin. Tuberculosis O. and Assist. M.O.H. £750.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hampstead Parish of St. John, New End Hospital.—Jun. Res. Asst. M.O. At rate of £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Asst. Path. and Research Fellow. £450. Also H.S. and H.P. Each at rate of £100.

Hull Royal Infirmary.—Asst. H.P. At rate of £130.

Indian Research Fund Association, Simla.—Bacteriologist. Also Research Worker. Each Rs.1500 per mensem.

Isleworth, West Middlesex Hospital.—Res. Asst. Med. Supt. and Asst. M.O. £450.

King's College Hospital, Denmark Hill, S.E.—Clinical Assistantships.

King's Lynn, West Norfolk and Lynn Hospital.—Sen. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.

Lewisham Metropolitan Borough.—Asst. M.O.H. and Maternity and Child Welfare M.O. £650.

Liverpool, St. Paul's Hospital, Oldhall-street.—H.S. £120.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. S. for Gynæcological Dept., Hon. Asst. Radiologist. Also Hon. M.O. for Actino-Therapeutic Dept.

London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.

London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175.

Manchester, Baguley Sanatorium.—Asst. M.O. £350.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester, Salford Royal Hospital.—Two H S.'s. Also Cas. H.S. Each at rate of £125

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £100.

Northampton, Northamptonshire County Council.—M.O.H. and School M.O. £1,100.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham Children's Hospital.—Res. H.P. At rate of £150.

Nottingham General Hospital.—H.P. Also 2nd Cas O. Each at rate of £150.

Otago and Dunedin University Hospital, New Zealand.—Sen. Res. M.O. £500.

Port Said, British Hospital.—Res. A.M.O. £350.

Princess Louise Kensington Hospital for Children, North Kensington.—Hon. Radiologist.

Prince of Wales's General Hospital, Tottenham, N.—Sen. H.P. Sen. H.S., and Special H.S. Each at rate of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

Rotherham Hospital.—H.S. £180.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100.

Royal Chest Hospital, City-road, E.C.—Res. M.O. At rate of £150. Also Out-patient M.O. and H.P. Each at rate of £100.

Royal Dental Hospital of London, 32, Leicester-square, W.C.—Hon. Anæsthetist.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. £125.

South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. Also 3 H.S.'s. Each at rate of £50.

Swansea Hospital.—H.S. £150.

Swindon Corporation.—Asst. M.O.H. £600.

Talgarth, Breconshire, South Wales Sanatorium.—Sen. Asst. M.O. £350.

Torquay, Torbay Hospital.—H.S. £175.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Worcester General Hospital.—Jun. Res. M.O. £120.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Portland (Dorset).

Births, Marriages, and Deaths.

BIRTHS.

GILDING.—On Sept. 5th, the wife of H. P. Gilding, B.M., B.Ch.Oxf., of a daughter.

HORROCKS.—At a nursing home, Manchester, the wife of F. S. Horrocks, M.B., Ch.B. Manch., of Gravesend, of a daughter.

HURRELL.—On Sept. 6th, at the Penlea Nursing Home, Newcastle-upon-Tyne, to Dr. and Mrs. George Hurrell, 31, Dencholm, Monkseaton—a daughter.

TAUNTON.—On Sept. 3rd, at Campbell-road, Hanwell, W., the wife of R. E. M. Taunton, M.B., Ch.B. Edin., of a daughter.

MARRIAGES.

COOKE—COWIE.—On Sept. 5th, 1920, at the Parish Church, Banff, by the Rev. D. Findlay Clarke, B.D., Robert Victor Cooke, M.B., Ch.B. Bristol, F.R.C.S. Eng., eldest son of Mr. and Mrs. John Cooke, Berkeley, Gloucestershire, to Betty Cowie, M.D., B.S. Lond., M.R.C.P. Lond., elder daughter of Hugh Gordon Cowie, M.A., M.D., Banff, Scotland.

FARR—EMERY.—On Sept. 2nd, at Holy Trinity, Coombe Down, E. A. Farr, M.R.C.S. Eng., L.R.C.P. Lond., of Andover, to S. A. Emery, of Bath.

GREGORSON—HOWE.—On Sept. 4th, at All Saints', Horsford Parish Church, Norwich, Albert William Gregorson, M.D. Glasg., to Edith Evelyn Howe.

WILSON—SMITH.—On August 31st, at Tiviot Dale Chapel, Stockport, John Greenwood Wilson, M.D. Lond., M.R.C.P. Lond., younger son of the Rev. John Wilson, M.B.E., D.D., of Woolwich, to Wenda Margaret Hithersay, eldest daughter of Ernest J. Smith, M.A., LL.B., of Disley, Cheshire.

DEATHS.

AMBLER.—On Sept. 9th, at Ampthill, R. Ambler, Esq., F.R.C.S., L.R.C.P. & S. Ed., L.R.F.P.S. Glasg., aged 72, last surviving son of Dr. E. H. Ambler, of Hemel Hempstead.

CAIGER.—On Sept. 5th, suddenly in Scotland, Frederick Foord Caiger, M.D. Lond., F.R.C.P., late chief medical officer, Infectious Hospitals Service, Metropolitan Asylums Board, aged 69 years.

CRAIG.—On July 26th, at the Cottage Hospital, Fort Beaufort, Peter Latimer Craig, M.A., B.Sc., M.B., C.M. Glasg., D.P.H. Camb., of Balfour, Cape Province, S. Africa.

HARRIS.—On Sept. 6th, at Hartwood House, Chorley, Lancashire, James Alfred Harris, M.D. Lond.

LOCHHEAD.—On Sept. 2nd, at Desenzano, Italy, after a short illness, Mathew Lochhead, M.B., C.M. Glasg., B.Sc., of Snaxland, Clovelly, Devon.

SHARKEY.—On Sept. 6th, at Portland-place, London, Sir Seymour J. Sharkey, M.A., M.D. Oxf., F.R.C.P. Lond., consulting physician to St. Thomas's Hospital, aged 82 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ENLARGEMENT OF DEAL HOSPITAL.—The Deal and Walmer War Memorial Hospital, which last year had a credit balance of over £1100, is to be enlarged by the erection of a nurses' home at the back, thus enabling the whole of the present building to be used as wards. The cost will be £10,000.

ST. BARTHOLOMEW'S HOSPITAL.—In his annual report, Lord Stanmore, the treasurer, states that the erection of the surgical ward block is making good progress and that the buildings should be ready for occupation by the beginning of next year. There will be five surgical units, each comprising a male and a female ward of 22 beds, with two small wards of one and two beds respectively attached to each section. Each unit has its own operating theatre, demonstration room, examination room, and offices. These buildings form part of the complete scheme of reconstruction. The Governors have approved a southern extension of Queen Mary's Home for the nurses, which will provide for 51 additional nurses. The in-patients last year numbered 9808 and cost £10 1s. 4d. each; the 94,803 new out-patients cost 11s. 1d. each. The income was £198,765 and the expenditure £201,774.

Medical News.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH.—Lord Rayleigh, F.R.S., Sir Arthur Balfour, Sir William Bragg, F.R.S., and Sir James Walker, F.R.S., have been appointed members of the Advisory Council in succession to Sir Harold Carpenter, F.R.S., Mr. G. C. Clayton, Ph.D., Sir Richard Glazebrook, F.R.S., and Sir James Jeans, Sec. R.S., who have retired on completion of their terms of office.

Dr. Leonard Nicholas Robinson, O.B.E., President of the Egyptian Medical Commission in Paris, has been granted His Majesty's royal licence and authority to wear the Insignia of the Third Class of the Order of the Nile, conferred upon him by the King of Egypt, in recognition of valuable services rendered by him.

TORBAY HOSPITAL CONTRIBUTORY SCHEME.—At the end of the first four months' working of this scheme the membership had reached nearly 15,000.

PAIGNTON HOSPITAL.—An enlargement of this hospital was opened last week by Mrs. J. A. Watson. It consists of a new wing, containing a men's ward, a women's ward, and accommodation for paying patients. The work has cost £15,000.

ANCOATS HOSPITAL, MANCHESTER.—A course of post-graduate lectures and demonstrations will be given during the Michaelmas Term on Thursday afternoons at 4.15 P.M., commencing on Oct. 17th, when Dr. W. J. S. Reid will speak on Hæmorrhagic Diatheses. A notice of each lecture will be inserted in THE LANCET of the preceding week. All medical graduates and senior students are invited, and there is no fee for the course. In addition to this course a post-graduate day of clinical teaching will be given by the honorary staff every Thursday during the Lent Term as part of the post-graduate scheme of the University of Manchester.

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.—The programme of the sixth annual conference, to be held at Trinity College, Cambridge, from Sept. 20th–23rd, has been issued. Among the subjects to be considered are the Ideal Form of a Journal from the Librarian's Point of View, Duplication and Infringement of Copyright, Technical English, the Training of Special Librarians, the Indexing and Classifying of Individual Collections of Data, and International Organisation of Information Services. A dinner will be held on Sept. 20th, when Sir J. J. Thomson, F.R.S., president-elect of the Association, will give an address. Full particulars can be obtained by those interested from the Secretary, A.S.L.I.B., 26, Bedford-square, London, W.C.

OPTICAL CONGRESS.—A congress and trade exhibition is being held at the Northampton Polytechnic Institute, St. John-street, London, E.C., to commemorate the tercentenary of the granting of the Royal Charter to the spectacle makers of the City of London. The congress was opened on Sept. 10th by Sir Osborn Holmden, Master of the Worshipful Company of Spectacle Makers. He said that at the end of last century the Company had decided to institute an examination for the craft, and at the present time nearly 2500 opticians held the Company's diploma. It was the object of the Company and of other optical bodies to raise the code of ethical practice among opticians and to ensure that persons afflicted by disease and needing treatment should be referred to ophthalmic surgeons.

"THE MIDLAND HOMŒOPATHIC AND GENERAL HOSPITAL" is the new name of the institution formerly known as the Birmingham and Midland Homœopathic Hospital and Dispensary. The 50 beds are always full, and 710 in-patients were treated last year; there were 3745 out-patients and 982 operations. The finances show an annual loss. The average cost per in-patient per week was £3 2*s.* 10*d.*, as against £2 0*s.* 4*d.* in the previous year.

THE SHEFFIELD HOSPITALS.—The seventh annual report of the Sheffield Hospitals Council, which administers the penny-in-the-pound scheme, states that the total number of patients admitted to the four institutions last year was 16,433. Children, unemployed, and patients unable to pay towards their maintenance numbered 6051, and for these persons and the necessitous poor the Council expended £60,000. The casualties exceeded 40,000, an average of 134 per day; out-patients totalled just under 74,000. At the end of the year the waiting list contained 2087 names and the accumulated debt to the bankers exceeded £59,000,

Notes, Comments, and Abstracts.

MEDICAL EXAMINATION OF CANDIDATES FOR THE POLICE FORCE IN 1844.

THE standards of fitness for candidates for the most physically exacting of our national services were the subject of comment in our columns last week. We have received from Dr. A. P. Gibbons a copy of the instructions issued nearly a century ago, for the guidance of the surgeon to the police force of the City of London, on his duties when examining candidates for the Force, and it is interesting to compare the criteria of sturdy vigour then established with more modern ones. The document, dated 1844, reads as follows:—

Instructions for the Guidance of the Surgeon.

I. The leading object of the following instructions is to guard against the admission of candidates into the Force whose health of body or mind is unsound who have any suspected taint of disease or disability and who, at the period of Inspection, are incapable of undergoing fatigue. The Duties of the Force to be efficiently performed necessarily require that each Member should enjoy sound Bodily health, as well as a fair proportion of physical strength and an appearance likely to command obedience.

II. The Surgeon is from his knowledge of the Duties of the Members of the Force, presumed to be capable of forming a correct opinion of the health of Candidates their capacity for exertion and general efficiency. The external characters of a sound constitution and efficient limbs may be briefly stated, viz., a tolerably just proportion between the trunk and different Members of the Body a Countenance expressive of health with a lively eye—Skin firm and elastic—Lips red—Teeth in good condition—Voice strong—Chest capacious and well formed—Belly lank—Limbs muscular—Feet arched and of a moderate length—Hands rather large than small—The reverse of these marks of a good constitution and efficiency may be considered to indicate infirm health or inefficiency.

III. The question of fitness or unfitness of a candidate must in a great measure be determined by the discretion of the Surgeon for no rule can be formed of so definite a character as to dispense with the exercise of the deliberate reflection and judgment of a Medical Man.

IV. As policemen are liable to be exposed to frequent vicissitudes of weather and to undergo much fatigue Candidates should possess vigorous constitutions and great muscular capability; hence no Man ought to be approved for the Service whose health is unsound and who does not possess adequate strength for the duties which he may be called upon to perform.

V. The following enumeration of the more common causes for which Candidates should be rejected when any of them exist to such a degree as will immediately, or in all probability may at no very distant period impair a Man's efficiency, is intended as a general guide to the Surgeon in the performance of the duty of inspecting Candidates.

1. Feeble constitution, unsound health from whatever cause, indications of former disease, as Leech bites, traces of Blisters, thereby showing a liability to infirm health, nodes, glandular swellings, or other symptoms of Scrofula, &c.
2. Weak or disordered Intellect.
3. Chronic cutaneous affections, especially of the Scalp.
4. Severe injuries of the Bones of the Head.
5. Impaired vision from whatever cause, or Inflamatory affections of the Eyelids, immobility or irregularity of the Iris, Fistula Lachrymalis.
6. Deafness or copious discharge from the Ears.
7. Loss of many Teeth or the Teeth generally unsound.
8. Impediment of Speech.
9. Want of due capacity of the Chest and any other indication of a liability to pulmonic Disease.
10. Impaired or inadequate efficiency of one or both of the superior extremities on account of palsy, old fractures, especially of the Clavicle, Contraction of a Joint, Mutilation, Extenuation, Deformity, Ganglions, &c., &c.
11. Lateral and other Curvatures of the Spine.
12. Hernia or a tendency to that disability from preternatural enlargement of the abdominal ring.
13. A varicose state of the Veins of the Scrotum or Spermatic Cord, Sarcocele, Hydrocele, Hemorrhoids, Fistula in perineo.
14. Impaired or inadequate efficiency of one or both of the inferior extremities on account of Varicose Veins, old Fractures, Malformations (flat feet, &c.), Palsy or Lameness, Contraction, Mutilation, Extenuation, Enlargement, unequal length, Bunions overlying or supernumerary Toes, Ganglions, &c., &c.

15. Ulcers or unsound cicatrices of Ulcers likely to break out afresh.
16. Diseases whether Acute or Chronic for which Medical treatment is required.

VI. Every Candidate is to be undressed before Inspection and it is directed that the Examination shall be conducted agreeably to the following Routine, by which means blemishes are not likely to escape detection.

VII. Upon entering the Inspection Room the Candidate is to walk a few times pretty smartly across the Apartment for the purpose of showing that he has a perfect use of his lower extremities. He is then to be halted and set up in the position of a Soldier under Arms with the Knees about an inch apart and examined both in front and rear from head to foot. Should no material defect be discovered during this Survey the Examination may go on. The Candidate is then to perform the following Evolutions:—to extend the arms at right angles with the trunk of the Body, then to touch the Shoulders with the fingers, next to place the backs of the hands together above the head in this position let him cough, while at the same time the Surgeon's hand is to be applied to the rings of the external oblique muscles. Let the Surgeon examine the Spermatic Cord and Testes, then pass his hands over the Bones of the Legs. The Candidate is next to be made to stand upon one foot, and move the ankle joint of each extremity alternately; when any doubt is entertained respecting the efficiency of this joint or any part of an inferior extremity he should be made to test his strength by hopping upon the suspected Limb for a short period, and the size and aspect of the corresponding joint or part of the opposite Limb should also be accurately compared. He is next to kneel on one knee, then on the other and subsequently on both knees. Let him then stoop forwards and place his hands on the Ground and while in this position it ought to be ascertained whether he be affected with Hemorrhoids. He is then to extend the superior extremities forward for the purpose of having his arms and hands examined, and with this intention he is to perform flexion and extension of the fingers and to rotate the forearm. The Head is next to be examined, including the scalp, ears, eyes, nose, mouth; the Surgeon is then to ascertain that he possesses the function of hearing, and the faculty of distinct enunciation. In regard to the mental faculties the Surgeon should invariably ask a Candidate a few short questions as what occupation he had previously followed, &c., &c., or adopt any other means which he may deem necessary to ascertain the condition of the intellect.

VIII. When a Candidate is approved the attestation is to be filled up and signed by the Surgeon.

IX. The Book required to be kept in regard to this Branch of the duty of the Surgeon is, a register of Candidates which is to be ruled so as to contain the following heads: (a) Date of examination. (b) Name of each Candidate. (c) Age. (d) Country of Birth (as England, Ireland or Scotland). (e) Previous occupation or Station in life. (f) Remarks and Observations.

Causes of Rejection.—Unsound Health. Weak Intellect. Traces of Scrofula. Muscular Tenuity. Chronic Cutaneous affections. Specks on the Cornea; Cataract. Deafness. Loss of many Teeth. Defective condition of the superior extremities in consequence of old fractures, contractions, &c. Deformed Spine. Hernia Inguinal on either side. Laxity of the ring of the external Oblique Muscles on either side. Varicose Veins, left or right Spermatic Cord. Disease of the left Testicle. Disease of the right Testicle. Hydrocele of either testicle. Defective condition of the Inferior Extremities in consequence of old fractures. Malformation. Varicose Veins of either legs. Ulcers, Wounds or Cicatrices of legs.

Modern Practice.

We understand that at the present time the question of fitness or otherwise of candidates for the City of London Police is largely left to the examining surgeon. Each candidate fills up a form on which he sets out his name, age, vaccination history, notes of illnesses for which medical attention has been required, and reports any history of hæmoptysis, fits, rheumatic fever, or discharge from the ears. He is asked on the same form whether he or any near relative has been afflicted with consumption, epilepsy, insanity, or nervous debility, whether he has ever been ruptured, and what, if his parents are not living, was the cause of their death. The surgeon then examines the candidates stripped, so that varicose veins, hernia, and deformities can be easily detected. His sight and hearing must be good and his organs sound; he should be six feet or more in height, have a mean chest measurement of 36 in., and weigh 11 stone or more when stripped. The use of stethoscope has, of course, made unnecessary such full ctions as were offered to the surgeon of 1844, and has a better estimate of the function of the respiratory systems to be made, but it is remarkable have altered since the early instruc- ed.

SOME ASPECTS OF HOSPITAL PLANNING.

In an address with this title, recently delivered before the Rotary Club at Welwyn Garden City, Mr. A. W. Kenyon, F.R.I.B.A., spoke of the choice of site for a general hospital, more especially as it might apply to a garden city. One of the most important factors was the selection of a really beautiful site, a point which often appeared to be overlooked, leaving architects to face the problem of fitting a hospital on to a difficult and unsuitable site. There were many reasons why this was so. The land might be given by a philanthropist who did not fully appreciate the requirements of future development, or the land might not be available in the particular district in which the hospital was required. In Welwyn, however, it should be quite possible to select an ideal site. It was essential in the first instance that the site should be large enough for future as well as present demands. There should be a broad frontage facing south and the ground fall gently towards the south, with access roads from the north and east, where there should be the shelter of a belt of trees. The amount of land required would depend on the type and size of the hospital to be erected. The modern tendency was to secure smaller hospitals in towns where noise is daily on the increase, and to make them tributary to larger hospitals in the country where fresh air can be obtained and plenty of space secured for gardens for convalescents. This ideal, he thought, should appeal to places like Welwyn which were making efforts to bring works and the workers from congested and noisy towns into the better environment of the country. The hospital of the future was going to be a very efficient building, which would provide for: (a) general patients who would come under the voluntary system; (b) paying patients who could only afford to pay a contribution towards the services rendered to them; (c) private paying patients who would be able to pay adequately for these services; (d) smaller wards; (e) special blocks, all of which were tending to increase the size of hospitals. If Welwyn was going to provide a hospital suitable for the county and so to relieve the more thickly populated towns, there was hardly any limit to the ultimate number of beds required. Having arrived at the probable number of beds ultimately needed, the hospital should be planned for the full accommodation, even if a small portion only was to be built. It was extremely difficult to add to an existing building if the future extension had not been thought out. There was the psychological effect to bear in mind, for donors would often contribute to some special department or would contribute towards finishing off a certain portion of the building. In new towns like Welwyn, run on idealistic principles, it should certainly be possible to plan a new hospital rather than adapt an existing building. To do the latter would be to find that when everything possible had been done, it was more than likely to prove a makeshift, uneconomical in planning, difficult to administer, and expensive to run.

PAINFUL FIBROSITIC NODULES.

To the Editor of THE LANCET.

SIR,—I offer the following suggestions for treatment. (1) Injections of fibrolysin; (2) paint painful nodules with analgit (the Analgit Co., 102, Wilmslow-road, Didsbury, Manchester); (3) a sodium iodide and sodium salicylate mixture; (4) soneryl grs. ii. at bedtime with a hot drink, to ensure sleep till other remedies get to work.

I am, Sir, yours faithfully,
C. G. S. BARONSFEATHER, M.D.

Bournemouth West, Sept. 6th, 1929.

A COURTEOUS ACT.

We are in a position to supply the information desired by the Leicester Health Committee on the whereabouts of Dr. W. B. Castle, who earned the gratitude of the Committee by his services to a fellow passenger on the Ostend boat. Dr. Castle sailed on Sept. 7th for Boston, where he holds an appointment at the City Hospital, to resume the experimental work on the association of achlorhydria with pernicious anæmia which he reported to the Section of Medicine of the Royal Society of Medicine on June 11th. Dr. Castle's courtesy in escorting a woman whose labour had begun prematurely to her home in Leicester, and in attending her until he could procure suitable medical and nursing attention, was especially noteworthy since the incident curtailed his final visit to London before he sailed for America.

X. Y.—We understand that keraphen (or tetraiodophthalophenon), a preparation given by the mouth as a preliminary to cholecystography (see THE LANCET, August 24th, p. 400), may be obtained from Mr. James Picker, 686, Lexington-avenue, New York.

WE are informed that Prunol Products, Ltd. is continuing to place on the market the proprietary remedy for constipation and kindred ills known as prunol.

Lettsomian Lectures

ON THE

RELATIONSHIP OF DERMATOLOGY TO OTHER BRANCHES OF MEDICINE.

Delivered before the Medical Society of London

BY H. W. BARBER, M.B. CAMB., F.R.C.P. LOND.,
PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT, GUY'S HOSPITAL.

LECTURE III.*

IN my first lecture I emphasised the close relationship that exists between the skin and the endocrine-autonomic system, and indicated how the latter is to some extent dependent for its normal functioning on the physical stimuli—e.g., light and cool air—that the natural environment of the skin should provide. This relationship is evident again when one studies the conditions which I propose to consider in this lecture, conditions that are *symptoms* rather than distinct diseases. They come within the province of nearly every medical and surgical specialist, as well as of the pathologist, bacteriologist, and biochemist, but they concern no one more intimately than the dermatologists, who, I think I may say, have done much to elucidate their exact pathogenesis.

For the purposes of this lecture I shall divide those conditions or symptoms into two groups:—

Group 1 comprises those that Freeman[1] has labelled the toxic idiopathies.

Group 2 is a triad of cutaneous disorders which are closely related both to each other and to certain maladies that concern the general physician. They are alopecia areata, vitiligo or leucomelanoderma, and scleroderma.

The conditions included in these two groups have this in common, that they are associated with manifest disturbances of the vegetative nervous system and certain endocrine glands. Before considering them in detail, I would insist on one point—namely, the regrettable tendency that still exists of referring to them as if they were *diseases* sui generis, whereas they are merely symptoms, each, it is true, with its own mechanism of production, but of widely different causation in different cases. It is absurd, for example, to talk of a "cure" for asthma or of urticaria, or, for that matter, of alopecia areata and scleroderma; one might with equal justification speak of a "cure" for itching or diarrhœa. Conversely, it is to my mind just as misleading to inform the victims of, say, asthma that there is no certain cure for their disability, for such a statement merely propagates the erroneous idea in the minds of the lay public that asthma is a definite disease of specific causation.

GROUP 1.

The Toxic Idiopathies.

The following list includes at any rate most of the recognised toxic idiopathies:—

Cutaneous.—Urticaria; true infantile eczema; certain forms of eczema occurring after infancy; certain forms of pruritus; prurigo of the Besnier type; prurigo of the Hebra type; prurigo of the simple type; prurigo nodularis; urticaria papulosa (lichen urticatus, strophulus); light-sensitisation of the adult type; dermatitis herpetiformis (probably).

Subcutaneous.—Angeioneurotic œdema.

Respiratory.—Paroxysmal rhinitis, of which hay-fever is one of the commonest examples; asthma.

Gastro-intestinal.—Certain forms of vomiting and diarrhœa; cyclical vomiting.

Nervous.—Migraine; epilepsy (probably).

Articular.—Paroxysmal hydrarthrosis.

I employ the term "toxic idiopathies," coined by Freeman, to describe the various symptoms included in this group, because it conveniently indicates their toxic origin, and implies what we call "idiosyncrasy," which is apparently a striking factor predisposing to their occurrence. By idiosyncrasy in this connexion we mean that certain persons have an inborn tendency to develop hypersensitiveness towards one or more foreign substances, such as animal or plant emanations, foodstuffs, drugs, &c. Thus only a small proportion of persons develop the hypersensitiveness to certain pollens that betrays itself by the paroxysmal rhinitis we call hay-fever, but many of them are also sensitive to other substances—e.g., foods, drugs, or animal emanations—which may produce different symptoms such as asthma, urticaria, eczema, or diarrhœa. This individual tendency to become sensitised—or idiosyncrasy—is, as is well known, a hereditary and familial trait, and Coca,[2] emphasising the influence of heredity, has suggested the term "atopy," in order to distinguish the basic factor underlying the genesis of the toxic idiopathies from true allergy and anaphylaxis.

Nevertheless, although every clinician recognises this hereditary and familial factor, as Bloch[3] points out, idiosyncrasy is a relative term, and its incidence varies according to the substance or idiosyncrasiogen towards which sensitiveness may develop. According to Coca and others over 60 per cent. of persons are or become sensitive to poison-ivy; Bloch states that 80 per cent. of all adults are sensitive to the round-worm ascaris, and Ancona[4] that all workers with grain, infested with the acarus, *Pediculoides ventricosus*—the cause of so-called grain-itch—eventually develop asthma. Moreover, according to Schittenhelm and Stockinger, all those who constantly handle salts of nickel sooner or later suffer from nickel dermatitis. We thus see the liability to become sensitised by repeated or constant contact with *certain* substances is found in a much greater proportion of persons than can be attributed to individual idiosyncrasy.

Cranston Low[5] succeeded in sensitising his own skin and that of his brother to *Primula obconica*, but failed with six other persons. In Low's case there is a history of asthma on the maternal side, and his mother suffered at one time from primula dermatitis, but in the unsuccessful cases also two had a family history of asthma, and the mother of another had had primula dermatitis.

Only a relative small proportion of those who handle *P. obconica* become sensitised, and there is often a familial idiosyncrasy towards it. Bloch, however, prepared a *concentrated extract* of the plant, and painted with it a small area of the skin of normal persons, including himself. *In every case* he thus succeeded in producing *sensitisation of the whole skin, so that subsequent contact with the plant* was followed by an acute eczematous dermatitis. As Bloch points out, the importance of this experiment lies in the fact that, by merely concentrating the antigen or idiosyncrasiogen, what is usually regarded as an idiosyncrasy—viz., primula sensitiveness—was transformed into a typical allergy. The experiment is, in fact, exactly comparable to the allergy produced by inoculating tubercle bacilli or certain ringworm fungi, as described in my second lecture. A primary focus was produced at the site of application of the primula extract, from which general sensitisation of the whole skin resulted. Moreover, Bloch was able to produce *focal reactions* in areas of skin to which the extract had previously been applied, but which had healed, on reapplication to other areas.

I think these observations show that the toxic idiopathies, although certainly often familial and hereditary, may, nevertheless, be regarded as allergic in nature. There is a type of person whose life-history may well be said to be one damned idiopathy after another. Often an ichthyotic, his troubles begin with infantile eczema; at about two years of age this may merge into the well-defined variety of prurigo known as the prurigo of Besnier; with this may appear asthmatic symptoms, and sooner or later attacks of urticaria, either of the papular or adult type, or of angeioneurotic œdema develop. Paroxysmal rhinitis, due to pollen, animal emanations, or other antigens, may follow, and acute attacks of eczema, caused sometimes by the skin having become sensitised to plants or chemical irritants, or there may be periodical attacks of vomiting and diarrhœa. Typical migraine may occur in childhood, or succeed some or all of these symptoms in later life.

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* Lectures I. and II. appeared in THE LANCET of August 24th and Sept. 7th respectively.

Such extreme cases are relatively uncommon. It is in them that the familial and hereditary factor is usually most evident, and, although one particular symptom may be traced through several generations —and angeioneurotic œdema is a notorious example of this,—more often the affected members of the same family manifest different symptoms. Moreover, there is every gradation between these rare cases of hypersensitiveness to various antigens, with multiple symptoms of such hypersensitiveness, and the much more numerous cases of idiosyncrasy to one substance only, in which the familial tendency is lacking or uncertain. I always regard myself as practically normal in this respect, and, as far as I know, I have but one such idiosyncrasy—namely, to the human flea—which is not shared by any other members of my family. When I was an extern I was so badly flea-bitten that I became definitely ill with symptoms not unlike those of mild serum sickness. The only similar idiosyncrasy that I have been able to trace in my family is that my maternal grandmother was extremely sensitive to strawberries, but to nothing else.

It is likely, therefore, as Bloch's experiments suggest, that we are all at any rate potentially sensitisable, but that certain persons are much more so than others, and in them the tendency is commonly inherited and transmissible to their children. Probably, as will be seen later, what is inherited is a disordered balance or "make-up" of the endocrine-autonomic system on which this tendency depends; this view is strengthened by the fact that a perfectly normal person, with no inherited predisposition, may, under the stress of an acute or chronic infection, or of a severe emotional shock, develop symptoms of such an endocrine autonomic disturbance, and simultaneously, for the first time in his life, one or more of the toxic idiopathies. I have, for example, seen chronic urticaria, angeioneurotic œdema, the prurigo of Besnier, or asthma, develop suddenly in adults hitherto apparently normal in every way, after acute infection or psychical shock, there being at the same time signs and symptoms of thyroid-adrenal-sympathetic exhaustion.

If, then, we admit that idiosyncrasy is but a relative term, and that we are probably all at least potentially sensitisable, there is no reason to discriminate between the atopy of Coca and allergy, and, personally, I think that the toxic idiopathies may justifiably be considered as allergic reactions, and the cutaneous manifestations of the group be compared, as regards their mechanism of production, to the recognised allergic eruptions such as the tuberculides and trichophytides. With regard to *anaphylaxis*, I agree with Bloch that "the entire process has all the earmarks which dermatologists have learned to regard as characteristic of allergic reactions," and that "only on historical grounds can one understand that some still insist on giving it a special classification, instead of including it under allergy, and stress as particularly characteristic and typical the anaphylactic symptoms of the guinea-pig."

It may be as well at this point to define what we mean by allergy, and I think one of the most comprehensive definitions is that of Bloch:—

> "Allergy is that state which has as its basis the property of certain groups of cells (organs) of the living organism to react in a specific manner when brought in contact with a substance, which is, as far as is known, foreign to the organ or cells; the characteristic of this specific pathologic process lies in the fact that it is caused by the reaction of this exogenous substance with its specific cellular fixed antibody. The basis and the essence of allergy is the ability of the living cell to react with the production of specific antibodies to the stimulus of foreign substances, which are, therefore, called antigens, as well as the fact that the contact of the antigen with its specific cellular fixed antibody causes a disturbance of cellular life, which usually results in an inflammatory reaction."

He then goes on to say:—

> "It is clear that an organism which possesses or has acquired (by previous contact) such specific antibodies will react to the application of the specific antigen differently from an organism which does not possess such antibodies (allergy = different reaction).
>
> "From this definition other qualities characteristic of the allergic process can be logically deduced. The type and course of the allergic reaction are independent of the nature of the antigen, but vary according to the localisation of the antibody, that is, according to which organ reacts to the antigen. The effect which a substance acting as antigen—namely, through reaction with its antibody, has on the organism is different from the simple pharmacological effect which the same substance has on an organism which does not have any antibodies."

For example, in the case of drugs, such as quinine or iodine, a pharmacological dose, which would be tolerated by a normal subject, would produce violent symptoms in a sensitised person.

In allergy not only are the tissue cells sensitised, but substances—"antibodies," to give them a non-committal term—may be present in the blood, and on them the possibility of active and passive immunisation and of desensitisation depends. Moreover, they enable us in certain cases to determine the substance to which a person is sensitised by means of the Prausnitz-Küstner reaction which has proved so invaluable in the study of allergy. It was employed by A. and M. Walzer[6] in their experimental studies on urticaria, and by it has been established a fact of great importance—namely, that true antigens are not necessarily proteins; in fact, it is probable that in all cases the actual specific antigenic bodies are non-protein substances of relatively simple chemical composition. This has been proved, for example, in pollen hypersensitiveness by Coca and W. Jadassohn, and in sensitiveness to various foods by the latter observer.

Thus in a child with egg-sensitiveness, mentioned by Bloch, a reaction could be produced on the skin of the child as well as on that of a person passively sensitised by the Prausnitz-Küstner method, not only with egg protein, but also with a protein-free dialysate of egg, and W. Jadassohn showed that the actual antigen of the ascaris worm, which provokes violent asthma or urticaria or dermatitis in sensitised persons, is not destroyed by heat and is dialysable: it is therefore not a protein. Moreover, Bloch and Karrer succeeded in preparing from primula plants a pure crystalline substance, with the formula $C_{14}H_{18}O_3$, which, in a quantity of only 0·02 mg., produced a widespread eczematous dermatitis in a sensitised person, characteristic of primula dermatitis.

Now in the various conditions we term the toxic idiopathies we meet with some cases—for example, urticaria from some definite food substance or hay-fever, in which there is specific sensitiveness to one or other pollen,—that are, so to speak, constants. The person has a definite idiosyncrasy, his skin gives a positive reaction to the specific antigen, and his serum will passively sensitise a normal person. The whole phenomenon can be reduced to a relatively simple physiological experiment. But in many cases no such specific sensitiveness can be determined.

Let us take urticaria as an example. We know from the researches of Lewis[7] and his co-workers that the urticarial wheal is provoked by the liberation of a histamine-like substance or histamine itself in the skin, which produces a primary local dilatation of the minute vessels, a widespread dilatation of the neighbouring strong arterioles brought about entirely through a local nervous reflex, and locally increased permeability of the vessel walls. This response may be evoked in certain persons merely by stroking the skin (dermographism); in other cases by the contact of an antigen with sensitised skin cells. It represents a local response to injury, and is presumably a defensive mechanism. But how are we to explain the so-called "psychogenic" urticaria, which certainly occurs? For example, a patient consulted me for recurring attacks of genuine urticaria and angeioneurotic œdema, which occurred only when he was confronted with an important business appointment, or the prospect of meeting strangers socially. The question of sensitisation can hardly arise here. Are we to suppose that in emotion or anxiety states there may occur a liberation of histamine, such as Lewis has tentatively suggested may be the cause of blushing? In any case, in patients of this type it would seem that there is adrenal-sympathetic insufficiency with relative predominance of the parasympathetic, and that in practically all the toxic idiopathies the anxiety state alone may provoke the paroxysms.

Vagotonia.

Since Eppinger and Hess[8] in 1910 first formulated their conception of vagotonia with its converse sympathicotonia, a great deal of argument for and against their thesis has taken place. The whole question is reviewed in Guillaume's[9] book "Vagotonies, Sympathicotonies, Neurotonies." That one cannot in actual practice sharply divide the vegetative nervous system into its parasympathetic and sympathetic portions is certain. Clinically, however, one does meet with persons in whom there is clearly a disturbance of the normal balance between these two portions of the autonomic system, as well as of the endocrine glands with which they are functionally so closely connected. To dismiss the whole idea as a wild theory, as some would do, is childish, since it is confirmed by pharmacological and other tests.

Persons belonging to Czerny's exudative diathesis—i.e., those manifesting the various toxic idiopathies—correspond more or less to the vagotonic type described by Eppinger and Hess, in which parasympathetic action tends to override that of the sympathetic. Bolten[10] considers that in them there is "a congenital insufficiency of the sympathetic system and of the endocrine glands with accelerator action."

In support of this view is the fact that the various acute manifestations of the exudative or allergic state (like those of anaphylactic or peptone shock) are relieved by adrenalin, and the tendency to their occurrence often lessened by the administration of thyroid, both of which, of course, stimulate the sympathetic; conversely they are aggravated by pilocarpine, which, on the whole, stimulates the parasympathetic.

On the other hand, it is but just to point out that the sweat glands are innervated by the sympathetic, yet pilocarpine, an exciter of the parasympathetic, provokes sweating, and atropine, which paralyses the parasympathetic, arrests it. Moreover, with the approach of death, at which time there is hyposympathicotonia and hypervagotonia, profuse perspiration occurs.

Whether or not, however, one accepts the conception of vagotonia, sympathicotonia, and of Guillaume's neurotonia, which is a sort of mixture of the two, there is no question that in the genesis of the different symptoms of the sensitised or allergic state the endocrine-autonomic system is intimately involved, just as it is in experimental anaphylaxis.

Factors Predisposing to the Manifestations of the Sensitised State or Toxic Idiopathies.

This relationship of the toxic idiopathies to the endocrine-autonomic system is clearly seen if one analyses the known factors predisposing to their occurrence. The principal ones are:—

(1) *Sensitisation to foreign substances*, whereby contact of the antigen with the sensitised tissues results in a train of phenomena, similar to those met with in experimental anaphylaxis, which, like the allergic reactions considered in my last lecture, are doubtless defensive in nature, and are associated with manifest disturbance of the vegetative nervous system. Drury[11] considers that the toxic idiopathies are essentially conservative, self-repairing mechanisms under parasympathetic control. At any rate, as I have said, they are on the whole accompanied by depression of the adrenal-sympathetic action with consequent predominance of the parasympathetic.

(2) *Peripheral irritation.*—This factor, the presence of a so-called reflex source of irritation, may be one of great importance, and is often forgotten. In asthma it is, of course, recognised that a nasal abnormality may be a provoking cause of the attacks by setting up a trigemino-vagal reflex; this is explained by Brodie and Dixon's classical experiments. Similarly, an overloaded stomach, or exposure to strong sunlight may excite the asthmatic paroxysm. The well-known experiments of Donaldson[12] on rectal distension, referred to in my first lecture, are of interest in this connexion. Many of the symptoms produced by an overloaded rectum are clearly the result, not of so-called intestinal toxæmia, but of reflex irritation of the autonomic nervous system, and are promptly relieved when the rectum is emptied. Guillaume[13] records a case of a soldier with various symptoms of the vagotonic state, including migraine-like headaches. He was found to have a small piece of shrapnel embedded in the left orbit, removal of which caused the entire disappearance of all his symptoms. Eye-strain, a painful tooth, and a misplaced uterus are other examples of peripheral sources of irritation that may provoke symptoms of sympathetic disturbance out of all proportion to their apparently trivial nature.

(3) *Psychical stimuli.*—I need not enlarge upon the influence of emotion, worry, and shock in precipitating or aggravating the symptoms of the allergic state. The work of Cannon, Crile, and others on the psychical factor in disturbances of the thyroid-adrenal-sympathetic system is well known, and has been admirably reviewed by Langdon Brown[14] in his Croonian Lectures on the Sympathetic Nervous System.

These three factors have been utilised by Hurst[15] and by Langdon Brown[14] to express asthma in a formula. The former has defined asthma as due to an irritable condition of the bronchomotor portion of the vagus nucleus, which causes it to react unduly to psychical or peripheral stimuli, or to foreign proteins in the circulating blood; under one or other of these stimuli there result bronchial spasm, and, as Langdon Brown suggests, vasomotor turgescence of the bronchial mucous membrane.

In toxic idiopathies other than asthma the same three factors may be operative, and this accounts for the fact that those who suffer from them fall, as Freeman[17] points out, into the hands of different specialists in turn—for example, the immunologist, the rhinologist, the dermatologist, the neurologist, the psychologist, the gastro-enterologist, and so on. Each has his own point of view, his own line of treatment. These patients, more than any others, provide the handle of accusation against specialism, and at the same time demand of their consultants a range of knowledge wider, I am afraid, than they usually obtain.

(4) There is yet a fourth factor which may, I think, when still further investigated elucidate much that is obscure—namely, the metabolic factor. Oriel,[18] working in my clinic, has shown that certain definite biochemical changes occur in the blood and urine before, during, and after the paroxysms or crises of allergic manifestations. It would appear that in true anaphylactic shock, in serum sickness, in the shock following extensive burns, and in the toxic idiopathies, such as asthma, hay-fever, urticaria, angeioneurotic œdema, migraine, cyclical vomiting, infantile eczema, and certain forms of prurigo, what may be called the biochemical formula is much the same. In the acute crises—e.g., an attack of urticaria, angeioneurotic œdema, migraine, or asthma—there is a definite cycle of changes in the blood and urine corresponding to the preparoxysmal, paroxysmal, and post-paroxysmal periods, and in chronic cases, such as in the prurigos or persistent urticarias, this cycle is repeated, the biochemical findings varying according to the exacerbations or remissions of active manifestations.

These investigations are being pursued both in patients and by animal experiments with promising results, but in the present state of our knowledge the difficulty of evaluating the influence of the metabolic factor is to decide to what extent the biochemical changes found are *the result* of the allergic reaction, and to what extent a metabolic error predisposes to their occurrence.

James Adam,[19] and following him, Haseltine,[20] La Forge[21] and others, have emphasised what they term the toxic factor in asthma, and have shown clearly that many chronic asthmatics may be entirely relieved of their symptoms after an initial treatment of detoxication by means of purgation and the promotion of diuresis and diaphoresis, followed by suitable dietetic rules and insistence on regular outdoor exercise. The same is true in the case of other idiopathies, such as urticaria, angeioneurotic œdema, and the prurigo of Besnier, which is so often accompanied by asthma. Moreover, even in cases of such specific sensitiveness as hay-fever, treatment along these lines may bring about a cessation of the attacks, in spite of exposure to the particular pollen to which the patient is susceptible.

The truth of this contention of Adam and his followers is beyond all question, and may be summed up by saying that, even in patients hypersensitive to a known specific antigen, freedom from active manifestations of such hypersensitiveness can, at any rate in some cases, be obtained by putting the patient under conditions ideal for the development of physical fitness, in spite of his being still exposed to the antigen to which he is sensitised. This is illustrated perhaps most strikingly in patients who are the allergics par excellence—namely, those belonging to the ichthyosis-asthma-hay fever-eczema-prurigo-urticaria syndrome, in whom there is hypersensitiveness to several antigens and multiple symptoms of allergy. If such a person live a completely out-of-door life in suitable surroundings with adequate exercise, combined with judicious heliotherapy, his symptoms disappear as soon as he attains a certain degree of physical fitness; his whole appearance is transformed, he may eat foods with impunity which formerly provoked one or more of his symptoms, and he can handle animals without risk, contact with which previously gave him asthma or attacks of paroxysmal rhinitis. In some cases, as is well known, the mere removal of such a patient from his home surroundings to hospital is sufficient to cause his symptoms to disappear, and, in spite of deliberately exposing him to antigens to which he is sensitised, it may be impossible to make them reappear. On the other hand, a return to his home and his former mode of life, or an emotional upset, may at once cause him to revert to his *status quo ante*. I do not for a moment believe that this effect of a change of surroundings is always due, as some would have us believe, to the patient being sensitised to antigens, such as moulds, dusts, and so on, present in his home; it may be true in a few cases, but in the majority it is not so. In some no doubt the effect is chiefly psychical, in others it is due to the restoration of the metabolic functions to normal.

Unquestionably the treatment par excellence for these allergic patients is, as I have said, to put them under conditions which are most favourable for the proper working of their purely animal functions. In the artificial environment of urban civilisation they are unable to adapt themselves to their surroundings either psychically or physically, and this maladaptation would seem to be partly due, as Bolten suggests, to an inborn insufficiency or hypotonia of the sympathetic and of the accelerator endocrine glands, chiefly the adrenals and thyroid; both their metabolism and their endocrine-autonomic balance is disturbed.

As regards metabolism, the biochemical investigations referred to suggest that it is in the detoxicating functions of the liver that the clue to the problem lies; it would seem, in fact, that this is true both with substances reaching the liver viâ the alimentary tract, and with those introduced parenterally. For example, in the case of metallic drugs such as the arsenical, bismuth, or gold compounds, we know that tolerance of them is largely a function of the liver, and that intolerance may be sometimes prevented by administering glucose in sufficient quantity to ensure an adequate supply for glycogen formation which, as Roger[22] insists, is essential for the antitoxic and detoxicating hepatic functions. I think that the liver may be regarded as the first line of defence, and, when this breaks down, I believe the skin takes on a vicarious protective function, as represented by the various cutaneous manifestations of allergy.

GROUP 2.

Alopecia Areata, Vitiligo, Scleroderma.

These three conditions form a closely-linked triad, since they not only frequently occur together, particularly alopecia areata and vitiligo, but because all three are often met with in association with diseases of the endocrine-sympathetic system—for example, Graves's disease. The literature concerning them is enormous, but all that need now be said is that the sum total of the clinical and experimental observations published concerning them leads one inevitably to the conclusion that they are all due to involvement of the autonomic nervous system and the associated ductless glands. Nevertheless, the exact mechanism of their production is entirely obscure, and, when one attempts to formulate theories, one is met at once with apparently contradictory facts. For example, scleroderma, as the late Dr. Castle[23] pointed out in his exhaustive review of its literature, occurs so frequently in association with thyroid disorders that there must be a relationship between the two, yet it is found both in Graves's disease and in myxœdema. Dittisheim[24] observed scleroderma in eight cases of Graves's disease out of seventeen, yet the peripheral and generalised form—sclerodactyly—is usually accompanied by symptoms of Raynaud's disease, acroasphyxia, and hypothyroidism. I shall content myself by comparing the three conditions as regards certain features they possess in common, and then briefly deal with each in turn, and record some personal observations upon a few cases.

(1) *All three may occur in a localised and in a generalised form.*—Thus in the majority of cases of *alopecia areata* one or a few asymmetrical patches are found on the scalp or beard region, but in others the loss of hair may become generalised and involve the entire body. *Vitiligo*, though usually extensive and bilaterally symmetrical, may be localised to one area. *Scleroderma*, like alopecia areata, commonly occurs in patches—*morphœa*. Much rarer is the diffuse form, but the pathological changes would seem to be essentially the same, and the two forms may be met with simultaneously or at different periods in the same patient.

(2) *All three may occur in the so-called "band" form.*—Thus *alopecia areata* may rarely be seen to follow more or less the course of the supraorbital nerve, and Sutton[25] has seen it thus succeed an attack of supra-orbital herpes zoster. *Vitiligo* and more often *scleroderma* may also have this "band" distribution. Queyrat and Leri,[26] and Leri and Lamy,[27] have described cases in which both vitiligo and scleroderma were present, followed a zoniform or pseudo-root distribution, and were associated with spina bifida. Hutchinson[28] long ago described cases of scleroderma affecting the distribution of the fifth nerve, and compared it to herpes zoster. Anderson[29] reported a case of scleroderma involving the whole distribution of the right fifth nerve. Alterations were observed not only in the skin, but also in the mucous membranes supplied by the nerve, including the conjunctiva. Moreover, the hair fell out on the same side as high as the middle of the vertex. Sequeira[30] has recorded two cases of scleroderma corresponding in distribution to the first and second divisions of the fifth nerve, and O'Donovan[31] one in which the first and third were affected. Castle also described one in which the first and second divisions were involved. Presumably in these cases the changes in the skin are due to involvement of certain postganglionic sympathetic fibres coming from the superior cervical ganglion, and reaching the skin and mucous membranes of the face via the

Gasserian ganglion and the divisions of the fifth nerve.

(3) *In the ætiology of all three conditions one or more of the three factors that are known to affect the endocrine-autonomic system—namely, infection, reflex irritation, and psychical trauma—appear to be of paramount importance.*

Alopecia Areata.

If one reviews the discussions that have for years centred around the ætiology of alopecia areata, one finds that there have been two main antagonistic theories—the parasitic and trophoneurotic. While the majority of dermatologists accept the latter, there are still some who cling to the former, at any rate in certain cases. Jacquet spent the best part of his life in seeking to prove the non-contagiousness of alopecia areata, and to establish the trophoneurotic view. The epidemics of it that have been reported can be explained partly, as Sabouraud[22] has pointed out, owing to an error in diagnosis between the bald patches following contagious impetigo and true alopecia areata, and partly owing to the occurrence in institutions or schools of one or a few cases of the latter, and the unconscious or deliberate production of bald patches by pulling out the hair (as in trichotillomania) on the part of other children, in order to excite the interest, and perhaps obtain the exemption from work accorded to the genuine cases, as in the epidemics reported by Haldin-Davis.[23]

It has, however, always been a mystery to me how anyone, apart altogether from clinical observations on the evolution and associations of alopecia areata, could possibly entertain the parasitic theory of its causation after a careful study of the remarkable series of changes that constitute the life-history of a patch from its beginning to its final recovery. I can only briefly summarise the most important points:—

(1) A patch of alopecia areata appears suddenly by the fall of a tuft of hair. In the early stages there is capillary dilatation, so that the patch is pinker than the surrounding skin. Sabouraud has described this erythema occurring as a sort of "pre-alopecia roseola" before the fall of hair. In older patches, on the other hand, the colour is paler than the unaffected skin. This initial erythema is common to alopecia areata, scleroderma, and vitiligo. Lévy-Franckel and Guillaume[24] have described changes in the capillary circulation of alopecia areata and vitiligo, as observed with the capillaroscope, which they consider characteristic of sympathetic nerve involvement. It is possible that, as Wright[25] suggests in a recent paper, the fall of hair in alopecia areata is due to interference with the vascular supply of the hair.

(2) Years ago Sabouraud noted that one of the earliest histological changes in alopecia areata is a disturbance of pigmentation at the site of the affected hair papillæ. There is what Besnier termed a pigmentary ataxy—i.e., hyperpigmentation of one part with depigmentation of another, exactly comparable to that which occurs in vitiligo.

(3) This redistribution of pigment is clearly seen in the so-called "exclamation-mark" hairs, which are for practical purposes the hall-mark of alopecia areata. More than any other feature, I think they give us the clue to the immediate cause of this variety of alopecia.

The exclamation-mark hair is usually from 4 to 6 millimetres, occasionally a little over a centimetre, in length; the proximal portion is thinned from atrophy, devoid of pigment, and ends below in a white "dry" bulb, represented by the dot of the exclamation mark; the distal portion is relatively thickened, club-shaped, and deeply pigmented. Sabouraud[26] has shown very clearly how this exclamation-mark hair is formed. If one pulls out a number of dead hairs from the border of an actively spreading patch of alopecia areata, and examines them microscopically, the majority will be found to differ in no way from those that fall after an acute infection, but a few, which would have become exclamation-mark hairs, will show us how these are formed.

At one or more points along the shaft of the hair the strands will be seen to become dissociated, exactly as in trichorrhexis nodosa, and at these points the hair cracks; below the fracture one sees the hyperpigmented bulbous end of the exclamation-mark hair, and proximal to this the atrophied, depigmented part terminating in the dead bulb. I wish particularly to emphasise:—

(*a*) The redistribution of pigment whereby the part near the root becomes depigmented, the bulbous end hyperpigmented—the pigmentary ataxy, which characterises vitiligo, already referred to

(*b*) The atrophy of the hair, which does not occur in parasitic infections such as ringworm.

Now of the affected hairs on a patch of alopecia areata, only a few take on the exclamation-mark form, the rest fall entire, atrophied and depigmented near the bulb, but without going through the exclamation-mark stage.

The real significance of the exclamation-mark hairs is that, apart from alopecia areata, they are met with, so far as I know, only in two other conditions—namely, after epilation with the X rays, and by the internal administration of thallium acetate. The loss of hair in alopecia areata, after X rays, and as a result of thallium acetate, is practically identical in type, and due to *inhibition* of the function of the hair-forming papillæ. The majority of the hairs fall suddenly and completely, but some, more resistant, perhaps, in the case of alopecia areata and thallium alopecia, or which have not received quite the full dose of X rays, go through the exclamation-mark stage.

It is probable that the epilatory action of X rays, as well as the trophic changes in the skin that excessive dosage may produce, are due to their action on the sympathetic nerve-supply of the hair and skin, or of their blood-vessels. It is certain that this is the action of thallium. Wadia, working with Dixon,[27] has shown that the effects of thallium are due to its action on the autonomic system; it diminishes the resistance of the sympathetic nerve-cells to various stimuli—e.g., to the Faradic current. Its action is more marked on the sympathetic than on the parasympathetic. Like so many drugs, it has a double and contrary effect; it destroys the existing hair, but also in small doses stimulates new growth. This accounts for the fact that, after thallium epilation, regrowth of the hair occurs much more rapidly than after X ray epilation.

As Dixon suggests, this action of thallium on the hair, so similar in its objective results to the phenomena observed in alopecia areata, affords an additional argument in favour of the sympathetic nerve origin of the latter. Histologically the loss of hair produced by thallium acetate is found to be due to failure of the process of transition from the large polygonal cells to the stratified cells forming the hair. It is clear, therefore, that this transition, which represents really the process of keratinisation, is under the control of the sympathetic, either directly or through the medium of the blood-supply.

When we come to consider the ætiology of alopecia areata from data afforded by *clinical* experience, we are struck by one significant fact, that two at least of the factors I mentioned as predisposing to the toxic idiopathies clearly also come into play here—viz., peripheral irritation and psychical stimuli; a third factor—acute or chronic infection—might perhaps be included under sensitisation to foreign substances. Moreover, familial or hereditary tendency to alopecia areata, if not so striking a feature as in the toxic idiopathies, is, nevertheless, common enough to exclude the possibility of mere coincidence (22 per cent. according to Sabouraud).

I will briefly review the above factors:—

(1) *Peripheral irritation.*—Jacquet,[28] whose inspiration and imagination were in advance of his time, attributed alopecia areata to a constitutional or hereditary dyscrasia, as revealed by biochemical analyses, combined with a central or peripheral source of nervous irritation (*pelades centrales et pelades réflexes*). He noted the association of alopecia areata

factor is to decide to what extent the biochemical changes found are *the result* of the allergic reaction, and to what extent a metabolic error predisposes to their occurrence.

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GROUP 2.

Alopecia Areata, Vitiligo, Scleroderma.

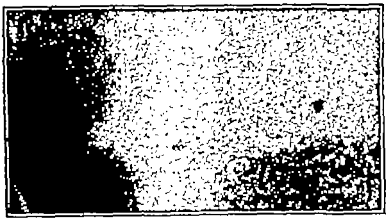
These three conditions form a closely-linked triad, since they not only frequently occur together, particularly alopecia areata and vitiligo, but because all three are often met with in association with diseases of the endocrine-sympathetic system—for example, Graves's disease. The literature concerning them is enormous, but all that need now be said is that the sum total of the clinical and experimental observations published concerning them leads one inevitably to the conclusion that they are all due to involvement of the autonomic nervous system and the associated ductless glands. Nevertheless, the exact mechanism of their production is entirely obscure, and, when one attempts to formulate theories, one is met at once with apparently contradictory facts. For example, scleroderma, as the late Dr. Castle[23] pointed out in his exhaustive review of its literature, occurs so frequently in association with thyroid disorders that there must be a relationship between the two, yet it is found both in Graves's disease and in myxœdema. Dittisheim[24] observed scleroderma in eight cases of Graves's disease out of seventeen, yet the peripheral and generalised form—sclerodactyly—is usually accompanied by symptoms of Raynaud's disease, acroasphyxia, and hypothyroidism. I shall content myself by comparing the three conditions as regards certain features they possess in common, and then briefly deal with each in turn, and record some personal observations upon a few cases.

(1) *All three may occur in a localised and in a generalised form.*—Thus in the majority of cases of *alopecia areata* one or a few asymmetrical patches are found on the scalp or beard region, but in others the loss of hair may become generalised and involve the entire body. *Vitiligo,* though usually extensive and bilaterally symmetrical, may be localised to one area. *Scleroderma,* like alopecia areata, commonly occurs in patches—*morphœa.* Much rarer is the diffuse form, but the pathological changes would seem to be essentially the same, and the two forms may be met with simultaneously or at different periods in the same patient.

(2) *All three may occur in the so-called "band" form.*—Thus *alopecia areata* may rarely be seen to follow more or less the course of the supraorbital nerve, and Sutton[25] has seen it thus succeed an attack of supra-orbital herpes zoster. *Vitiligo* and more often *scleroderma* may also have this "band" distribution. Queyrat and Leri,[26] and Leri and Lamy,[27] have described cases in which both vitiligo and scleroderma were present, followed a zoniform or pseudo-root distribution, and were associated with spina bifida. Hutchinson[28] long ago described cases of scleroderma affecting the distribution of the fifth nerve, and compared it to herpes zoster. Anderson[29] reported a case of scleroderma involving the whole distribution of the right fifth nerve. Alterations were observed not only in the skin, but also in the mucous membranes supplied by the nerve, including the conjunctiva. Moreover, the hair fell out on the same side as high as the middle of the vertex. Sequeira[30] has recorded two cases of scleroderma corresponding in distribution to the first and second divisions of the fifth nerve, and O'Donovan[31] one in which the first and third were affected. Castle also described one in which the first and second divisions were involved. Presumably in these cases the changes in the skin are due to involvement of certain postganglionic sympathetic fibres coming from the superior cervical ganglion, and reaching the skin and mucous membranes of the face via the

vitiligo may result, and the distribution of the leucodermic patches tends to correspond to the sites of election of pediculosis—viz., the shoulders, sacral region, and thighs, but may become widespread.

FIG. 3.



Showing vitiligo developing around small pigmented moles in the left scapular region.

This is shown in Figs. 1 and 2. It is of interest in this connexion that Dore has noted a group of cases of *alopecia areata*, in which severe and long-standing irritation from pediculosis capitis preceded the loss of hair.

(2) *Psychical stimuli.*—The sudden development of vitiligo after a severe nervous shock or accident has, as in alopecia areata, been frequently recorded; Gougerot has emphasised this factor. It was evident in a case to which I shall shortly refer.

There is one feature of vitiligo of great interest, which has not to my mind received sufficient attention, and that is its association with pigmented moles. Sutton,[13] in 1916, reported two cases in which the leucodermic patches surrounded small moles, and christened the condition leucoderma acquisatum centrifugum; in the same year I collected several cases, and also noted the frequency of large pigmented nævi in patients with vitiligo. Figs. 3 and 4 illustrate these two points.

To discuss the full significance of this association would involve a consideration not only of the whole question of cutaneous pigmentation, including Bloch's classical work on the subject, but also that of the origin of nævi, more particularly of the type nævus unius lateralis, of which there are various forms.

Masson, in his recent researches, concludes that the cells of pigmented nævi are of nervous origin. Gutmann and Dalsace have described a case of diffuse unilateral pigmented nævus in which there was evidence of involvement of the orthosympathetic on the affected side—e.g., arterial hypotension, diminution of sweating, and exaggeration of the oculo-cardiac reflex. The pseudo-radicular distribution of the nævus and these signs suggest a malformation localised to the sympathetic nerve centres of the right side of the spinal cord. Similar observations were made by Laignel-Lavastine and Tinel in a vascular nævus unius lateralis.

It would seem that vitiligo is more likely to occur in persons naturally hyperpigmented, and particularly in those who possess large or numerous pigmented nævi.

I will now briefly describe a case in which experiments carried out by Prof. M. S. Pembrey and J. C. G. Dickinson in my clinic seem to indicate involvement of the sympathetic.

The patient came under my care in 1924 for a generalised vitiligo. She gave a long history of repeated attacks of tonsillitis, and in 1914 had three patches of *alopecia areata*. The tonsils were removed in 1916, shortly after which her husband wrote to her from France to say that he had no intention of returning to her. This news produced a serious nervous breakdown, and was followed within a few weeks by the appearance of an extensive *vitiligo*. In 1923 she had an alveolar abscess, and an acute otitis media; 14 teeth were extracted for pyorrhoea. In the same year patches of lupus erythematosus appeared on the hands and feet.

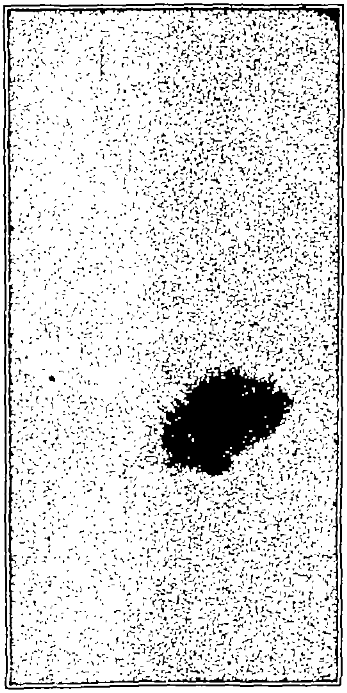
Investigations.—Wassermann reaction negative. Blood pressure 105/74. Test-meal complete achylia. *Loewi's adrenalin eye test positive* on two occasions.

Visible sweating, induced by a hot cradle on three occasions, took place on the non-pigmented, but not on the pigmented areas; on one occasion, however, some sweating of a pigmented area was evoked. But in a case of Addison's disease, with exophthalmic goitre and vitiligo, recorded by Burgess and Warner, in which the hot-air bath alone did not cause sweating, the injection of pilocarpine produced uniform sweating on both dark and light areas of vitiligo.

Other tests with pilocarpine, exposure to ultra-violet light, &c., were performed in my case, and Prof. Pembrey came to the conclusion that the vitiligo was associated with definite sympathetic nerve involvement.

A point of great interest in this case was that, while under observation in hospital, an *erythematous patch* developed on the right thigh, which gradually became transformed into an area of depigmentation and one of hyperpigmentation, the edge delimiting the two remaining pink for some considerable time. This suggests that, as in alopecia areata and scleroderma, there is in vitiligo a pre-erythematous stage before the redistribution of pigment occurs. The combination of alopecia areata and vitiligo, the long story of repeated infections, the signs and symptoms of adrenal-sympathetic exhaustion, and the dramatic onset of the vitiligo after psychical shock were the striking features in this case.

FIG. 4.



Showing vitiligo of the back in the neighbourhood of a large pigmented nævus on the right loin.

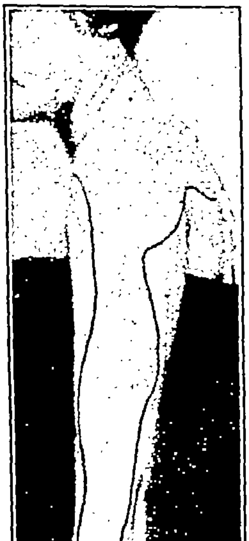
Scleroderma.

I have already referred to certain points of similarity and inter-relationship between scleroderma, alopecia areata, and vitiligo, and cannot here enlarge upon them. I will refer merely to a case of scleroderma (morphœa) involving the left arm and shoulder, associated with muscular wasting and an apparent involvement of the brachial plexus.

This patient, a girl of 24, was sent to me by Dr. C. P. Symonds, and was subsequently investigated by Dr. G. C. Millis. She had superficial patches of scleroderma involving the area shown in Fig. 5.

They were surrounded by the usual "lilac ring," and had begun, according to her own statement, as "red patches." At the same time there was wasting of the muscles of the shoulder-girdle (Fig. 6), particularly of the deltoid and the supra- and infra-spinatus. The patient had complained for some time of pain, chiefly of a "dragging" character, above the left clavicle and in the shoulder extending down the arm. There was seen a definite fullness in the left supraclavicular region, and palpation revealed a soft, ill-defined swelling, the nature of which could not be determined. On X ray examination there was no evidence of cervical rib nor any other bony abnormality, and no opacity in the soft tissues distinct from the surrounding structures. The Wassermann reaction was negative. In view of the distribution of the muscular wasting and of the sclerodermatous change in the skin, Prof. T. B. Johnston was asked to see the patient, and he thought that anatomically the condition suggested a lesion of the brachial plexus, no doubt connected with the supraclavicular swelling.

FIG. 5.



A case of scleroderma, showing the area of left shoulder and arm superficially involved.

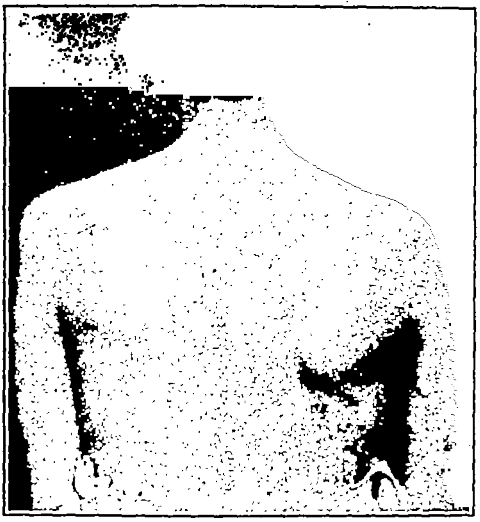
Dr. Millis gave the patient an injection of pilocarpine, which produced rather severe symptoms of collapse with profuse sweating, *but the area of the skin involved by the scleroderma exhibited no sweating,* thus suggesting involvement at any rate of the sudoral nerves in this area.

In this case, therefore, there would seem to have been an involvement of the left brachial plexus of unknown character, associated with partial atrophy of certain muscles, chiefly those supplied by the fifth and sixth cervical nerves, and scleroderma of the skin over the deltoid and suprascapular regions extending down the outer border of the arm to the wrist. I have seen two other cases, both in females, of scleroderma combined with muscular wasting.

I am afraid I have given a very incomplete review of the evidence in favour of the connexion between alopecia areata, vitiligo, and scleroderma and disturbances of the endocrine-sympathetic system, but the literature of these conditions is rich in confirmatory evidence upon which I have not touched. So far as our knowledge goes at present it would seem that the normal process of keratinisation in the epidermis which is disturbed in ichthyotics, the formation of the hair, the control of pigmentation, and what may be vaguely termed the normal nutritional processes in the skin, which is upset in scleroderma, apart from the secretion of the sweat and sebum and the cutaneous circulation, are all under the control of the endocrine-sympathetic nervous system. No doubt there are different groups of sympathetic nerve-cells and fibres controlling these various functions.

In alopecia areata, vitiligo, and scleroderma we meet with cases in which the disturbance is localised and in which it can be connected with a definitely regional area of nerve involvement. Such cases I have mentioned, and they are of paramount importance in establishing my thesis. In other cases the three conditions are more or less generalised, and it is then that we find as a rule symptoms not of local nerve lesion, but of a widespread disturbance of the endocrine-sympathetic system as a whole, such as Graves's disease, simple hyper- or hypo-thyroidism or pituitarism, Addison's disease, profound post-infectional or emotional exhaustion, &c.

FIG. 6.



The same case, showing wasting of the left shoulder-girdle.

Clinically we find that it is just those factors which are known to affect the sympathetic and the endocrine glands, that so often obtrude themselves upon our notice in alopecia areata, vitiligo, and scleroderma—viz., heredity and familial influences, psychical shock, worry or nerve-strain, acute or chronic infections, and peripheral sources of reflex irritation. We can understand that just as a local lesion, such as spina bifida or a meningo-myelitis, might lead to involvement of the sympathetic nerve cells or fibres controlling one function—e.g., sweating or pigmentation, so a general cause, such as an infection, may have a similar selective action.

CONCLUSION.

The title I chose for these lectures, "The Relationship of Dermatology to other Branches of Medicine," affords so wide a scope that I could without difficulty have prepared another series dealing with aspects of the subject upon which I have not touched at all. I have tried, however, throughout to emphasise one fact—namely, the great importance of the skin as a vital organ, both in health and disease. An appreciation of this is, I believe, gradually gaining ground; nevertheless, ignorance of the most elementary principles of the physiology and pathology of the skin is, it must be admitted, widespread among our profession. I believe this to be due partly to the fact that dermatology has been practically ignored in the qualifying examinations, and partly to faulty teaching of the real significance of cutaneous disorders and eruptions in relationship to general medicine. One does not wish to increase the task of the already overburdened student, but it seems to me that he might profitably spend more time studying the surface changes in the skin and accessible mucous membranes, indicative of metabolic errors or "the beginnings of disease," and be reasonably excused much irrelevant matter.

The ten years that I have passed in active dermatological practice since the war have taught me chiefly the following lessons: (1) First and foremost, the fundamental importance of making an accurate diagnosis. (2) To consider all possible *external* factors,—traumatic, irritant and infective,—before approaching the question of internal predisposing causes; this lesson I have learnt from bitter experience. (3) The importance of a complete routine examination of one's patients, and the folly of accepting the findings of others. (4) The value of urinary examination in specimens taken at different times of the day in gauging the metabolic functions of a patient. (5) The influence of acute or chronic infections in the ætiology of banal cutaneous eruptions. (6) The growing importance of the psychological factor in dermatology, as emphasised by O'Donovan and others. (7) The influence of hereditary and familial tendencies. (8) Lastly, to consider the habits, mode of life, and surroundings of one's patients, and to determine to what extent they can be modified, in order to approach as nearly as possible those demanded by a healthy animal.

If dermatologists have become more and more indebted to the expert knowledge of other specialists, from the anatomist to the psychologist, I like to think that to some extent the debt is mutual.

I wish to acknowledge the invaluable help and criticism given to me in the preparation of these lectures by Dr. T. Izod Bennett.

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A STUDY IN ENCEPHALITIS.

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THE following study deals with 28* cases of non-epidemic encephalitis, the outstanding features of which were agitation and depression. In all of them a post-mortem examination showed either active inflammation or the effects of antecedent inflammation in the region of the basal ganglia, and a gliosis not confined to the region of the basal ganglia. In six cases the gliosis in the frontal region had become so extreme as to give the appearance of a tumour formation with hæmorrhage.

Encephalitis, apart from the epidemic or lethargic variety, has been known for many years. The frequency of its incidence to-day has not met with general recognition, first because of the predominance of the epidemic variety, and secondly because the clinical manifestations are so indeterminate. The connexion between pancreatic deficiency and agitated melancholia or its milder manifestation, the anxiety neurosis, has been known since 1923. This work, which was done at Bethlem Royal Hospital, London, was based upon the surface tension readings of the serum and is supported by the blood-sugar observations of Farran-Ridge, Mann, and others, as well as by the post-mortem examinations and the clinical results obtained by treatment. Recent observations appear to show that this abnormal blood state is an immunity phenomenon and that such cases are liable to low-grade infections and inflammations which are often but not necessarily bacterial. Many cases of *Bacillus coli* infection and some of furunculosis show this abnormal blood condition. A majority of such cases of agitated melancholia have proved on microscopic examination to be cases of encephalitis. As a result of these observations the question arose whether or not the relation between encephalitis and pancreatic deficiency is constant. Without exception all the cases of encephalitis investigated showed corresponding pancreatic changes. Observation of a series of cases of encephalitis of different types leads to the conclusion that so long as the surface tension range of the serum remains abnormal the encephalitis is still active. Further facts pointing to the connexion between pancreatic deficiency and encephalitis are the increased sugar in the cerebro-spinal fluid, in encephalitis, and the frequency of diabetes—generally in elderly relatives—in the families of encephalitics. It is worthy of note that encephalitic patients very seldom pass sugar and that none of the cases investigated actually had pancreatic diabetes.

CASE 1.—Clergyman, aged 23, was admitted on March 30th, 1927. He had always been in good bodily health, except for partial blindness for three months in 1923 and diphtheria in 1920. In October, 1926, he became depressed and feared insanity, after which he suffered from restlessness, failure to concentrate, ideas of persecution and self-accusations of immorality. He left home and was found by the police wandering in London. He was taken to Moorcroft where he became violent and made a vigorous attempt to castrate himself. He was transferred to Bethlem, where he revealed auditory hallucinations but no memory defects. He was quiet and took his food. Under treatment with Secretogen he improved greatly, lost the confusion and began making plans for his future. Then there was rapid deterioration, he became restless and confused again, his memory failed, he became violent and noisy, his heart sounds were poor and his heart dilated. He weakened rapidly and died on July 20th, 1927.

Pathological and Post-mortem Findings.

Urine.—April 4th, 1927. Deposit of oxalates and stellar phosphates.

Blood.—April 11th. Wassermann and van den Bergh reactions negative. Surface tension range: 42·5 to 41·5 dynes.

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* Of the cases mentioned, seven have been selected for publication to show the diversity of types affected and the variability of the clinical picture in this condition.

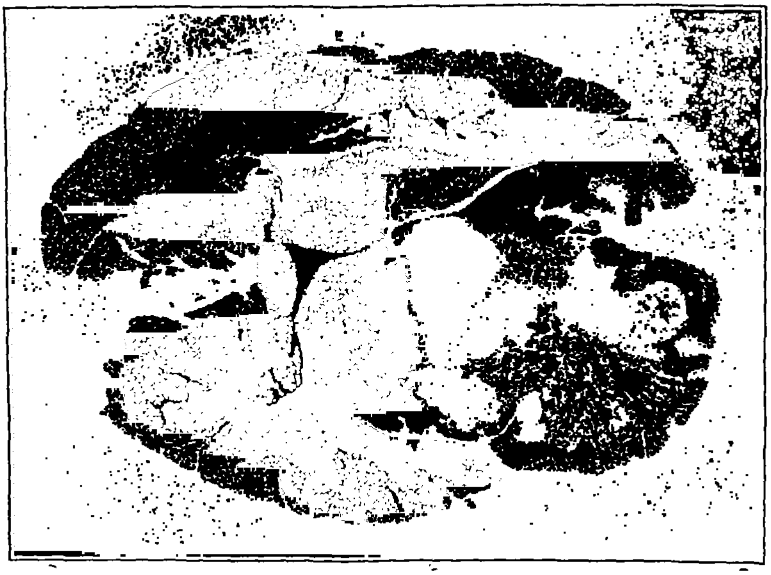
Certified Cause of Death.—(1) Heart failure, (2) lobar pneumonia. The pia and arachnoid mater were found opaque over the vertex. The pancreas was hard and pale; microscopically it showed patchy fibrosis with normal areas, and swelling of the lining of the ducts with cellular denudation. Sections of the brain showed an increase of glial elements and marked engorgement of the smaller vessels with perivascular exudation. These conditions were especially noticeable in the region of the basal ganglia.

CASE 4.—Clerk, aged 46, was admitted on Nov. 5th, 1927. The patient was always in good health. After his discharge from the army it was noticed that if upset he had sudden outbursts of temper. On Sept. 15th, 1927, he was sick at his office and vomited. He went home and was treated for "flu." He was restless during the night from then on. There was reversal of the sleeping habit and he refused food. There is a history of his having been treated for a large carbuncle on the neck in 1917. On admission his physical examination showed general muscular weakness and anæmia and signs which suggested organic disease in the central nervous system. The pupils were unequal, irregular, and sluggish. There was a positive Romberg sign. He was indifferent, spent most of his time huddled up on his bed, and sometimes wandered aimlessly about the ward. His replies to questions were inaccurate and irrelevant. There was a definite nominal aphasia. His memory for recent and remote events was defective. His emotional reaction was one of happy indifference. His thought-content and emotional reaction were in complete disharmony. He was thought at first to be a case of general paresis because of his acute confusional state with aphasia and other physical defects, all of which suggested an organic reaction. After the examination of the blood and cerebro-spinal fluid on Nov. 11th, however, he was treated for pancreatic insufficiency. He died on Nov. 24th.

Pathological and Post-mortem Findings.

Urine.—Nov. 8th. Specific gravity 1032, alkaline; heavy deposit of phosphates but no albumin, sugar, acetone, pus, or renal casts. Nov. 23rd: Acid with a trace of albumin. Deposit of about 2 per cent. pus cells. The pus cells showed a small Gram-positive diplococcus and a slender Gram-negative bacillus.

FIG. 1 (Case 10).



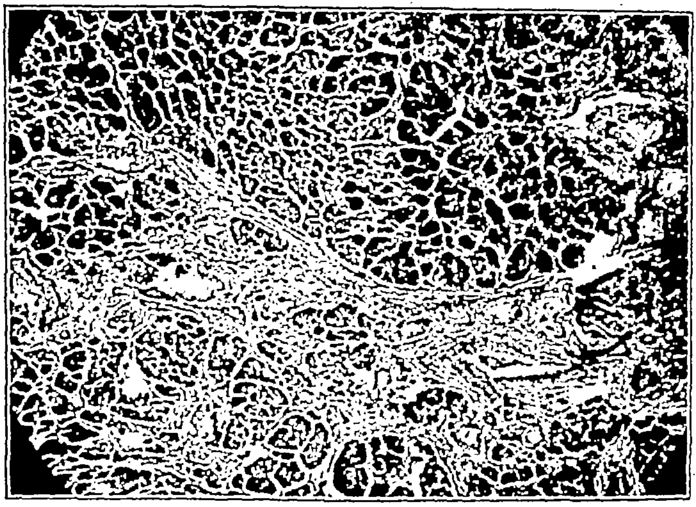
Glioma in the frontal region. Engorgement of basal ganglia.

Blood.—Nov. 11th. Wassermann reaction negative. Surface tension range 45 to 45·5 dynes (on Nov. 23rd, 45 to 45 dynes). Van den Bergh reaction positive.

Cerebro-spinal Fluid.—Nov. 11th. Wassermann reaction negative; Noguchi reaction positive; colloidal gold test, no change. Chlorides 0·71 per cent. Nov. 23rd: Chlorides 0·70 per cent.; contained 550 cells per c.mm. practically all red cells.

Blood Urea.—Nov. 23rd. 48 mg. per 100 c.cm. Urine urea 3 per cent. Ratio 1:60. On these figures the slight rise in cerebro-spinal chlorides between Nov. 11th and 23rd would be accounted for by meningeal irritation.

FIG. 2 (Case 10).



Pancreas in same case as Fig. 1.

Certified Cause of Death.—(1) Subacute encephalitis; (2) respiratory failure.

The dura mater was injected with blood and the veins and sinuses were dilated. The pia and arachnoid were red and injected and were thick and opaque in places. The convolutions were lead-coloured with marked injection. A large tumour was found in the right frontal lobe. Sections presented exactly the same conditions as in Case 1. The pancreas was red and injected but otherwise normal to the eye. Under the microscope, sections showed increase of fibrous tissue—very marked in places—with many areas of hæmorrhage into the substance.

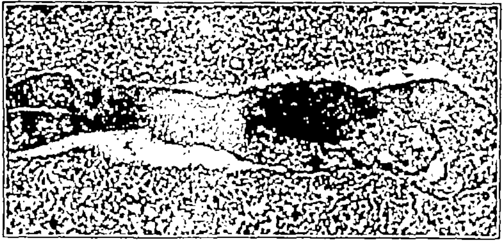
CASE 8.—Tobacco merchant, aged 61, was admitted on Sept. 21st, 1926. He was said to have been a hard-working, quiet man who enjoyed fairly good health. He was subject to influenza and there was a history of diabetes in the family. He was sent to Bethlem Royal Hospital after he had fallen nine feet from a window on to a lawn. He suffered only slight cuts, but was dazed, agitated, and confused. His clinical notes state that he had retired from business six months before on doctor's orders because of anxiety. Investigation by his son showed losses. His son stated that at times he had made "hare-brained schemes for business development." On admission he was in fair condition. His pulse-rate was 64 and regular. There were no murmurs. There were a few moist sounds in both lungs. He became very depressed and said everyone had deserted him, and seldom spoke. There was no history of delusions or hallucinations. There is a question whether he showed reversal of the sleeping habit. His depression and agitation increased. After being treated with Secretogen as a result of showing diminished surface tension range he improved mentally and physically. This improvement was maintained from Nov. 14th, 1926, until April 2nd, 1927, when he showed a temperature of 97·6°, and a pulse-rate of 120, and a respiration-rate of 30. In the lungs were signs of basal œdema. The abdomen was retracted (he had vomited) and there were signs of an old hemiplegia. Digitalin was given but he died the same night.

Pathological and Post-mortem Findings.

Urine.—Sept. 22nd. Specific gravity 1022, alkaline, deposit of phosphates, and trace of sugar, but no albumin, acetone, pus, or renal casts. Oct. 22nd: Specific gravity 1034, alkaline, deposit of phosphates, but no albumin, sugar, acetone, pus, or renal casts.

Blood.—Oct. 7th. Wassermann reaction negative. Nov. 12th: Wassermann reaction negative; surface tension range 48·5 to 41·6 dynes.

FIG. 3 (Case 10).



Thrombus in brain in a case of encephalitis.

Certified Cause of Death.—(1) Broncho-pneumonia and heart failure; and (2) arteriosclerosis.

The pia and arachnoid were somewhat œdematous, and slightly opaque. The liver was dark and bile-stained. Both kidneys were red. On section the pyramids were indistinct and the cortex irregular. The capsule was adherent. Sections from the brain showed exactly the same conditions as in Case 1. The pancreas was soft. Sections showed marked fibrosis.

CASE 10.—Station-master, aged 60, was admitted on Jan. 26, 1925. He was said to have enjoyed fairly good health. Fifteen years before his final breakdown he had what was then diagnosed as a "nervous breakdown" of some months' duration and was treated at home. Eight months before his admission he began to complain of forgetfulness and inability to concentrate. After a month he took a vacation and stopped work for five months. On *his return he found things still more difficult and was forced* to resign absolutely. He then began to complain of severe and almost continuous headaches. On admission his left pupil was fixed and the right pupil gave a just perceptible flicker. Both pupils reacted to accommodation. He was depressed and agitated. These moods seemed to depend on the severity of the headache. His conversation was largely inconsequent and his memory for both recent and remote events was poor. His reflexes were normal with the exception of the pupils and the bladder, which showed considerable leakage before micturition. A week after admission he became hallucinated, noisy, and restless. On sedatives he became apathetic, incoherent, and faulty in his habits. His pulse-rate was 100 and regular. His temperature was 97°. On Feb. 5th his pulse-rate went to 120 and then dropped to 70. He was then semi-conscious. His temperature was subnormal. On Feb. 7th, 1925, he suddenly collapsed. His pulse became feeble and his breathing shallow, and he went into a state of coma. He died the same day.

Pathological and Post-mortem Findings.

Urine.—Jan. 27th. Specific gravity 1012, amphoteric reaction, deposit of phosphates; no albumin, sugar, acetone, renal casts, or pus. Feb. 5th: Specific gravity 1010, urea 1·1 per cent., acid, a few granular casts, and leucocytes; a trace of albumin, but no sugar or acetone.

Cerebro-spinal Fluid.—Feb. 5th. No lymphocytosis. Colloidal gold test, no change. Noguchi reaction definitely positive (no blood). Feb. 7th: No lymphocytosis. Noguchi test definitely positive. Colloidal gold test, no change. Wassermann reaction negative.

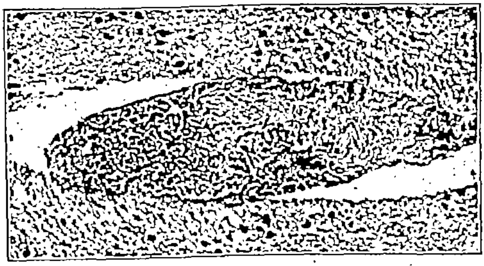
Blood.—Feb. 5th. Urea, 23 mg. per 100 c.cm. Ratio to urine urea 1:60. Feb. 7th: Wassermann reaction negative. Surface tension range 45·5 to 40 dynes; repeated, 45 to 45 dynes.

Certified Cause of Death.—(1) Encephalitis lethargica; and (2) respiratory failure.

The pia and arachnoid were normal but congested. The convolutions showed large effusions of blood over the right frontal pole and other small areas on the left temporal region. *The liver was fatty. The kidneys were* pale, with narrow cortex and no distinction between the cortex and the pyramids. On section a large glioma was seen in the right frontal region. Sections of the brain showed exactly the same conditions as in Case 1. The artery to the pancreas was blocked by a calcareous patch. There was softening of the body and the tail was hard and white. Sections showed extensive areas of fibrosis.

CASE 21.—Secretary, aged 38, was admitted on Dec. 16th, 1922. He was a well-educated and highly intellectual man, brought up with narrow Nonconformist views. He became a solicitor but after a "religious upheaval" he threw up the law and took up Y.M.C.A. work. He married at 28 and was looked upon as a very competent and capable man. He was sent to India just before the war and held a prominent post in the Y.M.C.A. there. Owing to the war he had to remain in India, where he worked continuously until his health broke down in 1921, and eventually he was sent back to England early in 1922 with dysentery *and malaria. He was treated by Castellani* and made a good recovery, and by August, 1922, he began to take up his work again. In November he undertook a lecture tour in Ireland, where he had one or two attacks of "influenza," which did not, however, incapacitate him. On Dec. 14th he received a telegram in Dublin saying that his mother had pneumonia, and he returned to London at once. He was met at the station by his brother with the news that she was dead, and he became emotional. His wife took him to a hotel, where the emotional disturbance increased, and during the night he became hallucinated, excited and confused. On Dec. 15th he was seen by Castellani, who pronounced him free from malaria and dysentery, and also by Sir F. Mott, who could find no neurological signs. The excitement persisted, he became noisy and violent, and he was admitted to Bethlem the following day. On admission he was well nourished and in good muscular condition. His heart was dilated and his pulse-rate 160. There were no murmurs. The apices of both lungs were dull and the bases congested. The pupils were pinpoint and reacted to light. Mentally he was in a state of acute toxic delirium. It was impossible to obtain his attention. He was restless, noisy, shouting meaningless words and phrases, and incontinent. He required tube-*feeding.* No physical signs presented themselves, though he occasionally showed a slight rise of temperature to not more than 100°. He wasted rapidly and the delirium subsided, until by the seventh day it was possible at times to keep his attention momentarily, but he never became properly accessible. He died suddenly on Dec. 24th, 1922.

FIG. 4 (Case 21).



Organising thrombus in vessel of brain.

Pathological and Post-mortem Findings.

Urine.—Dec. 19th. Specific gravity 1080, acid, a trace of albumin, and a deposit of uric acid. No sugar, acetone, renal casts or pus.

Cerebro-spinal Fluid.—Dec. 22nd. No lymphocytosis. Noguchi test gave definite flocculence. The Wassermann reaction was negative and the colloidal gold test showed no change.

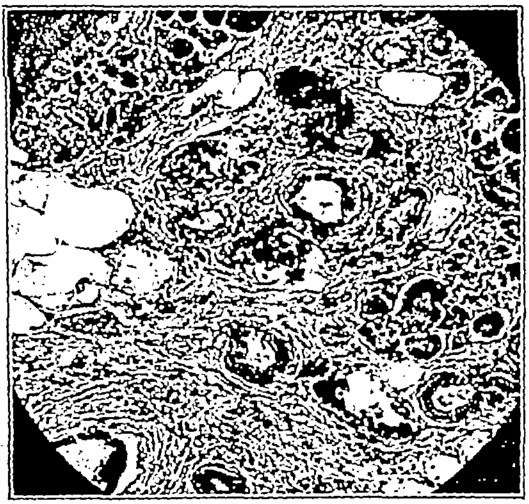
Blood.—Dec. 22nd. Wassermann reaction negative. Serum strongly anticomplementary. Moderate leucocytosis, of fourteen thousand, and marked vacuolation of the red corpuscles. No definite malarial parasites could be found. Urea in urine 2½ per cent., equals 2500 per 100 c.cm. Urea in blood 72 mg. per 100 c.cm. (fever). Ratio 30 : 1. Ratio in nephritis 10 : 1. Average blood-urea 40 mg. in 100 c.cm.

Brain Sections.—Dec. 28th. There is no evidence of malaria.

Certified Cause of Death.—(1) Cerebral œdema; (2) cerebral hæmorrhage; and (3) cardiac dilatation.

The veins and sinuses of the head were congested. The pia and arachnoid were very congested over the whole of the vertex. On the right side there was a subpial hæmorrhage about 2 inches in diameter, spread over the surface of the hemisphere. Sections showed the vessels dilated and thrombosed. There were many small hæmorrhages and perivascular infiltration. The neurologia was increased and there was chromatolysis of nerve cells. Sections from

FIG. 5 (Case 25).



sive fibrosis and increased nucleation of the pancreas.

ganglia showed exactly the same condition as in
The pancreas was normal to the naked eye.
wed round-celled infiltration and increase of
tissue.

Spinster of 52 was admitted on April 9th,
a publisher's clerk, had had a nervous
e of 21 and was treated at home, making
had never been very strong since then,
is frequently. In October, 1919, she
and fearful. She feared to be
badly and wept frequently. She
and spoke with tears of many
to Bethlem as a voluntary
ition at the time was marked
agitation. Physically there
ed tremor of both hands.
admission speak of many
It was necessary to have
She failed rapidly in
agitation became worse,
y. As her physical
and resistive. There
five weeks she lost
pt. 8th, 1920.

indings.

1018, acid. No
epithelial debris.
Deposit of uric
8th: Specific
some mucus,
spectrum.
pancreatitis.
d œdema over
considerable
firm. The
suprarenals
Accessory

suprarenals were numerous and prominent. Sections of the brain showed exactly the same conditions as in Case 1. The pancreas was shrunken, with multiple hæmorrhagic areas. Sections showed dense masses of fibrous tissue throughout the gland. There were large smooth empty cavities (fat necrosis) and very little normal tissue remained. The vessels were thickened and thrombosed.

CASE 26.—Married woman of 50 was admitted on May 19th, 1928. She had two children: a boy of 14 and a girl of 16. She was said by her husband to have been always nervous and highly-strung. Her husband separated from her ten years before her death because of her temper and a sex-habit to which she was addicted. In 1920 she was operated on for floating kidney and appendicitis, and made a good recovery. In 1923 she complained of extreme physical exhaustion and depression. She was treated medically at home and recovered some measure of strength. In February, 1928, she again complained of great weakness and was forced to stay in bed. She could not sign her name and gradually began to ramble in her speech. She was then very irritable, depressed and agitated. Three weeks before admission she left her home at night and was found by the police wandering in her night-dress. As there was no improvement, she was admitted to Bethlem as a voluntary boarder on May 19th, 1928. Physically she was in a very poor condition, with sickly pallor of the face and cyanosis of the lips. There were no heart murmurs. The blood pressure was 114–72 and the heart-sounds were weak. Her breathing showed a tendency to tubularity. The pupils did not react well to light. Her abdomen was rigid in the left and right iliac regions owing to prolonged constipation. She was drowsy for long periods, lying in an almost comatose state. She could be readily roused, when for a few moments she answered questions intelligently. She then rambled in her speech. There was marked confusion, and disorientation was complete in all spheres. The drowsiness was enhanced by bilateral ptosis. During her eleven days in hospital there was no mental change. Physically she failed very rapidly. On May 29th her temperature reached 105°. She was quite comatose and breathing rapidly. There was a patchy broncho-pneumonia. She died on May 30th, 1928.

Pathological and Post-mortem Findings.

Urine.—May 23rd. Specific gravity 1012, amphoteric and light cloud of albumin. Deposit of pus, but no sugar, acetone or renal casts.

Blood.—May 24th. Wassermann and van den Bergh reactions negative. Surface tension range 48·5 to 40 dynes.

Cerebro-spinal Fluid.—May 30th. No lymphocytosis (10 per mm. 3). Noguchi test positive. Colloidal gold test 0012332100,0 (meningitic type). Chlorides 0·68 per cent. at the highest (below normal).

Certified Cause of Death.—(1) Heart failure; (2) broncho-pneumonia; and (3) encephalitis.

The pia and arachnoid were engorged and the convolutions very red. There was no excess of cerebro-spinal fluid. The liver showed some fibrosis. The vessels of the brain were very obvious on section. The colour of the white matter was darkened to a pale buff. Sections presented exactly the same features as in Case 1. The pancreas was normal to the naked eye. Sections showed increase of fibrous tissue—very marked in places—with areas of hæmorrhage into the substance.

Encephalitis, therefore, appears to be a low-grade inflammatory process which occurs in persons with an abnormal blood serum and is always associated with pancreatic deficiency.

My thanks are due to Dr. J. G. Porter Phillips, the physician-superintendent of Bethlem Royal Hospital, for his advice and help in the preparation of this paper, and to the Governors of the institution for permission to work in their laboratory. My thanks are also due to Dr. C. Lovell and his staff for their assistance.

THE SUNDERLAND HOSPITALS.—The Monkwearmouth and Southwick Hospital, at Sunderland, is to be removed to another site, the present building being almost entirely surrounded by a factory. The new hospital will provide more than 100 beds—nearly double the present number—with facilities for extension. The cost is estimated at £100,000. Sunderland Royal Infirmary is also in course of enlargement. Princess Mary last year opened the block named after her, and the second part of the scheme, the building of pathological and bacteriological laboratories, is now being started. Next will come an administrative block which will cost £40,000, and is expected to be completed within the next 12 months.

THE INDUCTION OF INFLAMMATION IN THE TREATMENT OF MALIGNANT AND OTHER LOCAL DISEASES.

BY HAROLD BURROWS, C.B.E., F.R.C.S. ENG.

Bernhardt and Strauch[4] state that intravenous injection of isamine-blue reduces the rate of growth and decreases cachexia in certain cases of inoperable cancer. While trying to find a vital dye specific for cancer cells, and following their work, I found that isamine-blue, given intravenously or intraperitoneally, sometimes stained grafted tumours growing in the flanks of rats and mice. At first it seemed as though isamine-blue might have some degree of special affinity for malignant cells, but subsequent experience showed that isamine-blue, when administered during life, collects in inflamed tissues so as to make them a pronounced blue, while the normal tissues—with the exception of the liver and perhaps other components of the reticulo-endothelial system—remain quite unstained. Other colouring matters become localised in inflamed tissues in a similar way. Some of the preliminary observations which led to a recognition of this fact are as follows:—

(1) A mouse was given an intraperitoneal injection of 0·3 c.cm. of a 0·5 per cent. solution of isamine-blue in normal saline. Post-mortem examination six days later revealed some small patches of blue in the omentum, deep staining of the axillary and anterior mediastinal glands (such as would be expected after an intraperitoneal injection of the dye), and pronounced staining of the tissues immediately surrounding a parasitic cyst of the liver. No prominent blue coloration was present in any other tissue.

(2) An old albino rat was given an injection of 2 c.cm. of a 0·5 per cent. solution of isamine-blue in normal saline into the left femoral vein. Four hours later the rat was found to have died of hæmorrhage from the punctured vein. Post-mortem examination showed a striking blue coloration of the cæcum, which was the seat of a relatively large non-malignant ulcer.

(3) A rat with an ulcer below the jaw was given a similar intravenous injection of isamine-blue. On the following day the cutaneous edges of the ulcer were stained a distinct blue.

(4) On several occasions it was noticed that when injections of isamine-blue were given to rats who were suffering from scabies of the ears, the dye became localised in the zones of inflammation, each little nodule becoming blue.

(5) When dyes were injected into the femoral vein the groin was epilated, the rats were anæsthetised, the skin of the groin was disinfected with methylated spirit and lysol or with methylated spirit alone, an inguinal incision was made, the femoral vein was exposed, and the drug was injected into it, the wound was closed with a single stitch, and a final disinfectant was applied. Special care was taken to prevent any escape of the dye into the field of operation. In spite of these precautions a varying degree of staining of the epilated skin was repeatedly observed, and in cases where the small wound did not close by primary union the edges of the open wound were stained blue.

(6) Similar observations were made when trypan-blue was used; the following is a particular instance. An old albino rat which happened to be suffering from otitis media was given an injection of 3 c.cm. of a 0·5 per cent. solution of trypan-blue into the left femoral vein. Three days later the skin of the right side of the face was swollen and stained blue and the right eye was protosed.

From these and similar observations it was concluded that isamine-blue and trypan-blue, when injected into the peritoneal cavity or directly into the blood stream, have a special tendency to become deposited in tissues which are inflamed. Numerous experiments were subsequently carried out to test this general conclusion, the purpose being to produce a local inflammation and then to observe if a drug injected into the peritoneal cavity or into the blood stream would accumulate in the artificially inflamed area.

The following methods of causing inflammation were employed:—

(1) *Application of Chemical Irritants to the Skin.*—Epilation of a small area in the right flank or of a right limb was effected with sodium sulphide, and a swab wet with methylated spirit or chloroform was then kept applied to the epilated area while the drug to be tested was injected into the left femoral vein. The localisation of dye in the inflamed skin in these rats was definite, though usually not intense; but the inflammation of the skin was only mild.

(2) *Injection of an Irritant Beneath the Skin of the Right Flank of a Normal Rat before the Intravenous Injection of a Dye.*—The irritants used were Coley's fluid, sterile agar-agar (1 per cent. solution in distilled water), neutral gum (5 per cent. solution in distilled water), kaolin suspended in 5 per cent. solution of gum in distilled water, and kaolin suspended in distilled water. Turpentine and chloroform were also tried, but hypodermic doses of either of these drugs in amounts as small as 0·1 c.cm. caused the death of the animal almost immediately (i.e., in three of the four animals used. In the survivor no localisation of dye occurred at the site of injection of the chloroform). Coley's fluid did not appear to cause much, if any, inflammation in mice, but some success attended its use in rats. Of the reagents tried, agar, which was suggested to me by Dr. Piney, appeared to be the best, and the others were discarded. A 1 per cent. solution in distilled water sets as a jelly at the ordinary temperature of the laboratory. Nevertheless, even in this state, it can be drawn up through a medium-sized serum needle and injected by a hypodermic syringe. The usual amount given to rats was 1 c.cm.

(3) *Injection of sterile irritants (usually 1 per cent. agar-agar) into grafted tumours growing in the right flank*, followed by intravenous or intraperitoneal administration of the drugs to be tested.

(4) *Application of diathermy to the thigh of a non-tumour-bearing rat shortly after an intravenous injection of trypan-blue* (one experiment only).

The drugs tested for localisation in these experiments were, with the exception of India ink, chiefly vital dyes, and included India ink, trypan-blue, trypan-red, isamine-blue, Congo-red, water-blue, erythrosin, proflavine, and safranin.

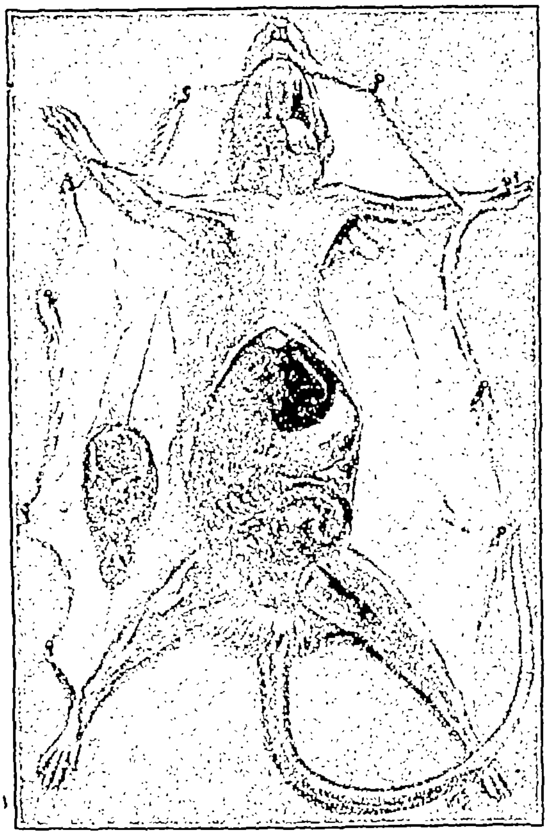
It was found that to get the best results an interval must be allowed between the injection of the agar and the intravenous administration of the drug to be tested. Poor results were obtained if this interval was shorter than two hours, and usually two and a half to three hours or more were allowed to elapse. With peritoneal injections of dye the inflammatory agent may be injected at the same time. The liver in particular has such an avidity for India ink and dyes, and fixes them so securely, that unless the inflammation induced by the agar has reached a sufficiently advanced stage by the time that the dye is circulating in the blood little or no dye will be available for the inflamed tissue. With intraperitoneal injections the passage of the dye into the blood stream is a slow process, and if the dye be injected by this route and the agar be given subcutaneously at the same time, the agar will have had time to produce a sufficient grade of inflammation before the major part of the dye has entered the blood stream.

Results.

Localisation of the colouring matters used in the inflamed tissues was strongly manifest with trypan-blue, trypan-red, water-blue, and isamine-blue, and it was definite also with Congo-red and India ink. With erythrosin, proflavine, and safranin the experiments were performed once only and the results were indefinite. Diathermy was used as the inflammatory (vasodilating) agent in one experiment only. A young rat was anæsthetised and an injection of 1·2 c.cm. of a 0·5 per cent. solution of trypan-blue in normal saline was made into the left femoral vein. Twenty minutes later the right thigh was submitted for three minutes to a diathermy current. On the following day, when the rat was killed, the tissues of the right thigh in the region treated by diathermy had become stained a uniform, pronounced blue. There was some evidence that the current used had been greater than would be desirable for therapeutic purposes. However, the problem is about to be further investigated with the collaboration of Mr. W. V. Mayneord.

In view of the possibility of treating malignant disease by setting up inflammation in the tumour and so causing it to retain a therapeutic remedy, a careful observation was made of the axillary lymphatic glands of the animals whose grafted flank tumours had been impregnated with colouring matter under the influence of inflammation. But it was found that the dyes were so firmly fixed in the tissues which had been inflamed that the axillary lymphatic glands remained free or nearly free from coloration.

It is possible that if a growth were destroyed by this method the disintegrating products, including the therapeutic agent itself, would ultimately drain away by the lymphatic system and so bring the lymphatic extensions of the original growth under the influence of the remedy. Whether such a process will occur remains to be proved. At any rate the experiments conclusively show that an inflamed tissue can hold and retain various colouring matters circulating in the blood against the competition of the liver and the reticulo-endothelial system generally. In therapeutic practice this competition can be largely eliminated by applying the remedy immediately to the inflamed tissue, either by direct injection into the tissue or into its artery of supply.



Rat with a J.R. sarcoma growing in right flank. One c.cm. of 1 per cent. agar-agar was injected into the tumour, and at the same time 1·5 c.cm. of 0·5 per cent. trypan-blue were injected into the peritoneal cavity. The dye has become concentrated in the inflamed tumour.

General Discussion.

This retention by living, inflamed tissues of certain substances conveyed to them in the blood is clearly a therapeutic principle of very great importance, and it has also a direct bearing on physiology and pathology. The fact itself is not entirely new. Lister and others of his time excess strated that an inflamed tissue could collect etal regions. the white blood cells, and within the l and the spleen quiries have been made into the diss showed some ective organisms when injected an abnormal narr into experimental animals. It has been shown that the organisms, very quickly after their introduction into healthy tissues, appear in the appropriate lymphatics and in the blood stream; whereas if the injection of organisms is made into tissues which are already inflamed the dissemination is retarded or prevented.

In 1924 E. L. Opie[1] showed that certain antigens introduced into a normal rabbit diffuse widely in the tissues, enter the blood stream, and appear in the urine, while the same substances injected into a sensitised animal are fixed at the site of injection and do not get into the blood (cf. Arthus's reaction). G. Spagnol[2] found that if colloidal mercuric sulphide were injected into the auricular vein of a rabbit while a pad of cotton-wool soaked in chloroform was applied for 15 seconds to the animal's side, a sharp black stain of the sulphide was found in the subcutaneous connective tissue under the chloroformed spot when the rabbit was killed—after two hours or eight days. A corresponding experiment on a guinea-pig, using trypan-blue instead of mercuric sulphide, showed a similar deposition of the injected material beneath the area of skin to which chloroform had been applied. Valy Menkin,[3] in a valuable paper recently published, has reported some experiments which demonstrate beyond doubt the fixation of trypan-blue when injected into inflamed tissues. He injected it into the forelegs of rabbits and collected the lymph returning from the treated area by inserting a capillary pipette into a subclavian lymphatic vessel. He found that when trypan-blue was injected subcutaneously into the foreleg of a normal animal the dye readily appeared in the lymph flowing from that leg. But if an inflammatory agent (5 per cent. aleuronat with 3 per cent. starch in 0·5 per cent. saline solution) was injected subcutaneously into the leg an hour or so beforehand, a subsequent injection of trypan-blue into that leg was not followed by the appearance of the dye in the lymph. Menkin mentions an experiment by Opie in which the latter found that a preliminary aseptic peritonitis set up by aleuronat prevents, after an interval of 24 hours, the dissemination of hæmolytic streptococci injected into the peritoneum.

From remote times until to-day clinicians have used therapeutic measures of which the effectiveness can be explained by the principle now advanced. For example, the remedial effects of setons, blisters, cauterisations, counter-irritations, poultices, hot fomentations, active and passive congestion, and sterile fixation abscess may be attributed at least in part to the capacity of inflamed tissues for removing from the blood stream the agents and noxious products of disease. Sunburn and the pigmentation of scars, the disappearance of micro-organisms from the blood stream in the most active stage of typhoid fever, and many other phenomena can be accounted for by inflammatory fixation.

Summary.

(1) Inflamed tissues have the capacity for collecting and retaining many substances carried by the blood stream or injected locally.

(2) If inflammation be caused in any part requiring treatment medicaments can be concentrated in that part and so prevented from damaging healthy organs.

(3) There is reason to suppose that a large variety of remedies may be supplied in a form suitable for use by this method.

I have to thank Prof. A. Leitch, Director of the Research Institute of the Cancer Hospital, who provided facilities for this work. Dr. E. L. Kennaway has been kind enough to suggest and supervise throughout, and the outcome of this experimental inquiry is largely due to him. Dr. A. Piney has given me helpful advice on several occasions. To these, to Mr. W. V. Mayneord, and to the laboratory attendants I am glad to acknowledge my indebtedness.

The work has been carried out at the Research Institute of the Cancer Hospital, London, under a

grant from the British Empire Cancer Campaign, for whose assistance I wish also to express my gratitude.

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FACTORS IN FOOT RECONSTRUCTION.

BY C. HOPE CARLTON, M.CH. OXF., F.R.C.S. ENG.,

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IN considering the mechanics of the foot I have had the help of Mr. L. N. G. Filon, F.R.S., Professor of Applied Mathematics at University College. After examining the bones of the leg and foot he wrote as follows:—

> "Removal of the astragalus might be expected to give better lateral stability than fusing the tarsus, since in astragalectomy the malleoli will engage the bones on the tarsus which lie immediately below. When the foot is dorsi-flexed in paralysis with weak calf muscles, then removal of the astragalus with posterior displacement would help mechanically, since dorsi-flexion is reduced first by the removal of bone at the fulcrum, and, secondly, by the greater mechanical advantage with which the calf muscles now act. When the deformity is that of plantar flexion, then anterior displacement would be desirable to enable the dorsi-flexors to act with greater advantage, or as an alternative, a stop must be produced to prevent plantar flexion beyond a right-angle."

It is satisfactory to find clinical experience agreeing with the deductions of a mathematician who was examining the bony skeleton for the first time.

I next sought the opinion of a consulting engineer as to whether such a mechanism as the tarsus occurs in any engineering system. Miss Verena Holmes, a member of the Institute of Mechanical Engineers, and of the Institute of Marine Engineers, says:—

> "The arrangements of the muscles and bones in the foot and leg are not analogous to any engineering device within my experience. The engineer, unlike nature, seeks to make each part of a mechanism in which positive motion is created follow a circumscribed path, generally in one plane, and where a complicated movement has to be obtained it is arrived at by the combination of a number of simple movements of different parts. Otherwise, where complicated and indefinite movements take place in mechanisms, these will generally be found to be movements of accommodation, as, for instance, at a universal joint between two parts that cannot be rigidly connected. *Engineers hardly ever combine two functions in one moving part as nature does.* . . . Whitman's operation substitutes a hinge of limited movement for what is almost a universal joint. With the springs that normally limit and control the action of the universal joint out of order, this would seem to be the best thing one can do, if it were not for the disadvantage of shortening. Further, in the Whitman operation there will be greater stability in a sideways direction owing to wider contact between leg-bones and foot, which will withstand better unequal lateral pulls."

The theoretical approach to the problem of tarsal reconstruction therefore agrees generally with the results of surgical practice.

The refashioning of the neck of the astragalus, combined with triple arthrodesis, which is associated with the name of Michael Hoke, has for the last three years been extensively practised in North America. On the orthopædic service at Harvard it is much employed, and their view of it is expressed in a letter I received some time back from Prof. Allison, of the Massachusets General Hospital, who says:—

> "It is a better operation for calcaneus than for equinus. In paralytic calcaneus it gives a most useful foot. Backward displacement is the important essential, and long fixation in plaster is desirable. It has no place in spastic feet, but is very useful in club-feet where manipulation is insufficient."

Emphasis may be laid upon the only two points about which there is any general agreement among those with experience of foot reconstruction. They would all rather deal with calcaneus than with equinus, and they almost all insist on the need of backward displacement.

There is no doubt that Hoke's operation yields good-looking, serviceable feet without instruments. It is also successful in equinus, because it corrects the downward pitch of the neck of the astragalus and metatarsus. No doubt some deformity thus abolished had its origin in muscular paralysis and stretching of the astragalo-scaphoid ligament. My criticism of Hoke's operation is its unnecessary difficulty. As I saw it practised at the Massachusets Hospital, the neck and head of the astragalus were taken out, held in forceps, and cut with an electric saw. In Hoke's words, the operator's aim is first to set the posterior foot which, after removal of the head and neck, is subject to the operator's wishes; and, second, to sink down the moulded head. I suggest that the "setting" is just as well performed after the removal of bone from the head of the astragalus as from the base of the neck. And it is certainly easier to mould the neck in situ, as does Dunn, than to reset and replace. Admittedly an exception might be made in severe equinus, where a very oblique neck would fuse with the scaphoid at too sharp an angle. This angle is avoided when the surplus bone is removed from the base of the neck.

Straight Triple Arthrodesis.

The alternative method of arthrodesis in general use at the Hospital for Sick Children, Toronto, consists in simple excision of the joints between the astragalus, scaphoid, and calcaneus. Relapse is infrequent. Dr. Gallie, in whose service I was privileged to work for a year, has told me that he thinks the slowly progressive form of relapse, which is apt to occur in children under ten, *is due to actual change in the shape of the* bones, such as occurs after arthrodesing operations at the knee-joint in young children. Dr. Gallie's favourite operation is subastragaloid and mid-tarsal arthrodesis with a tendon fixation of the tendo Achilles into the back of the tibia. He says that this operation has the advantage of stabilising the foot, and so allowing the patient to wear a high boot in cases of shortening. It does not shorten the limb; it holds the foot firmly in any desired degree of equinus, and it enables the patient to take weight on the ball of the foot.

The arthrodesis of spastic feet is employed much more in Toronto than in Boston. In a recent letter Dr. Gallie says: "I am strongly of the opinion that mid-tarsal and subastragaloid arthrodesis is an excellent operation for spastic paralysis." He goes on to say *that he has half a dozen beautiful results,* far better than he has ever seen with any other form of treatment.

I have recently performed the Toronto operation on three patients; one had an equino-cavo-valgus, and the other two had almost flail-feet in equino-varus. The operation gave them good plantigrade feet, although the first case still had five degrees of valgus. They have from 30 to 60 degrees of movement at the ankle, and one still wears a calliper to the hip. They all walk from one to five miles, and one kicks a football with the operated foot. Two of them have 2 per cent. anterior displacement, the other has no displacement. Two showed, under the X ray, bony union throughout, and all showed painless firm ankylosis.

Whitman's Astragalectomy.

I have had the privilege of studying a number of astragalectomy patients whilst assisting Mr. Laming Evans at the Royal National Orthopædic Hospital. This method appealed particularly to the mathematician and consulting engineer, who viewed it from a mechanical standpoint. It is very valuable for painful osteo-arthritis of the ankle and subastragaloid joints after fracture or disease of the astragalus. It gives relief from pain on walking, increases mobility, and so improves the shape of the foot as to make recognition of the injured limb difficult. One of Mr. Laming Evans's cases illustrates this: fibrous ankylosis had followed a pneumococcal abscess of the tarsus; after astragalectomy there was 40 degrees of movement at the new joint, no lateral deformity, good stability, and a shapely foot. The patient needed a three-quarter inch cork.

Personal impressions offer the only means of assessing the results of astragalectomy. Sometimes success is undoubted, as in a patient aged 19, from whom Mr. Laming Evans removed the astragalus in childhood. The man now works as a farm labourer, plays football, refuses surgical boots, and wears those obtainable in a village shop. As a rule, however, difficulty of assessment is due to associated paralysis and the length of time over which treatment has been spread.

To 19 consecutive cases at the Royal National Orthopædic Hospital I applied the following test: could the patient, in his present condition, get about well enough to act as a doctor, lawyer, housewife, teacher, or domestic servant? I concluded that 13 of the 19 could have done so, and six of them could do much more. Of the remaining six the disability of three was due to paralysed quadriceps. Another one had a paralytic dislocation of the foot. The astragalectomy was performed 13 times for calcaneo-cavo-valgus, and in 12 of these improvement followed. It was performed seven times for equino-varus, and in five of these improvement followed. These results are similar to those given by J. E. M. Thomsen in 1924, and Wallace in 1916. The paralytic group included 16 cases, of which 15 were improved. The congenital group included four cases, of which two were improved. The posterior displacement, estimated in percentages of foot length, varied from 1 to 12 per cent., with an average of 5 per cent. No definite correlation was established between posterior displacement and functional results; this may have been due to the presence of associated deformities, and the difficulty of measuring posterior displacement. The method was to measure the length of the foot which lay behind the external malleolus, and to speak of this as a percentage of the foot length. The difference in this percentage on the two sides is a numerical measure of the displacement.

Dr. Royal Whitman, in his text-book, criticises Dunn's operation for not giving enough displacement to prevent dorsal flexion. Posterior displacement is admittedly necessary in calcaneus to restore the grip of the fore-foot in walking, but it is equally important that the limb should function as a firm pillar with a stable base. I believe that many patients after Whitman's operation must be seriously handicapped when barefoot on a slippery surface, as in taking a bath, and that Dunn's reconstruction often gives a firm pillar together with good fore-foot grip.

I have had the privilege of studying this operation at the Hospital for Sick Children, Ormond-street, on the service of Mr. H. A. T. Fairbank, and the following remarks are based on 20 consecutive cases of his, with three of my own, treated elsewhere.

The average age of Mr. Fairbank's series was eight years, and the average time since the acute disease six years. In 11 patients there was some variety of equinus, and in the other nine some variety of calcaneus. I found no definite correlation between the quality of the result and the amount of posterior displacement. Feet with a posterior displacement of 4 per cent., 8 per cent., and 11 per cent., all gave excellent results. A comparison of these results with those after Whitman's operation shows an equal amount of posterior displacement, the average in both procedures being about 5 per cent. of the foot length. The actual shortening of the leg after Dunn's operation was trifling, perhaps a quarter of an inch, compared with a shortening of a half to one inch after Whitman's operation. There was a shortening of the foot of about 10 per cent. after Dunn's operation. There was no failure in the series, and in almost every case the result might be called good. Clinically, there was always painless firm ankylosis of the tarsus, although radiograms showed lack of bony union between the astragalus and the cuneiforms. Between these bones there was bony union in two cases only, and in the majority they were widely separated. There was usually bony union between the os calcis and the astragalus, and between the os calcis and the cuboid. After operation all the patients possessed useful plantigrade feet, although five of them had about 20 degrees of varus, two others 5 degrees of varus, and one 5 degrees of valgus. The average movement at the ankle-joint was 50 degrees.

The results are very similar in three Dunn's operations that I have recently performed. All were over 15 years of age. Two were for drop-foot and one for calcaneus. All three have good plantigrade feet with painless ankylosis. In the drop-foot there has been an increase of power in the dorsi-flexors. The calcaneus foot is efficient and shapely.

Summary.

Assessment of the results of foot reconstruction is difficult to express exactly, and must remain a matter of personal impression. My own preference is for the Dunn reconstruction, with an exception for astragalectomy when the astragalus is misshapen or subject to osteo-arthritic changes on both upper and lower surfaces.

The conclusions expressed in this paper have the defect that they are for the most part those of an observer rather than of a doer. It is usually a junior officer who is stationed in the observation post, and I am indebted to successive commanding officers for such excellent visibility that any failure to recognise facts presented is due to my own defective vision.

Clinical and Laboratory Notes.

A CASE OF VACCINATION WITH MENINGEAL SEQUELÆ.

By Dr. A. Lancet.

The first cases of postvaccinal encephalitis were observed by F. S. van Bouwdijk, Bastiaanse, J. Bijl, and J. T. Terburgh during an epidemic in Holland in 1925. In the following year cases occurred in England, and at about the same time four isolated cases were reported to the Société Médicale des Hôpitaux de Paris by J. Comby, by J. Huber, and by P. Netter, and at Montpellier by Euzière and Pagès. I myself have reported a fatal case[1] of primary vaccination in an infant, and no doubt many have remained unreported. The following case was attended by a colleague in my own district.

An English professional man, aged 34, whose health was generally good, had been vaccinated in infancy and inoculated against typhoid and cholera in adult life. He was revaccinated in London on April 17th, 1929. His wife was vaccinated at the same time, but did not "take." On April 20th, while crossing the Channel, he suffered from headache which increased in severity during the succeeding days, and which became almost intolerable on April 24th. During the nights of April 23rd and 24th he vomited a good deal, and on the 26th I was called in.

His temperature was then 104·5° F., and the pulse-rate 60. The local vaccinal reaction was intense, and he was suffering severe pain in the limbs, the nape of the neck, and the jaws; he said he felt he would go mad with the pain. He suffered from phono- and photo-phobia, and Kernig's sign was pronounced.

A turpentine injection was made in the outer side of the right thigh, and one of pyoformine (Gobey) in the right buttock. The headache diminished on the following day and the pulse-rate increased, while the temperature remained around 102°. On May 1st, a fortnight after vaccination, the temperature fell to 98·6° and there was a tendency to cardiovascular collapse, with syncope and hypotension. This was rapidly relieved by digitalis and adrenalin. On May 6th the blood pressure rose and the headache disappeared completely. The urine became abundant and the patient began to sleep soundly. The abscess, which had evolved slowly, was lanced on May 7th. On May 12th the temperature and blood pressure became normal and the patient felt well.

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[1] Gaz. Méd. du Nord, Oct. 15th, 1928.

This case appears to be one of vigorous meningitic reaction, appearing early after an apparently successful vaccination. Whether or not it proceeds from the same cause as postvaccinal encephalitis is not known, but it is certainly less serious. E. Frommel and J. Baumgartner[1] have recorded a case of acute meningitis with slight leucocytosis which was cured in ten days. Postvaccinal encephalitis, on the other hand, begins from 10 to 12 days after a normal primary vaccination, usually in the later years of childhood, and half the patients die within ten days. H. M. Turnbull and J. McIntosh[2] have reported seven cases of encephalomyelitis, of which six were fatal. The lesions were quite different from those of encephalitis lethargica and of poliomyelitis, and in three cases inoculations of the brain and spinal cord revealed the presence of vaccinal virus transmissible to rabbits. Turnbull and McIntosh attribute the disease to Jenner's virus, but C. Levaditi ascribes it to a virus similar to that of epidemic encephalitis which happened to be in the patient's body and was only intensified by vaccination. Postvaccinal encephalitis is unknown in Spain, where rabbit neurovaccine is used.

The complication is so rare as to give little cause for alarm; nevertheless certain precautions should be taken. Primary vaccination should be done as early in life as possible. The scarification should be light and the insertions should be two in number and set some distance apart. Congenital debility, diabetes, herpes, and convalescence after influenza or measles should be temporary contra-indications. Finally, the patient should avoid fatigue and risk of infection, and should pay especial attention to nasopharyngeal hygiene.

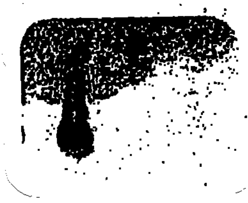
Ardres, Pas de Calais, France.

FACIAL NEURALGIA DUE TO A HIDDEN ROOT.

BY PERCY G. MURDEN.

THE following case appears worthy of record :—

An elderly woman had suffered for many years from neuralgia of the left upper jaw. When interviewed she was very insistent on the degree of suffering she had experienced, and complained of "burning" pains in the area of the third to the eighth teeth on the left side, the sensation extending to the Gasserian ganglion. When asked to open her mouth for examination she protested strongly that she could not do so, but from her manner there seemed little doubt that tact would accomplish the "impossible." This proved correct, and examination showed that the left fourth, sixth, seventh, and eighth teeth were missing, having been extracted (according to the patient) some 20 years previously. The gingiva presented a perfectly healthy appearance, and a thorough search failed to reveal a sinus or localise the pain.



Radiogram showing root embedded in alveolus.

At this stage two facts were clear: the "impossibility" of opening the mouth had proved to be imagination; and no obvious local disease had been found to account for the pain. To have assumed, however, that the pain was also a product of the patient's imagination would have been shirking the issue; for the fear exhibited by the patient—or at least part of it—might be secondary to some other sensation. Consequently an X ray examination was made, which disclosed a root embedded in the alveolus below the floor of the antrum (see figure). The root was subsequently removed, and the patient has since reported that the pain has ceased.

It seems safe to assume that had not the psychological aspect received due consideration the case might have been classified as facial neuralgia with an obscure ætiology and left unrelieved.

London, W.C.

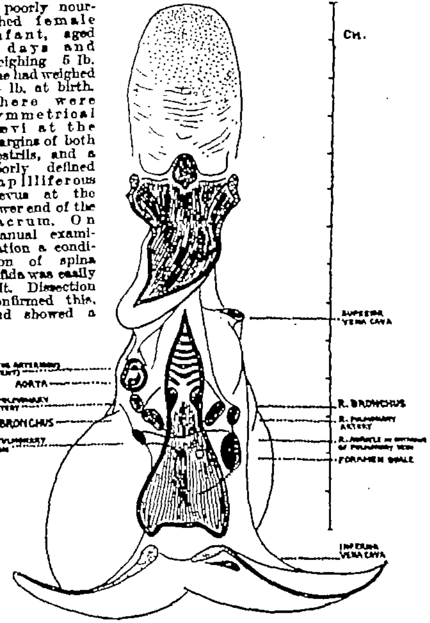
A CASE OF
CONGENITAL ATRESIC ABNORMALITY OF THE ŒSOPHAGUS.

BY T. V. COOPER, M.R.C.S. ENG.,

JUNIOR ASSISTANT PATHOLOGIST, JOHN BURFORD CARLILL LABORATORIES, WESTMINSTER HOSPITAL.

THIS abnormality was found in the body of a child which had died of broncho-pneumonia.

The child was a poorly nourished female infant, aged 4 days and weighing 5 lb. She had weighed 5¼ lb. at birth. There were symmetrical nævi at the margins of both nostrils, and a poorly defined papilliferous nævus at the lower end of the sacrum. On manual examination a condition of spina bifida was easily felt. Dissection confirmed this, and showed a narrow deficiency ¼ inch wide and 3 inches long. The nerves were normal in position. It had been noticed during life that the baby appeared unable to retain food, and when a small rubber catheter was passed into the œsophagus, milk immediately flowed into the postnasal space, causing an acute attack of dyspnœa, and the instrument was obviously not in the stomach. The child had never passed a normal stool, the motions consisting solely of meconium.



The child had been full-time with a normal presentation, but 14 days before labour acute hydramnios had come on, causing the mother to complain of œdema of the legs and shortness of breath. The fœtal parts could not be felt during this last period.

At autopsy the child's stomach contained gas and some greenish fluid, presumably bile. The œsophagus, when followed down from its upper end, terminated in a blind sac ½ inch above the bifurcation of the trachea. There was no apparent continuation of this sac. When followed up from the gastric (cardiac) end, the œsophagus was found to communicate with the trachea at its bifurcation. The lumen appeared of normal dimensions. Both the foramen ovale and the ductus arteriosus were patent, but I omitted to observe specially whether any other cardiovascular abnormality was present. No other congenital abnormalities were detected, but the right lung sank in water and showed several broncho-pneumonic patches, while the left lobe was markedly congested. The liver was toxic, but the spleen and kidneys were normal. The intra-abdominal umbilical cord was widely patent.

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[1] Schweiz. Med. Woch., 1926, lvi., 857.

[2] Brit. Jour. Exper. Path., 1926, vii., 181; see THE LANCET, 1926, ii., 504.

This type of abnormality has received considerable attention in the past.[1] [2] Sir Arthur Keith and Dr. J. E. Spicer[3] offer the following embryological explanation.

"At the end of the third week the floor of the primitive œsophagus becomes depressed and shows dorsal œsophageal and ventral tracheal divisions. These are demarcated by lateral ridges which meet posteriorly in a crescentic fold. From the caudal end of the tracheal division grow the lung buds. By the end of the fifth week the crescentic fold spreads forward, uniting the two lateral ridges and thus forming the tracheo-œsophageal septum. To produce the abnormality presented in this instance, the lateral ridges and folds, instead of growing horizontally backwards to meet at the junction of the lung buds and œsophagus, thus dividing the primitive œsophagus in two, must grow obliquely backwards and downwards so as to meet on the dorsal wall of the foregut.

I owe my thanks to Mr. Stanley Dodd, under whose care the case was; to Dr. Braxton Hicks, senior pathologist, for permission to publish the case; and to the pathological clerk, Mr. Michael Perkins, for the preparation of the drawing.

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[1] Mackenzie, Morell: Manual of Diseases of Throat and Nose, Edinburgh, 1902, vol. ii., p. 216.
[2] Ballantyne, J. W.: Antenatal Pathology, 1904, vol. ii., p. 462.
[3] Keith, Arthur, and Spicer, J. E.: Jour. Anat. and Physiol., 1906–07, xli.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 559.)

SECTION OF DISEASES OF CHILDREN.

UNDER the presidency of Dr. PAGET LAPAGE (Manchester) a discussion on

TUBERCULOSIS IN EARLY CHILDHOOD

was opened by Dr. CHARLES MCNEIL (Edinburgh), who began by paying tribute to the lasting value of Pirquet's work. The subject, he said, was not only wide and complicated, but also well worn; it was, however, of first-rate importance for all who had the medical care of children. He would confine his survey to the first five years of life, a period which in 1927 gave a much greater number of deaths than the later period of childhood and puberty. There were four chief clinical types—viz., meningeal, respiratory, abdominal, and the general or disseminated type; these were responsible for 95 per cent. of the tuberculosis deaths at this age. Meningitis easily took first place; in England and Wales the deaths from tuberculous meningitis were three times greater than those from pulmonary and abdominal tuberculosis. It was a common remark that the Pirquet test often failed in tuberculous meningitis and in general tuberculosis, but this was not so if the test were properly performed. In the first two years a positive tuberculin test was of great value in diagnosis and of grave significance because at this period latent or healed tuberculosis was a rare event and active tuberculosis was generally fatal. In later childhood a positive test was of less value in diagnosis, but a negative test was of great value in excluding tuberculous disease, although it had to be remembered that the test might, if rarely, fail to appear in an actually tuberculous condition.

The existence of healed or dormant tuberculous lesions was an important fact in later childhood, but in the first two years of life tuberculous infection nearly always proceeded to tuberculous disease, and in the great majority of cases the lesions were in the abdominal mesenteric glands. The practical conclusion from clinical and post-mortem evidence was that latent tuberculosis could scarcely be said to occur in infancy and was uncommon in the later years of the period of survey. Tuberculous meningitis, so common and so deadly in the first years of life, was only the end-result of an earlier focus of disease implanted in the body; it was a secondary and not a primary type. In an analysis of 51 fatal cases the pulmonary glands were the seat of the primary lesion in 33, the abdominal glands in 10, and the cervical glands in only 2 cases. The value of post-mortem examination in tuberculous meningitis could hardly be exaggerated in revealing the situation of the primary focus, and in the majority of cases this was a thoracic lesion. Of pulmonary tuberculosis there were four types—tuberculous bronchitis becoming broncho-pneumonia; acute caseous pneumonia with or without acute cavity formation; chronic fibroid pneumonia with cavities; and a caseous tuberculous process at the hilum of the lung, spreading into it. The first two types occurred at an age when simple bronchitis and pneumonia were common conditions, and they gave the same physical signs. Some clinical features were helpful in distinguishing the tuberculous condition; the illness was insidious in its onset and quiet in its course, but presently there was definite weakness, pallor, and loss of flesh. The X ray picture in tuberculous broncho-pneumonia was, of course, unmistakable. As to the third type, even at an early age pulmonary tuberculosis might be a relatively slow process, lasting for many months. The fourth type was more difficult to diagnose than any other, as there were only the general signs of a severe progressive toxæmia. One of the most interesting things about abdominal tuberculosis was the variation in its frequency in different towns and districts of the British Isles. In early childhood primary abdominal tuberculosis was a milk infection. A high death-rate and case-incidence of abdominal tuberculosis in any area were, therefore, a reliable index of widespread infection of the milk-supply with tubercle bacilli.

It was, said Dr. McNeil, hardly necessary to emphasise the greater importance of preventive as against curative treatment of tuberculosis at any time of life, and this was certainly true of the first period, where in some of its clinical types the number of deaths equalled the number of cases. The old heresy that tuberculosis was a hereditary disease, fatally transmitted from parents to children, still lingered in the minds of many and blinded them to the real dangers. The problem of milk in relation to tuberculosis in young children was complicated. Until all our dairy cattle were free of tubercle there were two ways of dealing with the situation: pasteurisation or boiling. It was a settled custom to boil our eggs; there was far more reason to boil our milk. The key to the problem of prevention of pulmonary tuberculosis in childhood lay in the early detection of cases of phthisis in the middle period of life, in their isolation, in their instruction in hygiene, and above all in the reduction of their numbers. The segregation of young children from tuberculous parents and insanitary homes, as in the Grancher system in France, was not feasible as a general policy; in the few cases where it was practicable it was, of course, the most effective safeguard.

Discussion.

Dr. H. THURSFIELD (London) confined his remarks to the clinical diagnosis of intrathoracic tuberculosis at two periods in childhood—viz., up to the third or fourth years of life and during school age. Below two years of age the diagnosis was extremely difficult between a chronic slowly resolving broncho-pneumonia, a tuberculous broncho-pneumonia, and a localised empyema. It was in such cases that the Pirquet and Mantoux tests were untrustworthy. The points on which to rely in diagnosis were a positive family history, the discovery of a palpable spleen, enlargement of the lymphatic glands of the thoracic wall, and lung puncture in all doubtful cases. In children of school age the diagnosis of a frank pulmonary lesion was as easy as in an adult, but pulmonary or intrathoracic tuberculosis was diagnosed a great deal too freely. The greatest importance should be attached to direct contact with a known tuberculous subject and but little importance to a history of chronic cough, unless associated with failure in general health. A physical sign of importance was persistent loss of movement at one or other apex. X rays were not an aid in early invasion of the lung. A subcutaneous tuberculin test was of great value in a suspected case when the temperature was running evenly. In such cases a general or focal reaction was decisive.

Dr. J. M. SHELLIE (Birmingham) gave statistics from the Birmingham Children's Hospital which showed that in 15 per cent. of the autopsies over a seven-year period death was due to tuberculosis. In 33 per cent. of these the mediastinal glands were the seat of the primary lesion, in another 31 per cent. both the mediastinal and mesenteric glands were involved. It was reasonable to deduce, therefore, that two-thirds of the fatal cases in Birmingham were due to infection with human tubercle bacilli. To find healed tuberculous lesions in children under five years of age dying from other diseases was so exceptional as to be wellnigh negligible. Whilst an appreciable reduction in the death-rate had been obtained by present methods, it was doubtful if they would produce any further reduction. If advances were to be made in its prevention they must be made along other paths. To protect infants and young children from all contact with tubercle bacilli, even if this were possible, would not appear to be the wisest course, as it would but store up added troubles for the periods of later childhood and puberty. For prophylactic purposes it was generally agreed that tuberculin was of no value. Whilst Calmette's "B.C.G." vaccine had been in use for some years, much more detailed information was necessary before his claims could be accepted. In the meantime, discontinuity of infection could be obtained by removing children for a time from all tuberculous environment and from tuberculous milk, and was extremely beneficial.

Dr. STANLEY MELVILLE (London) regarded pulmonary tuberculosis as primarily an affection of the lung parenchyma. It was true that the primary focus might be so small as to defy detection, but the enlargement of the lymph nodes was a secondary stage. The following types of pulmonary tuberculosis were recognised as giving definite radiological evidence: (1) primary acute broncho-pneumonia (infantile phthisis); (2) miliary tuberculosis; (3) the adult chronic indurative type; and (4) hilum tuberculosis—the word hilum being used in a topographical sense, and not conveying any suggestion as to the pathological process which was present. A small primary focus in the lung might produce a secondary mass of glands out of all proportion to the initial lesion. Lack of recognition of this fact had allowed clinicians and radiologists to be overwhelmed by the size of the shadow in the lung. To regard such shadows as evidence of involvement of the lung root in a tuberculous infiltration was fatal to the rational interpretation of the films.

Dr. HUGH ASHBY (Manchester) said the difficulty of diagnosis lay in the early case of tuberculosis. He had almost given up the cutaneous tests as of no value. Of much more value were the clinical signs and a radiological examination. There should be no hesitation in needling the chest in any doubtful case.

Dr. CATHERINE CHISHOLM (Manchester) gave the results of her investigations into the incidence of tuberculosis in about 3500 cases of children aged 1 to 2 years. In only 50 of these was a definite diagnosis of tuberculosis established, and in 20 per cent. of these there was a family history of active disease. She urged that pasteurisation or sterilisation of milk was imperative at present, but tuberculous-free herds were the ideal.

Dr. E. A. SAUNDERS (London) pointed out the extreme value of the collaboration of the clinician and radiologist in diagnosis. Children went through a process of establishing their immunity with a certain disturbance of health. There was a ray of hope in not removing them from all tuberculous contact, but in allowing them to get subminimal doses of infection in order to establish gradually an active immunity.

The PRESIDENT said that recent measures to reduce infection had borne fruit. Apparent healed adult tuberculous lesions might be infectious to children as tuberculosis was very infectious during childhood. Depending on the dosage and severity of the infection, a number of cases in children were curable by fibrosis and calcification.

Prof. C. W. VINING (Leeds) said that a purely localised tuberculous infection did not produce systemic signs of note, and that hilum tuberculosis had been grossly exaggerated as a cause of ill-health. The skin reactions had a negative value, as in suspected tuberculous cases a negative skin test showed that the disease was not due to tuberculous infection. He doubted whether any X ray picture except miliary tuberculosis could be diagnosed as tuberculous. The diagnosis of glands at the hilum of the lung was very difficult and very doubtful.

JOINT MEETING OF THE DERMATOLOGICAL AND RADIOLOGICAL SECTIONS.

X RAY TREATMENT OF THE COMMONER MICROBIC DISEASES OF THE SKIN.

The Joint President, Dr. W. J. S. BYTHELL (Manchester), introduced Dr. J. B. HIGGINS (Salford), who gave the opening address. He said that the progress of X ray treatment in dermatology might be divided into three eras. In the very early days results seemed miraculous. Later some mishaps and a few disasters brought X ray treatment into discredit. Study of the effect of X rays upon the skin, improved apparatus, and means of estimating dosage, had eventually made X rays one of the most reliable therapeutic agents in dermatology. Dr. Higgins proposed to discuss briefly the methods employed in the Manchester and Salford Hospital for Diseases of the Skin in treating the commoner microbic diseases. He said that when X rays were absorbed by the skin certain changes took place in the cells. Hertwig had stated that the secondary rays produced molecular changes in the colloidal albumins. Packard had presupposed enzymes controlling cell activity, which were stimulated by small doses of X rays. Large doses caused inhibition or even destruction of the life of the cell. Holzknecht's theory was that the effects of X rays were due to early changes which preceded injury, and to the suspension of inhibitory influences. Whichever view was adopted it was accepted that small doses of X rays had a stimulating effect in certain skin diseases, notably acne vulgaris. The essential factor was that diseased cells had a greater sensitivity and an effective dose could be given to them without injuring the normal surrounding skin. If hyperæmia was present, however, the surrounding skin was not normal, and there was a narrower margin between stimulation of diseased cells and injury to the hyperæmic area.

By the term "commoner microbic diseases" Dr. Higgins meant acne vulgaris (and indurata), sycosis vulgaris, paronychia, and furunculosis (including carbuncles).

In *acne* X ray treatment was now the method of choice, although it was not indispensable. The apparatus employed by Dr. Higgins produced a collection of soft and medium rays, and the erythema dose was estimated by the Sabouraud pastille. A preliminary course of three or four half skin doses (unfiltered) at weekly intervals was followed by a similar course employing a filter (of 0·5 mm.) of aluminium. In a series of 31 consecutive cases of acne of the face there were no actual failures, though the results in 4 cases were indefinite, and in 9 cases of generalised acne the results in 2 cases were indefinite and one failed to respond. Dr. Higgins cited other methods adopted by various workers. Comparison of the total dosages administered shows that their skin dosage was roughly equivalent to those used in his practice. But no attempt to standardise the dose should be made for the actual absorption varied. Blonde skin absorbed X rays more readily that did more pigmented skin. The shorter the interval between treatments the more cumulative would be the effects. It was supposed that the curative action of X rays in acne was due to the stimulating effects of fractional doses of X rays. There seemed no doubt that there was no direct bactericidal action. It required 120 skin doses to kill a culture of *B. coli* and *staphylococci* (Kloverkorn, 1925). Dr. Higgins had found that doses up to eight skin doses actually stimulate the growth of staphylococci.

The treatment of *sycosis* was peculiarly difficult. It was almost invariably accompanied by hyperæmia, which was the vital factor in deciding upon the X ray dosage. The skin was hypersensitive according to the degree of hyperæmia. The three available methods of treatment, namely, (1) epilation, (2) stimulation of the affected cells, or (3) a combination of the two, must be applied according to the merits of the individual case. General guiding principles were, first, not to treat the acutely inflamed skin seen in mixed infections before the hyperæmia had been reduced. Even then not more than one-third skin dose at weekly intervals could be used. Secondly, with moderate hyperæmia not more than half skin doses could be used. If there was no hyperæmia the dose might be carried to the point of epilation, with effective results. In a series of 30 cases of sycosis 10 received epilating doses and 9 were cured. No filters were used in the treatment of these cases. Probably a filter of 0·5 mm. of aluminium would allow rather larger doses to be used without ill-effects.

Super soft rays had been employed in the treatment of skin diseases by J. J. Eller (1927). Using specially constructed apparatus he found that the phenomena of erythema, pigmentation, and cumulative effects from successive doses corresponded with those of harder rays, but that erythema appeared almost instantaneously (in two or three hours, or less). The penetration was less, and therefore after erythema doses, or even ulceration, healing took place without permanent effects (after fifteen months). The results in acne treatment were not better than those obtained with harder rays, but good results were reported in sycosis, paronychia, and carbuncles.

Discussion.

Dr. **Douglas Webster** (London) expressed interest in the theory, with which he did not agree, that the effect of X rays depended upon the total dosage, five to six skin doses being required to cure acne. He had found ten weekly applications of one-sixth skin doses quite as efficient, and some workers used only one-fiftieth erythema doses. He pointed out that excellent results in lupus had been obtained with high-voltage irradiations and radium, so that the worker need not limit himself to softer X rays.

Dr. **Frederick Gardiner** (Edinburgh) said that the dermatologist, though he need not be a radiologist, should have adequate X ray training. He considered X ray treatment in acne only an adjunct to constitutional treatment. He believed in smaller doses—that is, three doses of one-third skin dose at ten-day intervals. Six months of treatment brought the risk of telangiectases. Regarding sycosis, he did not believe in epilation by X rays, which have a deleterious effect on the skin.

Dr. **Richard Connell** (Carlisle) also regarded X rays only as an adjunct in acne treatment. Microbes could not be destroyed by X rays, except indirectly.

Dr. **Haldin Davies** (London) pointed out that mild cases were not seen by the radiologists who were, therefore, pessimistic. Cases varied enormously in degree and ease of treatment. He emphasised the necessity of constitutional treatment. He usually applied two half pastille doses at an interval of a fortnight in cases of acne. For sycosis he preferred several small doses, avoiding erythema.

Dr E. **Hunt** (Liverpool) also emphasised the need for constitutional treatment.

Dr. **Ferguson Smith** (Glasgow) considered X rays the method of choice in the treatment of acne vulgaris. Personally he did not believe in such large doses, and did not exceed two skin doses per annum, unfiltered. He used doses of one-fifth pastille weekly, with a maximum of 12 doses. His results were brilliant. In sycosis he considered an epilation dose necessary. In treating boils, especially local, he had found a single pastille dose (with temporary atrophy of the gland) better than any efforts to destroy the microbes.

Dr. **William Dyson** (Manchester) believed in small repeated doses for acne. With regard to sycosis, he condemned the use of X rays in acute inflammatory conditions of skin, on account of the risk of atrophy, telangiectases, and epithelioma. He used fomentations first, and X ray treatment after the discharge had ceased.

Dr. G. H. **Lancashire** (Manchester) pointed out the possibility that under-exposure might be responsible for disappointing results.

Reply.

Dr. **Higgins** pointed out that all we can observe after stimulating doses is the clinical effect. We cannot state dogmatically that one-fiftieth or one-third of a pastille dose is the best stimulating dose. With reference to Dr. Lancashire's observation he had often seen patients who had previously had a course of treatment without any effect having been obtained. He did not imply that X rays alone constituted the method of choice, but X rays added to other methods of treatment. There must be coöperation between the dermatologist and the radiologist. The actual dosage used by him for epilation was three half pastille doses at weekly intervals, unfiltered, followed after three to four weeks by another dose using 0·5 mm. aluminium filter. Sometimes after one dose a mild erythema followed in about three days; in this event treatment would be discontinued for three months and recommenced with the filter.

Dr. **Lancashire** then took the chair. He traced the growth of X ray therapy in skin diseases from the time, some 28 years ago, when Schiff and Freund founded the method which had become an indispensable part of a dermatologist's equipment. He then read the following paper on the

X Ray Treatment of Wounds,

contributed by Prof. **Leopold Freund**. Prof. Freund wrote that the older radiologists had found not only that malignant and chronic infective ulcers healed more rapidly under the influence of X rays, but also sluggish and badly healing wounds. Sunlight and powerful artificial light had similar effects. Whether the effect of X rays upon wounds was one of stimulation of healing, or of destruction of a factor inimical to cicatrisation, was of less importance than the fact that small doses were of admitted benefit in badly healing wounds. Prof. Freund discussed one particular indication of X ray treatment, that of fresh and open wounds. Since 1898 he had noticed the curative value of X rays on keloids, and later he had observed histologically that in keloids the hyperplasia of connective tissue commenced in numerous young round and spindle cells around blood-vessels. It had occurred to him that to irradiate these young and particularly sensitive cells might prevent keloid. Since then, after excision of tumours in persons predisposed to keloid, he had irradiated the wounds without stitching or skin graft, using small X ray doses. The results were uniformally good, and the method had been employed in other conditions such as patches of lupus vulgaris, epitheliomata, rodent ulcers, keloids, and pigmented nævi. The advantages of this method over X rays used alone were, first, that X rays had not to penetrate the thickness of the lesion before reaching its base; secondly, if any traces of the disease were left, they were reached more directly by subsequent irradiation than if the wound had been stitched; thirdly, if local recurrences appeared they broke through the thin delicate scar more easily than if the wound had been stitched or skin-grafted. Such wounds, often thick and œdematous, sometimes prevented the recurrences from breaking through and thus delayed the recognition of their presence. The cosmetic results were excellent, and the scars as good as those obtained with Finsen light. In lupus vulgaris and malignant growths the period of irradiation was considerably shortened and over-radiation is avoided. The method was unsuitable where there was movement of the unstitched skin edges, for instance near joints or folds of skin, unless movement was prevented by firm bandaging. Wounds up to the diameter of about 10 cm. had resulted in perfect scars. The duration of healing appeared to be unaltered, and in animal experiments an irradiated wound healed slightly earlier than a control wound not irradiated. The dose used was about 6 to 7 Holzknecht units (H) applied at 6 or 7 sittings at intervals of two or three days. Unfiltered rays of 6 to 7 Wehnelt units (W) hardness are used. A contra-indication to the method was the situation of wounds near folds or angles of the skin. Prof. Freund did not recommend application of X rays before excision, because skin which had been recently X rayed sometimes reacted to every form of trauma with an X ray dermatitis. He quoted Richard Sparmann's statement that in Malays, who were liable to keloid formation, prophylactic irradiation before operation, or irradiation of closed operation wounds, was often useless.

Discussion.

Prof. M. **HAUDEK** (Vienna) agreed that results were better without the use of filters. He recalled good results in the early days before filters were used. He thought one should not regard Dr. Freund's dosage of 6 to 7 H as a set rule.

Dr. **FERGUSON SMITH** (Glasgow) said he had no experience of Prof. Freund's method of treating lupus. His method was to scrape the area, apply liq. hydrarg. nit. and irradiate three to four days later, using one application of X rays, though divided doses might be better. Comparison with non-irradiated patches showed definite benefit.

Sir **NORMAN WALKER** (Edinburgh) referred briefly to his experiences with X ray therapy. He hoped that closer coöperation between dermatologists and radiologists would bring to bear the experiences of both.

Dr. L. A. **ROWDEN** (Leeds) said that he did not believe in coöperation between radiologist and dermatologist. The dermatologist should do his own radiology and then the radiologist could not be blamed for occasional bad results. He pointed out that keloid following amputation of the breast was entirely prevented by X radiation. He did not advocate filters in dermatological cases.

Dr. **DYSON** said that quality and penetration of rays were much more important than the methods of application. Before the correct dosage could be prescribed we must know more of the exact action of X rays on cell metabolism.

The **PRESIDENT** suggested that there might be a return, in a modified manner, to the treatment of lupus by X rays, incorporating Prof. Freund's method. He still used the erosion method extensively, followed by local caustics. It would probably be of advantage to treat the clear granulating wounds, after separation of the sloughs, by exposure to X rays on the lines advocated by Prof. Freund. He had already tried the plan in two recent cases with promising results.

SECTION OF OTO-RHINO-LARYNGOLOGY.

Dr. **WELLS P. EAGLETON** (Newark, New Jersey) opened a discussion on the

CEREBRO-SPINAL FLUID AS AN AID TO DIAGNOSIS AND TREATMENT OF INFLAMMATORY INTRACRANIAL LESIONS.

Referring briefly to the arrangement of the primitive central nervous system, he went on to remind his audience that in mammals, including man, the mesh of the arachnoid mater grows out from the arterial system of the brain. Knowledge of that system enabled them therefore to construct a surgical map of the arachnoid and of the basal cisternæ. Where nerves left the cranium they carried a prolongation of the arachnoid as a fine tubular investment. So fine were the spaces of that system that they would retain the smallest concrete particles, though permeable to fluids. Any inflammation travelling along the nerves caused a reaction in this fine tube and completely obliterated it, shutting off the infected area from the basal cisternæ. But when we left the base of the brain there was no longer a system of large arachnoid spaces but a very fine network. Over the vertex we were concerned mainly with venous transmission of infection. The intracranial veins might be divided into the extradural veins and the venous sinuses, both of which had a dense fibrous coat; on the other hand, the cerebral veins had no outer coat, the place of which was supplied by prolongations of the arachnoid. Any inflammation involving these veins immediately involved the arachnoid. This explained the extreme virulence of intracranial complications of throat infections, which are borne by blood to the cavernous sinus. The clinical picture was not that of meningitis, but began with delirium and proved rapidly fatal. The problem of vertex meningitis was therefore that of the veins, while basal meningitis was concerned with the cisternæ. The arachnoid was part of the general protective mechanism of the body, a low-grade connective tissue. On infection, a rapid proliferation of cells occurred.

The cerebro-spinal fluid was entirely derived from the blood from all the vessels in the arachnoid, not from the choroid plexus alone. The latter did secrete chloride into the fluid, the chloride content of which was higher than that of the blood. The glucose content, however, was identical with that of the blood. In addition, the cerebro-spinal fluid contained a lytic ferment capable of digesting dead brain tissue, a fact that could be demonstrated in vitro. This process accounted for the pyrexia and convulsions that might occur following brain injury, and the presence of a toxin in the circulation (derived thus from the cerebro-spinal fluid) could be demonstrated by injecting the serum of a patient into an animal, producing convulsions in the latter. The cells found in the cerebro-spinal fluid were derived entirely from the arachnoid.

Points in Interpretation.—In interpreting the results of lumbar puncture in an inflammatory case he relied on the following points. Increase of pressure indicated irritation of the arachnoid. Disappearance of glucose meant that it had been consumed by bacteria. Diminution of the chlorides was of the gravest significance, and meant that the barrier between fluid and blood was breaking down. Increase of globulin indicated degeneration of brain cells. A yellow fluid was found when the blood was becoming disorganised and should be considered a presage of impending death. The site of a possible lesion should also be considered. For example, an effusion of blood in the posterior fossa produced all the symptoms of meningitis, with pyrexia and head retraction; in the anterior fossa it produced no signs unless it was large. Loculation might occur in inflammatory lesions, especially of the frontal region, and should be regarded as Nature's attempt to wall off the disease.

Diagnostic Points.—Papillœdema indicated one of three things: venous obstruction, renal disease, or interference with return flow of cerebro-spinal fluid. It was thus often a sign of cerebral abscess. The otologist had several diagnostic tests to assist him. Absence of a response on caloric stimulation of the labyrinth when the head was upright (a normal response being found in the supine position) was an early sign of increasing intracranial pressure. Absence of reaction in all positions was of grave significance in meningitis, unless due to disease of the labyrinth itself. An effusion of blood in the posterior fossa produced a permanent diminution of the reaction to rotation, a point of great medico-legal importance. If there were infection of the frontal area the fluid from a lumbar puncture might be quite normal. The infection was then localised in the subdural space. In the middle fossa no local accumulation of cerebro-spinal fluid occurred, the infection passing directly into the brain; except that in fracture cases a loculation similar to that seen in the frontal region might be found. In the posterior fossa the arachnoid was divided into two compartments by the brain stem; a local collection of fluid in the posterior compartment might lead to sudden death, especially if lumbar puncture were done. Other symptoms of localising importance were the euphoria and mental changes seen with frontal lesions. If the middle fossa were involved there was pain from affection of the fifth nerve, and characteristic indentations of the visual field. When the posterior fossa was infected one saw the basal cisterna complex—pain behind the eye, attacks of stiff neck of varying duration, external rectus paralysis, contraction of the visual fields, and a semi-comatose condition.

Treatment.—Referring briefly to treatment, Dr. Eagleton expressed his belief that the proper course was to remove the primary focus of infection, and to evacuate any localised collections of infected cerebro-spinal fluid. In addition, he ligated the common carotid artery of the same side; this was fairly safe if done under local anæsthesia and if the eye was continually under observation during the operation. He did not regard continuous irrigation of the spinal spaces as a practical measure; it did no good, and might do great harm. Nor was anything effected by injecting drugs into the theca. In order to be at all disinfectant they had to be at a strength which instantly killed nervous tissue. He had recently experimented with intracarotid injections of mercurochrome.

The Significance of Variations in the Cerebro-spinal Fluid.

Dr. J. G. GREENFIELD (London) said that the point of greatest importance was whether the infection of the meninges was local or general. The cerebro-spinal fluid might vary from normal to that indicative of generalised septic meningitis. Reduction of chlorides he considered to be due to a septicæmia, and not to indicate damage to the meninges. Glucose examination he thought of no great value in this class of case. Increase of protein with a normal cell-count indicated a chronic cerebral abscess and was due to œdema of the brain and not to meningeal changes. A high proportion of protein to cells was unusual with a localised meningitis only. A turbid but sterile fluid with normal chlorides and perhaps only intracellular cocci indicated a localised meningitis, and the prognosis was not necessarily bad.

Dr. H. COHEN (Liverpool) stressed the importance of the chemistry of the cerebro-spinal fluid. He did not attach great importance to a diminution in chlorides alone, which was usual with any profound toxæmia. But in generalised meningitis the chemical constituents of the fluid tended to approximate to those of the blood. When therefore uric acid and phosphates of the fluid rose, and the chloride content fell, the outlook was bad. The significance of cells and of bacteria was less; thus with a cerebral abscess there might be many polymorph cells but the chemistry was normal, since the meninges were undamaged, and the prognosis might be good. He did not agree that there was any encephalolytic ferment in the normal cerebro-spinal fluid. Dead brain would autolyse in saline. But disintegration of brain tissue did alter the fluid in one important way—viz., it gave a strongly positive Wassermann reaction. This did not indicate syphilis, and knowledge of this point was of the greatest importance from the clinical aspect.

The PRESIDENT spoke of the great value and importance of an early report on the cerebro-spinal fluid in these cases. The examination was made as a matter of routine with all his own cases of this nature as soon as they were admitted to his wards, and the report was thus available at his first visit. So important was it that a resident pathologist had been appointed to the Manchester Royal Infirmary.

Mr. W. MOLLISON (London) read a paper on the

Drug Treatment of Spasmodic Rhinorrhœa.

He had employed thyroid gland for cases associated with pregnancy, and in two such, as well as in others not so associated, had had striking successes. The drug on which he ordinarily relied was calcium, either as the lactate, colloidal, or as kalzana. With the calcium he gave small doses of parathyroid extract. The results he had obtained with all treatment had been very variable. Frequently there was no effect at all, in other cases the treatment was completely successful. Of 40 consecutive cases, 15 were cured, 11 improved, 5 in statu quo, and 9 untraced.

Mr. LINDLEY SEWELL (Manchester) spoke of the importance of a sudden access of cold in bringing on an attack. Thus to get out of bed on to a cold floor might produce one. He had used kalzana. He thought the best results were obtained from a strictly vegetarian diet (excluding even milk, cheese, and eggs), and from sea air. The latter seemed particularly effective if it blew over a wide expanse of sand or mud. Any obstruction in the middle meatus of the nose must be removed.

Dr. J. ADAM (York) referred to the importance of general treatment, and the value of a cold douche after a warm bath in promoting vasomotor tone. He relied little on drugs.

Mr. F. HOLT DIGGLE (Manchester) considered that three factors had to be considered: 1. Endocrine disturbance. Diagnosis was difficult, but a polyglandular treatment was often effectual. 2. Infective. The condition followed an acute infective condition such as appendicitis; such cases were very intractable. 3. Neurotic. Hypopiesia was often the characteristic feature, and cure of the latter relieved the rhinorrhœa.

Mr. T. RITCHIE RODGER (Hull) read a paper on the

Reproach of the Chronic Running Ear.

He pointed out that the principal difficulty arose from the indifference of the general public to the importance of treatment; this indifference was being to some degree diminished by the work of school clinics. Prevention was better than cure; an early paracentesis would in many cases avoid a chronic otorrhœa. If in spite of active treatment, including removal of adenoids, the acute ear continued to discharge, an early resort should be had to mastoid drainage. Aural discharge that continued despite treatment for a month indicated mastoid disease; operation should not be postponed beyond the sixth week. A determined effort was necessary to impress the importance of early, vigorous, and complete treatment.

Mr. H. NORMAN BARNETT (Bath) said that he did not think the treatment afforded by school clinics was very effective. If simple treatment did not rapidly cure otorrhœa, mastoid disease was present. Although in certain cases zinc ionisation gave good results, he urged the importance of early operative measures. It was futile to continue with palliative measures that were not rapidly successful. The Schwartze operation was in most cases all that was needed. It was very safe and gave very good results.

Mr. C. A. SCOTT RIDOUT (Southsea) assigned great importance to early and vigorous treatment. After paracentesis or perforation he did not like to wait beyond three weeks unless the ear was healing, but did a Schwartze operation. That operation was very successful, and offered no bar to recruitment to the public services. He had observed that operation for the otorrhœa following acute fevers was often too long postponed.

Dr. J. ADAM said that he had found that in chronic otorrhœa very frequent lavage was effective. Every two hours the patient's ear was thoroughly syringed by a trained nurse; he had found an enormous improvement in the chronic cases so treated, few proving intractable.

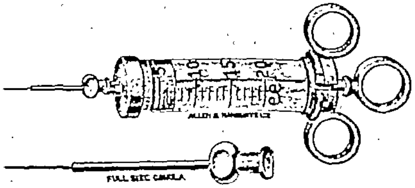
Mr. F. B. GILHESPY (Birmingham) said that he had been impressed by the importance of measles in the ætiology of chronic otorrhœa. In a large series of cases it was the starting-point in 1 in 4, and it had to be remembered that very many children suffered from this disease before school age. Local authorities were very difficult to move in this matter, but quite recently four beds had been assigned in Birmingham for the operative treatment of school-children.

Mr. R. SCOTT STEVENSON (London) had been impressed by the enthusiasm of school authorities, including medical officers, for ionisation. On the other hand, the general body of aural surgeons did not feel it. His own experience with this method was disappointing. Simple cleanliness was sufficient in most cases, and he believed that if the ear was meticulously cleaned it made no difference at all whether it was then ionised. He had tried both treatments in parallel series of cases, and had been forced to this conclusion: nearly all cases cleared up with cleaning alone; the remainder were resistant to ionisation and required operation.

New Inventions.

A VASOTOMY SYRINGE.

IN making an injection into the vas when doing a vasotomy two matters of primary importance in connexion with the cannula used are: (1) its point should be constructed so as to avoid damaging the inner lining membrane of the tube, and (2) the calibre should so fit the lumen of the vas as to prevent, if possible, any leakage out of the vasotomy opening of the fluid being injected. To overcome these difficulties I have had made a syringe, with fine bayonet-fitting and stainless steel cannulæ, which cannot become detached whilst the injection is being given. The cannulæ—made in four calibres, 21, 22, 23, and 24 standard wire gauge—are each mounted in a shaft which forms a shoulder. This shoulder effectually prevents the cannulæ from being inserted too far into the vas, eliminates the possibility of puncturing it lower down, and occludes the remainder of the vasotomy opening.



Messrs. Allen and Hanburys, Ltd., of Wigmore-street, London, are the manufacturers of the syringe.

London, W. J. F. PEART, F.R.C.S.I.

Reviews and Notices of Books.

THE WORK OF MEDICAL WOMEN IN INDIA.

By MARGARET I. BALFOUR, C.B.E., M.B., C.M., late Chief Medical Officer, Women's Medical Service, India; and RUTH YOUNG, M.B.E., B.Sc., M.B., Ch.B., Personal Assistant to the Chief Medical Officer, Women's Medical Service, India, and Lecturer, Lady Hardinge Medical College, Delhi. With a Foreword by Dame MARY SCHARLIEB, D.B.E., J.P., M.D., M.S. London: Humphrey Milford, Oxford University Press. 1929. Pp. 201. 9s.

SOME ten years ago, in connexion with the annual report of the National Association for Supplying Female Aid to the Women of India (Countess of Dufferin's Fund), we took occasion to plead once again for the establishment of a Government service, holding that the task of providing Indian women with adequate medical attention was beyond the power of any unofficial body, however richly subsidised. We expressed the view that with the limited resources at their disposal it would be wiser for the Women's Medical Service to restrict their activities to a narrower field so as to ensure more assistance, better pay, and more adequate equipment for those medical women officers who had undertaken to live and work in India. This criticism brought a reply from Dr. Margaret Balfour, at that time joint secretary to Lady Dufferin's Fund, to which we gladly gave publicity. In this letter she explained the curious difficulties in administration and finance under which the Fund struggled to maintain its position and influence in the absence of complete official recognition. The arguments were impressive. The claim of the Women's Medical Service to a status equal to that of the I.M.S. has always been advocated in our columns, and in our Students' Number the conditions of the Service receive annual recognition. Dr. Balfour became Chief Medical Officer of the Service in 1920, retiring some years later only to return to India for research work on maternal mortality. She has now from her unrivalled experience both inside and outside the Service, and with the collaboration of Dr. Ruth Young, produced a book on the work of medical women in India which demands serious study. It is now nearly 60 years since the first medical woman landed in India. Most of the earlier pioneers have died; some of them survive but no longer do active work. It is right that the new generation of medical women should realise the efforts and achievements of their predecessors in order that their enthusiasm for future developments may be kindled and that their criticism of present conditions may not be too severe. *Dr. Balfour and her collaborator* survey the field of work and briefly explain the purdah system and those problems of caste and racial custom which make the need of medical women in India greater than in any other land. Admittedly the greatest handicap to the advancement of Indian women in any direction is their lack of education. The Indian woman, according to the authors, is not "groaning for release from the purdah or pining for the blessings of education. . . . The reason for pressing reform and education is not so much the happiness of individuals, but the improvement of the whole standard of Indian life by enabling women's influence to permeate society." A chapter is devoted to the praise of famous women and of others whose names have escaped recognition in Europe. The steps whereby the Countess of Dufferin's Fund has expanded into the Women's Medical Service for India are set out; the work of women medical missionaries is discussed and also the conditions of private practice. The history of medical education of women in India is briefly outlined. The figures for 1928 show that 253 women students were studying for a University course in India last year, 121 in the Lady Hardinge Medical College for Women only, and 132 distributed in the mixed medical schools of Madras (63), Bombay

(50), Calcutta (18), and Lucknow (1). In addition there were 5 taking a course for certified practitioners (apothecaries) and 445 studying to become sub-assistant surgeons. The last part of the book is taken up by a discussion of the present position of preventive medicine in India and of miscellaneous activities in which medical women have been concerned; three short appendices respectively on maternal mortality, infant mortality, and early motherhood show how difficult it is to collect accurate statistics in India.

The authors have given a balanced presentation of the work of medical women in India, past and present, and have set out their ideas of its future needs. It would be unfair to summarise still further the closely written argument in which the direction of future development favoured by these experienced workers are outlined. It should be studied alike by the enthusiasts and the sceptics among those concerned with the provision of medical aid to the women of India.

LABORATORY METHODS.

1. *Die Laboratoriums-Methoden der Wiener Kliniken.* Herausgegeben von H. K. BARRENSCHEIN und R. WILLHEIM. Leipzig: Franz Deuticke. 1928. Pp. 800. M.44.

2. *Clinical Laboratory Procedures.* By GEORGE L. ROHDENBURG, M.D., Director of the Laboratories, Lenox Hill Hospital, New York. New York: The Macmillan Company. Pp. 266. 14s.

3. *Laboratory Manual of the Massachusetts General Hospital.* Second edition. By ROY R. WHEELER, M.D., and F. T. HUNTER, M.D. Philadelphia: Lea and Febiger. 1929. Pp. 101. $1.75.

1. ATTEMPTS to include the whole field of modern laboratory technique in one volume will soon have to be abandoned since the essence of these books must be a detailed account of technique. There are very few methods of investigation, whether in biochemistry, bacteriology, serology, or hæmatology, which have escaped attention from Dr. Barrenschein and his colleague, although pressure on the space has cut down many descriptions to an absolute minimum. On the other hand, room has been found for mention of the snags which await the investigator, and the arrangement of the book is admirable. Certain inclusions and exclusions are surprising. The serological diagnosis of tumours is given great prominence, with many alternative methods. So is the laboratory diagnosis of pregnancy, including even a reference to extra-uterine pregnancy. And there is a chapter on cinematography and photomicrography. Among the omissions we note the serological diagnosis of hydatid disease, the skin reactions of asthma, and the complement-deviation test for gonorrhœa. Little help is given in the search for *Entamœba histolytica*, and the cyst illustrated is not characteristic. No references to fuller descriptions of methods are supplied. But most laboratory workers will find a use for this book, if their duties take them off their beaten track.

2. In his preface Dr. Rohdenburg states that this is a collection of laboratory methods which in his hands have shown their relative simplicity and clinical accuracy over a period of years. No claim is made for originality, free use having been made of all current text-books. The selection only of those methods of which the author has personal experience prevents the perpetuation of errors, but it is doubtful whether this is a valuable addition to the vast library of works on clinical pathology of trans-Atlantic origin. Unlike most of its fellows it has no illustrations; in so far as this saves space it is an advantage, but the advantage has been counterbalanced by the insertion of blank pages. In theory such blank pages are meant for notes; in practice they serve the young and zealous for the collection of an interesting series of samples of reagents, most of which are soon forgotten. Viewed in later years these bring back memories of happy student days as nothing else can, and occasionally supply a triumphant solution to a problem. Rarely, however, will any worker make a useful private collection that fills up more than a fraction of the space here provided.

3. The book by Dr. Wheeler and Dr. Hunter, unlike many of its kind, gives a good deal more than it promises. Only the first three chapters are devoted to laboratory technique, and though they are adequate they contain nothing beyond what can be found in most manuals of clinical pathology. The remaining three chapters, however, deal with special diagnostic procedures, therapeutic technique, and prophylactic measures, and are mainly concerned with work at the bedside. Here is assembled material hitherto available only in a scattered form in various books and papers. The technique of such procedures as the liver function test by phenoltetrabromphthalein, the Dick test, duodenal intubation, blood transfusion, cisternal puncture, and a host of others is clearly described. These three chapters are really valuable and should be of great service to the hospital resident and to the pathologist with clinical interests.

LES ACCIDENTS DE LA CHOLÉCYSTECTOMIE.

By SERGE HUARD, Ancien interne des Hôpitaux de Paris. Paris: Masson et Cie. 1929. Pp. 116. Fr.16.

THIS is a good review of the dangers of cholecystectomy. The anatomy of the bile-passages and hepatic artery is elaborated with all the variations which have been described. The author's contention is that irregularities are common enough to render hazardous the classical methods of removing the gall-bladder, and that the patient's safety depends rather upon the skill of the surgeon than the suitability of the technique. A new method for cholecystectomy is described of which the essential features are the separation of the gall-bladder from the liver first in the middle of its length; then those structures in the gastro-hepatic omentum which are liable to injury are pushed backwards and to the left without being exposed to view. There is nothing radically new in the procedure, which has only been performed in six cases. There is an interesting résumé of reported examples of injury to the ducts or artery.

GYNECOLOGY.

Fourth edition. By WILLIAM P. GRAVES, A.B., M.D., F.A.C.S., Professor of Gynecology at Harvard Medical School; Surgeon-in-Chief to the Free Hospital for Women, Brookline. London: W. B. Saunders Company. Pp. 1016. 48s.

IN this country we have learned to regard the frequent appearance of weighty and encyclopædic tomes as a characteristic feature of American medicine. Yet each new edition awakens fresh wonder at both the reproductive and the absorptive powers of our professional brethren in the United States.

The volume is divided into three parts. The first part, representing about one-fifth of the whole, is taken up with physiology and the relationship of gynæcology to the general organism. The section on the physiology of the uterus and ovaries is excellent so far as it goes and has been brought up to date by the inclusion of recent work on the menstrual cycle and the functions of the corpus luteum. The separation of obstetrics from gynæcology, customary in America, makes the attempt to discuss the physiology of these organs apart from their reproductive functions appear illogical. The relation of gynæcology to the breasts, skin, and to the digestive, circulatory, nervous, and other systems is also discussed only in so far as menstruation and disease in the reproductive tract are concerned, not from the wider aspect of its relation to the reproductive function as a whole.

Part 2 covers the diseases of the reproductive tract classified on a pathological basis. Inflammation is considered under the two headings of special inflammatory processes, almost wholly devoted to gonorrhœa and tuberculosis, and general inflammatory processes, *in which an anatomical arrangement is adopted* and the infections of the various portions of the reproductive apparatus are described together with those of the urinary tract and pelvic portions of the bowel. In our view no adequate perspective of the infections of the reproductive organs can be obtained, if due consideration is not given to those arising from the reproductive process itself. Here the venereal infections appear to have undue prominence, whilst post-partum and post-abortum infections do not receive attention commensurate with the part they play in the causation of pelvic infections. Such conditions as chronic metritis and chronic subinvolution are dismissed with less discussion than is warranted by their clinical importance. New growths are exhaustively treated and well-illustrated, and the other aspects of gynæcology receive their fair share of attention.

Part 3 on operative gynæcology takes up about a third of the pages. Here a full account of the details of surgical procedures is given and this forms the most distinctive feature of the book. It is profusely and clearly illustrated—so much so that many of the operations seem simpler and easier than they will be found to be in practice.

THE SCIENCE OF CHARACTER.

By LUDWIG KLAGES. Translated from the sixth German edition by W. R. JOHNSON, B.A. London: Geo. Allen and Unwin, Ltd. 1929. Pp. 308. 10s. 6d.

GERMANY seems to welcome an occasional revolt against the narrow confines of the professorial world; an extreme example is the movement for "Schools of Wisdom," associated with Prof. Count von Keyserling. Ludwig Klages is also known for his unconventional educational ventures, but has not gone so far from the beaten track. Apart from the somewhat sweeping cultural vision which takes all knowledge to be its province, the author's approach to the study of character is not unorthodox; but unlike most recent observers, Dr. Klages uses the static method. Modern psychological approaches to the genesis of character traits are concerned with finding the processes at work. Dr. Klages takes up the older standpoint and describes character, character traits, and peculiarities making for disorder. It must be admitted that he does this very well, with a culture and equipment that more fertile minds might envy.

SPEECH AND HEARING.

By HARVEY FLETCHER, Ph.D., Acoustical Research Director to the Bell Telephone Laboratories. London: Macmillan and Co. 1929. Pp. 331. 21s.

THE art of analysing and accurately measuring electrical currents, and the characteristics of mechanically vibrating systems, having reached an advanced stage of development, it became apparent some 15 years ago to the Bell Telephone System that great advantages would accrue from a similar analysis of speech and hearing, to enable their technicians to engineer their instruments with greater intelligence. This investigation has been proceeding ever since at their research laboratories; a considerable part of the effort has been devoted to securing devices which would convert sound waves into electrical form and back again with the least possible distortion, and out of these researches have come large and unexpected returns in the application of such devices to gramophones, to radio reception, and to apparatus for testing defects of hearing. Dr. Harvey Fletcher has embodied the results of these researches in a large and interesting work of which Part I. is concerned with the mechanism of speech and the characteristics of speech-waves, Part II. with the physical properties of music and noise, Part III. with hearing, its mechanism, limits of audition, and means of testing, and Part IV. with the perception of speech and music, the recognition of pitch, the effects of distortion, and kindred matters. That section of the book which deals with hearing is the most interesting to the medical man. On the theories of audition, Dr. Fletcher states his conviction that the evidence is overwhelmingly in favour of an extension of the theory originally proposed by Helmholtz, the modifications being introduced by our greater knowledge of the mechanics of the cochlea, and particularly of the effects of "loading" of the fibres of the basilar membrane by the surrounding fluid on the lines suggested by G. Wilkinson and A. A. Gray. The excellent description of various types of audiometer has a special interest, for there is little doubt that these instruments will be in general use by otologists in the near future. A very interesting form is one to be used for testing large groups to find those whose hearing is deficient for speech; the instrument is of a gramophone type in which the sounds gradually decrease in intensity; these sounds are conveyed by electric wires to receivers in the ears of those to be tested, who write down what they hear as in a dictation lesson. It was tried in a public school in New York City; 40 pupils could be tested at a time, and about 100 in an hour. There are also valuable tables for correlating the results of tests by tuning-fork, watch, speech, and audiometer.

The book is full of detail, and, though the many mathematical formulæ make somewhat stiff reading, could hardly be improved upon.

PSYCHOLOGY.

The Health of the Mind. By J. R. REES, M.D., Deputy Director of the Tavistock-square Clinic. London: Faber and Faber, Ltd. 1929. Pp. 201. 6s.

AMONGST the books on Modern Psychology for the use of the intelligent layman, this little volume ought to take a worthy place. The author starts from the neurological approach to bodily mechanisms—considering particularly the conditioned reflex and the endocrine glands. The influence of mind on body and of body on mind is dealt with in a separate chapter. This topic, however, cannot be discussed very deeply in a popular book, and the philosophic pitfalls are left uncovered. The rest of the book deals with psychological mechanisms, mental breakdown, and the problems of adolescence and childhood. The explanations brought forward are substantially based upon the discoveries of Freud, whom the author does not follow into the deepest recesses. However, the book illustrates both in vocabulary and in interpretation the indebtedness which all psychotherapists must admit to Freud and his school. The author gilds the pill, and makes what to many layman would have been a nightmare as recently as ten years ago a clear and adequate explanation of mental distress and failure.

The A B C of Psychology. By C. K. OGDEN, Magdalene College, Cambridge. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 270. 6s.

WE have learnt to expect learning combined with liveliness in anything from Mr. Ogden's pen. This book does not disappoint us, for his exposition has a freshness surprising in a text-book. In fact this volume is not a text-book in the strict sense of the word, but is an introduction to a subject which has already been departmentalised to an alarming degree. The book begins with a terse definition of the basic terminology, and in the text that follows additional terms are fully defined. Mr. Ogden's linguistic theories give a refreshing bias to his view of the body-mind problem, and his account of nervous mechanisms associated with mind is coloured by the work of Pieron and Watson. In his concise note on psychopathology he gives Freud the credit due to a discoverer and a pioneer without slavish acquiescence in the detail of psycho-analytic theory. In the last 20 pages a number of psychological oddments, such as mental aspects of facial asymmetry, calculating boys, and musical prodigies are touched upon. In short, the author has his little fling before closing the book, and leaves the reader well entertained and disposed for more serious reading in psychology.

RADIUM IN CANCER.

The Conquest of Cancer by Radium and Other Methods. By DANIEL THOMAS QUIGLEY, M.D., F.A.C.S. Philadelphia: F. A. Davis Company. 1929. Pp. 439. $6.00.

THIS book contains the results of 15 years experience in the treatment of new growths by radium, together with a summary of the ætiology and pathology of the disease and an account of the uses of radium in non-cancerous conditions. The author has many good things to say and it is to be regretted that he has not succeeded in saying them more effectively. Particularly wholesome is his insistence on the necessity for diagnosing and treating cancer in its initial and curable stages, attention having been too much concentrated on the late stages of the disease. Dr. Quigley's manner of writing is confused and verbose, although he makes many dogmatic statements on subjects in which dogma is least justified. He complains that in his country the medical profession has not educated itself in the knowledge of cancer and that the treatment has consequently gravitated largely into the hands of quacks. He therefore advocates the concentration within the profession of all the scientific knowledge necessary to control the disease. But it may be doubted if the cause of science is advanced by the statement that the origin of tumour growth "cannot be other than the presence of low grade micro-organisms." The statement is entirely undocumented, as is every other statement in the book.

The time is not yet ripe for this kind of book, even if it had been better written. Precise information, which is here withheld, can alone decide the issue between radium and radical surgery, so that this book is useless to those who are seriously interested and misleading for the general or ill-informed reader. The volume contains 334 illustrations, some of which are good.

Reports and Analytical Records.

THE GERMICIDAL ACTION OF LISTERINE ANTISEPTIC.

(MANUFACTURERS: THE LAMBERT PHARMACAL CO., ST. LOUIS, MO., U.S.A. DISTRIBUTORS FOR GREAT BRITAIN AND IRELAND: S. MAW SON AND SONS, ALDERSGATE-STREET, LONDON, E.C.1.)

THE manufacturers of Listerine Antiseptic asked that their product might be examined for germicidal action by the methods described by their chief bacteriologist, Dr. George F. Reddish (formerly associate professor of bacteriology in the Medical College of Virginia, U.S.A.). Dr. Reddish has contributed many papers to the American journals on the subject of germicidal values and their determination and, as a result of the study of the action of phenol on newly isolated strains of various organisms, has suggested "standards" by which such organisms as *Staphylococcus aureus* and streptococci may be judged, in order that strains of equal resistance to antiseptics may be recognised and used in testing any unknown antiseptic preparation. For the purpose of the experiments here recorded, organisms conforming to the standards suggested by Dr. Reddish have been isolated and used. The culture medium has been prepared according to the formulæ given in the papers referred to, and the technique laid down by Dr. Reddish has been followed very closely.

The tests were conducted with *Staphylococcus aureus, Streptococcus hæmolyticus* and *viridans*, pneumococcus, and *Bacillus acidophilus* odontolycus types I. and II.

1. *Determination of the "Killing Time."*

The technique employed for the first test consisted of adding 0·5 c.cm. of a suitable broth culture of the organisms to be tested to 5 c.cm. of Listerine at 37° C. Subcultures were made with a large platinum loop into 5 c.cm. quantities of a broth suited to the growth of the organism. Owing to the short time required for the death of the organisms several separate experiments were necessary to find an exact end-point. In each case the very slightest growth, visible at the end of 48 hours, was confirmed by streaking some of the broth suspension on to agar. The *majority* of the organisms present were actually killed therefore in much less time than that recorded.

Staphylococcus aureus	20	seconds
Streptococcus hæmolyticus	20	,,
Streptococcus viridans	15	,,
Pneumococcus	10	,,
Bac. acidophilus odontolycus type I.	20	,,
Bac. acidophilus odontolycus type II.	20	,,

2. *The Number of Organisms Killed.*

Using the same strains of organisms as were used in the first series of tests, plating experiments were carried out to determine the number of organisms killed in 15 seconds at 37° C. The method employed consisted in adding 0·5 c.cm. of broth culture of the organisms under test to 5 c.cm. of undiluted Listerine: 1 c.cm. of the mixture was then diluted with 99 c.cm. of sterile saline at the end of 15 seconds. Subsequent dilutions were carried out in order that 1 c.cm. of a final dilution might produce a suitable number of colonies when added to 15 c.cm. of melted agar (temperature 55° C.) and cultured at 37° C. in a Petri dish. The colonies developing in 48 hours were counted, using a Pake's disc for the purpose. Control cultures, made by substituting 5 c.cm. of sterile saline for the 5 c.cm. of antiseptic, showed the number of *viable* organisms present in the 0·5 c.cm. of culture used for the tests. In this way an exact estimate of the number of organisms *actually killed* was obtained. The average result obtained from three estimations in each case was recorded:—

	Millions of organisms killed in 16 seconds at 37° C.
Staphylococcus aureus	612
Streptococcus hæmolyticus	650
Streptococcus viridans	720
Pneumococcus	More than 800
Bac. acidophilus odontolycus type I. ..	640
Bac. acidophilus odontolycus type II. ..	606

3. *Experiments on Serous Membranes.*

By means of animal experiments, whereby the effects of injecting the antiseptic into the various body cavities was studied by killing the animals after the lapse of varying periods of time, the antiseptic was proved to be perfectly safe for use in all the body cavities.

4. *Conclusions.*

1. The statement of the manufacturers in regard to the killing times of various organisms is substantially correct.

2. The actual number of micro-organisms killed in 15 seconds by the undiluted antiseptic exceeds that claimed by the manufacturers; over 600 millions were found to be killed in the 15 seconds time limit compared with the 200 millions mentioned by the makers.

3. The antiseptic has been proved to be perfectly safe for use in all the body cavities.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 21, 1929.

DIETARY PRINCIPLES IN TUBERCULOSIS.

EVER since OTTO WALTHER issued his challenge at Nordrach to the digestive capacity of phthisical patients, dietetic methods have continued to take a leading place in the treatment of tuberculosis. It was in a way of speaking the first example of a serious attempt to deal with a deficiency disease. But this was all before the science of nutrition had properly arisen. The tragic lessons of underfeeding and starvation seen in Europe during and after the war have taught the vital importance of fats in bodily health, the subtle distinctions in quality of proteins and their constituent amino-acids, the influence of vitamins upon disease and the resistance to infection. The incidence of tuberculosis in particular has shown itself to be profoundly affected by such factors, and attention is turning from the mere sum-total of nourishment required to its nature and exact composition. Work at present being carried on in some continental clinics, notably in Munich and Berlin, has provoked a considerable interest in the German press, both medical and lay. This work has arisen from principles which may be shortly recapitulated, though it must be admitted that upon many points our knowledge is still far from complete. Inorganic salts in a diet, through their influence upon metabolism, and particularly upon water metabolism, are capable of affecting, either adversely or favourably, bodily processes in disease. The liability to infection is closely allied to the water-content of the tissues, as is seen in the poor resistance shown by œdematous tissues, and the latter is largely dependent upon the mineral constituents of the diet. Restriction of sodium chloride may lead to removal of water from the body, and it is possible that variations in mineral salts may in some degree affect the actual reaction of the blood and tissues themselves. Upon the view that the acid-base equilibrium may be shifted to the one side or the other, so may an "alkaline" or an "acid" diet be employed, though upon this subject we are as yet far from fully informed. It is, however, certain that sodium, whether in the form of chloride or carbonate, may act as a water-retainer, whilst such ions as calcium and magnesium are diuretic in action. A drying up of tissues has shown itself to be an essential mode of healing in many so-called exudative conditions, and the value of restriction in fluids and salt has been proved by many in the past and has found particular use in the hands of FINKELSTEIN, STRAUSS, and others in the treatment of eczema and wound infections, and of lupus.

An extension of this principle has now been proposed in the form of a partially salt-free diet for the treatment of other forms of tuberculosis. It originated with Dr. GERSON, of Bielefeld, Westphalia, and attracted the notice of Prof. F. SAUERBRUCH, who instructed his assistant, Dr. A. HERRMANNSDORFER to study Dr. GERSON'S methods and report.[1] A discussion followed before the Berlin Medical Society in July last to which our correspondent there has called attention.[2] Besides the limitation of sodium chloride in the diet, the sole feature to which H. STRAUSS[3] attributes its effect, the Bielefeld workers employ a substitute called mineralogen consisting of a mixture of potassium, calcium, magnesium, and other salts (the exact composition of the mixture does not appear[4]). The diet is, moreover, one in which fresh uncooked food with a high vitamin content is employed as far as possible with a corresponding restriction of carbohydrates. No attempt at over-feeding is made, but phosphorated cod-liver oil is given to the amount of nearly 2 ounces (45 g.) a day. A total energy value of roughly 3000 calories is advised, made up thus: protein, 90 g.; fat, 160 g.; and carbohydrate, 220 g. Protein is thought to lessen the sensitivity to infection, fats and lipoids to raise resistance, whilst carbohydrate excess is said to favour the spread of tuberculous lesions. The diet is thus one of very limited salt and relatively reduced carbohydrate content, in which raw food as far as possible is given, and in no sense one in which increased nourishment *per se* can be the ruling factor. There are obvious practical drawbacks to such a diet, as, for example, its high cost and its somewhat unappetising nature which may make it difficult to overcome the anorexia and idiosyncrasies of tuberculous patients. There is, however, no doubt in the minds of those who have employed it of the value of the diet in lupus. The figures given by HERRMANNSDORFER and others in Germany are impressive, and C. EMERSON has reported favourably from America. Results in bone and glandular tuberculosis seem to offer a definite advance on existing methods of treatment. In phthisis there is at present little unanimity. HERRMANNSDORFER reports definite benefit, and EMERSON in a series of ten cases obtained striking improvement. Others are sceptical and time will show whether hopes have been raised in vain.

Significant is the evidence that over-feeding may be actually harmful in pulmonary tuberculosis. The new testimony that limitation in carbohydrate intake may be beneficial is in accordance with the older experimental work of WEIGERT and with the newer work of E. ANDERSON, FINKELSTEIN, and others. A moderate protein allowance is supported by W. S. MCCANN, C. MARTIN, and others who have found the optimum amount for phthisical patients in bed to lie between 60 and 90 g. per diem. The value of a relatively high fat and lipoid content of the diet is nowhere denied, and a sufficiency of vitamins is clearly important. There is, however, no certain evidence that an excess of vitamins or fat can sensibly aid the body's resistance to tuberculosis. But the influence of mineral salts may well be of vital importance, and the work of STRAUSS, GERSON, SAUERBRUCH, and HERRMANNSDORFER may point the way to a realisation of this fact.

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FOOT-AND-MOUTH DISEASE.

EPIZOÖTIC stomatitis has long baffled Ministries of Agriculture and has given rise to political difficulties, national and international. At the Ayr Congress of the National Veterinary Medical Association, to which allusion was made in our last issue (p. 574), a rather more optimistic feeling seemed to prevail regarding the situation in this country. There are several reasons why such a feeling may be justifiable. Our knowledge of the disease has been considerably extended as a result of the last few years of research in this and other countries, much more is now known as to the longevity of the virus in particular circumstances, and this knowledge has pointed to certain probable sources of origin for the initial outbreaks. Further, there is less likelihood nowadays of the widespread escape of infection from an initial outbreak, as happened in 1923, owing to the strengthening of the Veterinary Service of the Ministry of Agriculture. We shall always be exposed to danger from slowness in reporting suspicious outbreaks on the part of the agriculturist, though it is probably true to say that to-day he is better educated in this respect and more alive to his responsibilities. Great Britain can, however, never afford to relax her watchfulness, and there is no better example than foot-and-mouth disease of the futility of a penny-wise pound-foolish policy. The extra expenditure involved in maintaining an efficient and numerically strong veterinary service, and the cost to the country of developing and extending research, are certainly repaid by results several times over. Research into animal diseases not only brings relief to the agriculturist, but it is of benefit to the public health, and for that reason commands the sympathetic attention of the medical profession.

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[1] Münch. Med. Woch., 1928, lxxv., 35; and Med. Klin., 1929, xxv., 1235.

[2] THE LANCET, August 24th, p. 404.

[3] Med. Klin., 1929, xxv., 1383.

[4] It can be obtained from Pharma, M. Loebinger and Co., Berlin, Wilmersdorfer-Strasse.

Our knowledge of the virus of foot-and-mouth disease has recently undergone a radical change. It was regarded not long ago as a fragile virus outside the animal body, whereas now it is known to be very highly resistant under certain circumstances; for example, it can live for a period of two years when kept chemically dry; it can live for months on just those things which are most likely to result in its being brought into contact with healthy animals, such as hay, straw, bran, and clothing; and it can live for long periods in certain parts of carcasses of animals killed in the incubative or clinically infected stages of the disease provided these carcasses are kept at low temperatures. The virus can only increase in quantity in the body of the living animal, but there it is manufactured in enormous quantity and in amazing concentration in a matter of a few hours. Such is the concentration of virus in the vesicles that fluid from them is still infective in minute dosage when diluted ten million times, which means, as was pointed out at the Congress, that a tablespoonful of such fluid would make 30,000 gallons of infective fluid. In spite of the living body being such a prolific factory for virus production, nevertheless the infected animal's system very quickly purges itself of the virus, so that a few days after full clinical manifestation of disease animals cease to infect their fellows even on close contact. In view of these and kindred facts there would seem to be no reason to assume the existence of farm animals or vermin which act as true carriers of infection. Certain circumstances point to the origin of outbreaks in Britain from virus imported from infected countries in the ordinary course of trade. One such source was discovered a few years ago in undressed pigs' carcasses imported from Holland into Scotland. The possibility of infection reaching us in hay and straw used as packing materials and distributed to farms is beyond dispute, but the fact is very difficult to prove. There is strong reason to believe that some of our initial outbreaks originating in pigs have been due to scraps of chilled beef fed to these animals; indeed, the last two outbreaks in the United States of America have been definitely traced to such scraps of meat sold as pigs' food on shore from ships touching at American ports. We are dependent upon the chilled beef producing countries at present for about 50 per cent. of our meat-supplies, and, as their largest customers, we have every right to ask those countries to control foot-and-mouth disease at least within the premises of the frigorificos, in order to eliminate the very considerable chances of animals being killed for export when in the incubative stages of infection. It is understood that the countries referred to are endeavouring to meet our wishes in this respect, though their task may not be an easy one.

The question of human infection with foot-and-mouth disease was touched upon at the Ayr Congress. It has, of course, long been known that children, like calves, if they drink milk from foot-and-mouth infected cows are liable to develop a fatal enteritis. The losses in calves in this way are considerable in countries where the disease is enzoötic. Cases of supposed foot-and-mouth disease have been reported in adults, but only very rarely, and the diagnosis does not seem to have been supported by experimental proof. An interesting feature of the disease is the existence of three serological types of the virus. An animal can be made to pass through three consecutive attacks of the disease on exposure, in succession, to the three types of virus, and doubtless it is this phenomenon occurring naturally which has led to the belief that the immunity acquired by a natural attack is relatively short as compared with immunity in some of the bacterial diseases. The immunity left by the attack of any one type of virus against reinfection by its own type is now known to last for several months, if not for more than a year.

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THE AGE OF MARRIAGE AND OF CONSENT.

AT the fourth session of the Advisory Committee of the League of Nations on Traffic in Women and Protection of Children held at Geneva in May, 1925, it was decided to institute an inquiry into the law relating to the age of consent and the age of marriage. The investigation has since been going on and replies have now been received from 42 countries. These are analysed in a report which was published at Geneva last year.[1] At first sight it would appear a simple task to compare the age of marriage and the age of consent in different States, but the inquiry was evidently not so easy as it might seem. The age of marriage is not absolute. There may be a minimum age not subject to exception; a minimum age under which, in exceptional cases, marriage may take place by dispensation; and an age, generally the age of majority, under which the consent of a third party is necessary. The age of consent is also subject to modification. It may be without exception, or with special provisos, governing for instance offences by juvenile delinquents who are of much the same age as or younger than the victim; again, specially severe penalties may be instituted for offences committed by persons in authority, such as foster-parents, guardians, or medical men. The committee was faced with the difficulty of classifying offences; eventually they decided to consider only cases of indecent offences against a boy or girl.

It does not require much imagination to see that the numerous divergences between the laws of various countries on these matters are not so unreasonable as they might at first appear. The desirability of a rigid minimum age of marriage appears obvious at first sight; but in practice where no exceptions are admitted the marriage age has generally been set very low. The advantage of some elasticity is shown in the fact that the common reason for exceptions, in the States where they are admitted, is the pregnancy of the girl while it also becomes possible to raise the age minimum. The comparative figures in European countries and in the British dominions for the age of marriage are rather surprising. Great Britain, for instance, and Australia, have the low minimum age, not subject to exception, of 14 years for males and 12 for females; South Africa has 12 for females, part of Poland 7 for both males and females. On the other hand, subject to exception, Belgium has 18 and 15 years for males and females respectively, Denmark 21 and 18, Finland 21 and 17, France 18 and 15, and Germany 21 and 16. With regard to the age of consent, too, there are great discrepancies. In Great Britain and most of the Australian provinces it is fixed at 16, without exception, for both sexes, the figure for France being 13, Belgium 16, and Italy 12; while among countries which have an age limit subject to special provisos, in the United States of America this varies between 10 and 18 in the different States; in parts of Czechoslovakia, for both sexes, it is fixed at 14, and in South Africa, for women only, it is 16. The figures are not all strictly comparable, since they are formulated on entirely different bases. In the laws of Eastern countries there is also a marked divergence. In Japan, the marriage age, subject to exception, is 17 for males and 15 for females, and in China 16 for both sexes not subject to exception. The age of consent, not subject to exception, laid down for females only, is 13 in Japan and 12 in China. In Egypt the age neither of marriage (18 for males and 16 for females) nor of consent (14 for both sexes) is subject to exception.

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[1] Publications of the League of Nations. IV.: Social. 928, IV., 20.

In many countries, however, the minimum age of marriage bears little relation to the lowest age at which marriage actually takes place. In Great Britain, for instance, it must be many years since any marriage of a girl at the age of 12 has been recorded. But in some races, notably in India, a very low age of marriage is still the custom. The Indian press has recently given much publicity to proposals for alterations in legislation for the ages of both marriage and consent. The position in India is complicated, as regards the contraction of marriage, by the necessity of providing for so many different communities. The actual age at which marriage may lawfully be contracted is, except in Christians, undefined, but marriage cannot lawfully be consummated in females under the age of 13. Dr. MARGARET BALFOUR and Dr. RUTH YOUNG in a book reviewed on p. 613 note that the principle on which the Hindu custom of early marriage is founded is that young people of both sexes are likely to lead chaste lives and form lasting affections for each other if brought together early. But they state that the progress of education as well as legislation is tending to discredit early marriage. The age of consent in India (14, or 13 if the girl is married) applies only to females. The revival of interest in the subject in India at the present time may be due partly to Miss MAYO's book "Mother India" and partly to the fact that the committee appointed by Government to consider the age of consent is expected to report shortly. The committee has, we understand, recommended the raising of the age of consent, and has expressed the opinion that a law penalising marriages between parties below certain ages is essential. The need for registration of marriages, which is not at present compulsory, is likely to be emphasised in the report. Meanwhile there are indications that any reasonable strengthening of the existing regulations would receive public support. At a recent meeting of the Social Hygiene Congress in London, Prof. CREW expressed the opinion that there is little or no difference between the age of puberty in the tropics and temperate climates. This view was not contradicted, although it is not in accordance with the general teaching of the past. If it proves to be well founded there can be no good climatic reason for maintaining such pronounced differences in the age of marriage as at present exist in different countries, and the trend of legislation is likely to be in the direction of uniformity at the higher age limits.

Annotations.

"Ne quid nimis."

NOISE.

SOME of our newspapers reproduce each day, from their hundred-year-old files, extracts whose triviality does not prevent their being sometimes more instructive than the records of important events. Thus we learn that the *Times* of Sept. 11th, 1829, reported complaints that officers had seized the horses of a stage-coach in the City and threatened to take them to the green-yard. The Lord Mayor, whose orders were in question, explained that it was his wish to prevent the disturbance of divine service, and that no one who went to church could deny that the noise of the stage-coaches frequently drowned the voice of the clergyman. Earlier references to the nuisance of street noises in London can be found, and residents of what is now the West End once complained bitterly of the bellowing and quacking that accompanied the market methods of the day. It is probable that traffic in our cities is now quiet in comparison with earlier periods, for the noisy impact of iron upon granite has been replaced by the almost silent contact of rubber and wood, though the spasmodic explosions, rattles, and hootings of to-day may be more disturbing than the continuous din of bygone times, and the householder living by a busy traffic route must reconcile himself to sudden onslaughts of rumbling and shaking, which may easily upset his temper and damage his dwelling.

Noise has lately become the subject of vigorous protest, and many ills are attributed to it. A direct effect is to be observed in boiler-makers' deafness, in concussion deafness, and in the temporary loss of hearing caused by exposure to the loud noise of machinery. The inability to converse with ease in a tube train affects alike all people with ordinary powers of hearing, and is accepted as inevitable. A similar inability in proximity to a pneumatic drill is apparently accepted as inevitable by the operator, but calls forth emphatic complaint from victims slightly more remote. Such obvious physical results of noise are not, however, its only offence. Health is said to be affected, and in his annual report for 1928 Dr. C. W. Hutt, medical officer of health for the Borough of Holborn, suggests that the use of the pneumatic drill should be prohibited on the ground of injury to the health of the workmen using it. Evidence of such injury would be a valuable contribution to the subject for, apart from the cases of deafness noted above, demonstrable effects of noise upon health are rare. Workers in noisy trades are not known to suffer from illnesses attributed to noise, and records of its influence upon output do not appear to be available. The Duchess of Bedford, in describing her recent flight to India and back, noted casually that all communications with the pilot had to be carried on in writing; yet the effect of noise upon the health of long-distance aviators is not a problem of importance, nor did anyone anticipate evil results to the contestants from the terrific roar of the machines in the recent Schneider Cup race. The ordinary noises of modern life are trivial when compared with this vibratory assault upon the human frame.

The real mischief of noise is not, then, any demonstrable physical effect upon health. It is unfortunately obvious that too many people—some drivers of commercial vehicles, for example—can endure it with equanimity, so long as they are producing it themselves; but to the busy brain-worker, to the sick, the nervous, or the wakeful, noise is a serious infliction to which adaptation may be impossible, though it is perhaps an unsafe proposition to advance that it can of itself induce nervous troubles. A distracted woman, who recently committed suicide after killing her daughter, left an emotional description of the noises that she declared had so tormented her as to lead to the final tragedy. The description was evidence of a mind that would have grasped at any object upon which to project its inner troubles, but the uncritical publicity given to the case fostered the idea that noise can serve as a primary cause of insanity or suicide—an idea which, in view of the contagiousness of emotional states, would be wisely omitted from anti-noise propaganda. Such arguments are not needed. It is sufficient that many nervous people are peculiarly susceptible to all kinds of stimuli, and they have at least the right to be protected from those unnecessary noises that the ordinary man resents. This resentment may well serve as our standard, for our unsophisticated likes and dislikes are reasonable guides to conduct, and did not, for example, await the progress of science to tell us that butter was a better food than margarine, or fresh air and sunshine healthier than the smoke of the town. We need not wait for scientific proofs of ill-effects from modern din; our desire for peace and quiet is the justifiable foundation of the campaign against noise.

STREPTOCOCCUS IN RHEUMATIC FEVER.

It is perhaps nothing more than a coincidence that the production of highly plausible evidence incriminating the streptococcus in scarlet fever has been followed by a recrudescence of the old theory that rheumatic fever is caused by an analogous organism. There is, however, a considerable difference between the two cases. In scarlet fever there is found a streptococcus which produces an exotoxin which kills rabbits and behaves like other exotoxins. In rheumatic fever a remarkably neutral organism is held responsible; and whatever toxin it produces is certainly of small virulence to animals. Three strains of this organism are discussed in the annual report[1] of the Metropolitan Asylums Board. These are Small's *Streptococcus cardioarthritidis*, Birkhaug's strain, and that of Lazarus-Barlow isolated in England. Dr. Lazarus-Barlow has described in an earlier communication how he extracts from these organisms an endotoxin which, when injected into rabbits, causes a slight rise of temperature and ill-defined lesions. He now relates an attempt to produce antisera to these three strains, and finds the rise in temperature diminished (but not prevented) when it is administered. But the antisera were strictly specific, each to its own strain. He concludes that the lesions produced in no way resemble those of rheumatic fever, and though he considers there is evidence of some endotoxin, this is no more virulent than that obtained from many strains held to be saprophytic. Of exotoxin there is no evidence at all. In a companion paper[2] Dr. N. Gray Hill is unfeignedly sceptical of any advantages following the administration of antisera prepared from these strains in acute rheumatism. Rheumatic fever, he remarks, is a disease running an uncertain and complex course, not to be compared with that of scarlet fever. Improvement following injections needs careful analysis and control, and in the 15 cases he describes he could find no evidence of improvement although serum rash was troublesome. An attempt was made to discover the frequency of occurrence of this type of organism in rheumatic and control cases. Fifty throat swabs in each series were forwarded, unidentified, to Dr. Lazarus-Barlow; 34 per cent. of the rheumatic and 42 per cent. of the control cases showed the organism. During the last three years Dr. J. C. Small, of Philadelphia, has recorded a remarkable series of cases showing the advantages of serum treatment with his specific antisera. The smaller series at Carshalton must be weighed in the balance on the other side of the scale. This series seems to show quite clearly that the incriminated organism is as widely spread among normal as among abnormal children, that it is of small animal virulence, and that evidence of antitoxin formation is scanty. Allowance must be made for variations in technique, but in the main Small's technique was followed by Dr. R. G. White at the Belmont laboratories of the M.A.B.

THE PREVALENCE OF GALL-STONES.

A STATISTICAL review of cholelithiasis, based on a scrutiny of the records of 9531 consecutive autopsies on patients of all ages performed in the General Infirmary at Leeds, is given by Dr. D. M. B. Gross, of the Department of Pathology of the University of Leeds. The basis of this review is the sounder for the fact that an autopsy is made on nearly every patient who dies in the infirmary. Taking the figures, then, as representing some 10,000 unselected individuals it appears that 6 per cent. of all men and 12 per cent. of all women have gall-stones. The age-incidence shown in the charts which Dr. Gross has drawn does not differ materially from what is commonly assumed, except for the demonstration that the solitary cholesterol stone is quite rare until the sixth and seventh decades. An entirely new fact, however, emerges from the statistics in regard to latency. In the 800 autopsies in which cholelithiasis was present the corresponding clinical notes and history gave no suggestion of their presence in 576 cases; in other words, cholelithiasis was latent and symptomless, so far as could be judged from the records, in about three cases out of four. The widely accepted notion that pregnancy contributes to cholelithiasis is negatived by this study; it offers no support to the view that gall-stones are more frequent in married than in single women. The conclusion Dr. Gross draws is that "the factors influencing gall-stone formation are common to both sexes, but more potent in the case of women. In addition to the common factors there is a sexual one, other than pregnancy, acting in women alone." The survey provides confirmation of the current opinion that faceted stones and pigment concretions are associated with cholecystitis, whereas the solitary cholesterol and mulberry stones are not. The association between the "strawberry" gall-bladder and the "mulberry" calculus is established on statistical grounds, apparently for the first time. There appears to be a definite relationship between diabetes and cholelithiasis, and also between atheroma and cholelithiasis. But no association between cholelithiasis—as distinct from cholecystitis—and peptic ulceration can be seen in the data here given.

THE DISCOVERY OF TWO DIFFERENT FORMS OF HYDROGEN.

WITHIN the past two years a discovery of more than ordinary importance was made in Germany, and excited great interest in scientific circles. The discovery consists in the theoretical prediction, followed by the experimental proof, that in ordinary hydrogen gas the molecules are of two kinds instead of being all alike. The new work led to much discussion at the recent meeting of the American Chemical Society at Minneapolis, and thus arose an impression in uninstructed circles that it had its origin in the United States. The discovery does not in any way upset present-day views upon the intimate atomic structure of matter, according to which the ultimate atoms of any element are composed of a positively charged nucleus inside a surrounding shell of negative electrons which annul the central charge. The atom of hydrogen consists of the simplest possible nucleus carrying a simple unit of positive charge, together with one neutralising electron outside. In the atoms of elements other than hydrogen the nucleus itself has a definite structure, being built up of a number of hydrogen nuclei together with a lesser number of electrons intimately welded together by forces whose nature is not yet understood. The electrons and the hydrogen nuclei are the fundamental material out of which other elements have been formed, probably under the extreme conditions of high temperature and pressure existing in the stars. The new work leaves this conception unchanged, because it differentiates not the atoms but the molecules of hydrogen into two kinds. Ordinary hydrogen gas consists of molecules, each molecule being a pair of hydrogen atoms held together by a chemical band in a dumbbell-like structure. According to the system of mechanical principles which has been found in recent years to apply to matter considered on the subatomic scale, there should be two possibilities for the hydrogen molecule; the difference is subtle, but can be indicated by a crude representation of each nucleus as having a spinning motion which obeys the new mechanical principles and not the principles of ordinary mechanics; and the small difference between the two different kinds of hydrogen molecule depends upon whether the two nuclei of a molecule happen to have their spinning motion in the same direction or in opposite directions. This idea of a spinning motion of the nucleus is an addition to the earlier and simpler view in which the hydrogen nucleus was considered merely as a positive electrical charge. The two forms of hydrogen molecule, which have been named by their discoverer, K. F. Bonhoeffer, orthohydrogen and parahydrogen, can be separated at very low temperatures, and have slightly different freezing points and boiling points. Mathematical physicists have for some time been engaged in elaborating new mechanical and electrical principles to account for the ultimate structure and phenomena exhibited by matter. The real importance of the discovery lies in the fact that it confirms the truth of the principles tentatively adopted and gives confidence that the work is being pursued on the right lines.

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[1] Further Investigations into the Ætiology of Acute Rheumatic Fever. By P. Lazarus-Barlow, M.D., assistant bacteriologist, Queen Mary's Hospital for Children. Annual report for 1928–29, p. 379.

[2] The Relationship of *Streptococcus Cardioarthritidis* to Acute Rheumatism. By N. Gray Hill, *M.C.*, M.B., B.S., D.P.H., assistant medical officer at the same hospital, ibid., p. 385.

ALUMINIUM SILICATE IN THE TREATMENT OF GASTRIC ULCER.

THE medical treatment of gastric ulcer in England at the present time is largely confined to dietetic methods combined with the use of various antacid remedies, such as atropine and alkaline salts. It is, however, of interest that bismuth carbonate is still used in large quantities either alone or in conjunction with the magnesias, although it is generally accepted that its virtue as an alkali is almost negligible. In assessing the popularity of bismuth it should be remembered that when originally employed it was chosen not as a neutraliser of acid, but in order to afford protection to the ulcer itself. In small doses this could hardly be achieved, but many physicians were accustomed to give it in considerable quantity in the belief that by settling in the ulcer crater it would assist healing. There is no doubt that when administered in sufficient quantity it is possible for barium and bismuth to remain for long periods in the craters of gastric ulcers; the phenomenon is one which has been observed by countless radiographers, but whether such a local plaster, as it might be called, is of any real therapeutic value is more doubtful. In recent times there has been a tendency in certain European countries, notably in Spain, to make use of aluminium silicate in the treatment of chronic gastric ulcer, and a certain number of successful cases, with X ray evidence of the healing of the ulcer under treatment, have been published[1] by Dr. F. Gallart Monés, of Barcelona. Treatment of these cases consisted chiefly of milk feeds given every three hours with 75 grains of a preparation containing aluminium silicate thrice daily; the results were satisfactory, the ulcer craters disappeared in X ray pictures, and the patients gained steadily in weight. It is a little difficult to decide to what extent the aluminium silicate was responsible for the results in these cases because, according to the author's own statement, alkalis were given in addition when pain was present; but there would appear to be grounds for believing that the substance selected is more suitable for producing a local protective effect than was its predecessor bismuth. The medical treatment of gastric ulcer still presents such difficulties, and the surgical treatment is so far yet from perfection that this new therapeutic suggestion appears worthy of further inquiry.

A POLYVALENT BACTERIOPHAGE.

THE differential diagnosis between cholera and dysentery is not always easy in the early stages, and the increasing use of the bacteriophage in the treatment of both infections has suggested the desirability of the preparation of a polyvalent form of this agent for use in tropical countries. From India, where d'Herelle and Maloine claim to have treated cholera successfully with the bacteriophage, J. Morrison and A. C. Vardon[1] report the production of a bacteriophage having a wide valency amongst different types of dysentery bacilli and strains of cholera vibrios. By combining various strains of bacteriophage, each of which had its activity raised to a maximun, they have built up a polyvalent mixture which they have tested upon a number of cholera and dysentery organisms in order to evaluate its full potentialities. The question whether the bacteriophage thus obtained is to be considered a true mixture of independent strains or a strain which has acquired polyvalent characters is not discussed in their paper. For therapeutic use the different lysing solutions were prepared separately, the bacteriophage being of such strength that the contents of the culture flasks were completely cleared after six hours' incubation. After mixing, the solutions were filtered through Chamberland F candles, and, if sterile, were issued for use. The authors state that a compound bacteriophage prepared in this way was used in two small outbreaks of cholera, comprising 60 cases in all, and that the mortality in treated cases was 20 per cent., against a mortality of 70 per cent. in the untreated cases. With regard to dysentery, they state that the combined bacteriophage is as reliable as the ordinary dysentery bacteriophage, but do not give any details of the results achieved. This paper is a typical example of a number of individual reports, covering relatively small collections of cases, which are appearing at the present time. The value of such reports in creating interest in the possibilities of a new remedy is undoubted, but, as we noted, referring to the observations of Dr. A. Compton in our issue of August 10th, p. 289, it is important to devise clinical experiments with the object of estimating the true place of this agent in therapeutics. The bacteriophage acts only against living and multiplying bacteria. Theoretically it should find conditions very suitable for its activities, especially in cholera, and to a somewhat lesser extent in dysentery. If the bacteriophage will act as a destructive agent of these organisms in vivo, the discovery is of immense importance. Cholera and dysentery take a large toll of human life, and if their specific cure is really in our hands, the fact should be capable of proof in a fashion which will refute all statistical criticism, and comply with the requirements of a properly controlled scientific experiment. It should not be impossible to reduce the variable factors in two extensive and parallel series of cases to a single one—the administration or non-administration of the bacteriophage—and to settle whether under identical conditions this single factor sways the prognosis, and to what extent. Such an investigation is all the more urgently called for, since in the careful laboratory experiments of W. W. C. Topley and his collaborators no protective effect could be shown from the oral administration of the bacteriophage. There is, in the long history of medicine, such a melancholy tale of sovereign remedies, which one after another have fallen into discredit and are forgotten, that we are justified, even in the much abused name of humanity, in asking that the test shall be fairly made before we finally accept any new specific. This Ehrlich did for salvarsan; this Roux, Martin and Chaillaw did for diphtheria antitoxin; and these have stood firm in the "quaking bog of therapeutics." How will it stand with the bacteriophage?

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[1] Arch. Espan. de Enferm. del Aparato Digest., 1929, p. 1.

[1] Indian Journal of Medical Research, 1929, xvii., 45.

A FREE GIFT OF SPLINTS TO HOSPITALS.

GOVERNMENT contractors have still on their hands a large stock of splints and kindred items which they took over from the Royal Army Medical Corps at the end of the war. They have decided to give these away free of charge to hospitals, infirmaries, cripples' homes and similar institutions rather than hold them over a period of years to meet the slow requirements of the ordinary market. The whole of this stock is new, and although slightly store-soiled is in useful serviceable condition. The following are the principal items:—

Arm splints, wood, Clarke's pattern	85
Wrist splints, dorsiflexed, iron	50
Leg and thigh splints, wood, Liston's pattern, with or without footpiece, in sets of three .. Sets of each	150
Extension apparatus, Guy's pattern, complete with clamp, shot can, pulley, and cord	450
Humerus splints, iron, Le Page pattern	30
Back leg and thigh splints, wood, hinged at knee, with adjustable footpiece	140
Leg splints, iron, Jones's skeleton pattern	45
Arm extension splints, Sinclair's modification of Thomas's knee splint, with swivel ring	2600
Bed cradles, iron, Lawrence's pattern	90

We have no doubt that many hospitals will make haste to avail themselves of this generous offer. All the splints offered are those in routine use, and the opportunity should prove particularly valuable to the smaller hospitals on which the increasing number of motor accidents makes such heavy demands. The Sinclair arm extension splint with swivel ring proved its value in the war, and while it is undoubtedly the best all-round splint for arm cases in bed it is frequently absent from hospital equipments. The Liston splints, while now little used in the ward treatment of fractures, still retain their value as first-aid appliances, and should prove useful to hospitals which have ambulances to bring in accident cases. An illustrated list will be sent post-free on demand by Messrs. A. Fleming and Co. (Surgical Supplies), 39, Victoria-street, London, S.W. 1, and the splints will be packed free of charge and despatched carriage forward. The public-spirited offer merits the gratitude of the hospitals which will benefit by it, and is one, we feel, which might be followed with advantage by other firms.

IRRADIATION AND HEALTH.

THE suggestion made early this year by the Medical Research Council that artificial light may not be an effective agent in all circumstances was founded on the results of controlled observations on school-children and on the irradiation of varicose ulcers. The protocols of two of the investigations which led to the doubts expressed in their annual report for 1928 have now been published,[1] and the public will see how carefully these investigations were planned. The result of one of the experimental studies has already appeared,[2] but without the long table setting out details of each case. The other investigation now recorded in full is that in which a group of 287 school-children were divided into three approximately equal batches, one batch being exposed to light from a naked carbon-arc lamp in doses deemed appropriate, another batch to a similar lamp screened by window glass, while a third batch received no irradiation at all. The weight of each child in the various batches was noted periodically throughout the six months during which the experiment was carried out, and the height at the beginning and end of the period. A daily record of colds and coughs was kept, and of the prevalence of infectious fevers. The occurrence of chilblains (low in all the groups), the progress in school work, the incidence of diseases other than colds, together with the subjective impressions of teachers, parents, and the medical officer were also noted. Unfavourable symptoms attributed to treatment were rare and trivial. All these results, when carefully collated, gave no clear indication that either type of irradiation had produced either harmful or beneficial effects. In a prefatory note to this report the Medical Research Council make it clear that these investigations are only a part of a many-sided programme of study, and that the results of the particular inquiries here recorded supply answers only to the precise questions which Dr. Colebrook chose or was able to put. It would be legitimate for anybody to criticise her report on the grounds that she used the wrong kinds of rays, applied them too long or too briefly, at intervals too long or too short, but only provided that he can produce valid evidence that some kind of radiation applied under conditions obtainable in the wholesale treatment of school-children has a beneficial effect demonstrable under conditions as critically controlled as those of Dr. Colebrook's experiment. Until this has been done it is proper to doubt whether light treatment under such conditions will have any real benefit, and, further, whether the greater incidence of minor ailments among school-children in an urban area during the winter months is due in any significant degree to deficiency of light.

ACCLIMATISATION.

THE people of Jacobabad live in July under an average temperature of 98° F., or two degrees below blood heat, whilst in certain inhabited parts of Siberia the midwinter temperature is 60° F. below zero. Though much can be done to protect the body from such extremes, notably by creating artificial climates inside clothes or walls, a good deal of physical adaptation is required by those who greatly change their environment. This acclimatisation, always a fascinating study, has lately found a commentator in Sir Aldo Castellani, who has compiled a mass of valuable information into a short paper,[1] well illustrating both his practical knowledge and his original outlook. One of his maps shows that human energy is highest in Western Europe and the United States, and lowest in South America and South Africa. In the tropics much, of course, depends on humidity, and it has been found that the temperature of a normal man suitably clothed can be regulated so as to remain within normal limits with a high air temperature provided the humidity is low. Haldane found that there was no abnormal rise of temperature till the wet bulb indicated 88° F., provided the experimenters were stripped to the waist or clad in light flannel. If, however, the wet bulb exceeded this temperature by even a degree, then the body temperature rose hour by hour in proportion to the rise of the wet bulb above 88° F. With this abnormal rise of temperature there was an increase of the pulse-rate of about twenty beats per minute for every degree Fahrenheit. When Europeans first enter the tropics there is an increase of pulmonary capacity, but this is only temporary, and possibly due to the diminished quantity of blood which has been diverted to the congested skin and liver. No change is noted in the pulse-rate of the majority of normal Europeans on entering the tropics; the blood pressure is usually lowered. A tropical climate per se, says Sir Aldo, does not cause true anæmia; indeed in a series of observations made by Kop there was no difference in the blood of people in temperate and tropical climates. After discussing climatic effects on the digestive and urinary systems, and on endocrine metabolism, he passes on to the effects of pressure, and some of the local winds of the tropics. A further interesting section, on the rays of the sun, contains résumés of experimental work in connexion with the absorption and properties of these rays from the point of view of tropical medicine, and after some consideration of chronic skin irritation and of pigmentation the paper concludes with practical hints on clothing.

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[1] Irradiation and Health. Two Experimental Studies by Dora Colebrook, M.D., B.S.Lond. 1929. Special Report Series. H.M. Stationery Office. Pp. 47. 1s. 6d.

[2] THE LANCET, 1928, i., 904.

[1] Reprinted from the Jour. Trop. Med. and Hyg., July 1st and 15th, 1929.

The section on the effects of heat contains useful information on the various ways of taking temperatures. Sir Aldo says that if a temperature reading in the axilla is to correspond with a reading in the mouth the axilla must be dry; in the tropics there may be several degrees difference between axilla and mouth. Pembrey and Nicol point out that the temperature in the mouth is apt to vary considerably, and that it is not reliable in cold weather or after exercise, and Haldane has found that it varies greatly in different people. In warm and moist air the mouth temperature approaches the rectal. The reason why the oral temperature is lower than the rectal is said to be that in cold air the proximity of the skin, and possibly the nasal cavity as well, has a cooling effect, whereas in warm air there is no such difference. In India, Crombie found in 15 careful observations that the mouth temperature was on the average 0·22° F. below that of the rectum, whereas Pembrey found the difference as much as 1·50° F. during cold weather in England. As regards the time the thermometer should remain in the mouth when taking temperatures, Sir Aldo considers that if nothing hot or cold has lately been placed in the mouth, and it has been kept closed for a short time, two to three minutes should suffice. In his experimental work in India, Crombie found that to get accurate results ten minutes were necessary in the well closed and dry axilla, eight minutes in the mouth, and three or four minutes in the rectum.

THE TECHNIQUE OF BIRTH CONTROL.

IN a recent correspondence in the *Times* about the low birth-rate attention was drawn by Father Francis Woodlock, S.J., to the fact that fewest children occur in families whose eugenic value is highest, because the parents of those families practise birth control. "Don't blame Nature" writes Father Woodlock, "but give the Devil his due." This letter evoked a reply from Lord Dawson of Penn who, while urging the desirability of adequate parenthood for the well-being of husbands, wives, families, and the community, denied that the practice of contraception was necessarily diabolical. Few people, however, would deny that birth control, as practised in the community to-day, acts on the whole dysgenically. While the existing contraceptive methods are practicable by the better educated classes, they are ill-adapted to the use of unintelligent and improvident couples, or couples in which either partner drinks. Of all the psychological characteristics which are likely to promote fertility in England to-day, there is probably none more potent than habitual drunkenness. If the self-possession necessary to the taking of contraceptive precautions at the appropriate moment is lacking in either husband or wife an enhanced fertility will result. The dysgenic effects of contraception to-day are therefore intimately related to the problem of drunkenness in the slums. If these dysgenic effects are to be abolished, it is essential that a harmless and reliable contraceptive method should be discovered which will ensure a continuous period of sterility for a minimum of several weeks at a time, and which will demand no forethought on the part of wife or husband.

Such a method is practised in the clinics of Johann Ferch, in Austria. Another and quite different method was described by Dr. Ernst Gräfenberg and Dr. Norman Haire at the Third International Congress of the World League for Sexual Reform, which met in London last week. The method consists in the insertion into the body of the uterus of a small silver spiral ring which is left in situ for a year. Dr. Gräfenberg laid stress on the difference between his method and those involving the insertion of foreign bodies into the cervical canal, by which ascending infections are facilitated. He claims that he has used his method upon over 1100 women, that as long as the genital tract is healthy when the coil is inserted sepsis never ensues, and that sterility is never caused. In fact, the coil has several times been inserted as a treatment for sterility, and the woman conceived after its removal. According to Dr. Gräfenberg, the endometrium has but one response to mechanical stimulation—namely, hypertrophy. The hypertrophy caused by the coil is such that the fertilised ovum is incapable of embedding itself and conception cannot take place. Though this hypertrophied endometrium is shed at each menstruum neither menorrhagia nor dysmenorrhœa is caused. The coil never embeds itself in the uterine wall, and the incidence of neoplasia is no greater in his series than in the normal. The theoretical considerations which underlie Dr. Gräfenberg's method do not commend themselves to orthodox medical opinion in this country. Nevertheless, his paper was keenly discussed at the conference, and deserves the most impartial consideration. Dr. Haire also drew attention to this method in his paper. He pointed out that the Russian observers believe that its efficacy depends on a physico-chemical change which prevents fertilisation of the ovum. In his opinion it might well be that the Russian view and Dr. Gräfenberg's view were both correct.

Further evidence as to the practicability of the use of existing contraceptive methods by proletarian women has been submitted at a medical conference held on July 10th at the invitation of the North Kensington Women's Welfare Centre. Brief reports in response to a questionaire were submitted by medical officers from nine birth control clinics throughout the country and the following resolution was passed. "This conference . . of medical officers of birth control clinics . . . considers that a regular examination with a speculum is essential before a method of conception control is recommended; and it urges the committees of such clinics to afford facilities to their medical officers to make this examination." As one of the medical officers present said, the speculum examination makes the difference between a scientific and a philanthropic approach to contraception. Follow-up systems are by no means universally in use at these clinics, so that it is difficult to appraise the practicability of the methods advised. A significant note, however, is made by Dr. Kathleen Slim, of Wolverhampton, who says that "50 per cent. of women that were fitted with Dumas pessaries were advised by the doctor to use soluble pessaries also, and one box was given with the initial outfit. With two exceptions no one has renewed the supply." At Wolverhampton also Semori tablets were used in cases in which patients had a pronounced objection to using a rubber pessary. Semori is a froth-producing substance, made in Germany, for which powerful germicidal powers are claimed. It was too soon, however, for an opinion to be given as to the results. Though the patients are asked at their first visit to return after a week and then every six months, all the clinics appear to lose touch with a number of them.

So far as they go, the figures submitted at this conference support the conclusion of Mr. Norman Himes, who made a careful statistical survey of British birth control clinics in 1927. This conclusion was that the methods then taught were not satisfactorily practicable by the least desirable elements of the population, whose fertility is most burdensome to the State. The importance of discovering a really reliable contraceptive, which is also harmless and fool-proof, will therefore be grasped by everyone who shares Father Woodlock's sociological in contrast to his theological opinions.

Opening of the Medical Schools.

IN connexion with the opening of the session at the London Medical Schools, the following arrangements are announced:—

Charing Cross Hospital.—The prizegiving will be held at the hospital at 4.30 P.M. on Oct. 5th. The annual dinner will be held at 7 for 7.30 P.M. at Gatti's Restaurant, Strand, Dr. J. M. H. MacLeod presiding.

Guy's Hospital.—The formal opening of the winter session will take place on Oct. 1st at 3 P.M. at the hospital, when Sir Humphry Rolleston will deliver an address on Medical Societies as Educational Factors. The treasurer of the hospital, Mr. F. P. Whitbread, will preside.

King's College Hospital.—The opening of the centenary session will take place at the Medical School, Denmark Hill, London, S.E., on Oct. 2nd, at 2.30 P.M. Lord Gorell will preside, and Sir Gregory Foster will deliver the introductory address.

London Hospital.—The annual dinner will be held at the Mayfair Hotel on Oct. 17th at 7.30 for 8 P.M., Mr. Hugh Lett presiding.

Royal Free Hospital.—The inaugural address on the Return of Woman to Medicine will be given on Oct. 1st, at 3 P.M., by Dr. Jane Walker, who will present the prizes for the session 1928–29.

St. Bartholomew's Hospital.—The annual old students' dinner will be held in the Great Hall of the hospital on Oct. 1st, at 7 for 7.30 P.M., Sir Frederick Andrewes, F.R.S., presiding.

St. George's Hospital.—The annual prize distribution will take place in the board room of the hospital on Oct. 1st at 3 P.M., when an inaugural address entitled Doctor and Patient will be delivered by Dr. Edmund Spriggs. The annual dinner will be held at the Hyde Park Hotel, Knightsbridge, on the same day at 7.15 for 7.45 P.M., Dr. D. Cotes-Preedy, K.C., presiding.

St. Mary's Hospital.—The annual dinner will be held at the Trocadero Restaurant on Oct. 4th at 7 P.M., Sir John Broadbent presiding. The annual post-graduate course, of which a detailed programme will shortly be available, will begin on the same day, and will be continued during Oct. 5th and 6th.

St. Thomas's Hospital.—The old students' dinner will be held at St. Thomas's House, Lambeth Palace-road, at 8 P.M., on Oct. 4th. Dr. H. G. Turney will preside.

Middlesex Hospital.—Dr. E. A. Cockayne will deliver an introductory address entitled Life's Endless Chain at Queen's Hall, Langham-place, W., on Tuesday, Oct. 1st, at 3 P.M. Mr. Samuel A. Courtauld, vice-president of the hospital, will preside and will distribute the prizes gained during the past year. The wards, medical school, and research department will be open for inspection after the ceremony; also the new west wing of the hospital, which is now nearly ready for occupation. On the same evening, at 7.30 P.M., the annual dinner will be held at the Savoy Hotel, Mr. A. E. Webb-Johnson presiding.

University College Hospital.—The annual dinner of past and present students will be held at the Hotel Cecil on Oct. 25th, at 7.30 P.M. The chair will be taken by Dr. E. A. Barton.

Westminster Hospital.—The inaugural address will be delivered in the board room of the hospital at 3 P.M. on Oct. 1st by Dr. F. N. K. Menzies. The subject will be the Future Relationship of Public Authorities to the Voluntary Hospitals. The annual dinner of past and present students will take place at Grosvenor House, Park-lane, on Oct. 1st, at 7 for 7.30 P.M., Mr. Stanley Dodd presiding.

Pharmaceutical Society of Great Britain.—The inaugural address of the 88th session of the School of Pharmacy will be given on Wednesday, Oct. 2nd, at 3 P.M., by Dr. Henry H. Rusby, professor of materia medica in the College of Pharmacy, New York University.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLIV.

INTERPRETATION OF THE WASSERMANN REACTION IN ADULTS.

PART I.*—INDICATIONS, METHODS, AND NOTATION.

No test in clinical pathology has been more abused than the Wassermann reaction, but its value is becoming more and more recognised, and its employment consequently increased. Few realise the prevalence of syphilis in our adult population—10 per cent. would probably be a conservative estimate.

Indications for a Wassermann Test.

The indications for submitting a patient's blood to the W.R. are: (1) absolute; (2) relative.

(1) *Absolute.*—(*a*) Cases where syphilis is definitely diagnosed—by finding the *Tp. pallidum* or otherwise.

(*b*) All chancres and abrasions of the genital organs following illicit sexual intercourse. In all cases of suspicious sores where the *Tp. pallidum* cannot be found, the blood, if negative, should be tested weekly for at least six weeks, unless a positive result is obtained earlier.

(*c*) The presence of a rash which does not conform to any non-syphilitic skin lesion, with or without history of possible infection.

(*d*) Chronic swellings, ulcers, gummata, aneurysms, and cerebral tumours where syphilis cannot be absolutely excluded.

(*e*) Cases where the symptoms and signs point to a diagnosis of G.P.I. or tabes.

(*f*) Cases where syphilis is suspected or a risk of contracting it has been run.

(2) *Relative.*—(*a*) All cases of chronic ailments which do not respond to appropriate treatment.

(*b*) Patients showing myocardial weakness, especially if under 60 years of age.

(*c*) In angina pectoris, especially if occurring before the age of 40.

(*d*) All cases of gonorrhœa. (The patient may have contracted syphilis at the same time, and have an intra-urethral chancre.)

In this connexion it is important to remember that syphilis may simulate almost any chronic disease, and syphilis of a viscus may produce symptoms and signs of a failure of that organ to perform its normal functions as, for example, in diabetes, nephritis, cirrhosis of the liver. It may be pointed out here, though it will be discussed more fully later, that a positive W.R. does not necessarily mean that all or any of the symptoms are due to syphilis, whilst a negative (especially an isolated test) does not exclude syphilis.

The Choice of Methods.

Much of the odium cast upon the W.R. has been due to the large number of modifications of the original test employed by different workers, and to the fact that the carrying out of the test is frequently delegated to insufficiently skilled workers, often unqualified laboratory assistants. Stokes[1] says: "Few laboratory procedures involve more variables and factors known and unknown than the W.R. Not only do the reagents employed vary in strength so that they must be repeatedly and frequently titrated to determine their activity, but every step must be subject to control, and may vary under the most unsuspected influences. It goes without saying that a high degree of technical accuracy in the handling of the reagents is essential, and this part of the work cannot be entrusted to inexperienced technicians with satisfactory results."

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* Part II., on Positive Results, will appear next week.

[1] Modern Clinical Syphilology, W. B. Saunders Company, 1926.

The W.R. should mean a test carried out more or less in accordance with the original technique, using inactivated patient's serum, serum containing fresh complement, "antigen," red corpuscles, and hæmolytic amboceptor; these should be derived from *different* sources and a separate hæmolytic system should be used. Since the reaction is a quantitative one the titre of the reagents ought, within practicable limits, to be accurately known. Many of the methods employed are "short cut" ones—e.g., making use of the natural complement present in every fresh serum or of the natural antisheep hæmolytic amboceptor—but since the titre of these substances is not known the results are not always reliable. Admittedly many of these "short cut" methods are more sensitive than the original, but in view of the risk of non-specific results they should be used as complementary to, not in place of, the original method. They may be useful also for estimating the effect of treatment or as criteria of cure rather than for diagnostic purposes.

Four reliable methods of carrying out the original reaction are described and recommended for official use by the Medical Research Council,[1] and of these the most generally performed is No. 1 method, by which many tens of thousands of tests were performed before, during, and immediately following the war at Rochester Row Military Hospital, where they were carefully checked from the clinical side. Moreover, this test gave the most satisfactory results of all the methods of performing the W.R. discussed at the recent International Congress at Copenhagen.

The Wassermann is essentially a test which must be very carefully controlled. The pitfalls are numerous and mistakes easy. Unless the serologist adopts a uniform technique errors will creep in. Consequently laboratories where large numbers of tests are carried out, and where the results are carefully checked by the clinician, will tend to furnish more reliable results than isolated laboratories performing small numbers of tests at comparatively long intervals. The M.R.C. recommended that where tests are carried out for official purposes not less than 100 tests per week should be performed, preferably in batches of about 50.

It is most unfortunate that no general standardisation of the W.R. has been found possible, but seeing that so far no one method has been able to oust all the others it seems probable that the method employed in the largest number of cases, adequately checked, will give the most reliable results. Moreover, since the various reagents on the market vary very much in potency and reliability, it follows that a large, well-equipped laboratory which makes its own reagents will have a considerable pull over a small one when they have to be purchased from outside.

Notation.

With the large number of methods employed there are of necessity many notations. Some use + + + +, + + +, + +, +, and − or negative to indicate strongly positive, moderately positive, weakly positive, doubtful, and negative results respectively. Others employ numerals from 0 to 4 to indicate the amount of hæmolysis in the various tubes of the reaction; thus Kolmer uses 4 4 4 4 4 to indicate a strong positive, 4 4 0 0 0 to indicate a moderate positive, and *0 0 0 0 0 to indicate* a negative. The method most commonly employed in this country is that recommended by the Health Section of the League of Nations: this consists of + +, +, ±, − to indicate strongly positive, positive, doubtful, and negative respectively. In any case it is a sound plan for the pathologist in giving a result to amplify the report by stating in brackets after his notation sign the words applicable to the result—e.g., + + (strongly positive); ± (doubtful).

Technique of Taking and Forwarding Specimens.

Varying amounts of blood serum are required for the performance of the W.R. according to the method employed. Generally 1 c.cm. of blood or 0·25 c.cm. of serum is the minimum amount required, but most pathologists will be grateful to the clinician who sends a more than adequate supply; few patients are any the worse for losing 5, 10, or even 20 c.cm. of blood, and an ample supply of serum enables the test to be repeated if necessary, or confirmatory flocculation tests to be carried out.

Much the best method of obtaining the blood is by venepuncture, which in adults is usually simplicity itself, though the blood may be obtained by pricking the finger or lobe of the ear.

Venepuncture.—For venepuncture a sterile all-glass or Record syringe, and a fine sharp hollow needle are advisable. The syringe should be rinsed out with sterile physiological saline before use, especially if it has been sterilised with spirit or by boiling. Spirit may interfere with the reaction, and water present will cause more or less hæmolysis of the blood, and so discolour the serum. A good specimen is more likely to furnish a satisfactory result than a bad one.

The patient should be *seated* or *lying down* with the arm lying on a small table, palm uppermost. A tourniquet, *consisting of a length of* rubber tubing, is fixed round the upper arm and held by the patient, or tied in a half bow so that it can easily be released with one hand by the operator. A prominent vein over the antecubital fossa is chosen, and the skin over it painted with tincture of iodine: in this area the veins are comparatively fixed, and do not tend to slip away from the point of the needle. If the veins do not stand up well the patient should be instructed to hang the arm down and open and clench the fist, finally keeping it closed, or the arm may be immersed in warm water for a few minutes. The tourniquet should be sufficiently tight to make the veins stand up but not so tight as to obstruct the arterial circulation. The needle is attached to a syringe, preferably having the nozzle situated close to the periphery of the distal end (not in the centre, as in the ordinary type of syringe): this arrangement enables the needle to be held more in line with the vein. A point is chosen immediately over or just to one side of the vein; the skin is first punctured, then, when the point of the needle is located under the skin and over the vein, it is pushed on and will enter the vein with a well-marked but indefinable sensation of having overcome a slight resistance. The advantage of doing the puncture in two stages is that there is less likely to be an escape of blood following withdrawal of the needle. Sufficient blood is now withdrawn, the tourniquet released, the needle withdrawn, a pad held firmly over the site of puncture, and the patient instructed to hold his arm *straight* up vertically for a minute or so. No dressing is required unless blood oozes when the arm is allowed to hang down. The blood should be transferred to a sterile test-tube immediately and not allowed to clot in the syringe.

A simpler method is to use a needle to which a short length of rubber tubing is attached; the needle is held between the thumb and first finger, whilst a test-tube into which the rubber tubing leads is grasped by the ring and little fingers. This obviates the use of a syringe—but entails the use of a wide-bore needle, as otherwise the blood may not flow freely. Many forms of apparatus for taking the blood are on the market, but the above method is rapid and simple.

Serum by Post.

In cases where the blood has to be sent through the post, and/or when the test is not likely to be carried out within 24 hours of taking the specimen, it is preferable to send serum only, not whole blood. After the blood has stood in the test-tube for a few hours the serum separates quite readily; if it does not, a platinum wire or glass rod should be used to separate the clot from the sides of the tube, and the tube should be placed in warm water for a short time. When the serum has separated it should be poured out into a small sterile glass tube, and the latter tightly corked. If whole blood is sent through the post, and especially if the weather is warm, hæmolysis is apt to occur; this may vitiate the test or render its performance impossible. The specimen should be kept sterile as far as possible; infection with organisms, if heavy, may render the serum so anticomplementary that the test will fail and the pathologist will be unable to furnish a report. Though it is wise to test a specimen of serum as soon as possible, preferably within a day or two, a satisfactory result can be obtained after several weeks or even months. I have tested sera sent from West Africa, India, and Mesopotamia by ordinary post.

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[1] Medical Research Committee Special Report Series, No. 14, 1921.

When sending specimens of blood or serum through the post it is necessary to comply with the Post Office Regulations on the subject. The specimen must be (1) sent by letter, *not* parcel, post; (2) enclosed in a receptacle securely closed and placed in a box in which it cannot shift about; (3) surrounded by a sufficient quantity of some absorbent material, such as cotton-wool or sawdust, so as to prevent any possible leakage; (4) marked "fragile, with care, pathological specimen."

It is most desirable that all sera should be accompanied by clinical details giving a short account of (*a*) situation and character of the lesion; (*b*) length of time the disease has existed; (*c*) treatment administered (if any), both local and general; (*d*) results of previous tests with dates; (*e*) any special remarks. This information enables the pathologist to give a much more satisfactory opinion as to the interpretation of the reaction—an opinion which should always be expressly asked for.

T. E. OSMOND, M.B. Camb.,
Pathologist, Venereal Diseases Dept., St. Thomas's Hospital, London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. (D.) H. M. Meek is placed on the Retd. List at his own request.

Surg. Lt.-Comdr. (D.) J. F. Place to be Surg. Comdr. (D.).

Surg. Lts. E. C. Davis, A. L. McDonnell, and S. G. Weldon to be Surg. Lt.-Comdrs.

The following appointments are notified: Surg. Comdrs. C. E. Greeson to *President*, and E. St. G. S. Goodwin to *Victory*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following appointments are notified: Surg. Lt. A. R. Thomas to *Victory*, for R.N. Hospital, Haslar, for training, and Proby. Surg. Sub-Lt. R. H. Wheeler to *Pembroke*, for R.N. Barracks, Chatham, for training.

ROYAL ARMY MEDICAL CORPS.

Capt. R. R. Evans to be Maj. (Prov.).

Lt. (on prob.) P. D. Johnson resigns his commn.

ARMY RESERVE OF OFFICERS.

Lt.-Col. H. V. Bagshawe, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. A. Hemingway to be Capt.

TERRITORIAL ARMY.

J. H. B. Livingston (late Offr. Cadet, Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

DEATHS IN THE SERVICES.

Surgeon Captain Richard Miller, R.N., retd., who died after an operation on Sept. 12th at the age of 67, was a graduate of Trinity College, Dublin, and entered the Royal Navy as surgeon in 1887. Two years later he received the Bronze Medal of the Royal Humane Society for jumping overboard from the *Iron Duke* off Malta, and going to the assistance of a corporal of marines. In 1903 he was promoted to fleet surgeon, and, after service in battleships, was placed in charge of the Royal Hospital at Yarmouth. In 1916 he became medical officer of the battle cruiser *Princess Royal*, and a year later retired on age limit with the rank of surgeon captain.

Special Articles.

BACILLARY DYSENTERY IN AN INDUSTRIAL AREA.

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THE English text-book descriptions of bacillary dysentery almost always present to us a disease of great antiquity, the concomitant and curse of our multitudinous military operations from Agincourt to Gallipoli, an endemic disorder which nowadays limits its activities, for the most part, to the tropical and subtropical zones. They suggest that its presence in these islands is infrequent, showing itself occasionally in sporadic cases, in outbreaks affecting mental institutions and their inmates, or in larger epidemic manifestations, such as the Glamorgan outbreak of 1921 where infected water or milk is the chosen medium of dispersal. Even the causal organisms are indifferently differentiated, and while due regard is paid to the toxicity of the bacillus of Shiga, those other members of the group which are associated with the names of Flexner and Sonne are regarded as being relatively avirulent and often almost non-pathogenic. These facts are insufficiently understood, despite the work of Nabarro,[1] and the Aberdeen[2] and Glasgow[3] investigators.

It is our intention in this article to combat certain of these conceptions, and to endeavour to demonstrate that in some parts of Great Britain bacillary dysentery is not a rare and spectacular occurrence, but a fact of everyday life.

History of the Investigation.

Proven cases of bacillary dysentery have been discovered from time to time during the last eight years in Newcastle and the two northern counties of Northumberland and Durham, and records of the isolation of the causal organisms are in existence in the Public Health Department of the University of Durham College of Medicine Bacteriological Laboratory. The present detailed inquiry dates from March, 1928, when three members of a Newcastle household fell ill with symptoms which suggested a food poisoning infection. Bacteriological investigation showed that these mild cases were due to the *Bacillus dysenteriæ* Flexner, Type Z. Within a month two sudden deaths occurred in boys aged 8 and 9 years respectively, and post-mortem and bacteriological examination proved that the cause of death in each case had been a dysenteric infection by a Flexner organism.

In consequence of these facts the medical practitioners of the city were circularised and requested to notify to the medical officer of health any cases where signs and symptoms suggestive of dysentery were present, with a view to their thorough investigation and hospitalisation if necessary. Up to June 30th of the present year this request had resulted in the notification of some 355 cases of suspected dysentery. Many of these were discarded on clinical or bacteriological grounds, but from this source and through other channels of inquiry—e.g., inquests, &c.—information was obtained of 141 cases of true bacteriologically proven bacillary dysentery.

The 111 positive and 80 suspected cases which were admitted to the City Hospital for Infectious Diseases, during the period under review (March, 1928, to June 30th, 1929), afforded ample material for clinical and bacteriological investigation, the results of which are synopsised in the following sections.

Clinical Features.

Primarily a distinction must be made between the ordinary simple case, which though of varying severity yet progresses steadily to convalescence and cure, and the acutely toxic one, in which onset, the development of symptoms, and death follow one another so swiftly that the whole course of the disease requires but 24 hours for its completion. The ten fatal cases in this series were all examples of this fulminant entero-colic dysentery.

In the mild cases the onset is usually gradual. A simple malaise and headache develop, and are occasionally associated with vomiting. There is fever, and the temperature reaches 100° or 101° F. Abdominal pains of colicky type follow, and in the course of a few hours these are succeeded by the passage of a few loose motions. After the bowel has been emptied of its fæcal contents, the stools rapidly increase in number and mucus and blood make their appearance. The presence of these in the stool may take one of several forms, occurring either as the true red-currant jelly stool of dysentery, or a watery mucous motion in which float shreds of blood-clot, or the grumous stool flecked with mucus and blood. All these have been observed, and the presence of dysentery bacilli in them confirmed. The diarrhœa in certain cases is almost continuous, and 20–30 stools in the 24 hours are not infrequent. Throughout this stage the colicky pains are invariably present, and relief follows the evacuation of the bowel. Tenesmus, particularly in adults, is a common symptom, while pain on deep pressure over the abdomen, except in the region of the pelvic colon, is comparatively rare. Enlargement of the spleen has been observed in not more than 10 per cent. of cases. Furring of the tongue is generally present. The appearance of the patient varies according to the severity of the attack, but is usually one of distress and discomfort. The commencement of treatment results, almost immediately, in the disappearance of the blood and mucus from the stool; the pyrexia gradually diminishes until coincident with the improvement in the intestinal condition, it ceases about the eighth day of the disease along with the diarrhœa. Complications have been very few. Nephritis and broncho-pneumonia were each found as a sequela on one occasion, though albuminuria during the early stage of fever was relatively common. In one extra-mural case, which was reported to us, there was a definite polyarticular arthritis. The bronchitic signs which the Aberdeen observers associated with infection by the Sonne bacillus were never met with. Personally, we found nothing to differentiate between the cases caused by the several types of dysentery organisms, except that Sonne infections appeared on the whole to be milder, less frequently associated with the cardinal signs of pyrexia, tenesmus, and blood and mucus, and more liable to present the features of a mild diarrhœa with semi-solid rather than liquid stools.

Only one patient suffered a relapse—and this was while she was still in hospital. Further, although multiple, more or less simultaneous cases from individual houses have been frequently encountered, there has been no evidence of "return" cases. Bacteriological examination of a certain number of patients after discharge from hospital has given negative results.

A few figures may be of interest. The average duration of pyrexia in all cases was seven days, with 2 and 16 days as the extremes of duration; blood and mucus in the stool were generally present for four days with recorded limits of 1 and 16 days; diarrhœa continued on an average for about a week, but was found in several cases for only two days and in one for 19 at least. Some idea, although admittedly only an approximate one, of the length of time during which the causal organism could be found in the stools, can be gathered from the fact that the average period from the outset of the attack to the ascertainment of the first negative stool was 10 days. On this basis the shortest period of infectivity was 0, and the longest—which practically amounted to a carrier state—71 days.

Fatal Cases.

In fatal cases the onset is extremely sudden, and the symptoms are toxic rather than diarrhœic. Headache and vomiting are invariably present, the temperature at first may be as high as 102° or 103°, but even though the typical colicky pain, diarrhœa and blood and mucus may make their appearance, they are of little moment in the presence of the profound toxæmia, coma, collapse, and circulatory failure which develop so rapidly in these cases. A common history is that of a child well enough to attend school in the morning, who after dining at home, and feeling perhaps not quite so well thereafter, returns to school for the afternoon. After school he is sick, lies down, refuses his tea, and then appears to sleep. Later in the evening the prolonged drowsiness or a change in his colour attracts the parent's attention. A doctor is summoned, the patient removed to hospital, but even the most energetic treatment with stimulant and serum fails to rouse him, and death occurs within 18 to 24 hours of the onset.

Diagnosis.—Both in the mild and the fatal cases diagnosis has certain pitfalls. The commonest errors are to regard the condition in children as a non-infective enteritis, and in adults to suspect the presence of a true food poisoning infection. But other diagnoses such as intussusception, encephalitis lethargica, enteric fever have been made, and on two occasions a moribund and stertorous child has been admitted to hospital as suffering from laryngeal diphtheria. One particularly interesting case which was brought to our notice by Dr. J. W. Lickley, of the Fleming Memorial Hospital, was that of a child with a facial paralysis, due to a toxic neuritis, which had appeared as a sequel of a proved infection with Flexner dysentery.

Treatment.—The routine treatment of all simple cases has comprised rest in bed, light diet, colon lavage, and the administration of sodium sulphate in appropriate doses. Serum treatment with a polyvalent Shiga-Flexner serum has been employed comparatively freely. Its place in the therapeutics of our cases may be summed up quite shortly. Generally the mild cases as they occur in children do not require serum; the severer ones in adults yield quickly to its administration, and in the relief of symptoms, particularly of the tenesmus, it is remarkably effective; in the fulminant cases serum, however administered, has never succeeded in combating the toxæmia.

Post-mortem Appearances.

It will be remembered that all the deaths in the present series occurred in cases of the fulminant type of the disease, and the findings of the ten post-mortem examinations performed differed but slightly from one another. No case showed the signs of chronic dysentery, nor yet of the ordinary acute type of the disease. In every instance the pathological findings indicated an inflammatory condition of both ileum and colon—the entero-colic type of the disease—and in the majority the enteritis predominated. The changes were most marked in the lower third of the ileum, though in one case it was the upper part of the jejunum which appeared to be chiefly affected. The blood-vessels in the wall of the gut were generally engorged, and on opening the peritoneal cavity it was easy to locate the portions of bowel involved by their congested appearance. Of actual peritonitis there was never any trace. The appearance of the bowel wall internally was invariably that of a folliculitis, passing on to follicular ulceration, but the Peyer's patches, though prominent and hyperæmic, were rarely ulcerated. The condition of the colon was similar to that of the small intestine, though to a less degree. Neither large nor small bowel was ever found to be the seat of chronic thickening, though recent œdema was constantly present. In several cases the mesenteric glands were found acutely enlarged, and in one case there was a slight degree of splenomegaly. Toxic changes were invariably present in the heart, kidneys, and liver.

Of the ten post-mortems, only one was negative bacteriologically, but from this case shortly before death a stool was obtained from which a Flexner organism was isolated. All the others were positive, and the causal dysenteric organism was isolated from one or more sources. The results of the bacteriological examinations of the specified organs are shown in Table I.

TABLE I.

Organ.	P.M. specimens examined.	Positive for dysentery organism.
Stomach	5	0
Small intestine ..	10	5
Colon	8	6
Spleen	7	1
Liver	2	1

It is interesting to note that though gross pathological changes were more frequently observed in the small intestine, a higher proportion of positive cultures was obtained from the colon.

Epidemiological Features.

In an interim report on 22 of the present cases which has been published by one of us,[4] a comprehensive review was made of a number of possible epidemiological agents in the causation of the disease, and the relation of water, milk, milk products, ice-cream, prepared meats, shell-fish, watercress, salads, flies, epizoötics, school attendance, and sanitary conditions was carefully investigated. In view of the fact that the results of this critical review were entirely negative—a conclusion which has been borne out by continued investigation on more recent cases—it is not proposed to discuss these individual features further. Some consideration of certain other factors is, however, necessary.

Age and Sex Distribution.—Table II. gives the age distribution of the 355 suspected cases, and the age, sex, and mortality distribution of the 141 proved cases.

TABLE II.

Suspected Cases of Dysentery.

Under 1 yr.	1 yr., under 2	2–5	5–15	15–25	25–45	45–65	Over 65	Total.
25	60	126	86	14	36	6	2	355
Proved Cases of Bacillary Dysentery.								
M. ..2(1)	16	26	20(6)	3	7	3	—	77(7)
F. ..3	12(1)	20(1)	18(1)	1	8	2	—	64(3)
Total 5(1)	28(1)	46(1)	38(7)	4	15	5	—	141(10)

M. = Male; F. = Female. (The figures in parentheses which are included in numbers by which they stand indicate fatal cases.)

Several facts are at once apparent—viz., the comparative rarity of the infection under the age of 12 months, the heavy incidence on children between 2–5, the lower death-rate in females, and the very high mortality amongst boys from 5–15. Further, it is evident that adults are by no means immune from infection. *It is probable that the encouragement* which has been given to breast-feeding of infants in Newcastle accounts for their freedom from the disease, for of the five in the first age-group who contracted the disease only one was breast-fed. Above the age of 1 the same adherence to the principles of sound dietetics is lacking. There is a tendency to simplify the domestic arrangements by giving the toddler "the same as we," which results in his regarding any stray article of food, however broken or dirty, as suitable material for ingestion. The freedom of girls from the presumably massive infections which are responsible for the toxic dysenteries so common in boys may be due to the more delicate habits of the female, or to a statistical illusion which a larger number of cases will remove.

Seasonal Incidence.—As will be seen from Table III., cases of bacillary dysentery have occurred throughout the year, though an increased incidence is apparent in the warmer months—e.g., August, September, 1928, to April, May, and June, 1929. Our figures, however, are not free from the error that as the knowledge of the condition extends amongst medical practitioners so also do the number of positive cases increase. Accordingly, it is impossible to make any strict comparison for example between the incidence of dysentery upon children under the age of two and the deaths registered under "enteritis" in the same age-group, and so obtain figures which might show the presence or absence of any connexion between the two.

Distribution of the Cases.—The 141 positive cases occurred not only singly, but also as multiple cases in individual households.

There was one hospital outbreak made up of seven cases, four domiciliary groups of three each, 13 where two patients were affected, and 96 single cases. Among the latter, however, there were 16 which gave histories of associated cases of diarrhœa in the same dwelling, usually before the discovery of the positive case. These cases were often highly suggestive of dysentery, but were either not available for examination early enough or were bacteriologically negative.

Mention may be made here of certain facts which will be considerably amplified later. No fewer than six types and varieties of dysentery organisms have been found active in the causation of the disease in Newcastle. This alone is highly suggestive of the endemicity of the disease, provided always that it can be shown the types do not change one into the other. The first point of evidence to suggest that the types do remain constant and stable is the persisting specificity of the domiciliary infection. By this we mean that whenever multiple cases have occurred in a dwelling the same type of organism has been isolated from every case in that house.

Out of 17 such domiciliary outbreaks, there was only one in which this principle did not hold; and in this instance a newly arrived lodger who had been roughing it in hedges and lodging-houses developed a Flexner W infection in the same house in which a child had previously had a Flexner Z dysentery. The circumstances of the lodger, and the negative results of further investigation of the child, led us to regard this as a coincidental rather than as a transmitted infection.

The usual sequence of the disease in a household is interesting. Simultaneous onset in several of the members is rare. Most commonly the illness of one child is followed a little later by the classical signs in another, and lastly the mother, who has been doing the nursing, falls sick herself. The hospital outbreak of seven cases already referred to occurred in a female diphtheria ward, and was apparently due to the admission of an undetected Sonne carrier. Here, again, there was no simultaneity of attack, but only the customary case-to-case infection, which was followed by the isolation of a Sonne bacillus in every instance. The disease was widespread throughout the city, and 17 of the 19 wards yielded cases, while the unaffected districts were high-class residential suburbs.

One ward—in large part owing to the keenness of its medical practitioners—supplied 51 cases spread over the 16 months' investigation. Twenty of these occurred in a large housing estate of 24 blocks of flats which had been built during the war. This property, by name *Rochester* Dwellings, with its 384 dwellings and 1800 inhabitants, was the subject of intensive research. Three distinct organisms were associated with the 20 cases occurring there, and the principle of the persisting specificity of domiciliary infection *not only applied, but in several instances over a period of* months, has shown itself true for whole blocks of flats.

Lastly, a word may be said as to the occurrence of bacillary dysentery in the surrounding neighbourhood. Ten of the 141 cases notified were extra-mural cases, which had been admitted from towns and villages in Northumberland and Durham. In only one of these cases could infection be traced to Newcastle. During the same period the laboratory records show that 14 more cases were bacteriologically diagnosed from seven different sources in the two counties. Evidence of sporadic outbreaks, both in the city and the neighbouring counties, has gradually accumulated. From the beginning of 1922 to the commencement of the present investigation, there are records of 12 outbreaks, reports on three of which have been published by Breakey and Clayton,[5] Clayton,[6] and Warren.[7] The organisms implicated were *B. dysenteriæ* Flexner (various types) on six occasions, a definite Sonne bacillus (1926), and two almost certainly identical organisms which were isolated earlier (1922 and 1923), and regarded as inagglutinable Flexners, the original strain of the Newcastle bacillus, an indefinite *B. dysenteriæ* Schmitz, and an atypical Shiga organism.

Overcrowding.—There is no need to stress the importance of overcrowding, with its manifold opportunities for personal contact, in the spread of infectious disease. The census definition which lays down that overcrowding is present when the number of persons per room in a dwelling exceeds two is the simplest for our purpose, and in 1921, on this basis, 33·6 per cent. of the population of Newcastle were living under such conditions. Since that date 6000 new houses have been built and the general overcrowding has diminished, but in the case of the population from which the dysentery cases came, it was even worse than the average for 1921, for 52·6 per cent. of them came under the census definition. Further, of the eight Newcastle families amongst which fatal cases occurred, 94·6 per cent. of their members were overcrowded. Actually the average number of persons per room in those households was four.

Hospitalisation of cases of acute dysentery is of obvious practical value in many ways, and not least because it removes a focus of infection from a house, and incidentally reduces the overcrowding. The following facts are put forward as being highly suggestive. In the first eight months of the present investigation there were 58 cases with eight deaths, occurring in 46 outbreaks, of which 10 or 22 per cent. were multiple. The corresponding figures for the last eight months were 88 cases with two deaths, occurring in 69 outbreaks, eight of which were multiple—a percentage of 12. Apart from these figures our feeling is that with the spread of an increased clinical consciousness of the disease among practitioners, and the better appreciation of the hospital facilities available, the multiple case-rate, and the case-mortality have steadily diminished.

Mode of Infection—Our conception of the spread of the infection is that it occurs through close and intimate contact of infecting persons with others or with their food, its preparation and service. The conditions under which many of our patients lived were such as made ordinary cleanliness very difficult, and the proper hygiene of the kitchen and food storage almost impossible. The actual sanitary conveniences of these families were good—apart from the fact that they were shared too frequently in common with others. Without doubt, the missed case of dysentery is the principal factor in the diffusion of infection. On several occasions we have obtained a history of an earlier case in a house, and confirmed it by agglutination tests, which invariably showed the same causal organism both in it and the later case or cases.

We have not found definite and conclusive evidence of the existence of carriers. In three instances, however, we have come across suggestions of their presence.

1. A case of enteric during the convalescent period yielded a stool containing Sonne bacillus, without history of recent attack or exposure to infection.

2. The seven cases of Sonne dysentery in a female diphtheria ward occurred consecutively amongst convalescent patients, in whom again both recent attacks and exposure to infection could be ruled out.

3. One patient with Flexner "Z" dysentery (and probably a double infection with Sonne also) did not give a negative stool until 71 days from the onset. For the last eight weeks of this period he was entirely free from symptoms of any description.

Bacteriological Data.—From 471 specimens submitted to examination, dysentery bacilli were isolated on 210 occasions. It is necessary to observe that the number of examinations carried out was the absolute minimum necessary for purposes of diagnosis, and for determining whether a patient awaiting discharge from hospital was free from infection. If a single stool examination did not confirm the clinical diagnosis no further examination was made. This voluntary restriction of the field of inquiry undoubtedly prevented a larger proportion of positive results being obtained from the 355 cases notified.

After a clinical cure had been established, one negative stool was regarded as sufficient to enable a patient to be discharged from hospital. This policy seems to have been justified by results. Only one relapse occurred, and even though discharged cases are still kept under observation, and attempts made to associate them with new notifications, no evidence of any return case is available as yet.

Specimens from cases of chronic bacillary dysentery were not met with. Generally speaking the stools obtained from acute cases of the disease consisted of watery muco-pus, and more frequently of muco-pus, sometimes with blood and often bile-stained. The convalescent stool was usually composed of fæcal material. The negative results of microscopical examination for amœbæ, intestinal parasites and cysts, led to the discarding of this form of examination at an early date.

The actual diagnosis of bacillary dysentery was made by the isolation of a recognised dysentery organism from the fæces. Tests for agglutination in human sera were not found to give marked and clear-cut results, and their use was limited to confirming whether a cured clinical but non-bacteriologically proven case with a suggestive history had really been suffering from dysentery, and to ascertaining whether such a case occurring early in a domiciliary outbreak had been infected with the same type of organism as was isolated later from other members of the family.

The routine method of examination consisted in washing pieces of muco-pus in normal saline, and then sowing two or three bile-salt lactose-peptone-neutral-red agar plates. All specimens, where food-poisoning was suspected, particularly from post-mortem cases, were also inoculated into brilliant-green peptone water, and subsequently plated as above after 24 hours' incubation at 37° C. This procedure of brilliant-green enrichment practically never resulted in the isolation of dysentery bacilli. On direct plates, however, the results varied from an almost pure culture of a dysentery bacillus to the presence of one single colony amid many coliform ones.

The dysentery organisms isolated belonged to the three main groups: (1) *B. dysenteriæ* Flexner; (2) *B. dysenteriæ* Sonne (III); and (3) the Newcastle bacillus. The various types were identified both by their biochemical reactions and serologically. Occasionally when there was some doubt, motility was tested, but this was not done as a routine, and in no instance was any of the three groups found to be motile.

Biochemical Reactions.—For this purpose the following peptone water sugars were used—glucose, lactose, saccharose, mannite, and dulcite. Litmus milk and peptone water for indol production were also employed.

The reactions of the three groups were as follows:—

(1) The Flexner group uniformly gave the recognised sugar reactions—acid with glucose and mannite, and no change in lactose, saccharose, or dulcite. In litmus milk slight acidity followed by alkalinity was the usual change, only varied by the milk occasionally not going definitely alkaline. Indol was produced by most of the strains, but just a few were definitely negative. All reactions were incubated for at least ten days.

(2) *B. dysenteriæ* Sonne III. All the strains which we have identified as belonging to this group have given uniform results in that they rapidly produced acid in glucose and mannite, and after incubation at 37° C. for at least 14 days, showed late fermentation of lactose and saccharose, acid production in milk, and non-production of indol. These findings confirmed the description of Kerrin,[8] except that maltose, dextrin, and xylose were not used. None of the strains appeared to belong to the *dispar* group of Andrewes.

(3) The isolation of the Newcastle bacillus as described by Clayton and Warren[7] has formed part of this investigation. Its biochemical reactions conformed to those given by these authors, and are as follows: Acid is produced in

glucose, and acid with possibly a little gas in dulcite after four or five days. Mannite, lactose, and saccharose give no change. (When lemco broth sugar media were employed, acid and gas were produced in glucose in 24 hours, and in dulcite in four to six days). Litmus milk remained unaltered, and no indol was produced.

Serological Investigations on all isolated organisms were also carried out, and no identification was made until this had been completed. In this work we received great assistance from Dr. W. M. Scott, of the Ministry of Health, who examined and confirmed the identification of the majority of our strains.

As regards the *Flexner group*, the serological races of these organisms as established by Andrewes and Inman[10] formed the basis of the typing of the strains isolated by us. The isolated organism was first subjected to a polyvalent Flexner serum, and if agglutinated, was then put up to the five type sera—V, W, X, Y, and Z. In our case simple agglutination with impure type sera was employed, and saturation tests were not used. Scott used chiefly pure specific type sera from which the group agglutinins had been removed. Such tests enabled us to confirm the biochemical reactions which placed these organisms in the Flexner group, and to separate them out into the various serological races, V, W, X, Y, and Z.

By simple agglutination we found a few W and X strains, which appeared to be more closely related to the Y group than is normal, but when subjected by Scott to specific type sera, these organisms all proved to be simple W or X strains.

In all, 109 Flexner strains were isolated and were distributed as follows: V, absent; W, 51; X, 8; Y, 1; and Z, 49. The only variation found in the Flexner group was that occasionally one met with an organism which agglutinated rather poorly, but even such a one could be typed. Further, a mixture of more than one type of Flexner organisms was never encountered in any specimen examined. This search for a multiplicity of Flexner types in one stool was not made as a routine, but from time to time all the colonies taken off a plate (4 or 5, as a rule, when possible) were put up for typing and were found to be identical. This was done with W, X, and Z strains.

The serological features of the *Sonne group* can be summarised as giving definite agglutination with Sonne III serum, and a negative reaction with polyvalent Flexner serum. At first we encountered the usual difficulty in getting recent strains of Sonne to agglutinate, but no difficulty was experienced later, when the significance of agglutination of the rough and smooth stages of the organism had been appreciated. A mixed rough and smooth serum obtained from Scott was of great use in quickly identifying this group, and a smooth serum prepared in the laboratory has been found so far to agglutinate all recently isolated cultures quite well.

The serological characteristics of the *Newcastle bacillus* have been described in detail in their second paper by Clayton and Warren.[11] In short, it may be said that although this organism is serologically distinct, it bears some relation to the Flexner group.

It is noteworthy that all the types isolated with the exception of Y were possessed of lethal powers to a greater or lesser degree. Their association with the ten fatal cases was as follows: Flexner W, 3 cases; X, 1; Y, 0; Z, 2; Sonne, 2; Newcastle bacillus, 2.

The seasonal incidence and distribution between the sexes of the various organisms are also recorded in Table III.

TABLE III.

Type of organism.	1928										1929						Males.	Females.	Totals.
	Mar.	Ap.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Ap.	May	June			
Flexner W ..	1(1)	1	2	—	2(2)	7	6	2	1	1	2	—	3	5	8	10	27(2)	24(1)	51(3)
„ X ..	1(1)	—	1	1	—	—	—	—	—	—	—	2	—	3	—	—	4(1)	4	8(1)
„ Y ..	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	1
„ Z ..	3	2	1	3	2	2	6	2	3(1)	2	2	1	4	6	8	2(1)	32(2)	17	49(2)
Sonne	—	—	3(1)	1	—	2	2(1)	1	4	1	—	—	5	2	—	5	11(1)	15(1)	26(2)
Newcastle bacillus	—	—	—	2(1)	—	—	—	1(1)	—	—	2	—	—	—	—	1	2(1)	4(1)	6(2)
Totals ..	5(2)	3	7(1)	7(1)	4(2)	11	15(1)	6(1)	8(1)	4	6	3	12	16	16	18(1)	77(7)	64(3)	141(10)

The figures in parentheses, which are included in the numbers alongside which they stand, indicate fatal cases.

Discussion.

We have still to speak of certain observations on the variability of the dysentery bacilli isolated from the 141 cases in the series. Two facts have already been mentioned. First, that where multiple domiciliary cases occurred, the group and type of the organism were the same for each individual case in the series; secondly, that when several colonies of dysentery bacilli were taken from a plate sown from the fæces of a single case, these colonies when typed were all found to consist of one and the same strain of organism.

Attention is now directed to another series of observations. In 128 out of the 141 proven cases, the examination of the stools was repeated until a negative result was obtained. We found that—

96 patients gave 1 pos. stool followed by 1 neg. stool.
17 „ „ 2 „ „ „ 1 „ „
8 „ „ 3 „ „ „ 1 „ „
2 „ „ 4 „ „ „ 1 „ „
1 „ „ 5 „ „ 1 „ „

The type of organism remaining unchanged throughout the respective serial examinations.

Four patients gave variations in the types of organism isolated as follows:—

Patient.
Z 734 gave Flexner W, then Fl. Z, then neg. stool.
Z 341 gave Fl. Z twice, then Fl. W, once, then neg. stool.
Z 294 gave Fl. W twice, then Fl. X once, then neg. stool.
Z 251 gave Fl. Z four, then Sonne III once, then Fl. Z three, then neg. stool, which was repeated two months later.

There are thus 28 serial investigations where the same organism occurred two or more times, and four where there were variations. With regard to one of these four cases, we consider that the occurrence of Sonne III. in the middle of the course of the obvious Flexner Z case (No. Z 251) was indicative of mixed infection. As for the others we are not prepared to state whether they are examples of mixed infection, or of mutation, or even, possibly, of errors in technique. Our opinion is that these various Flexner types do not change one into the other, but maintain their identity in the same way as do the Sonne and Newcastle organisms.

Conclusions.

(1) Bacillary dysentery is a relatively common disease. Our experience, together with those of Nabarro and the Glasgow and Aberdeen observers, suggests that in certain areas it is undoubtedly endemic. (2) Mild, severe, and fatal cases are all to be met with, and conform in the main to the classical types of the disease. (3) Its seasonal incidence is not limited to the warmer months of the year, and for this reason and because of its low attack-, and still lower mortality-rates among children below the age of two years, it does not appear to have any definite association with the infective summer diarrhœa of infants. The causation of this latter condition requires further and extensive research. (4) Six different organisms belonging to the Flexner, Sonne, and Newcastle group of dysentery bacilli have been found in association with the disease. It is not improbable that in other

areas the prevailing types may be different. (5) In view of the persistence of the same type of organism, (*a*) in multiple domiciliary cases, (*b*) in the examination of several colonies from a single plate, and (*c*) in the large majority of serial examinations from the same case, our opinion is that these various causal organisms breed true.

We beg to offer our thanks to Prof. Harold Kerr, medical officer of health, Newcastle-upon-Tyne, for the facilities for conducting this investigation which were so freely placed at our disposal, and to Dr. W. M. Scott, of the Ministry of Health, for advice and assistance in many ways too numerous to mention. This paper, moreover, would be incomplete without an acknowledgment of our indebtedness to Dr. F. H. A. Clayton, *in conjunction with whom the inquiry was* initiated.

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THE STATE OF THE PUBLIC HEALTH.

(Concluded from p. 474.)

WE have already dealt with the general lessons of the Annual Report[1] of the Chief Medical Officer of the Ministry of Health for 1928 (August 31st, p. 460), and with the sections devoted to maternal and infant welfare, and the insurance medical service. The following is a brief summary of the remaining sections of the report.

The Local Government Act.

The Report discusses the evolution of the poor-law and the development of public health administration in England since the Reform Act of 1832. It urges medical officers of health to be prepared to advise their councils on such general questions as:—

1. The desirability of discharging certain of the transferred functions through some committee other than the Public Assistance Committee, to which most of the transferred powers otherwise stand referred or may be delegated.

2. The advisability and practicability of providing certain forms of medical assistance under the Public Health and other Acts rather than under the Public Assistance Committee and the Poor-law Act.

3. Whether in districts where it is impracticable to declare that all assistance for the sick should be provided under the Public Health Acts, it may be desirable to appropriate one of the transferred institutions to hospital purposes and to administer it under one or other of these Acts.

4. The desirability in counties which have decided to provide certain forms of relief under the Education Act, 1921, or the Maternity and Child Welfare Act, 1918, of delegating the provision of such assistance to other local authorities.

The principal question is how many and which of the poor-law medical services can be absorbed into the public health organisation of the area, and how many must remain *ad hoc*. Each individual area must aim, not at providing every service everywhere, but at supplying as effective and complete a service as is practicable. The Report advises local authorities and their medical officers to consider the medical functions of boards of guardians on the one hand and those of county and county borough councils on the other hand, and to devise an organisation most likely to prove effective for the joint performance of these functions in the varying circumstances. It offers a most valuable guide in a complete review of the medical functions of both bodies, and mentions the principal matters which will require the prompt attention of medical officers of health. Perhaps the most essential thing to secure is effective coördination, not only between the various branches of the service and the various institutions carrying out related duties, but also between local authorities and voluntary agencies and between institutional medical treatment and environmental hygiene and sanitation. The services which must now be woven into a unified organisation on behalf of the whole community include water-supply, drainage, refuse collection, housing, smoke abatement; the control of the food- and milk-supply; health in the office and factory; maternity, infant and child welfare; school medical service; isolation hospitals and treatment of fevers; baths and wash-houses; cleansing of persons, and the direct treatment of such diseases as tuberculosis and venereal and mental disorders. "For the first time in the history of the public health service the medical officer of health has a direct and ample opportunity for closely and effectually coördinating in his area all the varied medical services of the State."

Epidemics during 1928.

The outstanding events of the year in general epidemiology were the continued prevalence of small-pox (to which we referred in an earlier issue[2]), an unusually large incidence of scarlet fever, and a widespread epidemic of influenza in the winter of 1928–29. The diphtheria figures are also greater than during the preceding quinquennium, and the mortality was 5·2 per cent. Seventeen borough councils in London, but only 19 local authorities in other parts, are now providing immunisation against diphtheria. The personal influence of the health visitor, supported by a simple pamphlet, usually provides a steady flow of applicants at the clinic. Toxoid-antitoxin mixture is generally used, but a preparation of toxoid alone is equally safe and is said to be equally effective. The experience of the year has strengthened belief in the value of the method, but has shown that better results are obtained if an interval of two or three weeks is allowed between each injection.

Scarlet fever continues to be mild, with a case mortality of 0·56 per cent. More use is being made of antitoxin, which reduces the tendency to complications, but the progress of active immunisation with toxin is limited by the number of doses required.

Measles ranks second only to whooping-cough as the most fatal infectious disease of childhood. During 1928 it accounted for 4302 deaths. The serum of convalescent patients has been found a very useful prophylactic, although not of much use in treatment.

The deaths from whooping-cough show a decline from 3681 in 1927 to 2970 in 1928.

A study of the outbreaks of enteric and the paratyphoid fevers show that gross sanitary defects are becoming less and less responsible, while special danger lurks in the modern methods of wholesale distribution of foodstuffs, which make it difficult to track down the originator and distributing agents. During July and August nearly 400 persons in London were attacked by paratyphoid B; it was found impossible to trace the infection beyond a wholesale cream dealer who received cream from three different sources, two of them outside the country.

There was a decrease in prevalence of infectious diseases of the nervous system, especially of acute poliomyelitis and, to a lesser extent of encephalitis lethargica. The encephalitis unit at Winchmore Hill is to be extended, and progress has been made with the arrangements for dealing at the Rampton State Institution with cases certified under the Mental Deficiency Acts.

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[1] On the State of the Public Health. H.M. Stationery Office. Pp. 295. 3s.

[2] THE LANCET, August 31st, p. 480.

There was no plague in 1928, although plague-infected rats were found on board several ships which reached this country, and the anticipated drift of cholera westward did not materialise. There were three cases of typhus, two of them in Stepney being confirmed by the Weil-Felix reaction. The 683 cases of dysentery notified during the year represents a considerable increase; 58 per cent. of the cases occurred in mental hospitals.

Influenza.

Since the third pandemic wave in March, 1919, there have been several trailers: in January, 1920; in April and May, 1923; and early in 1924. In January, 1925, the whole country was affected. There was only a slight recrudescence in 1926, but in 1927 there was an epidemic of the second order of importance. The year 1928 passed without any influenza, but the news from America caused disquieting anticipations which were fulfilled by a serious epidemic from January to March, 1929. The death-rate per 1000 rose from 0·16 for the great towns in the first week of December to 5·78 in the last week of February. There seem to have been two main waves, the first proceeding southward from Glasgow while the other extended northwards from greater London. None of the signs recognised by epidemiologists as precursors of an influenza epidemic was noticed in this country in the autumn of 1928, and it seems probable that the infection was introduced directly from America and fostered by the exceptionally cold weather in January and February. The public schools suffered considerably in this epidemic, but the disease was mild. Otitis media, however, was a rather common complication. The report discusses the symptoms of influenza and the variations shown in the different epidemics. That of 1928 was characterised by a four days' fever with some pulmonary catarrh and two kinds of onset: sudden, with acute hyperpyrexia, followed generally by rapid convalescence, or insidious, with early subnormal temperature, headache, and malaise, followed by a protracted convalescence. The respiratory system was frequently involved and acute sinusitis was common. The symptomatology, however, varied in different parts of the country. The Report draws attention to the possibility that a rash may be associated with influenza, and outlines the principles of treatment and prevention.

Tuberculosis.

During 1928 a total of 77,881 new cases of tuberculosis were notified, and it is generally agreed that notification is steadily becoming more effective. Nevertheless, 4252 of these new cases were only notified after death, so that there is still room for improvement. The number of deaths from all forms of tuberculosis was 36,623, a decrease on the previous year. Since 1911 the gross death-rate from pulmonary tuberculosis in men has fallen from 1233 to 879 per million, while the reduction in non-pulmonary tuberculosis is from 436 to 188. These encouraging figures show that the measures taken to combat the disease are well worth continuing. The Report discusses the present accommodation for tuberculous patients, the possible modifications under the new Act, and the notification returns. The new Act should greatly assist local authorities in the important task of formulating wise schemes for after-care and technical education. Investigations have been and are still being made into immunisation of the newly-born by Prof. Calmette's method. The results of the special inquiry into tuberculosis among printers have now been published; the report does not explain the high incidence of this disease among printers, but brings out certain differences between the occupational groups which will pave the way for further inquiry.

Cancer and Radium Treatment.

Cancer continues to exact its heavy toll, the death-rate in 1928 per million population being 1425, an increase of 50 on the previous year. Sir George Newman discusses the problems which are brought out by the statistics relating to cancer incidence and reviews the special inquiries which have been made by the Departmental Committee. Especial attention is given to the possibilities of treatment by radium and the effects and modes of application of radiotherapy. The conclusion reached is that radium alone, properly applied, will bring about the disappearance of a primary cancer, in a fair proportion of cases, from the skin, the cervix uteri, and the mouth and tongue. There is not as yet sufficient experience available to claim an equal success against cancer in other parts of the body, and secondary cancer in glands requires supplementary X ray treatment in every case. The Report reviews the organisation of radium therapy in the various European countries and lays down certain guiding principles for its development in England. These are:

1. If this rare element is to be used as economically as possible it should be kept constantly in action, so that as many patients as possible receive treatment.
2. The radium must be maintained in different quantities in containers of various sizes and shapes for use in different regions.
3. The supply of patients at suitable centres must be adequate to keep the radium in continuous use; sending radium to patients causes loss of radio-active time and is likely to lead to inefficient treatment.
4. The services of regional surgical and radiological specialists must be available.
5. Attendants must be fully trained in the use of radium, both from the point of view of skilled service and from that of their own safety.
6. Radium can be used safely and wisely only by thoroughly competent experts.
7. The radiotherapist and the surgeon must coöperate from the very beginning of treatment.

The conclusion is the same as that of the Radiological Subcommission of the League of Nations[2] that radium therapy can only be adequately developed by means of specialised centres serving large populations, and that research and treatment must proceed hand in hand.

Venereal Disease.

At the end of 1928 there were 188 treatment centres for venereal disease in England and Wales, employing 386 medical officers and with an average of 787 sessions weekly. There was a decrease of 2·7 per cent. in the new cases of syphilis, an increase of 9·9 per cent. in gonorrhœa, and an increase of 10·2 per cent. in patients who attended the centre but were found to be free of venereal disease. The London County Council initiated during the year a scheme for continued observation of girls discharged from hostels. Through the Central Council for the Social Welfare of Girls and Women in London, a certain number of rescue homes have agreed to take in girls who have been under treatment for venereal disease but have become fit to mix with others. This will provide continued treatment and observation for these girls while at the same time enabling the existing hostels to find room for a greater number of acute cases. Experience continues to show that the most important factors in the success of a treatment centre are the personality of the staff and the convenience of the premises. There is a definite improvement in the promptitude with which patients seek treatment, and this is attributed to the steady educational work carried out by local authorities and the British Social Hygiene Council. Expenditure on propaganda is economically justified, for the cost of treatment of a patient whose serum reactions have become positive is at least £2 more than that of a primary case in which the reactions are still negative. Reviewing veneral disease schemes in other countries the Report points out that the British scheme has the advantage of central supervision and universal free treatment.

Food.

An ever-increasing interest is being taken in dietetic questions, and the value of milk for growing children is becoming generally recognised. More than one dairy organisation has inaugurated a scheme for paying farmers a bonus on the bacteriological cleanliness of their milk. The suggestion that "if the public will drink more milk they will get a better, cleaner, and cheaper supply" is characterised as putting the cart before the horse. Not until a better, cleaner, and cheaper supply is provided can increased consumption be expected. There seems no doubt that the cooling of milk at dépôts and its despatch in bulk in suitable tanks is a great improvement, both economically and hygienically. Its only disadvantage is the difficulty which it imposes when any district wishes to trace an infected sample to its origin. The solution seems to lie in the development of a more active control by the authorities of the producing areas. The number of producers and distributors who obtain licences for Certified and Grade A milk is steadily increasing. Of the 12,000 milch cows in licensed herds in 1928, some 4800 were in Certified herds and 7200 in Grade A tuberculin-tested herds. The intradermal tuberculin test has been found the easiest and most reliable under ordinary farm conditions. A large number of samples were taken for bacteriological examination, and most of them were satisfactory. As the Report remarks, the indirect effect of grading is of paramount importance, for it has stimulated the whole industry to produce better milk.

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[2] THE LANCET, August 17th, p. 348.

Imported meat proved satisfactory during the year, except for some consignments of tuberculous meat from the Irish Free State, and a rather large incidence of caseous lymphadenitis in mutton imported from South America and Australia. The new Food and Drugs (Adulteration) Act came into force on Jan. 1st, 1929, and will simplify the work of those concerned in its administration. Of 120,034 samples of food analysed during the year, 7524 were found adulterated or below standard, and 757 contravened the Preservative Regulations. Nearly half these were sausages or other meat products. The Artificial Cream Act, which came into operation on June 1st, 1929, attempts to regulate the "reconstituted cream," which is prepared by emulsifying butter, dried skim milk and water, and which, if carefully blended, cannot be distinguished from natural cream by the analyst. There were no striking outbreaks of food poisoning during the year, but the Report discusses a number of cases where it was not possible to prove the source of the infection.

Hygiene and International Health.

The Intelligence Section has continued its collection, tabulation, and indexing of medical information from home and foreign sources, and a number of important reports and memoranda were issued during the year. The working arrangement between the Ministry, the Medical Research Council, and the London School of Hygiene and Tropical Medicine has proved satisfactory. During 1928 a great deal of important statistical work was carried out, including investigations into anthropometric data, pre- and neonatal mortality, cancer, certified incapacity, and experimental and clinical epidemiology. The Ministry's pathological laboratory has been paying special attention to the immunological classification of streptococci[3] and a revision of the serological types of the Flexner group.

Rheumatism and Undulant Fever.

The value of the notification of rheumatism remains doubtful. The number of rheumatism supervisory centres is increasing, and the number of beds for the treatment of rheumatic affections under the Metropolitan Asylums Board has increased to 520, in addition to the special unit for 60 acute cases at Carshalton.

Recent investigation has shown that cases of undulant fever occur in European countries where the disease had not been suspected, and the Ministry therefore investigated the possibility of its occurrence in this country. Although it does not appear that there is any endemic undulant fever in England, it is unwise to assume that there never will be, and medical practitioners and bacteriologists are asked to bear the possibility in mind.

Miscellaneous.

Among other inquiries carried out by the Ministry in 1928 was one into the existing provision for sick public-school boys and the principles which should underlie sanatorium accommodation. Another inquiry was made into the supervision which is exercised by local authorities over working conditions in offices. Liverpool seemed to be the only town where offices not associated with workshops undergo any routine inspection. Cubic space, ventilation, lighting, and sanitary accommodation are points of great hygienic importance for office workers, but it must be admitted that detailed systematic inspection of all offices would be extremely onerous, and in the opinion of the Ministry it is doubtful whether the results would justify the time and expense involved. An office committee has considered the hygiene of swimming baths and has laid down certain principles for its maintenance. The Reports on rural water-supplies and artificial light treatment have already been noticed in our columns.[4] The unhappy condition of the coalfields in 1928 led to an inquiry into the conditions of the inhabitants of certain mining areas. The results on the whole were reassuring, apart from an increase in rickets in certain areas of South Wales and a lack of vitality among women, especially expectant and nursing mothers.

THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.

MEETING IN HOLLAND.

THE Thirteenth International Congress of Ophthalmology—the first meeting of this nature to take place since the war—was held from Sept. 5th to 13th in Holland. Under the presidency of Prof. J. VAN DER HOEVE the Congress was officially opened by the Queen Mother in Amsterdam, while the concluding sessions were held in the seaside resort of Scheveningen. The meeting was a very large one—larger than any previously held—and the members included the great majority of the leading ophthalmic surgeons from every country in the world; the social arrangements were efficiently and delightfully organised and bore testimony to the boundless hospitality of the Dutch, not the least pleasing aspect being the personal interest shown by the Royal House; and the scientific proceedings throughout were of sustained interest and high standard.

Glaucoma.

The first question for discussion was the Ætiology and Non-operative Treatment of Glaucoma, upon which a symposium was held. It was opened by Duke-Elder (London) who introduced the subject from the physiological point of view. He suggested that in glaucoma the raised tension, although the most obvious symptom, was not the basically essential factor, but was one of the more striking manifestations of a general derangement of the intimate metabolism of the eye. He discussed the economy of the eye in so far as it affected glaucoma under three headings: the equilibrium between the capillary blood plasma and the intraocular fluids; that between the intraocular fluids and the vitreous body; and that between the blood in the choriocapillaris and the retina. He concluded that in the majority of cases glaucoma was ultimately due to an upset of these equilibria determined by changes in the capillaries and changes of a physico-chemical nature in the vitreous body, while the onset of pressure was largely conditioned by a failure in the facilities for drainage at the canal of Schlemm. Hagen (Oslo) followed with a paper wherein he stressed the importance of diurnal variations in pressure; in simple glaucoma the curve generally shows nightly heights, in secondary glaucoma it shows nightly falls. He suggested that the rationale of the first change depended upon obstructed drainage, that of the second on a disturbance in the production of the aqueous humour. Magitot (Paris) started from the principle that glaucoma is essentially an œdema of the eye, the ætiology of which should be associated with the general pathological considerations which produce œdema elsewhere. The chief factor is a derangement of the permeability of the capillary walls, a state determined by disease of the vessels or irritability of the nervous system; general treatment devoted to the whole body is therefore of the first importance. Wessely (Munich) laid stress upon the fact that no theory of glaucoma had yet arrived at the stage when its application could be put to the test of practice, and suggested that it was premature and dangerous to be led away by preconceived theoretical considerations to the subordination of the well-tried local methods of therapy by miotics and operation. He discussed the newer methods of therapy which had been advocated, such as the use of adrenalin, and stressed the danger of allowing the right moment for successful operative intervention to pass through placing unjustifiable reliance upon them. These four opening papers were followed by a prolonged discussion: Passow (Munich) stressed the ætiological importance of the ductless glands, especially an increased function of the thyroid; Fracassi (Arezzo) spoke of the importance of a disturbance of the capillaries either of anatomical or functional nature; Friedenwald (Baltimore) gave a very interesting account of his pathological investigation into the state of the capillaries in acute glaucoma, and described experiments relating these changes to the action of histamine. Hamburger (Berlin) suggested that since glaucoma means a rise of pressure and cyclitis is associated with a fall, the rational treatment of the first disease would be the artificial production of the second. Bonnefon (Bordeaux) discussed the hypotensive action of a retrobulbar injection of adrenalin; in some cases this is due to vasoconstriction, in others to the mechanical pressure effect of the injection. Other papers on glaucoma included a contribution by Sallmann (Vienna) on diurnal pressure curves; by Bistis (Athens) on the influence of the sympathetic nervous system; by Waardenburg (Arnhem) on its association with nævi; by Kerry (Montreal) on the effects of congestion of the ciliary body on the drainage channels of the eye; by Troncoso (New York) on the gonioscope in the diagnosis of glaucoma; by Comberg (Berlin) on the international standardisation of tonometry; by Péretz (Cairo) on the association of glaucoma and cataract; by Jasinski (Poznan) on the osmotic pressure of the blood in glaucoma; by Mawas (Paris) on the hydrogen-ion concentration and the alkali reserve of the aqueous humour; and several contributions to the operative treatment of the disease—those of Tulières (Bordeaux) on sclerectomy; Velter and Duverger (Paris) on the sclerecto-iridectomy of Lagrange; Preziosi (Malta) on the effects of electro-cautery puncture; Meyenhof (Cairo) on sclero-iridotomy; Szymanski (Wilno) on a modification of Elliot's operation; and Fiore (Rome) on a new procedure wherein a sclero-ciliarotomy is made by cautery incision.

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[3] THE LANCET, 1928, ii., 697.

[4] THE LANCET, 1928, ii., 1070; 1929, i., 654.

Trachoma.

The second subject chosen for a symposium was the Geographical Distribution and the International Social Campaign Against Trachoma. This attracted a very large number of speakers drawn from all over the world, and, each contributing in statistical form the incidence of trachoma in his own country and the measures which were taken to combat it, an unprecedented review was accumulated which should prove of no small value. Over 25 papers were contributed, but their value can only be appreciated on detailed study; the most impressive result which emerged was the extraordinarily wide geographical distribution of the disease and the immense social and economic disadvantage it brings in its train. In England the incidence of trachoma is low, but in such countries as the Sudan, Palestine, Cochin China, the Argentine, Formosa, and others it is met with in 20 to 30 per cent. of the entire population. The extent of this universal scourge is now generally recognised and measures adopted against it include the control of the frontiers, compulsory notification, examination and treatment of school-children and recruits. It is to be hoped that the result of the wide publicity given to the question in this Congress, and the gathering together of information and the exchange of ideas will lead to a still more intensive world-wide campaign which can do nothing but good.

Suprasellar Tumours.

A third symposium of more than usual interest on the Diagnosis of Suprasellar Tumours was introduced by Christiansen (Copenhagen), Cushing (Boston), Gordon Holmes (London), and Van Bogaert (Antwerp). Christiansen outlined the general symptomatology of these tumours and explained the rationale of the various clinical manifestations, illustrating his remarks by the description of cases. He laid stress on the diminution of the visual acuity, which was usually unilateral and frequently temporal; colour vision alone may be first affected, and a central scotoma was frequent. Cushing omitted from his remarks the more obvious tumours affecting the chiasmal region which were readily recognised by X rays, and confined himself to the simple chiasmal syndrome of optic atrophy and bitemporal field defects produced, in the practical absence of other symptoms, by suprasellar tumours occurring with an approximately normal sella turcica. He discussed the various pathological entities which may be responsible for the condition (adenomata, tumours of Rathke's duct, chiasmal gliomata, meningiomata, &c.), and stressed the importance of distinguishing their early symptoms from toxic amblyopias and retrobulbar inflammatory conditions. Gordon Holmes dealt in detail with the symptomatology of tumours of this region and emphasised several points in their differential diagnosis; he also discussed the clinically related conditions of basal aneurysms which involved the optic pathways, and chronic basal arachnoiditis and the formation of meningeal cysts in the region round the chiasma. Van Bogaert drew a pathological distinction between tumours associated with Rathke's pouch and the other neoplasms in the chiasmal region. He discussed the local symptomatology, and emphasised the systemic derangements which are also met with: somnolence, polyuria, vasomotor, respiratory, and pigmentary disturbances, an upset of the basal metabolism with derangements of carbohydrate, fat, and chloride metabolism, and also psychic effects. He pointed out that these patients usually first applied to the oculist with whom rests the responsibility of diagnosis and the possibility of early treatment. These opening speakers were followed by papers by Brouwer (Amsterdam), who discussed the difference in the visual fields in intra- and suprasellar tumours; by Hirschmann (Berlin) on the diagnostic and therapeutic value of transfrontal pituitary puncture; by Rollet (Lyons) on the clinical forms and complications of suprasellar tumours; by Igersheimer (Frankfurt), Hirsch (Vienna), and others.

Other Subjects.

In addition to these special subjects chosen for symposia a great volume of individual papers was presented, numbering over 250 and ranging over every branch of ophthalmology. The more interesting contributions of a scientific nature included an exposition of the rôle of the rods in the retina in dyscritic vision by Sir John Parsons, who seconded his argument by phylogenetic and recent experimental studies; a paper on the vessels of the iris in reptiles and birds by Mann (London); on the finer structure of the retina with special reference to the corpuscles recently described by Fortin, by Enriquez (Madrid); papers on the lens, with special reference to the iso-electric points of its proteins by Scalinci (Naples), and its mineral constituents by Burdon Copper and Lewis (Bath); and on lens' antigen by Davis (Wisconsin). Interesting cases included one described by Paton and Williamson-Noble (London) of Lindau's disease; the case had come to histological examination and this suggested that the primary lesion is a capillary angioma and that the gliosis is secondary. A somewhat similar case associated with a glioma of the spinal cord was described by Jess (Giessen). Oguchi's disease of the retina and the syndromes associated with congenital hemeralopia was discussed by Oguchi (Nagoya). Cyanosis of the retina in association with vascular disease and polycythæmia was discussed by Moreno (Madrid); arachnodactyly by Ormond (London); retinal melano-epithelioma by Paschoff (Sofia); and many more. Several speakers strongly advocated the treatment of detached retina by ignipuncture, the cautery being inserted through the hole in the retina (if that were present)—Bufill (Barcelona), Gonin (Lausanne), Arruga (Barcelona), and others. The problems of refraction and the prescribing of spectacles, of muscular anomalies and heterophoria, attracted a great deal of attention, and newer methods of operative technique and of treatment, such as by diathermy, provided material for discussion.

Not the least interesting contribution was the demonstration of apparatus and special methods: the gonioscope of Troncoso (New York), the nystagmograph of Ohm (Bottrop), the phoro-optometer stereoscope of Wells (Boston), the ergograph of Berens (New York), the adaptometer of Hertel (Leipzig), the red-free ophthalmoscope of Lauber (Vienna), and others; while a novel and interesting sideline was the demonstration of several films showing ophthalmic operations, particularly by Wessely (Munich) and Elschnig (Prag).

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Prohibition.

THE event at the recent meeting of the American Medical Association which has given rise to most publicity is one in itself of no particualr importance. Dr. Thayer, the retiring president, let fall some remarks disparaging the present tendency of government to control our personal behaviour. This proved an active stimulus to the chairman of the Methodist Church Board of Temperance, Prohibition, and Public Morals, Rev. Clarence True Wilson, who thereupon launched a violent attack on Dr. Thayer, asserting that he had been unfairly elected to his high office by "wet" influence. This attack was noticed by the House of Delegates, who adopted unanimously a report which stated: "The committee expressly commends and endorses the sentiments expressed by Doctor Thayer concerning legislative enactments that are inimical to the best interests of the medical profession and public by restricting medical men as to what shall, and what shall not, be prescribed for the relief of human ills." Several of the State medical journals, and not least those from the "dry" states, have printed editorials condemning the outburst of this "dry" leader, and extolling the action of the House of Delegates.

Meanwhile, an "open forum" on the subject of prohibition if being conducted by the *Medical Journal and Record*. Letters are printed from doctors in various distant parts of the country, apparently in response to a questionaire. The pros and cons are fairly evenly divided, and the arguments used for the most part, cancel out. Thus the superintendent of a State hospital in Ohio notices "a marked decrease in alcoholic psychoses." The superintendent of a hospital in Michigan is equally positive that the alcoholic psychoses have increased. On this particular point some independent statistical evidence was published last month by H. M. Pollock and F. W. Brown in *Mental Hygiene* (1929, xiii., 591). It appears from their investigations that alcoholic psychoses in 15 States have increased per 100,000 of general population during the years 1921, 1922, 1925, and 1926. The latter rate, however, is slightly less than the corresponding rate for 1919. Data concerning the proportion of intemperate users of alcohol among new admissions were received from 65 hospitals in the 15 States, and show a steady increase in these intemperate users, which is, however, proportionate to the increase in population. The interpretation of all these observations is open to question, since no one can tell what would have happened to the rates if prohibition had not been in force. Whether alcoholism has decreased or not in this country it seems rather obvious that it has not decreased here as rapidly as it has in Great Britain.

Medical Literature and the Mails.

It has been generally assumed that information on contraception cannot be legally put in the mails. Quite recently an article containing such information was offered to the editor of a State medical journal. The article was printed, but only after all the specific instructions as to method had been expurgated. Dr. Dickinson, the energetic secretary of the committee on Maternal Health, now points out that the same law which bans information on contraceptive methods also bans information on the technique of abortion: "every book . . . giving information directly or indirectly . . . by what means . . . any act or operation . . . of any kind . . . for the . . . producing of abortion . . . or how abortion may be performed . . . is declared non-mailable matter." A good many standard text-books must come under this ban. However, it is doubtful whether the law will be enforced against either publisher or recipient in the present state of public opinion. Reports containing details of contraceptive methods, as well as medical journals describing them, have actually been sent through the mails without prosecution having ensued. On the other hand there is no security, and the recipient, as well as the sender, of such literature is liable to a fine of not more than $5000, or imprisonment for not more than five years, or both. The customs authorities rigidly exclude contraceptive apparatus from the country, even when it is addressed to leading hospitals. This has no pronounced effect, since the apparatus is manufactured by several concerns and sold freely at quite reasonable cost within the United States. There are, of course, other means of transportation besides the Federal postal service.

The Prevalence of Venereal Disease.

Recent statistics indicate that the venereal diseases are still widespread in the United States. Among 100,000 male prisoners undergoing routine examination in California a history of venereal sore was obtained from 15 per cent., and in 9·2 per cent. the blood gave a positive Wassermann reaction. Nearly 50 per cent. gave a history of gonorrhœa that could not well be mistaken. Last year in the State of Illinois there were reported 19,826 cases of gonorrhœa and 12,690 cases of syphilis. Among all other diseases pneumonia took first place with 19,130 cases; followed by chicken-pox, 18,081; scarlet fever, 12,855; and tuberculosis, 12,155. Public health authorities tend to rely increasingly on education to prevent the spread of venereal infection. It is reported that some sex instruction is now given in more than 25 per cent. of the high schools of this country, as compared with similar instruction in not more than 10 per cent. of the schools ten years ago.

Tariff Revision.

There has been a good deal of protest against the general upward revision of the Tariff by the House of Representatives in this country, as well as abroad. The proposed increases in the duty on medical and dental instruments (from 45 and 35 to 70 and 60 per cent. ad valorem respectively) caused as much protest as any proposal, and the finance committee of the Senate has tentatively agreed to recommend against the increase. The committee has approved, however, increases in the rates on other instruments and utensils used in hospitals and medical laboratories, and it is to be feared that, unless energetic opposition develops in the Senate itself, a definite increase in the cost of such necessary articles as ophthalmoscopes and hæmocytometers is likely to result from the legislation of the present Congress.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Control of Milk and Meat.

IT is stated that early in the next session of the Dail the Government of the Irish Free State will introduce legislation to control the milk and meat trades in the interests of health. It is believed that in regard to milk two grades will be officially recognised—namely, Grade A (tuberculin tested), and Grade A. For Grade A (tuberculin tested) the milk must be produced from cows which have passed a tuberculin test and have been submitted to veterinary examination. The whole herd must be tested, and every animal to be added to it must be tested before admission to the herd. A veterinary examination is to be made every six months. The milk must not have a bacterial count of more than 100,000 organisms per c.cm., or any coliform organisms in one-tenth c.cm., and must be bottled before distribution. Milk in this grade will be controlled and tested by the Department of Local Government and Public Health. Milk of Grade A must also be bottled before distribution. The herd from which it comes must be submitted to a veterinary examination every three months. The bacterial count must not exceed 200,000 organisms per c.cm., and the milk must not contain any coliform organisms in one-hundredth c.cm. Milk in this grade will be controlled and certified by the local authority. The sale of pasteurised milk will be permitted only in accordance with defined conditions, and the use of misleading terms will be prohibited. Power will be given to a medical officer of health to stop the sale of milk if there is epidemiological evidence that it is the vehicle of infective disease.

The problem of the control of the meat trade is different. Legislation will deal rather with the safeguarding of meat intended for export than with the prevention of disease at home, although, no doubt, both objects are in view. The export trade in fresh meat of all kinds—beef, mutton, pork—has increased nearly fortyfold in the past few years, and the Government is anxious lest this development should be checked by any carelessness about the condition of the meat. Legislation will prohibit the slaughter of animals for export in other than registered slaughterhouses, which must have been inspected to the satisfaction of the Minister before registration. Every slaughter-house will be under the supervision of a veterinary surgeon who will examine all animals before and after slaughter, and he will examine not only the carcasses but the offal. Provision will be made to control methods of transport by road, rail, and sea. The Bill will also deal with the conditions of packing and export of rabbits and poultry.

Conditions of Nursing Service in Cavan.

A recent inspection of the Cavan County Hospital by Dr. Boyd Barrett, one of the inspectors of the Department of Local Government and Public Health, has brought to light the highly unsatisfactory conditions under which the nurses in that institution are expected to work. For a considerable time past there has been discontent among the nursing staff, and many nurses have left after brief periods of service. In his inspection Dr. Barrett found four nurses sharing one bedroom. Another room was given to two nurses, one of whom was on night duty. It was therefore impossible for the nurse on duty to enter the room without disturbing the night nurse. Dr. Barrett found that the time off duty was only two hours a day, which period appeared to have included the dinner-hour. No half-days were allowed, and a whole day was only granted occasionally if work was slack, or to a night nurse after a month's night duty. In this hospital the worst features of the "living-in system," now no longer tolerated by shop-workers, still persist. It is to be hoped that the Department will exercise a careful supervision over the conditions of service of nurses in all institutions under its control.

Recent Appointments in Dublin.

Dr. W. E. J. Jessop has been appointed professor of physiology, physics, and chemistry in the School of the Royal College of Surgeons in Ireland. He has shown exceptional ability as a student in Dublin University, where he is at present assistant to the professor of bacteriology, and has been engaged in research work in chemistry and biochemistry.

Dr. A. G. Thompson has been appointed Rockefeller Foundation Fellow in Biochemistry in Dublin University under the scheme established last year by the Rockefeller Foundation. After a distinguished career in Trinity College, Dr. Thompson last year was appointed director of the pathological laboratory, Jervis-street Hospital.

Public Health Services.

A FATAL CASE OF POST-VACCINAL ENCEPHALITIS.

THE Bridgwater coroner held an inquest on August 27th on a girl of 13, who was vaccinated on August 10th, together with nine other children, all inmates of the Cottage Home at Cannington. Government lymph was used, and four insertions were made. She had not been previously vaccinated, and was in good health. The vaccination ran a normal course, the pustules being well-marked at all four insertions, and the surrounding inflammation quite moderate. On August 21st the girl complained of headache; on the following day she was drowsy, and the temperature rose to 103°F. On August 23rd, on removal to the Isolation Hospital, her temperature was 104°; she was then semi-comatose, with signs of encephalitis. She died at 4.15 P.M. next day without having recovered consciousness. Dr. G. W. Harvey Bird, medical officer of health for Bridgwater, tells us that the post-mortem examination, carried out the same night, revealed no sign of disease in chest or abdomen. There was no meningitis, but the entire brain was congested. None of the other nine children vaccinated developed untoward symptoms. Dr. Bird remarks that the incubation period of 11 days is apparently typical of post-vaccinal encephalitis.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 7TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 150 (last week 131); scarlet fever, 1964; diphtheria, 884; enteric fever, 107; pneumonia, 538; puerperal fever, 56; puerperal pyrexia, 94; cerebro-spinal fever, 8; acute poliomyelitis, 21; acute polio-encephalitis, 0; encephalitis lethargica, 20; dysentery, 9; ophthalmia neonatorum, 105. No case of cholera, plague, or typhus fever was notified during the week.

The number of case in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 10th–11th was as follows:—Small-pox, 150 under treatment, 14 under observation (last week 165 and 8 respectively); scarlet fever, 1837; diphtheria, 1456; enteric fever, 18; measles, 277; whooping-cough, 218; puerperal fever, 23 (plus 8 babies); encephalitis lethargica, 125; poliomyelitis, 2; "other diseases," 28. At

St. Margaret's Hospital there were 15 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (2) from enteric fever, 15 (2) from measles, 5 (0) from scarlet fever, 25 (6) from whooping-cough, 14 (2) from diphtheria, 79 (15) from diarrhœa and enteritis under two years, and 15 (2) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (the number of which is practically stationary), 8 were reported from Liverpool, 7 from Birmingham, 6 from Gateshead, 4 from Sunderland, and 3 each from Leeds and Hull. Glasgow, Dublin, and Belfast reported 7, 0, and 4, respectively. Deaths from measles were reported from Liverpool and Sunderland, 3 each. Both fatal cases of enteric fever occurred at Birmingham.

The number of stillbirths notified during the week was 240 (corresponding to a rate of 37 per 1000 births), including 48 in London.

Obituary.

CHARLES ALEXANDER MORTON, O.B.E., F.R.C.S. ENG.

THE death of Mr. C. A. Morton which occurred, as *briefly announced on Sept. 14th, during a holiday in* Switzerland, ends a long and useful surgical career. Charles Alexander Morton was born in Bristol in 1860, his father John Morton himself being a surgeon, at one time on the staff of the East India Company in the Madras Presidency. He was educated at Clifton and went on to St. Bartholomew's Hospital for his clinical work, when he took prizes at every stage of his course, ending with the coveted Brackenbury Medical Scholarship. After qualifying in 1881 he became house surgeon at the Stanley Hospital in Liverpool, returning in the next year to be house physician at St. Bart.'s. In the period that followed he continued to gain varied experience in resident appointments, including that of house surgeon at the Cumberland Infirmary, resident medical officer at the Manchester Children's Hospital, clinical assistant at Great Ormond-street, and resident clinical assistant at the Leicester Infirmary. *At this time* he frequently contributed to current medical literature, his interests covering such subjects as subacute anterior spinal paralysis, coal gas and carbolic acid poisoning, ruptured hydatid cyst of the liver, and intestinal obstruction. Returning to Clifton he took the F.R.C.S. Eng., and became in 1891 registrar to the Bristol General Hospital, and assistant surgeon two years later; for 27 years was on the surgical staff of the hospital, retiring as senior surgeon in 1920. For 25 years he was also surgeon to the Bristol Children's Hospital, and he had surgical charge *at the Cossham Memorial* Hospital. These appointments were a matter of course, for Morton was, with the exception of Greig Smith, the first man of the Bristol school to devote himself purely to surgery.

PROF. MORTON.

Morton's work as a surgical teacher began with his appointment as professor of surgery in University College, Bristol, in 1897, and he occupied the chair for 28 years until his resignation in 1925, when he was appointed emeritus. As a teacher of students he was acutely aware of the contradictory nature of many of the statements contained in the current text-books, and he put forward a scheme for the production of a standard text-book of surgery for use by examiners and examinees alike. The objection that such standardisation might stifle inquiry he met with arguments to the contrary that impressed if they did not convince his fellow-teachers. As a surgeon he spared no effort in diagnosis, and demonstrated to students in the wards with emphasis which omitted no pathological possibility from consideration. He prepared the patient's skin for an operation with a thoroughness that amounted almost to a fault, operated and closed the wound with great deliberation, relying on others to the minimum, and doing his own dressings with a ritual that was nearly as precise as that of his operations. Such a laborious and painstaking performance may sometimes have been tedious to fellow workers, but it led to results which compelled the respect of the surgical profession and the warm admiration of his dressers, and earned the deep gratitude of his patients. During the war his work at the Beaufort (Territorial) Hospital was specially responsible and onerous. His interest then centred round injuries of nerves and blood-vessels, but he remained all his life at heart a general surgeon in the widest sense, and his contributions to surgical literature cover a large field. Two of these, on cuneiform osteotomy of the tibia for genu valgum and on the end-results of the surgery of cancer of the breast, are typical of his sound style and reasoning.

A man of strong individuality Morton took some part in public life and on committees of various kinds he showed an independence of thought which led him along well-reasoned lines to many valid conclusions. The critical faculty so dominated him that it often led him to assume opposition, as if his fellows could never be on the side of wisdom and truth, but at no time in his career did anyone, whether in agreement or disagreement with him, question either his sincerity or his singleness of heart. After retiring from hospital work he served as a member of the board of guardians, and here again he was concerned with the wider issues of administration. In politics his careful and analytical mind led him to support a non-partisan policy. Always of a retiring disposition Morton was latterly rather a lonely figure in Bristol. He was never physically robust, and he was unable to keep up the cycling and walking that had always served him as sole recreation in his more strenuous years. But many scores of patients will thankfully remember the unstinted services in which his life was spent.

Charles Morton was unmarried. His elder brother, Mr. Stanford Morton, the ophthalmologist, who lived in Clifton after his retirement, predeceased him by two years.

ST. GEORGE'S HOSPITAL.—The annual report of the House Committee calls attention to the enormous increase in the cost of maintenance. Last year it was £88,916, which is more than double the expenditure in 1913; the adverse balance was £7016. It is stated that every economy consistent with the proper treatment of the patients has been continuously practised, but unless an additional income of at least £20,000 can be secured "the time cannot fail to arrive when it may become necessary to curtail the hospital's activities." In 1928 there were 6000 in-patients, who stayed on the average 22 days and cost £14 10s. each. There were 30,705 new out-patients who cost about 7s. each. Contributions by, or on behalf of, patients amounted to £18,561.

Correspondence.

"Audi alteram partem."

THE "GRADING" OF BREAST CARCINOMATA.

To the Editor of THE LANCET.

SIR,—No one appreciates more than I the admirable work which Mr. D. H. Patey and Dr. R. W. Scarff have undertaken to divide carcinomata of the breast into different grades of malignancy. Their task is difficult and none would be justified in disparaging their careful methods of observation. At the moment all I wish to point out is that the primary tumour in carcinoma of the breast is the epithelial neoplasia that exists within the normal boundaries of ducts and acini and from which the invading cells originated. All epithelial cells that have transgressed those boundaries and are multiplying in outside tissues have an equal claim to be regarded as "secondary deposits," whether or no they have reached lymphatic glands. From this point of view—and it appears to me to be the correct one—the lump that forms the compact mass in the breast and which is generally spoken of as being the "primary tumour" is composed of "secondary deposits" and the primary tumour situated in the ducts and acini. When suitable methods are adopted the initial primary tumour—viz., the epithelial neoplasia—in the ducts and acini can be detected in all examples of early carcinoma of the breast without exception. In the later stages the detection is not so easy and in many instances the primary lesions are obliterated by the welter of secondary epithelial cell invasion. In attempting to grade the degree of malignancy in carcinoma of the breast the morphological and biological characteristics of the epithelial neoplasia within ducts and acini forms the most instructive and accurate standard on which to base comparisons between it and all its epithelial descendants.—I am, Sir, yours faithfully,

G. LENTHAL CHEATLE.

Harley-street, W., Sept. 12th, 1929.

THE "ASUERO" TREATMENT

To the Editor of THE LANCET.

SIR,—In the spring of this year the reports in the lay press of cures of paralysis by the Asuero method of treatment led to inquiries from patients suffering from different forms of paralysis whether they ought to risk the adventure of foreign travel to obtain this treatment or whether it could be applied in this country. I have recently had an opportunity of meeting in Lisbon a Dr. Patacho, who had just returned from a course of instruction in San Sebastian under Dr. Asuero, who is an ear, nose, and throat surgeon at the Red Cross Hospital. The line of treatment associated with his name evidently consists in setting up a reflex action through the mucous membrane of the nose. With a blunt probe shaped in a peculiar manner he searches for a sensitive spot —usually found in the mucous membrane covering the inferior or middle turbinate bones. This spot is not a fixed one, and is detected by the fact that every slight touch on it is sufficient to cause lacrymation and dilatation of the pupils. When the spot has been found it is treated by another blunt instrument which has been previously warmed; only occasionally is this instrument made hot. Most of the reports of the treatment have come from Lisbon, and I was content to make that city the centre of my investigations. I came to the conclusion that the people of Portugal are a more impressionable people than we are, and that no blame could be attributed to Asuero or his trained assistants for the sensational accounts of the cures obtained, though these are grossly exaggerated.

The following list of diseases from one of Asuero's printed cards shows the varied conditions which he claims to have treated with benefit: glycosuria, varicose ulcers, rheumatism in all its manifestations, hæmorrhoids, menstrual conditions, all pains, headache, noises in the ear, vertigo, pyorrhœa, epilepsy. Dr. Patacho did not entirely agree with this list, and it is hardly necessary to emphasise the fact that Asuero makes no mention of paralysis. In anterior poliomyelitis Dr. Patacho had failed to produce any results. The treatment is always used in conjunction with other known medical measures.

Whether any of the types enumerated by Asuero are really benefited is uncertain, but meantime it may be a service to my colleagues to have further confirmation of what they already must have guessed. Patients and their friends may rest assured that miracles are not being performed, and no case of paralysis with destruction of nerve or muscle tissue need hope for cure by such a method. On the other hand, it may be that in functional cases a strong reflex stimulation will suddenly rearrange the disordered cycle of impulses and lead to a restoration of voluntary activity, but the patient may rely on his family physician to know whether he falls into that category. An electrical test will soon reveal the condition and, if nerve conduction is intact, results of a startling nature may often be obtained quite apart from Asuero treatment. I am, Sir, yours faithfully,

THOMAS MARLIN.

Park-crescent, W., Sept. 16th, 1929.

*** This account confirms the impression conveyed by the note on this treatment from Dr. A. G. Gray, of Madrid, published in THE LANCET of June 15th, p. 1284.—ED. L.

OCCUPATIONAL DISEASES OF HOP-PICKING.

To the Editor of THE LANCET.

SIR,—The paper by Dr. Beatrice M. Smithies in your issue of Sept. 7th (p. 494) is of great interest to any practitioner who, like myself, works in a hop-growing district. Every year one comes across the three conditions she describes so clearly. With regard to the third, "hop gout," I am inclined to think the terminology is misleading. All the cases I have met with have differed in no way from typical tenosynovitis. Naturally this is unilateral, as the movements of the two hands in hop-picking are different; one hand is used for holding and the other for picking. Occasionally true gout occurs among hop-driers, but this is a totally different condition from that described by Dr. Smithies, and arises from quite different causes.—I am, Sir, yours faithfully,

Ledbury, Sept. 12th, 1929. LESLIE B. C. TROTTER.

IS CHILDBIRTH EASY AMONG PRIMITIVE PEOPLES?

To the Editor of THE LANCET.

SIR,—In an annotation on the Infancy of Midwifery in THE LANCET of April 6th (p. 727) I read that "among primitive peoples childbearing is often so easy as hardly to disturb the mother's working life." I was, Sir, of that opinion until I came to this island of the South Pacific (lat. 7° south), where I am the first medical man to be stationed.

These people are certainly primitive. The practice of head-hunting ceased only six years ago, and many men still carry their axes or spears and shields. Within the last fortnight, and only a mile distant, for no very apparent reason, a man killed his wife and child and burnt the hut over them. Spirit-worship is prevalent and fear of evil spirits is deeply inbred in the lives of the people. The women support the family by work in the gardens and carry their heavy loads home at night usually two to four miles over rough and hilly ground. When his wife is near full term the husband builds a leaf hut in the bush. This is the nursing home where she must stay until 14 days after the birth of the child. She sits on a log, her back supported by the knees of a woman sitting behind. Another woman presses on the fundus.

But childbearing under these conditions is by no means a minor event to the woman and not rarely the leaf hut witnesses the death of the mother or child or both. The last six consecutive cases admitted to this hospital support this view.

1. Second pregnancy. Last baby born dead. This time two and a half days' labour; pains increasing in strength and severity. Forceps. Puerperium: cystitis.
2. First labour difficult. Baby born dead. This labour: small pains 12 hours, severe 30 hours. Puerperium: obstinate cough.
3. Primipara. Labour 18 hours, strong pains. Puerperium: breast induration with fever.
4. Multipara. Labour 12 hours; strong pains.
5. Multipara. *Last labour, uterus "came right outside."* Vulva showed old tear of second degree. This labour: 16 hours, severe pains. Puerperium: severe perisplenitis of enlarged spleen (malaria).
6. Primipara. Small pains, increasing in severity. Waters broke after 48 hours. Severe pains for further 24 hours.

Further confirmation is supplied by the frequently heard statement "his mother died when he was born." I am not dealing with causes. I wish only to state that here, at least, amongst this primitive people with all its disease, dirt, and customs which go to make up the picture, labour is not a minor incident, and would seem to be no whit easier than in New Zealand or Dublin.

I am, Sir, yours faithfully,

CLIFFORD JAMES, M.B. (N.Z.), D.T.M. & H. (Lond.), F.R.C.S. Edin.

Methodist Mission Hospital, Choiseul, British Solomons,
July 24th, 1929.

EFFECT OF X RAYS ON BLOOD-PLATELETS.

To the Editor of THE LANCET.

SIR,—We are certain that Dr. Cramer and Dr. Mottram need no assurance from us that we had no intention of misrepresenting their results, or of detracting in any way from the value of their work. The important points to us appear to be: (1) What are the changes produced by radiation on the blood-platelets? (2) What relation, if any, do they bear to the symptoms of radiation sickness? (3) Is the cat a suitable animal for blood-platelet studies?

Our experiments show that the decline in the platelet count in the cat is not associated with evidence of infection, and does not seem to run parallel with the deterioration in the clinical condition; in fact, signs of general improvement are visible before the platelets are at their lowest level, and the animal may appear outwardly quite normal long before full recovery of the platelets to their original level has taken place. Animals that succumbed with marked evidence of infection showed no significant change in the platelet count; in the experiments of Cramer, Drew and Mottram, the animals that died of infection also showed a thrombopenia. It was this difference between our results and theirs that we wished to draw attention to, especially in view of the fact that Dr. Cramer and his co-workers have in a number of communications laid stress on the frequent association of infective states with thrombopenia.

We incline to the view that the infective conditions which are so striking a feature following lethal doses of X radiation in the cat may be due to injury to the small intestine (of which we have ample evidence), coupled with the almost complete disappearance of the white cells from the blood. Dr. Cramer has reported changes in the intestine following gamma radiation, though they do not appear to be altogether of the same nature as those observed by ourselves following X radiation.

Dr. Cramer and Dr. Mottram further suggest that the cat may be an unsuitable animal for blood-platelet studies. We think that it is always advisable to work with an animal which is as high up the scale as possible, if one hopes to draw any conclusions which may be applicable to man. The statement in our paper that "the range of normal variation noted in the small series studied is from 0·75 million to over 5 millions," meant, of course, that this was the range noted in the series and not in any one individual. In fact, cats can be divided into two groups from this point of view: those with high and those with low platelet counts. Animals with high platelet counts continue to show this feature if regularly examined over a period of weeks, and such animals appear to us peculiarly suitable for radiation studies for this reason. The criticism frequently offered on platelet work in the past has been that the variations produced are not strikingly outside the range of error of the technique; we feel that this objection cannot be offered against results such as ours, in which the platelet decline was from the order of several millions to one of several hundred thousands per cubic millimetre.

We are, Sir, yours faithfully,

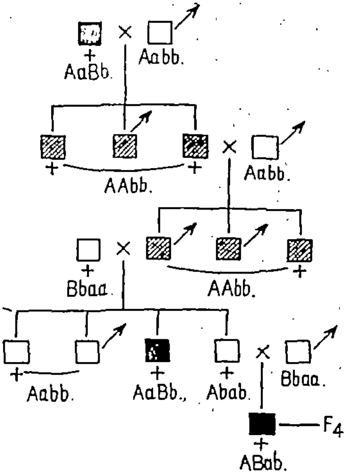
SAMSON WRIGHT.
H. A. BULMAN.

Cancer Research Laboratories, The Middlesex Hospital, W.,
Sept. 17th, 1929.

AN INHERITED TENDENCY TO SUPERNUMERARY DIGITS.

To the Editor of THE LANCET.

SIR,—"*Phalanx's*" *letter in your issue of August 3rd* (p. 256) affords some more data with regard to the complicated story of polydactylism. There exists a mass of apparently conflicting evidence in cats, guinea-pigs, and poultry. The matter is not at all clear yet and the following hypothesis, which accounts for the pedigree cited by "Phalanx," must not be considered to be necessarily correct. I suppose that the supernumerary digits are the result of the interaction of two Mendelian factors (A) and (B); while when one factor (A) is present in the homozygous condition it produces the long thumbs, like index-fingers. In the accompanying chart I have set out the pedigree given by "Phalanx," the black signs representing persons with supernumerary digits and the shaded signs those with long thumbs. On this hypothesis it is seen that any of the F_4 children are liable to have supernumerary digits.



I am, Sir, yours faithfully,

HUMPHREY J. H. HARE, M.A.

Great Yarmouth, Sept. 3rd, 1929.

Medical News.

DEATH OF DR. R. T. SLINGER.—The death of Robert Townley Slinger, M.B. Manch., F.R.C.S. Eng., on Sept. 10th, at the early age of 49, is deeply regretted in Worcester, where he was in general practice for 20 years. An honours graduate of Owens College, he qualified in 1903, and began a series of appointments at the Manchester Children's Hospital and the Royal Infirmary. In 1906 he collaborated with Sir Victor Horsley in a paper on the Orientation of Points in Space by the Muscular, Arthrodial, and Tactile Senses of the Upper Limbs, and two years later he took the diploma of F.R.C.S. Dr. Slinger went to Worcester in 1909 as a partner of the late Dr. T. P. Gostling, and when the latter retired he undertook single-handed the work of a general practice which was continually expanding. His services were early sought for the Worcester Infirmary, and he became at first anæsthetist and then hon. surgeon. He gave of his best to his patients here in skill and in time. Despite the calls of a big practice, he always regarded the infirmary as his first duty. His surgical technique was of a high order, and he successfully undertook operations requiring much experience and judgment. His colleagues and patients in Worcester were about to present him with a testimonial in token of their regard, and to show their sympathy with him in his misfortune at having to give up practice owing to bad health. Unfortunately, the presentation never took place, owing to the rapidity of his last illness. The fund is still open for those who would show in a practical way their gratitude for kindnesses received. He leaves a widow.

ROYAL INSTITUTE OF PUBLIC HEALTH.—A course of lectures on Problems of Personal and Public Health will be given at this Institute, 37, Russell-square, London, W.C. on Wednesdays, at 4 P.M., from Oct. 16th. The lecturers will be Dr. Graham Little, on the Health and Conditions of Work of Medical Students (Oct. 16th); Mr. J. C. Stobart, on Broadcasting and Health (Oct. 23rd); Dr. A. F. Hurst, on the Asthma Problem (Oct. 30th); Mr. Stanford Cade, on the Possibilities and Limitations of Radium Treatment (Nov. 6th); Dame Louise McIlroy, on the Influence of Pathology upon Maternal Welfare (Nov. 13th); Dr. Malcolm Donaldson, on the Early Diagnosis and Treatment of Malignant Disease (Nov. 20th); Prof. Lyle Cummins, on Some Aspects of the Tuberculosis Problem (Nov. 27th); Dr. Alfred Jordan, on Dress in Relation to Health and Disease (Dec. 4th); Prof. Winifred Cullis, on Speed as a Psychophysiological Factor in the Life of To-day (Dec. 11th); and Prof. E. L. Collis, on Industry in Relation to Personal and Public Health (Dec. 18th).

The *Harben Lectures* will be given at the same place at 5 P.M. on Fridays, Oct. 18th and 25th, and Nov. 1st, by Dr. R. A. Peters, Whitley Professor of Biochemistry in the University of Oxford. His subject is the Coördinative Biochemistry of the Cell and Tissues.

MANCHESTER ROYAL INFIRMARY: *Post-graduate Courses.*—From Sept. 24th post-graduate lectures and demonstrations at the Royal Infirmary will be held weekly, at 4.15 P.M. on Tuesdays, until Dec. 10th, after which they will be resumed in March. Besides these lectures, there will be others on special subjects, from Friday, Sept. 27th, onwards. Particulars will be found each week in our Medical Diary.

The *Lloyd Roberts Lecture* will be given this year on Wednesday, Nov. 27th, at St. Mary's Hospital, Whitworth-street West, by Mr. Comyns Berkeley, who will speak on the Teaching of Obstetrics and Gynæcology.

HOSPITAL SATURDAY FUND.—The annual collection for the Hospital Saturday Fund will be taken on Sept. 28th, and Lord Burnham, the treasurer, has issued a special appeal in which he calls attention to the fact that the demands of medical science make it imperative that additional support should be given to our hospitals to enable them to take full advantage of the knowledge available for combating disease, and expresses the hope that the public will respond generously. Offers of help should be made to the Secretary of the Fund, 52–54, Gray's Inn-road, London, W.C.1.

A HOME FOR CRIPPLED CHILDREN.—Viscountess Feilding last week opened the Paybody Convalescent Home for Crippled Children at Allesley, near Coventry. A house known as The Elms was presented to the Coventry and District Crippled Children's Guild by Mr. Thomas Paybody, of Coventry, who subsequently gave £2000 in memory of his son towards the cost of adaptation. There are 750 crippled children on the books of the guild.

ROYAL NORTHERN HOSPITAL POST-GRADUATE COURSES.—A course of lectures or lecture-demonstrations on Children's Diseases, for practitioners and others, will be given at the Royal Northern Hospital from Oct. 14th to 22nd, lectures being delivered daily at 2.30 P.M., Saturday and Sunday excepted. Further particulars may be had from the Dean of the hospital, Holloway-road, London, N.7.

POST-GRADUATE COURSES IN BERLIN.—A series of special post-graduate courses will be held in Berlin during October. Particulars of these, and of courses held regularly through the year, may be had from the information bureau of the Kaiserin Friedrich-Haus für das ärztliche Fortbildungswesen, Luisenplatz 2–4, Berlin, N.W.6, which can also arrange for attendance at clinics and accommodation in lodgings.

EPSOM COLLEGE.—A vacancy has arisen for a Salomons Entrance Scholarship of £50 a year. Candidates must be sons of legally qualified members of the medical profession either living or deceased, and only those may apply who were over 11 years and under 14 years of age on Jan. 1st last. The regulations provide that the candidate must show an adequate standard of education for his age, and that his financial condition is such as to make it impossible or difficult to obtain an education at the College without the help of the scholarship. Applications must be sent by Sept. 30th to the Secretary of the College, 49, Bedford-square, W.C.1, from whom the requisite forms can be obtained.

NORTH PERSIAN FORCES MEMORIAL MEDAL.—Dr. G. Stuart, Colonial Medical Services, has been awarded the North Persian Forces Memorial Medal for the year 1928 for his paper, the Serological Diagnosis of the Enterica by the Method of Qualitative Receptor Analysis, written in conjunction with Dr. K. S. Krikorian, and published in the *Journal of Hygiene*, Nov. 26th, 1928, vol. xxviii., No. 2, pp. 105–126. This medal is awarded annually for the best paper on tropical medicine or hygiene published in any journal during the preceding 12 months by a medical officer, of under 12 years' service, of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service.

NEW TROWBRIDGE HOSPITAL.—The Marquess of Bath last week opened a new hospital in place of the old inadequate one, which has been sold to the Wiltshire County Council for use as a clinic. The nucleus of the institution is Adcroft House, a large private residence which has been converted into an administrative block; new buildings, all on the ground floor, have been added on each side. On one side are a men's ward of eight beds, three private wards for men, and a children's ward of six beds. On the other side are women's wards of somewhat similar accommodation, including a maternity ward of six beds. In the operating block are an X ray room, and the usual appurtenances. The cost has been about £10,000.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 23rd, to SATURDAY, Sept. 28th.—WESTMINSTER HOSPITAL. Special all-day course in medicine, surgery, and the specialties. 10.30 A.M. to 5.30 P.M. daily.—BETHLEM ROYAL HOSPITAL, S.E. Post-graduate course in psychological medicine. Tues. and Sat. at 11 A.M.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Sept. 23rd.—2.30 to 5 P.M.: Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Sept. 23rd.—1.30 P.M., Examination and Diagnosis of the Ear.

WEDNESDAY.—1.30 P.M., Examination and Diagnosis of the Nose.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Sept. 24th.—4.15 P.M., Mr. J. P. Buckley: Some points relating to the Ætiology and Treatment of Appendicitis.

FRIDAY.—4.15 P.M., Dr. Catherine Chisholm: The Treatment and Development of the Premature and Immature Infant.

Appointments.

LITTLE, R. H., M.B., B.S. Lond., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Ringwood District of the County of Southampton.

MCCURRACH, ELIZABETH G., M.B., Ch.B. Aberd., D.P.H., Assistant Medical Officer of Health for Aberdeen.

Westminster Hospital: KENDALL, A. W., M.B., B.S. Lond., Senior Resident and Casualty Officer; HUTTON, A. E., L.R.C.P. Lond., M.R.C.S., Resident House Physician; CAUDWELL, C. E., L.R.C.P. Lond., M.R.C.S., Resident House Surgeon; TOLAND, C. P. K., L.R.C.P. Lond., M.R.C.S., Resident House Physician; MORGAN, J., M.B., B.S. Lond., Resident Obstetric Assistant and House Physician to the Children's Department.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Albert Dock Hospital, Connaught-road E.—Surgeon.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £180.

Barrow-in-Furness County Borough.—Asst. M.O.H. and Asst. Tub. O. £600.

Bath, Royal United Hospital.—H.S. At rate of £150.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham General Hospital.—Two Res. Anæsthetists. Each £120. Also three H.S.'s. Each £70.

Birmingham, Selly Oak Hospital.—Res. Physician. £100–£600.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Bournemouth, Royal Victoria and West Hants Hospital.—H.S. At rate of £120.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £120.

Brighton, Royal Sussex County Hospital.—H.P. £150.

Bristol City and County Mental Hospital.—2nd Asst. M.O. £500. Also 3rd Asst. M.O. £350.

Cape Town University.—Asst. Anatomist. £750.

Chester Royal Infirmary.—H.S. £120.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Coventry City.—M.O.H. £1225.

Epsom, Surrey, Norton Mental Hospital.—Fourth Asst. M.O. £425.

Exeter, Royal Devon and Exeter Hospital.—Hon. Physician.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Federated Malay States, Central Health Board.—Three M.O.'s for Estate Service. Each at rate of £980.

Godalming, King George V. Sanatorium.—Jun. Asst. M.O. £500.

Golden-square Throat, Nose, and Ear Hospital, W.—Registrar. Also Hon. Anæsthetist.

Gloucester, Gloucestershire Royal Infirmary, &c.—Hon. S. to Ear, Nose and Throat Dept. Also First H.S. At rate of £135.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Grosvenor Hospital for Women, Vincent-square, S.W.—Res. M.O. At rate of £100.

Guy's Hospital.—Astley Cooper Studentship.

Hampstead Parish of St. John, New End Hospital.—Jun. Res. Asst. M.O. At rate of £200.

Hospital for Sick Children, Great Ormond-street, W.C.—Asst. Path. and Research Fellow. £450. Also H.S. and H.P. Each at rate of £100.

Hospital of St. John and St. Elizabeth, Grove End-road, N.W.—Res. H.S. At rate of £75.

Hull Royal Infirmary.—Asst. H.P. At rate of £130.

Isleworth, West Middlesex Hospital.—Res. Asst. Med. Supt. and Asst. M.O. £450.

Lewisham Metropolitan Borough.—Asst. M.O.H. and Maternity and Child Welfare M.O. £650.

Liverpool, David Lewis Northern Hospital.—Res. H.S. and Res. H.P. Each at rate of £100.

Liverpool, Royal Southern Hospital.—Medical Tutor and Registrar.

London Homœopathic Hospital, Great Ormond-street, W.C.—Asst. Surg. for Dis. of Eye.

London Hospital, E.—First Asst. and Registrar. £300.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. S. for Gynæcological Dept., Hon. Asst. Radiologist. Also Hon. M.O. for Actino-Therapeutic Dept.

London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.

London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Manchester, Salford Royal Hospital.—Two H.S.'s. Also Cas. H.S. Each at rate of £125.

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £100.

Maudsley Hospital, Denmark Hill, S.E.—Asst. M.O. £300.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. Also Asst. Cas. O. Each at rate of £100.

National Dental Hospital, Gt. Portland-street, W.—Hon. Anæsthetist.

Northampton, Northamptonshire County Council.—M.O.H. and School M.O. £1,100.

North Middlesex Hospital, Silver-street, Edmonton, N.—Res. M.O. £200.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham Children's Hospital.—Res. H.P. At rate of £150.

Poole, Cornelia and East Dorset Hospital.—H.S. At rate of £150

Prince of Wales's General Hospital, Tottenham, N.—Sen. H.P. Sen. H.S., and Special H.S. Each at rate of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

Princess Louise Kensington Hospital for Children, North Kensington.—H.P. At rate of £75.

Queen's Hospital for Children, Hackney-road, E.—H.P. Also Cas. O. Each at rate of £100.

Queen Mary's Hospital for the East End, E.—Anæsthetist for the Dental Dept. £25.

Rotherham Hospital.—H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £150. Also Cas. O. £150.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £120.

Stafford, County Mental Hospital.—Second Asst. M.O. £600.

Stockport County Borough.—Clin. Tub. O. and Sen. Asst. M.O.H. £750.

Stockton-on-Tees, Stockton and Thornaby Hospital.—Jun. Res. M.O. £150.

Sudan Medical Service.—M.O. £E720.

Swansea Hospital.—H.S. £150.

West London Hospital, Hammersmith, W.—Hon. Registrar for Throat, Nose, and Ear Dept. Also House Officer for Children's Dept. At rate of £150.

Births, Marriages, and Deaths.

BIRTHS.

ARCHER.—On Sept. 11th, at York-place Nursing Home, to Frances, wife of Dr. G. E. Archer, of Victoria Park, Manchester, the gift of a son.

LINDSAY.—On Sept. 11th, at 47, Harefield-road, Brockley, the wife of Sidney S. Lindsay, M.B., B.S., M.R.C.S., of a daughter.

LONGFORD.—On Sept. 12th, the wife of Dr. W. U. D. Longford, Holywood, County Down, Ireland, of a son.

ROLLES.—On Sept. 14th, at Fitzjohn's Avenue, Hampstead, the wife of Francis C. Rolles, M.A., M.R.C.P., of a daughter.

SHAW.—On Sept. 11th, at Trafalgar-lawn, Barnstaple, N. Devon, the wife of Dr. S. C. Shaw, of a son.

WAKELY.—On Sept. 9th, at Carshalton, the wife of Dr. A. S. Wakely, of a son.

WHITTINGTON.—On Sept. 9th, at Oakfield, Sutton, Surrey, the wife of Theodore H. Whittington, M.D., of a son.

MARRIAGES.

ELGOOD—FRANCIS.—On Sept. 9th, at St. Martin-in-the-Fields, London, John Elgood, M.B., F.R.C.S., to Christine Phyllis Francis, M.B., B.S., elder daughter of Mr. and Mrs. J. E. Francis, of the Athenæum Press, London.

FLIND—RUSSELL SMITH.—On Sept. 10th, at St. Michael's Church, Highgate, James Flind, M.B., B.Ch., D.P.M., to Joan, younger daughter of Mr. and Mrs. Russell Smith, of Moorhaven, Stormont-road, Highgate.

WESTLAKE—BROWN.—On Sept. 9th, at the Wesleyan Church, Deal, Henry John William Jennings Westlake, B.Sc., M.R.C.S., L.R.C.P., to Evelyn Crosdee, only daughter of Mr. H. G. Brown, Solicitor, and Mrs. Brown, of Melsonby, Grange-road, Deal.

DEATHS.

BLUNT.—On Sept. 12th, at Linden Villas, Westfield-road, Wakefield, Henry Brine Blunt, M.B., C.M., aged 70 years.

GIFFARD.—On Sept. 15th, at a nursing home in Bournemouth, Douglas William Giffard, M.R.C.S. Eng., L.S.A., formerly of Brighton, aged 81 years.

HARRIS.—On Sept. 6th, at Hartwood House, Chorley, Lancashire, James Alfred Harris, M.D.

MARSHALL.—On Sept. 10th, at Inglewood, Eldorado-road, Cheltenham, Dr. Lewis Marshall, aged 80.

SLINGER.—On Sept. 10th, Robert Townley Slinger, F.R.C.S., of Foregate street, Worcester, aged 49 years.

WARNER.—On Sept. 8th, suddenly, after an operation, Winifred Warner, M.B., B.S., of Gold Hill House, Chalfont St. Peter.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CONGRESS OF THE ROYAL SANITARY ASSOCIATION OF SCOTLAND.

THIS Association, which has lately held its fifty-fifth annual congress at Kirkcaldy, may be said to have done more than any single agency to raise the standard of public health administration in Scotland. It combines the professional and administrative in a specially intimate way, and the result is the cultivation of understanding between officer and authority both central and local.

This year's President is Mr. Harvey, of Edinburgh, for many years convener of the health committee. In his opening address he advocated propaganda by health authorities on the ground that removal of the poor-law stigma, along with the prolonged period of unemployment, must be counter-balanced by persuading people to look after themselves and so avoid hospital. In a popular lecture Dr. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, sketched the growth of health services from the days of the old "parochial boards" to the modern system of school health administration, maternity service, and child welfare, milk inspection, meat inspection, housing, tuberculosis, insurance, therapeutic substances protection, and others. All these date from 1908 and most of them are post-war. In describing the regional scheme of hospital services and general health services and the facilities for specialised advice and treatment, Dr. Kinloch commented on the absence of team-work among doctors, and stressed the importance of regional development as a means of securing immediate advance towards an efficient and economic health service.

Dr. John Guy, deputy medical officer of health and tuberculosis officer for Edinburgh, read a paper on the Economic and Nutritive Aspects of Diet. On a theoretical basis, and giving adequate amounts of all the constituents, he found that a fully balanced and varied ration could be had on 6*s.* a week, but this required some knowledge of food values. The cheapest form of diet was one consisting chiefly of oatmeal, herring, bread, margarine, and potatoes. This worked out at about 3*s.* 6*d.* to 3*s.* 9*d.* per head per week. But such a diet was monotonous and unattractive—a failing which, in his view, led to the use of condiments by the poor. The town-dweller needed a variety in his diet such as the agricultural labourer did not demand. About 18 months ago Dr. Guy studied the dietaries of some 30 families in Edinburgh, their cost ranging from 4*s.* 1*d.* to 9*s.* 9*d.*, with an average of 7*s.* He found that only 8 of the 30 gave the amount of protein usually accepted as necessary in the diet of a person at rest, and if these 30 diets were typical vast numbers of people must be living on slightly over bare subsistence diets. In the buying of food greater ignorance was shown than in the buying of any other commodity.

In an address on Town and Regional Planning Mr. George D. Macniven, F.R.I.B.A., said that building by-laws had laid a good foundation in securing a certain minimum standard of air-space, light and ventilation, and restraint of overcrowding, but that, under those very by-laws, the suburbs had grown into utter drabness and monotony. This showed that something had been lacking. Town-planning aimed at preventing disease, and therefore promoting health; at preventing ugliness and preserving beauty; at preventing congestion and confusion, and therefore safeguarding industrial and commercial efficiency. Mr. James McAllan, veterinary officer for the city of Aberdeen, pleaded for the prohibition of hawking meat from barrows and stalls on the street. He regretted the great flaw in the definite, uniform, and national system of meat inspection—namely, that the local authorities had not greater powers for the actual control of the handling and transport of meat and meat food products.

The Congress was attended by some 500 delegates. The President-elect is Dr. T. F. Dewar, of the Scottish Health Department.

PAINFUL FIBROSITIC NODULES.

To the Editor of THE LANCET.

SIR,—I suggest that "M.B., B.Ch." should try either diathermy or ionisation. Dr. Lewis Jones, in his "Medical Electricity," states that "These cases are much relieved by ionisation, and salicylic or iodine ions may be used."

I am, Sir, yours faithfully,

MAY RATHBONE.

Keston, Hayes, Kent, Sept. 14th, 1929.

THE VENTILATION OF A PICTURE THEATRE.

A REPRESENTATIVE of THE LANCET lately visited the new Commodore Super Cinema at Hammersmith which is to hold 3000 people. In such a building everyone ought to have plenty of warm, clean, dry air, and, recognising this necessity, the proprietors of the theatre have spent some £15,000 on installing a modern ventilating plant.

That there may be no shortage, air will be provided for 3500 people at the rate of 1500 cubic feet per person per hour, in six changes. Seeing that 1 cubic foot of air weighs about one-twelfth of a pound, the hourly supply for each person will be some 125 lb., or rather over a twentieth of a ton, and the total supply of the theatre about 200 tons of air per hour. The magnitude of the task of ventilation is thus evident. The air is taken from the roof of the building, 60 feet above the street level, and is drawn through a preheater, where if necessary it is warmed to prevent it from freezing the washing water, which it meets in the cleansing chamber as an impalpable mist, emitted from myriad jets. Here the gross impurities fall out, and no drops of water go further, being baffled by the eliminator plates. Through these the air, clean but saturated with moisture, passes to the secondary tempering coils and then to the fan which carries it to the roof of the theatre, where it is further warmed if required, and distributed above the heads of the visitors, to be drawn out at last under their feet. It is intended that the air supplied shall never have a wet-bulb temperature lower than 52° F., but it is important that distribution shall be made at a desired temperature. This is controlled from the ventilating engine-room where an indicator shows, by thermo-electric circuits, the temperature in any one of some dozen sections of the house. The operator can alter the temperature as he likes, having beside him another board with five lines of compressed air relay switches, each of which controls one of the five unit steam heaters which, in each of the sections, warms the incoming air.

There will be no cold draughts in this theatre when the doors are opened, for there will always be a positive pressure of warm air within it. The visitors, even if their boots and clothes are wet, will not be chilled. Their clothing will tend to dry without chilling them, and the risk of infection from person to person will be lessened by the withdrawal of expired air towards the feet. Fog is mostly removed, so the pictures will be seen the more clearly. No one will be inclined to sleep because the atmosphere is stuffy, and the audience's eyes and ears will be relatively alert. These are all benefits for the audience, while the management will gain by a reduction in the cost of cleaning the theatre and by the longer life of all furniture—owing to the lessened quantities of dust and sulphuric acid entering the house—and by the continuing patronage of people who find themselves comfortable. We are informed that a bacterial control on the ventilation would have been arranged had the designer found any literature on the subject. If such information should become available, and if it seems expedient, he hopes he may be able to add some suitable odourless antiseptic in an effective proportion to the washing water in the cleansing chamber.

We are obliged to the management of the theatre for permitting a view of the premises, and to Mr. H. A. Stirzacker, technical manager to Messrs. J. Jeffreys, the contractors for the heating and ventilation, for explaining the ventilating plans to our representative.

THE AUTUMN PHOTOGRAPHIC EXHIBITION.

THE seventy-fourth annual exhibition of the Royal Photographic Society of Great Britain, now being held at 35, Russell-square, W.C., keeps up the high standard of previous years. Medical men will find their chief interest in the scientific section, where are to be seen a series of pictures of mouse tumour cells taken with the aid of the ultra-violet miscroscope at a magnification of 1800. Here also are photomicrographs of the interior of the eye, illustrating the pathological changes resulting from lead poisoning, high blood pressure, and other conditions. A set of colour photographs of the eye by Mr. L. D. Redway merits attention. Dr. G. H. Rodman shows studies of the house fly and a graphic representation of the way in which a nettle stings, while Kodak, Ltd., are well represented with a fine set of X ray photographs, including one showing clearly renal calculi. The exhibits in the natural history room bear witness to the patience and ingenuity necessary to the achievement of success in this branch of the art. Of particular interest are flashlight photographs of a stoat, and of a honey-bee in flight, the latter showing to perfection the detail of the wing. In the library are shown the various stages in the reproduction of illustrations by the half-tone, line, photogravure, and photo-litho processes. In the pictorial section the most pleasing among many attractive prints is No. 137. No visitor should miss the lantern slides and colour plates in the studio, and a demonstration of natural colour cinematograph films. The exhibition remains open until Oct. 12th.

A Review

OF THE

NERVOUS AND MENTAL ASPECTS OF PERNICIOUS ANÆMIA.

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FRESH interest in the subject of pernicious anæmia in all its bearings has dated from the appearance of Hurst and Bell's [9] paper on achlorhydria in subacute combined degeneration of the cord, Price-Jones's [13 14] observations on the constancy of megalocytosis in pernicious anæmia, and more recently the excellent results of Minot and Murphy's [11] liver diet.

I have here made an attempt to review the neurological and mental aspects of the disease in a wider sense than is usual in text-books, to deal with certain points in early diagnosis, and finally to consider the results of liver therapy on the nervous complications. For this purpose 24 cases have been studied. Although relatively few in number, they serve to illustrate the points mentioned above.

In the first place, with regard to the incidence of so-called "subacute combined degeneration of the cord" I will quote only one set of figures—namely, those of Woltman [22] who in 1919 examined the nervous system in 150 cases of pernicious anæmia. In just over 80 per cent. he found "indisputable evidence of destruction of nerve parenchyma."

PATHOLOGY OF SUBACUTE COMBINED DEGENERATION OF THE CORD.

There are points regarding the nature of the changes in the cord which are still unsettled, but the following, I think, fairly represents the general consensus of opinion. Two types of lesion occur: (1) Foci in which the myelin sheaths of the nerve-fibres are destroyed, resulting in the formation of numerous vacuoles. These foci are found in the white matter, especially in the posterior columns, cerebellar tracts and pyramidal tracts, both crossed and direct. They make their appearance first in the lower cervical and upper half of the dorsal region of the cord. They are irregular in shape and tend to occur near the periphery of the cord. This distribution suggests that they bear a close relationship to the small entering arterioles. These foci of degeneration constitute the essential lesion. (2) Secondary degenerations in the long tracts of the cord; these occur only in the more chronic cases and can be recognised by their more homogeneous distribution. They result from the destruction of the axis-cylinders, a further stage of the initial lesion. Most authorities are agreed that the posterior roots are not affected. With regard to the peripheral nerves, according to Buzzard and Greenfield,[3] they are healthy. Russell, Batten, and Collier,[17] in their original paper, written in 1900, described the pathological findings in nine cases; only one of these showed definite changes in the peripheral nerves. Yet Collier [5] has recently written "some degeneration is always present in the peripheral nerves." The literature contains very few references to this point and it is obvious that this part of the nervous system has not received the proper attention of those who have studied the pathology of this disease. The cases in which a careful examination of the peripheral nerves has been made are so few that no conclusions can be drawn from them. It may be remarked, however, that definite changes have been met but they are not constant.

EARLIEST SYMPTOMS OF INVOLVEMENT OF THE CENTRAL NERVOUS SYSTEM.

Various forms of *paræsthesiæ* are common at the onset, such as a sensation of tingling, numbness, pins and needles, coldness, tightness, &c. Later in the disease a feeling as if something were tied round the leg or a sensation of walking on cotton-wool is not uncommon. In eight cases pain in the lower limbs was a prominent feature, usually in conjunction with one of the other forms of paræsthesiæ. It was generally described as sharp and stabbing, sometimes being sufficiently severe as to interfere with sleep.

With regard to the distribution of the paræsthesiæ, they were always referred to the periphery of the limbs. In a few cases one limb was affected before the others but the distribution soon became symmetrical. In approximately half the cases the paræsthesiæ were first felt in the feet, the big toe being, not uncommonly, the starting-point; in all these cases the hands were affected at a later date. In eight cases the hands and feet were affected at the same time; in five cases the hands were attacked first. In one case a "pins-and-needles" sensation was felt in the fingers of one hand for seven years before becoming generalised. The paræsthesiæ tend to spread centrally, in the case of the arms from the fingers up to the elbows and in the legs from the toes up to the knees, thighs, and in some cases to the waist. Paræsthesiæ generally precede the onset of motor disability, either in the form of paresis or ataxia, by some months, and in two cases in this series by seven and eight years respectively, although in acute cases difficulty in walking is noticed within a week or two of the onset.

Alteration in the Reflexes.

A spastic paraplegia is commonly regarded as the usual form of the disease, the deep reflexes in the lower limbs disappearing shortly before death. The following table shows the condition of the reflexes in the lower limbs in 24 cases, when first coming under observation:—

Cases.	Knee-jerks.	Ankle-jerks.	Plantar responses.	Cases.	Knee-jerks.	Ankle-jerks.	Plantar responses.
6	+ +	+ +	↑	3	+	+	↓
2	+	0	↑	3	+	0	↓
3	0	0	↑	6	0	0	↓
1	+	+	↑↓				

From this table it will be seen that there were only 11 cases (45 per cent.) in which there was unequivocal evidence of pyramidal tract involvement.

INTERPRETATION OF SYMPTOMS AND SIGNS.

In the earliest stage of the disease there may be no loss of sensation in the extremities, despite the definite subjective sensations felt by the patient. Eventually, however, two varieties of sensory loss may occur: (1) Diminution or loss of vibration sense, either alone or occasionally accompanied by impaired postural sensibility in the toes and fingers. The other forms of sensation are unaffected. This type of dissociated sensory loss is explained by the commencement of the disease in the posterior columns, usually the columns of Goll, which convey the impulses of postural sensibility and vibration sense up to the sensory nuclei in the medulla. (2) Impairment of all forms of sensation in the periphery of the limbs in the "glove-and-stocking" distribution, so characteristic of a peripheral neuritis. In this series of cases these two forms of sensory loss occurred with about equal frequency when the patients first came under observation. The second type of sensory loss can best be explained by a lesion of the peripheral nerves. Further proof of this is afforded by the occurrence of pains "cramp-like" or sharp in the limbs, accompanied sometimes by definite tenderness. Such pains certainly are due to effects of the neurotoxin on the peripheral sensory neurone. Pains in the lower limbs were a prominent feature in a third of the cases in the present series. When we come to study the reflexes, I have already shown that absent deep reflexes in the lower limbs, with or without an extensor plantar response, occurred in over half the cases. The abolition of the deep reflexes has been explained by the effect of the disease on the posterior columns. There is no anatomical proof, however, that the reflex arc passes through these columns. An easier solution to the problem would be to implicate the posterior root or posterior root entry zone. However, the consensus of opinion amongst those who have studied the pathology of the disease seems to be that these parts escape. Again, when looked at from the point of view of anatomy, the abolition of the deep reflexes on the basis of a cord lesion is equally difficult to explain. As previously stated, the cord is first affected in its middle third. Yet it is by no means uncommon to find the ankle-jerks disappearing early in the disease. This reflex is situated in the lowest part of the cord—viz., sacral segments 1 and 2. These points, therefore, suggest that the interruption of the reflex arc does not take place in the cord or posterior root, but in the peripheral nerve.

It is reasonable to deduce from this fact and the peripheral type of sensory loss that the peripheral sensory neurone is almost constantly affected, either alone for a time, or concurrently with the spinal cord.

MENTAL CHANGES IN PERNICIOUS ANÆMIA.

These are briefly dismissed in most text-book descriptions of the disease. That mental changes do occur more frequently than are supposed may be deduced from the fact that within recent years several important papers on this subject have appeared. Addison,[1] in his original description of pernicious anæmia, refers to "occasional wandering and indeed a terminal delirium." We are not here concerned with these terminal manifestations, but with those arising early in the disease. In 1905 Langdon,[10] in a paper entitled Nervous and Mental Manifestations of Pre-pernicious Anæmia, drew attention to a group of cases in which nervous and mental symptoms might precede the typical picture of pernicious anæmia. Amongst the mental symptoms he noted peevishness and a gradual mental deterioration, varied, however, by periods during which the patient more or less returned to normal. In these cases, when first seen, in addition to the mental changes, there might be symptoms and signs pointing to involvement of the spinal cord, prior to the development of the pernicious feature of the anæmia. His views were severely criticised, but with the knowledge that has accumulated since then regarding the disease it is now evident that such cases occur not uncommonly. With regard to the mental side of the question his views have recently received striking confirmation by the work of Warburg and Jorgensen,[19] which will be mentioned later. Their paper, incidentally, contains an excellent bibliography relating to the mental changes in pernicious anæmia. Only one or two of the more important papers on the subject will be mentioned. Pickett,[13] in six cases of pernicious anæmia, noted shallow confusion with impairment of ideas of time and space. Delusions, especially of a persecutory character, he believed to be common. Barrett,[2] in an important paper, studied the mental changes in 11 cases. In nine of these he made a histological examination of the brain. The commonest symptoms were delusions of persecution, sometimes systematised, disorientation in time and space, confabulation, irritability, but little mental deterioration. The blood picture in nearly all the cases was that of a severe pernicious anæmia. In over half the cases there was a psychopathic family history. Histologically all the cases showed varying degrees of destruction of the long tracts in the cord. The changes in the brain were not uniform but the commonest findings were: (1) rarefaction of perivascular nerve-fibres, (2) endarteritis, (3) changes in the nerve-cells, (4) in several cases areas of focal disintegration of the myelin sheaths.

Woltmann[21] described the histological changes in the brain in seven cases. Amongst his conclusions are the following: (1) Not only do degenerated areas, such as are typically found in the posterior and lateral columns of the spinal cord in pernicious anæmia, occur in the medullary portion of the brain, but they do so with about the same frequency, though their demonstration may be rendered more difficult. (2) In addition, there is sometimes a diffuse degeneration, which though it is, as a rule, somewhat more marked in the long association traces, also occurs in the short commissural fibres passing from one gyrus to another. (3) The grey matter is by no means immune from the destructive process, which usually occurs focally around the pyramidal cells, some of which may be destroyed. (4) Well-marked psychoses, such as are occasionally associated with pernicious anæmia, probably have little or nothing to do with these destroyed areas, but the milder mental manifestations, such as somnolence and apathy, may be dependent on them.

In the present series the mental condition of the patient was investigated in 17 cases. In 11 of these some departure from the patient's normal mentality was noted. In three cases this merely amounted to depression with lack of mental energy.

Depression with Lack of Mental Energy.

In none of these cases was the blood count below 3,500,000 red cells, so that anæmia, per se, could not be held responsible for the condition. In one of the cases marked improvement in the patient's mental outlook followed liver treatment. In one other the depression remained; in this case the patient had been on liver treatment for one year before coming under my observation and there had been no improvement in his neurological condition. The remaining case was as follows:—

Male, aged 50, was referred to me from the Western Ophthalmic Hospital on account of recent retinal hæmorrhages. Nothing of note was found in his cardiovascular system, and the urine was free from albumin. Further questioning of the patient elicited the fact, which he had not previously mentioned, that for the past three months he had noticed a numb feeling in his legs, and that his feet always felt cold. He showed a slight impairment to all forms of sensation below the knees, with loss of vibration sense below the level of the anterior superior iliac spine. The knee-jerks were present, but the ankle-jerks could not be obtained. The right plantar response was equivocal; the left flexor. The average blood count before treatment was as follows: R.B.C., 3,500,000; Hb., 77 per cent.; C.I., 1·05.

A fractional test-meal showed complete achylia. He was in hospital from December, 1927, for three months. His mental condition throughout was one of mild depression and indifference. He had never previously felt depressed. His blood picture slowly improved under liver treatment, but there was no corresponding improvement in his neurological condition. He committed suicide three months after leaving hospital.

Confusion with Failure of Memory.

Four cases showed a mild state of confusion, which varied in intensity in the same patient from time to time. Failure of memory, for both recent and past events, indifference and even apathy, slow cerebration, and a tendency to somnolence were the prominent features in these cases. The following is an example of this group.

Male, aged 61, was seen by me early in 1928. According to his son, following an "influenzal cold" in 1924, a marked change in his mentality was noticed. He had always been regarded as a man of intellectual type, but he then began to lose interest in his work and made elementary mistakes. He became childish in his general outlook on life, and often "seemed to be in a dream." This mental deterioration was gradual. In 1926 he developed numbness in his fingers and toes, which persisted. When examined in June, 1928, he appeared mentally dull and indifferent. His memory was markedly defective for both recent and past events. There were no hallucinations or delusions or disorientation in time or space. There was no definite paresis of the lower limbs. The knee-jerks were sluggish on admission to hospital, and soon disappeared. The ankle-jerks were absent. The plantar responses were equivocal. There was hypoæsthesia to all forms of sensation below the knees. Vibration sense was diminished up to the level of the seventh rib. There was slight loss of postural sensibility. A blood count showed R.B.C., 3,570,000; Hb., 67 per cent.; C.I., 0·93. There was complete achylia. The Wassermann reaction was negative in the blood and cerebro-spinal fluid. As a result of three months liver treatment he lost 18 lb. in weight. His blood picture, however, showed slight improvement. On discharge there was little or no alteration in his neurological or mental condition. Since then he has continued liver treatment as well as hydrochloric acid. When seen on July 20th, 1929, his condition was about the same.

Toxic Psychosis.

In the following three cases a definite toxic psychosis, with symptoms of a paranoidal nature, was present.

Female, aged 57, was admitted under my care in March, 1929. She had enjoyed good health until the summer of 1927, when she began to experience numbness in the big toe of either foot, and at times sharp pains in her legs. Later a frozen feeling, with numbness, was felt in the hands. These symptoms became aggravated, and later difficulty in walking was experienced. She was inclined to be sleepy, depressed, and irritable. She thought that no one wanted her, that everyone was looking at her, and that her neighbours had taken a dislike to her. On admission she appeared depressed, but otherwise normal mentally. There was no history of depression in the past. There was slight paresis of both lower limbs, with loss of deep reflexes. Both plantar responses were flexor. There was "glove" anæsthesia in her hand and marked loss of all forms of sensation below the knees. A blood count showed: R.B.C., 2,950,000; Hb., 70 per cent.; C.I., 1·8. There was complete achylia. She was treated with half a pound of liver daily, and dilute hydrochloric acid. The mental symptoms quickly disappeared. The blood picture gradually improved. On discharge from hospital on March 22nd: R.B.C., 4,033,000; C.I., 0·06. The paræsthesiæ had become much less pronounced, and she was able to walk with the support of a stick. In June, 1929, she reported herself as still further improved.

Male, aged 46, was admitted into Maida Vale Hospital, under the care of my colleague, Dr. A. Felling, in April, 1924. In October, 1922, he first complained of pain and numbness in the ankles, which gradually spread up to the thighs. In September, 1923, he was admitted to the National Hospital, Queen-square, where a diagnosis of subacute combined degeneration of the cord was made. After about a month in hospital he became mentally confused and suicidal. He was discharged to an infirmary, but made a good recovery within a few weeks. In March, 1924, the left leg became weak, and he was unable to walk. On examination in April, 1924, he appeared pale and depressed. There was a typical glossitis. The legs were spastic, with double extensor plantar responses. There was hypoæsthesia to cotton-wool and pin prick below the knees. Vibration sense and postural sensibility were much impaired. A blood count showed: R.B.C., 3,200,000; Hb., 65 per cent.; C.I. 1·0. There was complete achylia. At the beginning of June, 1924, he developed persecutory ideas; he thought that his food was being poisoned, and that everyone was against him. He discharged himself from hospital, and died in July, 1925.

The following case is of especial interest. Female, aged 41, early in 1925 first experienced a tingling sensation in the ring and little fingers of the left hand, followed later by a pins-and-needles sensation in the same fingers, an aching and cold feeling around the ankles, and dull aching pains in the feet and legs. In March she noticed that her walking was affected. In May she was admitted to the West Middlesex Hospital on account of the pains in the legs and vomiting. After three days there she became excitable and at times violent. She took off all her clothes, refused to eat, thought she had been cut up, and threatened to commit suicide because she was being ill-treated. She was transferred to Springfield Mental Hospital on May 20th.

I am indebted to Dr. R. Worth for permission to use the notes, of which the following is an extract:—

Past and Family History.—She had never before suffered from any form of nervous breakdown. One sister had been insane for a week at the climacteric. Otherwise there was no psychopathic history in the family.

On admission she showed some clouding of consciousness. She was not disorientated, but her memory for recent events was very poor, for current and remote events fair. She was suffering from delusions—e.g., stated that she had been through an operation that morning. She was somewhat restless. She complained of abdominal pain, and there was a very offensive diarrhœa. No definite neurological signs were noted. There was slight motor weakness in the lower limbs. The deep reflexes were active, and the plantar responses flexor in type.

June 2nd, 1925.—Mental condition about the same, but depression more marked than on admission. Abdominal pain still complained of, and diarrhœa continues. 3rd: Quiet; rather confused. Memory for current events, poor. Signs of colitis abating. 10th: Improvement in mental condition. She answers questions sensibly and is beginning to take an interest in her surroundings. Diarrhœa has now stopped, and she appears stronger. 17th: Much better mentally and physically. The only mental abnormality now present is a tendency to worry over trifles. July 24th: Improvement in mental condition has been maintained. August 8th: Discharged as recovered.

She was admitted to the Hospital for Epilepsy and Paralysis, Maida Vale, six weeks later—Sept. 22nd—under the care of Dr. C. M. Wilson, complaining of weakness and numbness of the legs, unsteadiness in walking, and a feeling as if she was walking on cushions. Her arms felt stiff and numb up to the elbows. Mentally she appeared somewhat emotional and her attention was poor. The tongue was red and glazed. There was slight paresis in the legs. The knee-jerks were active; the ankle-jerks were absent. The plantar responses were flexor. A blood count showed R.B.C., 3,288,000; Hb., 57 per cent.; C.I., 1·0. Wassermann negative in blood and cerebro-spinal fluid. There was complete achylia. She left hospital in December, 1925, improved. Unfortunately this patient cannot now be traced.

The chief interest in this case lies in the association between the psychotic state and the attack of diarrhœa, which was almost certainly a symptom of pernicious anæmia.

THE RELATION BETWEEN MENTAL SYMPTOMS AND PERNICIOUS ANÆMIA.

Warburg and Jorgensen,[19] in a recent paper which should be read in the original, draw attention to the occasional association of psychoses and neurasthenia, with achylia gastrica and megalocytosis and discuss the relationship between this syndrome and pernicious anæmia. In their conclusions they state that there is a chronic pathological condition, associated with achylia gastrica, which covers a great many cases of neurasthenia and some cases of early psychoses, and that these mental disorders are often associated with mild spinal symptoms, glossitis, and megalocytosis. The epoch of pernicious anæmia is a rare and late stage in this condition, in which, not infrequently, one observes anæmia with a low colour-index at an early juncture. The majority of their cases improved with liver treatment. Their findings fit in well with Langdon's original conception of a pre-pernicious anæmia, in which mental or neurological symptoms may first dominate the clinical picture. With regard to the incidence of achylia in the psychoses, Ford-Robertson[8] has recently investigated this matter as part of an inquiry into the relationship between gastro-intestinal infection and mental disorder. He comes to the conclusion that gastric dysfunction, especially hypochlorhydria, is present to a much greater extent than in normal persons. In 14 cases (12 per cent.) he found absence of free hydrochloric acid after a test-meal; whilst 35 cases showed a diminished amount of free hydrochloric acid.

Reviewing the cases in the literature and those referred to in this paper, it seems certain that mental changes of varying severity occur not uncommonly in pernicious anæmia, sometimes in its earliest or pre-pernicious stage. The condition may range from a state of depression and lack of mental energy to a mild and even severe confusional psychosis. Frequently paræsthesiæ in the limbs may accompany or follow the mental symptoms, indicating the generalised effect of the neurotoxin on the central nervous system.

The early recognition of these symptoms, by means of an examination of the blood and gastric contents and their adequate treatment, may result in considerable improvement.

Diagnosis of Pernicious Anæmia.

What are the necessary criteria for the diagnosis of this disease? First and foremost comes *achylia*, which was present in each of the 21 cases in which a gastric analysis was made. A fractional test-meal is unnecessary. A stomach-tube should be passed before the test-meal is given in the morning, and the presence or absence of free hydrochloric acid determined in the resting gastric juice. Specimens taken one and two hours after the test-meal should be similarly tested. This can be done qualitatively by means of a drop or two of methyl-orange, which is added to the specimen. If free hydrochloric acid is present an orange colour develops. This test can be carried out by the general practitioner without any special apparatus and without taking up too much of his time.

Secondly comes the *examination of the blood.* This may show a definite picture of pernicious anæmia—e.g., low cell count with high colour-index and megalocytosis. Not infrequently, however, the red cells are but little reduced in number or may even exceed five millions; in such cases the colour-index may be low—e.g., 0·7 or 0·8. In the present series several cases which were under observation in hospital, and on whom blood counts were performed on an average three times a week before and after treatment with liver, showed a colour-index not exceeding 0·9. Campbell and Conybeare,[4] in a large series of cases of pernicious anæmia, found the colour-index to be above unity in only 60 per cent. of their cases. I think this point ought to be emphasised, as the majority of text-books lay undue stress on a high colour-index as an important feature in the diagnosis of pernicious anæmia. There is one feature of the blood picture which is constant before and probably after liver treatment—namely, an increased diameter of the red cells or megalocytosis. Price-Jones [15] [16] originally described this condition and a method by means of which the average diameter of the red cells is arrived at. As a dried film is used, the method cannot be really accurate owing to alterations in the size of the cells. Its chief drawback, however, lies in the time required to do a count—namely, about two hours.

Pijper,[14] in 1924, devised an indirect means of measuring the *diameter of cells.* By means of a strong beam of light, which is allowed to pass through a lens of a known focal length and through a dried blood film, coloured rings are produced by diffraction, from which it is possible to calculate the diameter of the cells by measurement. I have tried this method, but was unable to obtain constant results.

Recently Eve[7] has described an instrument which he calls the Halometer. This is intended as a rough guide to the size of the red cells for the use of practitioners. It depends on the same theory as that underlying Pijper's instrument—namely, a thin blood smear acts as a diffraction grating and splits up the rays from a small source of light into a brightly coloured halo. I have used this instrument in a number of cases. I found that dried slides, two or three weeks old, gave too low readings. The blood film must be fresh. In three out of four cases, in all of whom the blood count exceeded 4½ million red cells, and who had been under treatment with liver for several months, the readings on the scale were just within the " pernicious anæmia zone." In one of the cases there was a low normal reading. This instrument certainly should provide the general practitioner with a means of substantiating a suspicion of pernicious anæmia, which could be further reinforced by gastric analysis and examination of the blood. An accurate method of estimating the size of the red cells, and at the same time a method which does not require any length of time, is still required. Lastly, the presence of a *Hunterian glossitis*, although not a constant feature of pernicious anæmia, frequently provides a valuable diagnostic link.

EFFECTS OF TREATMENT ON NERVOUS COMPLICATIONS.

With the advent of liver treatment, and its remarkable effects on the blood picture, it was thought by some and hoped by many that a panacea for all the evils of pernicious anæmia had arrived. As far as the spinal cord symptoms are concerned this has not proved to be the case, except in the opinion of a few. Minot and Murphy[12] treated 31 cases of pernicious anæmia, which showed definite evidence of involvement of the central nervous system. They found that the paræsthesiæ and ataxia were improved, but that the reflexes remained unaltered. Recently developed symptoms of injury to the nervous system usually yielded more rapidly and satisfactorily than those due to old-standing lesions. They further state that no improvement usually takes place until the red cell count has reached four million. Symptoms have not definitely progressed or developed under adequate dietary treatment. Davidson, McCrie, and Gulland[6] found that in the tabetic type of subacute combined degeneration of the cord very marked improvement may occur, but in cases of the spastic type there was no improvement. A few other isolated cases have been reported, in some of which improvement has been noted; in others none. Much the largest series of cases are those described by Ungley and Suzman.[18] They report their observations in 61 cases of subacute combined degeneration of the cord, observed at the Royal Victoria Infirmary, Newcastle, since 1925. The large number of cases is striking, and suggests that pernicious anæmia is a commoner disease in that part of England than in London. Thirty of these cases were treated by liver therapy. Of the 31 cases that had no liver, 28 died within an average period of 4·6 months from the onset of the disease. Of those treated with liver, 17 were improved, eight remained stationary or became worse, and five died. The authors state that the results have been very promising. Numbness and tingling, as a rule, disappear entirely, postural sensibility is re-established more or less completely, and, as a result, incoördination and ataxia diminish or disappear. Further, vibration sense often returns, although in some cases it has remained absent. In three cases the plantar responses became changed from the extensor to the flexor type. Sphincter troubles also were improved. They conclude " that since all evidences of cord involvement may disappear, it is clear that the degenerative changes in the white matter in this disease are not of a permanent character." I have analysed their case reports, especially from the point of view of the degree of anæmia present. In 13 cases they give details of blood counts before and after liver treatment. The average number of red cells in these cases before treatment was 2,300,000. The approximate average after treatment was 5 million. In some of the 12 cases that did not improve on liver there is insufficient data, with regard to the blood counts, from which to draw conclusions. It is obvious, therefore, that the degree of anæmia should be taken into account when considering the possible action of liver treatment on the neurological symptoms as distinct from its effect upon the blood picture.

In my own series of cases the results were not nearly so favourable. Eleven cases have been treated with liver, and adequate doses of dilute hydrochloric acid have been given over periods exceeding six months. Four cases have made slight improvement, three are stationary, and four are worse. None of the four cases that have improved showed definite evidence of pyramidal tract involvement, and their deep reflexes were absent. All four cases in which the condition slowly progressed were of the spastic type. As several of the cases that were not treated by liver could not be traced after leaving the hospital, no comparison is possible between these and the liver-treated cases, but my impression is that life is prolonged in the latter group.

The general effects of liver treatment which have been observed are as follows: 1. An improvement in the blood picture, which, however, in some of the cases has been slow, even though 1 lb. of liver, or its equivalent, in the form of an extract, has been given daily. 2. The general condition has improved, especially with regard to appetite and digestion. Glossitis, if present, has lessened. 3. Paræsthesiæ become less marked, but their total disappearance, even after months of regular liver treatment, has been rare. 4. No appreciable alteration in the reflexes has been noted, although in one case an extensor response became equivocal. 5. Ataxia has in some cases improved; all of these cases had walking exercises. 6. Mild mental symptoms usually disappear.

The spastic type of subacute combined degeneration of the cord, in whom the degree of anæmia is slight, as a rule slowly progresses despite treatment. Ungley and Suzman's conclusions are, I feel sure, too optimistic. The type of case which shows the best results is that in which the reflexes are diminished or lost and there is no pyramidal tract involvement. Two well-established points in treatment must not be overlooked: (1) eradication of all sepsis, especially dental; (2) the administration of dilute hydrochloric acid in ʒi doses thrice daily. Although liver treatment offers an efficient protection to the blood, it does not act in the same way against the effects of the intestinal toxin on the nervous system. The best method of combating the neurotoxin is to raise the patient's resistance to infection as far as possible by the removal of sources of sepsis, prevention of anæmia by means of liver, and elimination of the toxin originating in the upper intestinal tract by the administration of adequate doses of dilute hydrochloric acid.

CONCLUSIONS.

1. The neurotoxin, associated with pernicious anæmia, may attack all parts of the nervous system, cerebrum, spinal cord, and peripheral nerves, although not necessarily simultaneously.

2. In subacute combined degeneration of the cord the peripheral nerves are generally affected, especially in the so-called "tabetic type" of the disease.

3. Pernicious anæmia is a common cause of peripheral neuritis in persons over the age of 35. If the tongue be affected, the diagnosis becomes more probable.

4. Mental changes occur not uncommonly in pernicious anæmia. They range from states of depression, accompanied by loss of mental energy, to definite psychoses. They, like the nervous symptoms, may precede the characteristic changes in the blood by many months. More frequent examination of the gastric contents and of the blood, especially for the presence of megalocytosis, is called for in primary neuroses, and psychoses occurring after the age of 35, in view of the favourable results that may follow adequate treatment, instituted at an early stage.

5. The effects of liver treatment on the neurological symptoms are variable. In cases showing a marked degree of anæmia the improvement may be largely attributed to the favourable effect of such treatment on the blood and general condition. When an extensor response exists this improvement is slight; the progress of the disease may for a time be arrested, but not uncommonly it advances despite adequate treatment.

6. The type of case with abolition of deep reflexes, in which it is suggested that the peripheral sensory neurone largely bears the brunt of the disease, at least in the early stages, is naturally the most favourable.

7. The well-established rules regarding the eradication of dental sepsis and the administration of hydrochloric acid still maintain their importance.

I am much indebted to several of my colleagues at the Hospital for Epilepsy and Paralysis for permission to examine certain of the cases which were under their care.

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OBSERVATIONS ON
HARMINE IN THE TREATMENT OF CHRONIC EPIDEMIC ENCEPHALITIS.

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IN 1928 Lewin reported the results of his experiments on the pharmacological effects of the plant *Banisteria caapi* and of an alkaloid extracted from it which was termed "banisterine." He found that in laboratory animals and in man banisterine produced stimulation of the central nervous system, followed, especially with larger doses, by depression. As a result of this work the alkaloid was tried in cases of post-encephalitic parkinsonian rigidity and was said to have produced benefit equal or superior to that obtained by administering hyoscine. Beringer (1928) reported excellent results as regards improvement in the rigidity, involuntary movements, and muscular weakness of parkinsonism. He regarded the drug as "a new alkaloid influencing the extrapyramidal nervous system."

Identity of Banisterine and Harmine.

Following Lewin's investigations, Merck stated that banisterine was physically and chemically identical with the better-known alkaloid harmine which is obtained from the plant *Peganum harmala*. Both possessed the formula $C_{13}H_{12}N_{2}O$. Lewin was not convinced of the identity of the two alkaloids, but the claim was supported by the fact that *Banisteria caapi* was used in the preparation of *jagé*, an intoxicating drink manufactured by the Indians of Central and South America. Jagé had frequently been examined and the most recent results had left no doubt that the alkaloid it contained was harmine. Bayon isolated an alkaloid from jagé which he named "telepathine," but which was probably harmine. In addition it is significant that harmala seeds are used in the preparation of an intoxicant by natives of North Africa. The identity of banisterine and harmine appears to have been established conclusively by the recent work of Gunn, in which he shows that the drugs produce similar pharmacological effects in laboratory animals.

The reputed benefit resulting from banisterine in parkinsonism and the suggestion that it was identical with the more easily procurable harmine led to the administration of the latter drug in cases of chronic encephalitis.

Pharmacology of Harmine.

Gunn states that Tappeiner in 1895 was the first to investigate the action of these alkaloids when he gave a general account of the action of harmaline. He described (1) motor stimulation of the central nervous system, with tremors and convulsions, followed or accompanied by paresis; and (2) slowing of the pulse-rate. His experiments with harmine gave similar results. Gunn in 1910–11 came to the conclusion that the actions of harmaline and harmine greatly resembled those of quinine, but that with regard to stimulation of the central nervous system their actions resembled those of some of the other cinchona alkaloids rather than quinine itself. His further work supports these conclusions, and he mentions that Flury obtained very similar results as far as the nervous system and circulation were concerned. Many of the actions of harmine are not relevant to any effect that it may exert in parkinsonism and can be briefly dismissed. It is said to cause relaxation of the intestine and spleen, and to be powerfully toxic to protozoa. It has been used with some apparent benefit in malaria. It produces contraction of the isolated parous uterus of the rabbit and progressive shortening accompanied by gradual lessening of response to stimulation of voluntary muscle (frog's gastrocnemius); the action on all forms of muscle appears to be peripheral.

As regards the central nervous system Gunn states that harmaline does produce slight and transient increase in the excitability of the "spinal reflex" of the frog, and he considers that harmine has a similar action. The main effect, however, is "a paralysis of the spinal reflexes." Gunn found that the chief symptoms produced by harmine in the rabbit were: (1) tremor and swaying of body; (2) impulse to continual movement, especially to "running" movements or "drum-beating" movements of the fore-limbs, followed by general paresis. The tremor was aggravated by voluntary movement. From the use of harmaline in cats Gunn deduced the occurrence of hallucinations, and states that Lewin observed the same result with banisterine in dogs. Of harmine the former observer expresses the opinion that "it is possible that in larger doses it will produce a kind of intoxication in man, seeing that it has been found to produce a pronounced stimulation of the cerebrum in the lower animals."

Harmine in Parkinsonism.

Stern stated in 1928 that he had obtained a few successes in the treatment of parkinsonism with the use of harmine, and the same year Rustige published the results of his experiments with the drug. The latter will be considered in some detail.

Rustige began by giving harmine in doses of 0·005–0·05 g. hypodermically, and later increased these doses in some of the cases; 18 patients received 27 injections in all. In addition, in two cases 0·01 g. was given by the mouth three times a day for several days. All the patients before the experiment showed marked bradykinesia with muscular rigidity.

No effect was noticed on the blood pressure or pulse-rate. In every case, 7 to 15 minutes after the injection of 0·02–0·05 g. harmine, 11 patients complained of giddiness, tinnitus, and a feeling of drunkenness, and, in addition, in one case, of faintness and nausea. The susceptibility of the patients to such symptoms varied greatly. In some the effects increased in severity and duration with an increase of dose. In practically all cases these symptoms disappeared in from 15 to 60 minutes. In one case of post-encephalitic tachypnœa (with a respiratory rate of 80 inspirations per minute), without other signs and symptoms, a diminution in rate to 20–40 per minute occurred 20 minutes after injection and lasted for hours, the breathing being deep and quiet.

A clear objective diminution of muscular rigidity was found in six patients, resulting from the injection of 0·02–0·03 g. harmine. In three of these cases the very pronounced rigidity disappeared entirely, but returned after an interval of 20 minutes. In all six cases it remained somewhat reduced for six hours.

In nine patients an effect was produced on the tremor, but it was variable in nature, and in some cases, if not in all the cases, it was probably the result of suggestion.

The most pronounced effect of the drug, both objectively and subjectively, was upon voluntary movement. In 13 patients (to whom, in all, 16 injections ranging from 0·01 g. to 0·05 g. were administered) a definite improvement in voluntary movement was seen, not only in speed but in vigour, range of movement, and in the ease of performance of rapid alternating movements. This effect was noticed 10 to 22 minutes after injection and had ceased objectively after one hour at the most. Also, the general bradykinesia appeared ameliorated and the patients quicker and freer. The mental state of the patients brightened, and their subjective improvement continued long after all apparent effect of the drug had passed away.

In two cases no effect was produced upon an oculogyric crisis. Harmine given by the mouth exerted no action. No enhancing of the effects of harmine mentioned above was produced by an increase of dose except that the toxic effects of vertigo, &c., were increased in severity and duration. No dose higher than 0·05 g. was given, and the majority received doses varying from 0·02 to 0·03 g.

Only four patients denied receiving benefit, and the author believed that he had avoided the effect of suggestion in other cases.

Personal Cases Treated with Harmine.

We have administered harmine to 38 cases of generalised parkinsonism following encephalitis lethargica. This group was composed of 16 severe, 13 moderately severe, and 9 mild cases. Twenty-two patients were males and 16 females, their ages ranging from 12 to 44 years, with an average of about 26 years. In 10 cases the drug was given by mouth and in 19 hypodermically, the two forms of administration being distributed evenly over the three types of case. The following tables represent the doses and the periods for which they were given in all but two or three cases:—

By Mouth.

0·01 g. twice a day for seven days
0·02 ,, ,, ,, five ,,
0·03 ,, ,, ,, three ,,

Hypodermically.

0·02 g. every morning for seven days.
0·02 ,, three times a day for seven days.
0·04 ,, ,, ,, one day.

All cases prior to the administration had been under treatment with hyoscine given hypodermically. This treatment was stopped in all cases one week before beginning the course of harmine. During this week the condition of all the patients deteriorated greatly so that all except the mildest became very helpless, their ability to walk, talk, dress, and feed themselves being greatly impaired and in many cases completely abolished. Tremor, sialorrhœa, muscular rigidity, bradykinesia, bradyphrenia, and oculo-gyric crises were all much more evident. A few days after the completion of the harmine course, the hyoscine treatment was resumed and all the patients rapidly returned to the state in which they were prior to the omission of hyoscine.

The patients whilst receiving harmine showed no change whatever in their symptoms of parkinsonism at any time during the course. There was no amelioration of the syndrome even for a short period after each dose. Effects on the blood pressure, pulse-rate, muscular rigidity, bradykinesia, and bradyphrenia were particularly sought and none were found. Tremor, involuntary movements, and oculo-gyric crises were unaffected. The only signs or symptoms, subjective or objective, produced by the drug developed in seven patients 30 to 90 minutes after each administration of the highest of the hypodermic doses given—i.e., 0·04 g. In these cases there was a sudden onset of dizziness, generalised headache, usually nausea, and sometimes vomiting. The symptoms lasted about 30 minutes, though the headache occasionally persisted for some hours, and recurred after each dose.

After completion of the course of harmine and resumption of hyoscine hydrobromide gr. 1/100th hypodermically three times daily, nine cases were given, in addition, 0·02 g. of harmine hypodermically three times a day for 14 days with no increased benefit. Two or three cases were kept a little longer than the others on 0·02–0·04 g. harmine hypodermically, three times daily, before the resumption of the hyoscine, but no result other than the toxic effects referred to above was observed.

One case of post-encephalitic respiratory dysrhythmia, in a boy of 13 years free from parkinsonism, was treated with harmine. He was undersized and was suspected of being a mild example of the Lorain type of dyspituitarism, secondary to pituitary or hypothalamic involvement. His respiratory dysrhythmia was of the well-known type in which a deep inspiration is taken and the breath held for 10 to 20 seconds, being then expelled noisily and followed for a variable period by loud tachypnœa before the cycle begins again. In this case the administration of 0·02 g. harmine, three times a day hypodermically, appeared to produce from the start a diminution both in severity and duration of the attacks of apnœa and tachypnœa. Secondarily to this the patient slept better at night. This effect was maintained over a month of treatment with harmine.

Commentary.

The results of our experiments show that harmine administered in the doses given above exerts no perceptible effects, objectively or subjectively, other than the production of vertigo, nausea, and vomiting following the highest doses given hypodermically. These results differ greatly from the findings of Rustige and a few criticisms of his work are indicated.

Rustige's 18 patients received only 27 injections of harmine in all; consequently his conclusions as to the effects were drawn from the results of only one or two injections in each patient. That some of the apparent effects were "functional" and due to suggestion is admitted by the author, and the impression that most of them were probably so produced is gained from a close scrutiny of his paper. The likelihood of their being due mainly to suggestion is increased by the drawing of conclusions from the apparent effects of only one or two doses in each patient. It is remarkable that the reported improvement of parkinsonism was not increased by giving a larger dose of harmine and that the only enhanced effect was an increase in vertigo and nausea. If the amelioration of parkinsonism were a physical effect of harmine it would be expected to have been made more pronounced by increasing the dose. Rustige's findings differ considerably from those of Beringer, although it is now shown that they were using the same drug. Beringer reported no amelioration of the general bradykinesia and no psychical effect from the administration of banisterine. Lastly, it may be pointed out, though tentatively, for Gunn has observed that the actions of harmine vary in different animals, that the reported effects on parkinsonism are somewhat inconsistent with the effects upon laboratory animals. Rustige reports no production of involuntary movements, restlessness, or muscular contraction as immediate effects of the administration of harmine, but describes diminution of rigidity and increased freedom of movement as the first effects evident upon the musculature.

Conclusions.

1. The identity of the alkaloids banisterine and harmine appears conclusive.

2. Harmine in doses up to 0·04 g. given hypodermically has no perceptible objective or subjective effect in ameliorating any of the symptoms presented in the parkinsonian syndrome and is of no value in the treatment of this condition.

3. When given in the above doses harmine produces toxic symptoms of dizziness, headache, nausea, and vomiting in a certain proportion of cases.

4. These toxic symptoms are probably due to the action of harmine on the brain-stem—e.g., stimulation of the vestibular nuclei and vomiting centre.

5. In one reported case, and in one of our cases, the symptoms of severe chronic tachypnœa in a patient free from parkinsonism were partially relieved.

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ACTINOTHERAPY.

SOME CLINICAL RESULTS OF TREATMENT.

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THE clinical results here described have been based upon records from over 800 cases under my personal care. Some had failed to progress by other methods of treatment, and all were selected, after careful clinical examination, as being likely to respond favourably to light. About 6000 applications of light have been given. Two methods of treatment were adopted: (1) the irradiation of the normal skin of the body—general treatment; (2) application of rays to the site of local lesions—local treatment.

The technique of general treatment has been based upon the principles of "short-ray therapy," which has already been fully described,[1 2 3] and can be summarised as: (1) exposure of an area of skin roughly equal to one-sixth of the surface area of the body; (2) an interval of 10–14 days between irradiations of any given area of skin; (3) irradiation conducted two to three times a week; (4) the application of the minimal erythema dose.

The table classifies the lamps which have been employed and the average dose of rays applied.

In the early cases the sensitiveness of the skin to ultra-violet rays was estimated by means of the "test dose armlet"; the result determined the minimal erythema dose for the type of lamp used for irradiation. In practice it was found that constant and biological dosage could be obtained by careful control of the ampèrage and voltage passing between the electrodes of a lamp. The sensitiveness of the white skin to short ultra-violet rays differs from its sensitiveness to long ultra-violet and visible rays. Thus many cases of pathological photo-sensitisation show marked hypersusceptibility to exposure to visible rays, but normal reaction to short ultra-violet rays. Children are more resistant to light than adults. The types of skin which are very sensitive to ultra-violet rays are: (1) The "rheumatic or gouty" type, having a dry skin, sweating with difficulty, and a high nitrogen content of blood or urine. The extreme types are seen in some cases of uræmia and nephritis, which are very sensitive to light. In these types erythema is very irritable, painful, and often produces a papular or vesicular rash over the whole body. Improvement is obtained by a course of "sweat-producing baths" and alkaline medicines. (2) The skin over varicose veins of the legs. (3) The type showing vasomotor circulatory disturbances, such as chilblains. This is usually associated with a white, poorly pigmenting skin, sweating, and diminished capillary tone. Marked improvement is seen in these cases after preliminary irradiation.

Table showing Classification of Lamps.

Type of lamp.	Voltage between electrodes.		Ampèrage.		Kilo-watt energy.	Time in minutes for minimal erythema for normal white skin.
	Min.	Max.	Min.	Max.		
Long-flame arc. Iron-cored carbons. 240 D.C.	55	85	25	32	1·375–2·720	3½–5
M.V.L. (atmospheric) 480 volts D.C.	200	250	2·5	5	0·5–1·25	1½–3½
M.V.L. (vacuum) 240 D.C.	105	135	2·0	5	0·21–0·675	2–5
Kromayer type water-cooled M.V.L.	105	180	2·0	7	0·21–1·26	½–2
Throat lamp.	60	120	0·6	2·0	0·036–0·240	2–4
Quartz mercury H.F.E.	—	—	300 ma.	500 ma.	—	3–5

D.C. = Direct current. M.V.L. = Mercury-vapour lamp.
H.F.E. = High-frequency electrodes. ma. = milliamèpres.

Hæmobactericidal Power.

The erythema reaction obtained by exposure of the normal skin to rays shorter than 3000 A.U. was correlated in 182 cases with an increase in the bactericidal power of the blood tested in vitro by the "slide cell technique," described by Wright, Colebrook, and Storer.[4] In each case the minimal erythema dose of rays was applied to an area measuring, roughly, 144 sq. in. Samples of defibrinated blood were collected before and two hours after irradiation. The hæmobactericidal power of each sample was determined. The following results were obtained:—

	Per cent.
Cases in which hæmobactericidal power increased after irradiation of skin	153 = 84·5
Cases in which hæmobactericidal power decreased after irradiation of skin	15 = 8·5
Cases in which hæmobactericidal power did not change after irradiation of skin	13 = 7·0

Prof. Greenwood has kindly investigated the results of these observations, and has determined the mean average bactericidal power of the cases treated before and after exposure to light. These results show that 84·5 per cent. of cases tested have increased bactericidal properties of the blood two hours after irradiation, and that the average increase is 6·5 per cent.

Experiments have been carried out[5] which suggest that a local bactericidal effect is produced at the site of irradiation, and carried later by the blood stream into the general circulation. In many cases the bactericidal property of human blood is high, and the increased bactericidal effect after radiation appears comparatively small. The fact that it is improved after irradiation can be accepted as an index of beneficial action. In some cases in which the bactericidal power was abnormally low a marked increase resulted after irradiation. Excessive dosage and over-exposure to light cause a fall in bactericidal power, and harmful results follow, as in chronic pulmonary tuberculosis. Although in laboratory experiments the hæmobactericidal power of animals has been increased by other physical agents, such as heat and mustard plasters, the application of these agents to the human skin is impossible, as the intensity of the burning or blistering necessary is too severe. While the bactericidal test of the blood is an index of the response of the human body to the erythema-producing rays shorter than 3000 A.U., it is no index of the effects of the infra-red, visible, and long ultra-violet rays. When the leucocytic function of the blood is impaired and hæmobactericidal power is low, as in some types of chronic tuberculous disease of the lungs and acute pyrexial microbic infection, dosage and treatment by short ultra-violet rays should be controlled by the study of the bactericidal power of the blood; this makes the method of treatment safe, as an increase in the power can be accepted as evidence of progress.

The series of cases which are described have all received individual treatment and supervision. General treatment was first applied by irradiation with mercury-vapour lamps; at a later stage when slight pigmentation was evident, exposure to two long-flame arc lamps was added to the treatment.

Debility.

Debility accounted for a large proportion of the cases treated. Many of the patients gave a history of previous acute illness—e.g., influenza, colds, and catarrh; in others there was evidence of susceptibility to colds. Although many had no signs of organic disease, the subjective symptoms—i.e., fatigue, weakness, and general malaise, generally demonstrating a subnormal state of health, were the chief reason for treatment. The average number of treatments per case was 13·3. So far as clinical results of treatment can be assessed by personal observations, the general tonic effect of radiation was evident in many patients. They usually said they felt brighter and more energetic, and often that their skins felt warm and glowing and able to withstand cold. Some patients, however, described a feeling of lassitude and drowsiness with an inclination to sleep. Since there are no definite physical signs obtainable to assess the results of treatment, personal subjective observations must be accepted. In cases of severe debility following acute illness the treatment appeared to hasten speedy recovery and return of vigour and health. A low hæmoglobin percentage was obtained in 18 cases, and all these showed an increase of hæmoglobin after 12 treatments. The average percentage before treatment was 66·2 and 82 after 13·9 treatments.

Skin Diseases.

Cases of eczema, acne, alopecia, and early psoriasis have shown the best results. A short course of general exposure by "short ray therapy technique," usually 4–6 treatments, was given before intensive treatment—i.e., a full erythema dose over the lesion every 10–12 days. The erythema persisted for four to five days, and desquamation of the skin occurred after six to eight days. When the skin lesions were diffusely scattered over the whole body, different areas were selected for intensive treatment once or twice a week, but treatment was never reapplied to any given area until all signs of desquamation had disappeared. Ichthyosis showed an excellent response, and cases of complete alopecia of many years' duration improved, four having almost completely recovered after 18 months' progressive treatment.

Tonsillitis and Sinusitis.

General exposure to light by "short ray therapy" improves the general body health and the anæmia and debility which are associated with subacute inflammatory diseases. Catarrh is lessened and the œdema and congestion of tonsils and pharynx are diminished. Local treatment to the mucous membrane and tonsils is indicated in cases of chronic catarrhal inflammatory conditions with recurrent acute attacks. The treatment has proved beneficial in lessening the susceptibility to colds and acute bronchitis. Treatment is indicated: (1) as a general tonic following the debility and toxæmia associated with septic throats; (2) to improve the general health before tonsillectomy or drainage of maxillary antrum; (3) to heal septic tonsils and discharging sinuses; (4) to diminish the frequency of colds and bronchitis. Local treatment of the pharynx, tonsils, and mucous membrane by the water-cooled throat lamp should only be applied in chronic conditions; in active acute inflammatory conditions it may give rise to a spreading acute cellulitis.

Asthma and Bronchitis.

General treatment has been beneficial and has hastened the healing of cases of active bronchitis. Some cases of bronchial asthma have reported definite improvement. The treatment is of great help during the cold, wet winter months, and assists many patients with chronic emphysema and bronchitis to carry on with their routine work. Cases of debility and bronchitis in young children have responded well.

Lumbago, Arthritis, and Chilblains.

A full erythema reaction over the dorsal lumbar region has in some cases greatly benefited cases of lumbago. Beneficial results have only been obtained in early cases of arthritis. The condition of fibrosis and thickening of synovial membranes with effusion have not shown improvement. The exposure of the hands or feet to intensive radiation has completely cured chilblains by improving the capillary circulation. The continuation of the treatment lessened the incidence of recurrence during the cold weather.

Tuberculous Diseases.

Lupus Vulgaris.—Early cases of lupus vulgaris are healed by general irradiation of the skin. All cases were given general irradiation in addition to periodic local treatment at the site of lesions. Chronic cases in which there was much fibrosis, scarring, and hypertrophy of granulation tissue proved most resistant. Before local treatment, the skin was carefully prepared and cleaned so as to remove dead cells, scales, and scabs. The application of a diathermy needle to isolated fibrous nodules was helpful. In one chronic case a "light sensitiser" (eosin) was injected locally; this caused intense reaction and a slow-healing ulcer. The result was favourable, and the method appears to be indicated in the most resistant types of lupus. If the treatment was continued long enough, in some cases for many months, all cases of lupus completely healed.

Glands.—All cases were treated by general irradiation; local treatment was only applied to discharging sinuses and soft caseous glands. Careful dosage of local irradiation at first caused swelling of the glands, followed by softening and increased discharge, and finally by healing. This inflammatory reaction and increase in size was often seen in the early stages of general treatment, but none of the glands broke down and suppurated. Periadenitis was lessened, and the glands became smaller in size, discretely isolated, and freely mobile. Fibrosis and healing of glands was obtained in all the cases selected, together with marked improvement in the general health with increase of weight, appetite, and general appearance.

Lungs.—The cases selected were chronic, "organised," non-pyrexial types of tuberculous disease. During the early stages of treatment expectoration was increased, and rest in bed after treatment was prescribed if there were symptoms of fatigue or malaise. The patients have improved and have kept well during the past year.

Larynx and Palate.—Tuberculous disease of the palate, tonsils, pharynx, and larynx respond to irradiation favourably. Local treatment is indicated in all cases in which there is no serious lesion of the lungs. Early cases heal with great rapidity. General irradiation of the skin two to three times a week and local treatment of the lesions was applied every 10 to 12 days. Patients were rested for 24 hours after local treatment, as a general reaction sometimes occurred. The technique of treatment with the special throat lamp has already been fully described.[6] The results are very satisfactory, and so far all cases have healed completely, except one case in which there was disseminated tuberculosis of the lungs. Tuberculous disease of the mucous membrane heals with greater rapidity than tuberculous disease of the skin.

Acute Pyrexial Microbic Infections and Granulating Wounds.

Small areas of skin, equivalent to one-twelfth of the surface area of the body—i.e., front of one leg—were exposed daily to a mercury-vapour lamp, and the minimal erythema dose was controlled by tests of the bactericial power of the blood. In all cases tested the initial bactericidal power of the blood was high, and an increase was observed after irradiation. If the hæmobactericidal power had decreased after irradiation treatment would have been discontinued. Lassitude, drowsiness, and sleeping were common after treatment, and in some cases a slight rise in temperature was attributed to the irradiation. Treatment was not applied when the temperature was high. More clinical evidence is necessary before definite conclusions can be recorded.

The improvement of general health by general treatment and local irradiation hastened the repair of granulation tissue and discharging sinuses after surgical operation. The most favourable results were obtained in the treatment of granulating wounds after radical mastoid operations.

Conclusions.

Light ray therapy is a painless method of treatment, which can be carefully controlled during the whole period of illness by cautious technique and correct dosage. Compared to other methods of treatment, such as radical surgical operation, scraping, or curettage, painting with strong acids, caustics and cauterisation, successful results of treatment of some tuberculous diseases by radiation therapy are a wonderful triumph. The treatment needs no anæsthesia, and causes little pain, and patients can often safely continue their normal routine during treatment. The scar tissue which follows healing of ulcers and granulation tissue is soft and freely mobile, and has a characteristic "white tissue-paper" like structure; telangiectic and keloid scars are unknown. The rapid healing of extensive tuberculous and other pyogenic chronic ulceration of the palate and fauces by means of this therapy decisively proves its curative power.

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HOSPITALS AND ROAD ACCIDENTS.—The Ministry of Health and the Royal Commission on Transport have informed Mr. W. Renshaw, of the Altrincham Provident Dispensary and Hospital, that the position of hospitals in regard to the treatment of cases arising from road accidents "shall be taken into consideration." Mr. Renshaw is asking hospital secretaries all over the country to inform him of the number of such cases treated in 1928, their cost, and the payments made by the patients concerned.

THE IMPORTANCE OF THE LIVER IN CHEMOTHERAPY.*

WITH SPECIAL REFERENCE TO THE TREATMENT OF MALIGNANT DISEASE.

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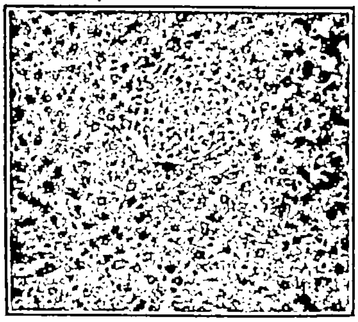
WHEN we come to consider the variety of its functions it is evidently no mere accident or caprice of Nature that the liver is the largest organ of the body. Its portal circulation brings it into intimate relationship with the gastro-intestinal canal and spleen, so any blood changes occurring in these organs must act with particular intensity on the liver. The fact that all the material that enters the blood from the stomach, the small intestines, and the proximal part of the large intestine must pass through the liver before it enters the general circulation, helps to protect the body from toxic substances that may be absorbed from the intestinal canal. Some are converted directly into atoxic material, as when ammonium salts are converted into urea. Others combine with glycocoll, sulphuric acid, or glycuronic acid, and are thereby deprived of poisonous properties. Lastly, alkaloidal and mineral poisons are, to a certain extent, removed from the blood during their passage through the liver, and, as Willcox[1] states, as many others have done, this organ must be regarded as the first line of defence in all cases of generalised poisoning. The importance of the part played by the liver in carbohydrate metabolism, in the contribution of fibrinogen to the blood, in anaphylactic shock, in the secretion of bile, and the absorption of water is well established.

The toxic effect of arsenic on the liver has been the source of great concern to those employing the substance therapeutically. Foulerton[2] was among the first to call attention to the possible harmful effects of the arsenical compounds as essentially identical with poisoning by chloroform, ether, trinitrotoluene, and phosphorus. He experimented with rabbits and found an interstitial hepatitis with injury to the parenchyma cells and, in addition, nephritis. Clinically the toxic effects on the liver tissues and kidney may now be regarded as being among the most common of [illegible] ill-effects following the administration of [illegible]

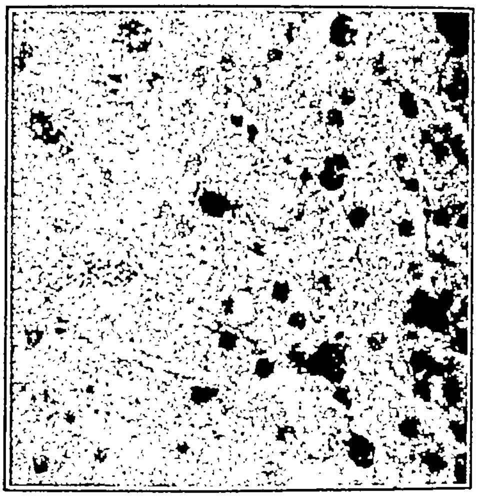
FIG. 1.



Liver from a rat treated with colloidal lead showing focal necrosis. (Microphotograph × 110. Prof. Carter Wood.)

MacCormac [illegible] investigated the liver function of [illegible] [illegible]rent stages of disease undergoing [illegible] [illegible]senobenzol. In 52 of these t[illegible] proper [illegible]rmal, and in the [illegible] out, any liver damage need not necessarily be due to the arsenic which is used, but may be caused by the syphilis which is being treated. There appears to be abundant evidence that every degree of jaundice and even acute yellow atrophy may occur in syphilis as an

FIG. 2.



Liver from a cat treated with colloidal lead showing particles of the metal in the Kupffer cells. (Microphotograph × 500. Prof. W. J. Dilling.)

accident of this disease, and perhaps, therefore, is in no way connected with the use of an arsenical preparation. On the other hand, arsenic when administered to patients for other conditions than syphilis has been known to cause definite derangement of hepatic function.

General anasarca following the ingestion of arsenic was recorded by Bang[4] as long ago as 1774. Geyer[5] reported the occurrence of wholesale poisoning from arsenic at Reichenstein, and mentions the frequent occurrence of serous effusion and ascites. Broadbent[6] made the interesting observation that the serous effusions occasionally seen in Hodgkin's disease might be attributable to the arsenic commonly employed in the treatment of this disorder. Rolleston[7] states that arsenic seems to be capable of setting up cirrhosis of the liver, mentioning in particular the Manchester epidemic in support of this view. O'Leary[8] reported undoubted examples of portal cirrhosis occurring in cases of chronic arsenical poisoning following the therapeutical use of potassium arsenite.

There is little doubt that many of the toxic effects of lead administered intravenously are in part due to liver damage. The varieties of pathological changes produced, especially in the experimental stages of the treatment of malignant disease with lead, have already formed an interesting study.[9]

When we consider the importance of the liver as an eliminator of lead it is not surprising that in industrial poisoning the rôle played by this metal in the production of hepatic lesions assumes considerable proportions. Several types of lesions of precirrhotic or cirrhotic character have been described. Potain[10] reports the occurrence of atrophy of the liver cells, fatty degeneration or infiltration, and intercellular or interlobar cirrhosis, and other observers add that small areas of exudation and hæmorrhage may also be seen.

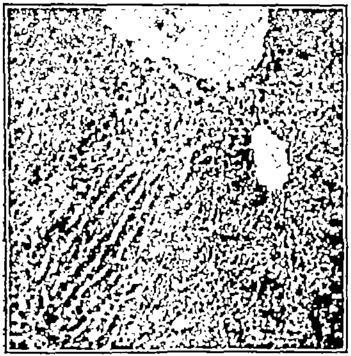
Kussmaul and Maier[11] believe that lead acts directly on the portal vessels, but Hanot and Charpentier[12] think that the hepatic cells themselves are chiefly affected. Meillère[13] states that periportal cirrhosis may be produced experimentally by lead, but Ophuls,[14] who worked with guinea-pigs, failed to observe this lesion.

[illegible] ho Liverpool [illegible] W. Blair

Seeligmüller [15] found evidence of hepatic cirrhosis in the liver of a new-born child of a lead worker, and recovered lead from the organ.

In spite of all the pathological conditions which have been noted in plumbism the consensus of opinion among pathologists who have studied lead poisoning is that post-mortem examination of the liver reveals no changes specific for lead. We ourselves have produced focal necrosis in the liver of rabbits that have received intravenous injections of lead, but no cirrhotic changes have been observed. Carter Wood [16] has demonstrated focal necrosis in the liver of rats by similar means (Fig. 1). Prof. Dilling [17] has shown that shortly after intravenous injections of colloidal lead the liver contains a considerable part of the metal which is distributed throughout the body. This observation is supported by those of other investigators. It must, however, be remembered that the route, frequency, and size of the dosage, and the time elapsing subsequently before the death of the animal, influence the final distribution of lead in the tissues. Dilling both estimated his lead quantitatively and demonstrated it microscopically. He found that the Kupffer cells appeared to contain large quantities of the metal (Fig. 2). This illustration shows the appearances of the Kupffer cells in the liver of a cat after intravenous injections.

FIG. 3.



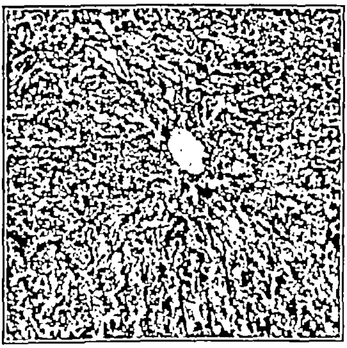
Liver from a rabbit treated with colloidal lead malate showing hæmorrhages into the liver substance. (Microphotograph × 110.)

The toxic effects of lead on the liver apparently arrange themselves into two groups: first, there is the general toxic or massive dose effect, similar to that which any toxin would produce if introduced into the blood stream, and which has been repeatedly demonstrated by many investigators. This can be produced by lethal doses of any lead preparation and is well illustrated in Fig. 3, which is a microphotograph of the liver of a rabbit treated with a large dose (60 mg.) of colloidal lead malate. Secondly, there is the delayed lead effect which can be produced by most preparations of lead if the dosage be controlled (Fig. 4). There is dilatation of the capillaries compressing the parenchyma cells, a condition which is general throughout the whole liver and is brought about by doses of lead preparations slightly larger than the amount required to produce abortion in pregnant does (a method of which use has been made in regulating the therapeutic doses of the various lead colloids prepared for the Liverpool Medical Research Organisation). If now more lead be given to the animal hæmorrhage will occur and the appearance will be similar to that in Fig. 3 described above. This is probably the explanation of the hæmorrhage mentioned by Legge and Goadby [18] in the livers from cases of lead poisoning.

With smaller doses, as employed in the treatment of patients, cloudy swelling results but rapidly clears up, and the liver is probably normal again in 24 hours. Substances like colloidal lead selenide, colloidal lead phosphate, and colloidal lead hippurate can be administered to rabbits in large doses (30 mg. per kg. of body-weight) without producing any effect other than cloudy swelling commencing around the central vein, the parenchyma cells in the neighbourhood of the portal systems being involved to a lesser extent or not at all. We suggest that if the lead had been administered by the mouth the portal areas might have been the first to degenerate, and would like to point out that in discussing the effect of lead on an organ like the liver, to which the blood arrives from distinct sources, it is essential always to bear in mind the portal of entry. This is so often overlooked by writers on the pathology of industrial lead poisoning and may perhaps be the explanation of the variety of changes described by different investigators. The period over which the lead has acted and the time when the post-mortem was performed should always be stated in drawing conclusions from particular histological appearances. The cloudy swelling may, of course, proceed to actual necrosis of the cells.

The fact that cirrhosis of the liver of the animals was not found is probably due to the fact that insufficient time had been allowed to elapse between the time of injection and that when the animal was killed. It seems quite probable that it would occur in the healing process after degeneration of the cells, but would not arise with the quantities employed during a course of treatment for malignant disease. In the livers examined histologically particles similar to those described by Dilling were constantly found in the liver cells.

FIG. 4.



Liver from a rabbit treated with colloidal lead aspartate showing the congested and dilated capillaries compressing the liver cells. (Microphotograph × 140.)

Clinical Manifestations.

Just as in the case of arsenic the obvious clinical manifestation of liver involvement in the course of treatment of malignant disease with lead, following the technique of Blair Bell,[19] is jaundice. With the increase of experience with regard to dosage and the interval between each dose we now see very little of this symptom, and it rarely attains any severity. It is very probable that a good many other symptoms, such as nausea and vomiting may be in part due to liver involvement. Table I., compiled from a series of 216 recent consecutive cases, illustrates the frequency of jaundice during treatment and the extent to which it is dependent on the nature of the preparation used.

TABLE I.

—	Number of consecutive cases observed.	Number developing jaundice.	Percentage developing jaundice.
S_7. Lead suspension (Pb = 0·5 per cent.)	172	19	11
L.S. Lead selenide (Pb = 0·2 per cent.)	19	2	10
H_9. Lead phosphate (Pb = 0·4 per cent.)	25	0	0

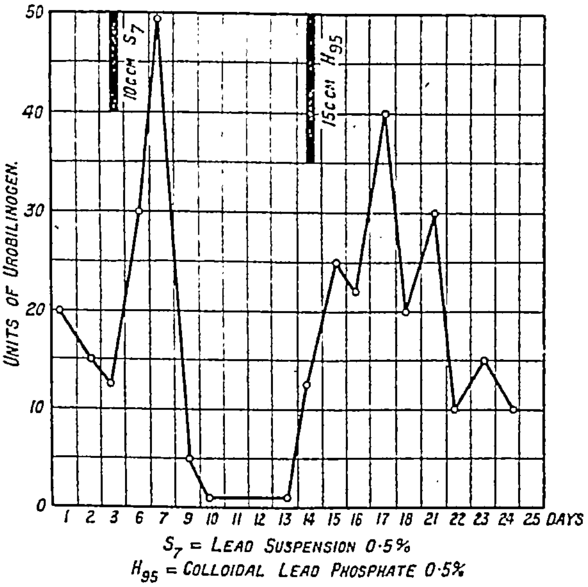
Tanquerel des Planches [20] in 1830 drew attention to two kinds of jaundice occurring in lead poisoning. He distinguishes "jaunisse suite des doleurs de colique" from "l'ictère saturnine, résultat de l'altération du sang par le plomb." The former he states to be due to extravasation of bile from its usual reservoir, and the other to a direct change of the blood by lead. This observation was amazingly accurate, and with our present knowledge of the reticulo-endothelial system is easy to explain.

In the early days of experimental lead therapy when larger doses were used three distinct types of jaundice presented themselves.

(1) A pure hæmolytic jaundice due to destruction of red blood-cells by lead and characterised by a fine icteric tinge, an indirect van den Bergh reaction, and excess of urobilinogen, but with no bile pigments in the urine.

(2) A type in which jaundice was deeper and in which a variety of van den Bergh reactions, including the biphasic, were obtained and along with which were found excess of urobilinogen and bile pigments in the urine. This type must have been associated with definite damage to the liver parenchyma.

FIG. 5.



The effect of intravenous colloidal lead phosphate on the output of urobilinogen.

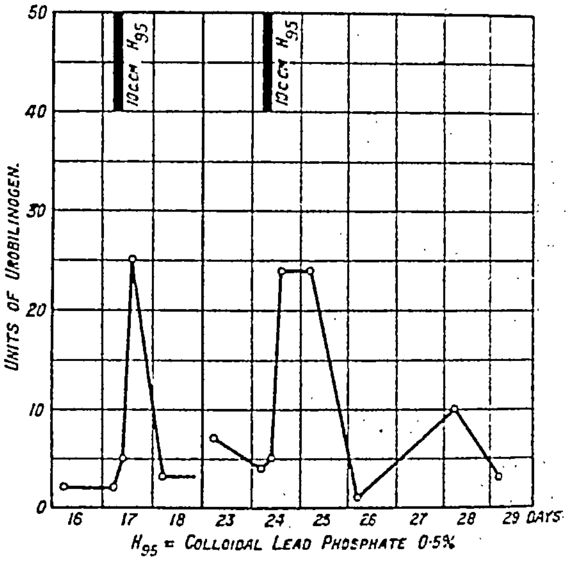
(3) A frankly obstructive jaundice where in addition to the changes in type (2) there must have been a cholangitis leading to obstruction of the smaller bile-ducts. In this type the jaundice is deep, bile pigments are present in the urine in large quantities, and the van den Bergh reaction is of the immediate direct type.

The majority of cases developing jaundice was apparently of the hæmolytic type and transient in nature, but the following case illustrates the rapid production of obstructive jaundice following a massive dose of lead suspension.

CASE N. H. 17.—Male, aged 24. Diagnosis, radiographic and histological, sarcoma of the femur.

Initial investigation revealed absence of anæmia and normal renal function. A massive dose of lead suspension (40 c.cm. of 0·5 per cent.) was administered intravenously at midday on Dec. 18th, 1924. The patient had a rigor lasting ten minutes at 6.30 P.M. and vomited three times. There was no diarrhœa. The following day there was marked diminution in the secretion of urine; hæmaturia, jaundice, and vomiting continued. On Dec. 22nd there was still oliguria, only 64 c.cm. of urine being secreted in 24 hours. The jaundice was deeper, there was bile in the urine, and the serum gave a positive direct van den Bergh reaction. By this time the blood-urea had risen from 23 mg. to 167 mg. per 100 c.cm. and the hæmoglobin had dropped from 98 per cent. before treatment to 38 per cent. after. On the following day the jaundice was less deep but persisted in some degree until the patient's death on Jan. 1st, 1925.

FIG. 6.



The effect of intravenous colloidal lead phosphate on the output of urobilinogen.

Output of Urobilinogen.

The consensus of opinion is that bacteria in the intestine convert bilirubin into urobilinogen. Most of this is excreted by the gut, but some is carried to the liver by the portal system and so reaches the liver parenchyma. The absorbed portion is largely reconverted by means of the liver cells and re-excreted with the bile; a small portion remains unchanged and is excreted in the urine. This conversion by the liver of most of the urobilinogen into bilirubin is important, in that many observers regard excess of urobilinogen in the urine as evidence of a damaged liver which is unable to bring about the conversion. MacCormac and Dodds [3] conclude that if there be any damage to the liver cells this property of converting urobilinogen into bile pigment is lost and, therefore, urobilinogen accumulates in the blood and is excreted in excess in the urine.

Uvedale Owen [21] has drawn attention to a fact which had escaped the attention of some observers—namely, that the output of urobilinogen varies from hour to hour and from day to day in the same individual. We have been able to confirm this observation and further to note that such factors as ketosis and intestinal stasis tend to increase the output of urobilinogen in the urine. Bearing these limitations in mind we have found the output of urobilinogen in the urine to be a valuable guide to the probable extent of liver damage, the result of lead therapy.

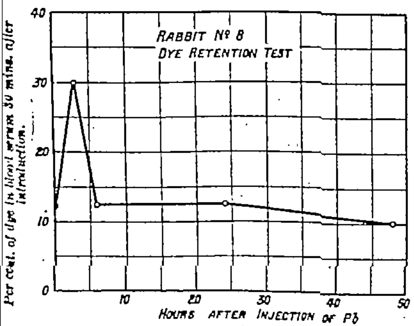
ndeed, we have considered a high urobilinogen ontent of the urine as the result of lead therapy to e a contra-indication to further dosage until more ormal values have been obtained.

The quantitative test we have used is a modificaion of that of Wallace and Diamond [22] who used hrlich's aldehyde reagent which produces a red olour with urobilinogen. The effect of lead therapy n the output of urobilinogen is shown in the following two charts of patients who are undergoing treatnent (Figs. 5 and 6). Each morning the amount of robilinogen in the urine is estimated and in some ases each specimen that is passed for 24 hours or 8 hours as in Fig. 6. The immediate rise corresponds closely with the period of maximum dye etention in rabbits following injections of lead hich will be described later. Occasionally no rise n the urobilinogen output occurs, and it is these ases which show but little tendency to develop toxic nanifestations.

Dye Retention.

The dye-retention test was devised by Rowntree, Hurwitz, and Bloomfield,[23] who noted that phenoletrachlorphthalein, when injected subcutaneously, scaped from the body exclusively via the biliary assages. By careful animal experiments the origiators of this test were able to prove that the excretion f the drug diminished in proportion to the amount f liver tissue damage. Since this work various mprovements have been suggested both in the nethod of administration, nature, and dose of the dye. Graham and Cole [24] inject 40 mg. of phenoltetraodophthalein per kg. of body-weight intravenously, hereby taxing the liver to its utmost with a relaively toxic but brilliant dye, estimating the amount f dye left in the blood after half an hour. They ave found that by using this amount it is possible to estimate smaller variations in extent of liver damage than can be found by using the lesser quantities of phenoltetrachlorphthalein and bromsulphthalein.

FIG. 7.



The effect of intravenous lead suspension on dye retention in a rabbit.

In our experiments we have used both the bromsulphthalein as recommended by Bulmer[25] and more recently phenoltetraiodophthalein, adopting the method of Graham and Cole and following their technique in every detail. Our experiments were divided into two groups: in one group the dye retention in rabbits following lead (S_7) injections was determined, and in the other group the effect of lead on the dye retention was estimated in patients undergoing treatment with this drug.

Table II. and Fig. 7 illustrate the effect of lead in the form of S_7, which is a suspension containing 0·5 per cent. of lead, on the dye retention of rabbits.

It will be noticed that the highest rise occurs about three hours after the injection, but that a rise is frequently observed also on the day following injection and that this tends to return to normal after two or three days. In the case of patients undergoing treatment with lead—that is, with relatively smaller doses than were given to the rabbits—no difference was observed in the dye retention either in the case of bromsulphthalein or phenoltetraiodophthalein.

TABLE II.

Date.	Rabbit.	Amount of Pb.	Dye per cent. after half-hour.	Time after Pb.
24/2/29	No. 7,* Chinchilla, 2750 g.	—	10	Before Pb.
25/2/29	—	10 c.cm. S_7	25	3 hours
26/2/29	—	—	10	6 ,,
26/2/29	—	—	20	24 ,,
24/2/29	No. 8, English, 2250 g.	—	12·5	Before Pb.
25/2/29	—	10 c.cm. S_7	30	3 hours
25/2/29	—	—	15	6 ,,
26/2/29	—	—	12·5	24 ,,
27/2/29	—	—	10	48 ,,
7/3/29	—	—	5	10 days
8/3/29	—	5 c.cm. S_7	35	4 hours
15/3/29	—	—	10	7 days
20/11/28	No. 5, 2350 g.	—	3	Before Pb.
21/11/28	—	10 c.cm. S_7	—	—
22/11/28	—	—	10	24 hours
23/11/28	—	—	3	48 ,,
28/11/28	—	—	4	7 days
28/11/28	—	10 c.cm. S_7	—	—
29/11/28	—	—	12·5	24 hours
30/11/28	—	—	3	48 ,,
20/11/28	No. 6, 2000 g.	—	0	Before Pb.
21/11/28	—	10 c.cm. S_7	4	24 hours
28/11/28	—	—	2·5	7 days
28.11/28	—	10 c.cm. S_7	—	—
29/11/28	—	—	10	24 hours

* No positive van den Bergh reactions were ever obtained. This rabbit was very ill 24 hours after the lead administration and had to be killed. Histological examination of the liver showed definite liver damage. This will account for the increased dye retention when the test was carried out before the animal was killed.

Lævulose Tolerance.

The lævulose tolerance test as described by Spence and Brett [26] has been of no value to us in determining the extent of liver damage the result of lead therapy. It has, however, been useful in determining the suitability of cases for treatment with this drug in the initial investigation of the patient. One of the causes of its failure is the fact that nausea and vomiting, which the ingestion of large quantities of lævulose may produce, militate against the success of this procedure and these are of necessity a frequent accompaniment of a damaged liver.

Conclusions.

The conclusion we have come to in the observation of the toxic effects of the injection of colloidal lead is that a careful study of the existing damage to the liver in the course of treatment, so far as this is possible, is of importance in the determination of the extent and interval of dosage. A careful examination of the liver function is of great importance also in the initial selection of cases, for we cannot hope to treat a case successfully with lead where the liver function is even moderately impaired.

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CONGENITAL ECTODERMAL DEFECT.

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IN 1920 Goeckerman[1] reported a case of a patient who presented more or less aplasia of most of the cutaneous ectoderm. He discussed six similar cases in the literature and considered they formed a distinct and easily recognisable type. He applied to them the term high grade or major ectodermal defect.

MacKee and Andrews[2] described a similar case. After a consideration of the literature they came to the conclusion that various grades of congenital aplasia of the skin, nails, hair, and teeth, and even of the subcutaneous and sweat glands, alone or in combination, are of fairly frequent occurrence, but that it is much more uncommon to meet with patients presenting congenital anomalies, ranging from deformation to complete absence of all the cutaneous structures originating from the epidermis. Goeckerman, in the discussion on this paper, referred to a further case seen by him, and stated that Jhadani, of India, had seen many of these cases as a hereditary, generally sex-linked, anomaly transmitted through the mother. Goeckerman's own case was in a female though all the other recorded cases were in males.

MacKay and Davidson[3] record a family, which they include under this group, showing a minor degree of ectodermal defect without involvement of the teeth, sweat or sebaceous glands. In this family the condition had shown itself in five generations and occurred in both males and females. As is usual with hereditary conditions in several of the cases no history of a familial incidence could be obtained. Jean Smith,[4] under the term abnormal dentition, showed a case in a male child of 5 years of age, markedly under weight, with dental aplasia, hypotrichosis, absence of sweating, and a history of a previous admission to hospital when 3 months of age with a temperature of 107·8° F. which rapidly fell and for which no cause could be detected, which apparently belongs to this group.

The main clinical characters described by MacKee and Andrews are as follows:—

1. A dry, white, smooth, thin, pliable, and glossy skin. In their own case there were numerous fine wrinkles at the corners of the eyes and on the cheeks near the nose.

2. Absence of sweat glands. None of the recorded cases had ever shown sensible perspiration, and histological examination which had been carried out in the majority of the cases failed to show sweat glands or anlage.

3. Dental aplasia to a pronounced degree was found in all the recorded cases. The case described by MacKee and Andrews had five teeth, the largest number recorded, including one in the lower jaw which is unusual as in all the other cases the lower teeth were absent.

4. Hypotrichosis. Congenital hypotrichosis is common to all the cases, the hairy parts being involved in various degrees. Lanugo hair is absent from most of the body surface.

5. The lips are thick, muscular, and everted, presumably the result of the additional labial activity required for mastication without teeth.

6. Depressed nasal bridge and chronic atrophic rhinitis. A depressed nasal bridge and prominent frontal bosses were present in all the recorded cases. In the great majority there was a chronic atrophic rhinitis.

The case described below is peculiar in that the bridge of the nose is not depressed.

7. In several cases the nails were deformed.

8. Papular lesions of the face are recorded in a considerable proportion of the cases.

9. Inferior mentality has been recorded in several of the cases, in others the mentality has been normal or somewhat above normal.

10. Patients are handicapped through inability to radiate sufficient heat under certain environmental conditions, but they are healthy and active and longevity is apparently unaffected.

In Tendlan's case[5] the mammæ were absent.

Subjective Symptoms.—The main subjective complaint which is common to all patients is discomfort in hot weather. They find it necessary to avoid heat, vigorous physical exercise, hot food and drink, especially in hot weather, and often are compelled to resort to artificial perspiration by keeping their clothes wet with water.

A New Case.

The following case was admitted to hospital under my care in July, 1924, and has been under intermittent observation ever since:—

V. J., male, aged 6¼ years. Complaint: absence of teeth, hair, and sweating, with great discomfort during the hot weather.

Patient was born at full time after a difficult labour. He weighed 5½ lb. at birth. During the pregnancy the mother vomited incessantly but her general health did not seem to suffer much. He was breast fed for two months, but as he was extremely thin he was put on lactogen and later other foods. Nothing seemed to disagree with him but he remained extremely thin. At 9 months of age he developed a cough accompanied by hoarseness, and ever since then he has had periodic attacks of hoarseness. Up to 18 months of age he had no hair on his head or body, but at 18 months he began to show some downy hair on his head and a little on his body. He began to walk and talk at 18 months and at 2 years he cut two teeth in the upper gum, one on each side far back. An X ray taken at this time was said to have shown no evidence of further teeth. He had had various forms of ductless gland treatment, chiefly thyroid, but his mother always stopped them as they caused mental excitement. He was born and lived in Zululand, and ever since birth he had been very uncomfortable in hot weather and had never been seen to sweat. He managed to get through the hot weather by the use of frequent cold baths and keeping his hands and feet in cold water. Apart from the discomfort during the hot weather and the periodic attacks of hoarseness he had been well.

Family History.—There are two other children—4 and 6 years older than the patient. There have been no miscarriages. They are both perfectly well-developed and normal children. The mother is a well-developed woman. The father is rather small and thin. Recently (1929) he is reported to have developed tabes dorsalis. There is no known similar case on either side of the family.

On admission to hospital (June 9th, 1924) the boy's appearance (Fig. 1) simulated very closely a

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[1] Arch. Dermat. and Syph., 1920, i., 396.
[2] Ibid., 1924, x. 673.
[3] Brit. Jour. Dermat. and Syph., 1929, xli., 4.
[4] Proc. Roy. Soc. Med., 1929, xxii., 648.
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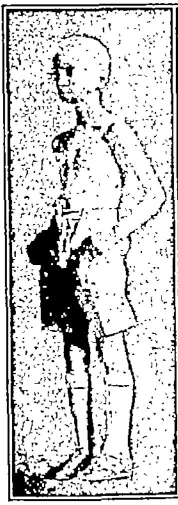
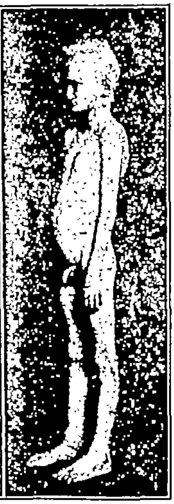
diminutive old man. He had a large globular head very scantily covered with an almost colourless down from 1 to 1½ inches long. There were numerous prominent veins all over his head. There was a complete absence of eyebrows; the eyelashes were present in moderate amount, but as they were almost colourless, they were not seen at first glance. Over the upper part of the face were a few scattered cream-coloured papules, the largest about the size of a large pin. Running horizontally backwards from the outer canthus were numerous fine wrinkles, and similar wrinkles were present from the inner canthus running down the cheek and at the angles of the mouth. The nose was straight and not depressed. The lips were relatively thick and everted. The lower jaw was very poorly developed. The alveolar margin was thin and sharp, not much thicker than the blade of a knife. There were two teeth, one on each side of the upper jaw for back. An X ray shows no evidence of further teeth.

FIG. 1.



Patient, aged 6½ years.

FIG. 2.



Aged 7½ years.

The whole lower half of the face was tiny compared with the upper half. The body was extremely thin; there was a complete absence of breasts and the nipples were represented only by a minute pigmented spot. The whole skin was dry but not harsh except on the palms of the hands, where the skin was thick, cracked, hard, and dirty. There was on the limbs a very scanty, very fine down-like hair. The genitals are underdeveloped, the testicles being about the size of small cherry stones.

Radiological Appearances.—X ray of the skull showed a normal sella turcica. The bones of the vault of the skull were very thin. X ray of the limbs showed ossification normal for his years. There was no cardiac enlargement.

The blood pressure was 100/62. The urine showed no albumin or other abnormal constituents. There was a distinct polyuria varying from 50–80 oz. per day. The urea-concentration test at the second hour showed 2·45 per cent. The two-hour test showed a variation of 10 in the specific gravity and no increase of nocturnal urine. The blood-urea was 30 mg. per 100 c.cm., creatine 1·75 mg., uric acid 2·3. A blood-sugar curve was normal. The basal metabolic rate was on first admission estimated at +15 per cent., a year later at −6 per cent.

Dr. J. Luckhoff, in charge of the nose and throat department, reported:—

> "The upper jaw though with an ill-developed alveolar margin is shallow but very broad, consequently the nasal spaces are quite abnormally wide, the turbinate bodies are relatively small, and the mucous membrane dry with a secretion of yellow tenaceous muco-pus—a pathological condition clinically (though not typical) very similar to the disease we term atrophic rhinitis. Relative to the size of his nasal spaces his maxillary sinuses are not large, his frontal sinuses are very small. Larynx shows a typical laryngitis sicca secondary to the nose condition. Mastoid processes both in surface bulge and in length are abnormally developed with a deep sulcus between them and the meatus on each side. The skull bones seem thin."

The Wassermann reaction was negative. Mentally the boy was bright and, possibly because he had never been to school on account of his peculiar appearance, precocious. In 1929 his appearance had improved and he is now attending school and doing quite well. His mother states that he has already had several articles or children's stories published in the newspapers.

Pilocarpine up to one-sixth of a grain, followed by a hot pack, produced no visible perspiration.

Readmission.—The patient was readmitted again for examination in April, 1925. His appearance had distinctly improved and he looked decidedly younger (Fig. 2). There was an increased growth of hair on the head and there was definite evidence of eyebrows. He was still very uncomfortable in hot weather, but thinks he sweats a little now. After pilocarpine, gr. ⅙, although no visible sweat was apparent, on palpation there did appear to be some moisture on the skin. The physical examination was as on previous examination except that the knee-joints were rather more prominent. There was no pain but there seemed to be slight effusion in both joints. The testicles did not appear to have developed much.

There was much difficulty in getting permission to excise a portion of skin for examination, but since the patient had a small wart on the thenar eminence of one hand, this was removed with a portion of the surrounding skin. Prof. B. J. Ryrie reports on it as follows:—

> "The sections show a papilloma with 0·6 to 0·75 cm. of the surrounding skin on either side of it. The line of excision is sufficiently deep to bring all layers of the skin and part of the subcutaneous fatty areolar tissue under examination. The epidermis shows well-marked differentiation into the various layers. Stratum granulosum is very marked and there is a high degree of keratinisation. Corium and subcutaneous tissue appear normal and the fine muscular fibres are well developed. Epithelial skin appendages are entirely absent, there being no hairs, no sebaceous glands, and no sweat glands."

The patient was seen again in June, 1929, although there was no opportunity to overhaul him. He had still further improved; the hair on his head had grown still more, and his mother considered him much better.

Discussion.

Except for the fact that the bridge of the nose is not depressed and that the sexual development is backward the case corresponds exactly with those described by Goeckerman and MacKee and Andrews. With regard to the ætiology there seems no doubt that the condition is a true hereditary developmental defect frequently familial, the arrest of development occurring very early in intra-uterine life. Although the present case is, in view of the father's tabes, possibly a congenital syphilitic, there is no evidence in the other cases that syphilis plays any part in the ætiology.

A further interesting and practical point is the similarity in appearance, at any rate, in the early stages of some of these cases, to the clinical picture described by Hastings Gilford as progeria. Although this was not remarked upon in any of the cases collected by MacKee and Andrews, the appearance of the present case when first seen in 1924 closely resembled the photograph of Hastings Gilford's Case 1 at 15 years of age and also his reproduction of Variot's case.[6] There was the same leanness, the same absence of hair, the wrinkling of the skin of face about the eyes and nose, the general dryness of the skin, the thin skull with visible veins coursing over it, the relative smallness and shortness of the lower part of the face accentuated by the ill-development of the alveolar portions of the jaw, and the absence of teeth. There was also the backwardness of sexual development. It is true that the lips were thick, but this could reasonably be accounted for as the result of muscular hypertrophy on account of the complete absence of teeth. The nose was thin and short. A diagnosis of progeria had actually been made.

In the discussion on Dr. Jean Smith's case shown at the Section for the Study of Disease in Children of the Royal Society of Medicine under the term abnormal dentition, Dr. Kingston Barton remarked on the facial resemblance to progeria, and Dr. Jean Smith stated that progeria had been at first suggested as the diagnosis but had apparently been ruled out on account of absence of cardiovascular changes and the lack of a dry withered skin.

Resemblance to Progeria.

It is of interest also that Gilford's Case 2 was first described by Hutchinson when 3½ years old as "congenital absence of hair and mammary glands with atrophic condition of the skin and its appendages in a boy whose mother had been almost wholly bald from alopecia areata from the age of 6." Hutchinson further described the nails as thin and curved backwards so as to present more or less of a hollow in the middle. Although Hutchinson described the teeth at the age of 3½ as all cut and tolerably regular, Dr. Jago, in describing the condition at the age of 14, ated "the teeth are abnormal in number, none are cayed, nor have any been lost or extracted. The anines, bicuspids, and incisors are normal but somewhat irregular, but there are no molars."

In Gilford's Case 1 the mammary glands also were absent, and unusually small nipples were present. The nails were very short, flat, ill-shaped, and membranous. The teeth were few in number, crowded, and erratic in situation and variable in size. The skin was soft and pliable and usually dry, although Gilford was able to detect sweat twice in hot weather. Gilford in 1911 looked upon progreria as a premature senile decay affecting the body as a whole, arising in an individual in a state of infantilism. He did not consider the evidence sufficient at that time to implicate the pituitary. He did, however, differentiate the senile appearance frequently presented at a somewhat later age by ateliotic dwarfs from true progeria.

Simmonds [7] described in adult women following embolic destruction of the anterior lobe of the pituitary the onset of cachexia, greying of the hair, loss of the axillary and pubic hair, wrinkling of the skin, loss of teeth, and a general appearance of premature senility. Later he reported [8] the case of a dwarf, 110 cm. in height, who died at the age of 21. At autopsy the posterior lobe of the pituitary was normal, but there was almost complete destruction of the anterior lobe with replacement by cysts which Simmonds considered the result of an embolism. It is noteworthy that, although he had already described moderate grades of apparent premature senilism in adults the result of embolic destruction of the anterior lobe, he makes no mention of its presence in this case.

Harvey Cushing [9] definitely accepts progeria as a pituitary syndrome. He publishes a remarkable photograph of a female, aged 8, as an example of the Hutchinson-Gilford syndrome of progeria. It differs, however, very strikingly from the Hutchinson-Gilford cases in the fact that she possesses well-developed eyebrows and an excellent head of coarse black hair. The shape of the lower part of the face is also quite different from the ill-developed lower jaw of progeria. The whole appearance of the case is much more suggestive of Gilford's ateliotic dwarfs with consecutive senilism which he definitely differentiated from progeria. Examples of this correlation he figures on pages 663 and 693 of his book.

It seems clear that anterior lobe deficiency commencing at an early age may lead to various degrees of dwarfing with infantilism and a more or less striking appearance of premature ageing, but these cases differ materially in appearance from the cases described by Hastings Gilford as progeria. In these cases an essential feature seems to be a more or less extensive ectodermal defect which in itself gives a peculiar aged appearance to the individual. In Gilford's Case 1, as in the present case, the nipples were completely absent, and this must have originated in an early stage of intra-uterine development. In other cases a similar ectodermal defect occurs as a hereditary anomaly without progressing to the visceral and vascular changes accompanying the full-blown picture of Gilford's progeria. Clinically in their early stages some of these cases simulate to a remarkable extent the appearance of Gilford's cases.

Should such a patient become affected with a chronic nephritis, to which he might be considered unduly liable on account of the frequency of chronic septic infections of the nose and the increased strain on the kidney from the defective sweat apparatus, his condition would certainly be indistinguishable from one of progeria. It might be suggested that the ectodermal defect in progeria included the pituitary; but of this there is no proof, and in both Gilford's cases at autopsy the pituitary, although not examined with the care that would now be devoted to it, was stated to be normal macroscopically both in size and appearance.

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[6] Disorders of Postnatal Growths and Development, 1911.

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Clinical and Laboratory Notes.

PROGNOSIS IN MALIGNANT MELANOMA.

A REPORT ON FORTY CONSECUTIVE CASES.

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During the 15 years 1910–24, 40 cases of malignant melanoma were examined in the pathological department of Leeds University, 22 arising in skin or mucous membrane and 18 in the eye. Thirty-six of these came from the Leeds General Infirmary, one from the East Leeds War Hospital, one from the Women's Hospital, and two from private sources.

Incidence of the Disease.—The in-patient admissions at the infirmary during this period were 136,600 and 36 cases of malignant melanoma were reported. However, as some of these patients were treated in the out-patient department the incidence is even less than the figures shown.

Age and Sex Incidence.—Of the eye cases there were 13 males and five females, the average age being 58·4 years. Of the skin cases there were seven males and 15 females, the average age being 56·3 years. The youngest patient was aged 27, the oldest 82. These figures may be compared with those of Broders and MacCarty (1916), who found an average age of 49 in a series of 70 cases. The Leeds figures suggest that the age incidence for eye and skin cases is the same.

Subsequent History of Cases.

1. *Eye Cases.*—Of the 18 eye cases, 15 have been traced. Five are alive and well after periods ranging

from 5 to 10 years. Three died within one year of operation, three within two years, and one each at seven, eight, and nine years. The cause of death could not be ascertained with certainty in all the cases, but several of the histories suggest the presence of secondary deposits. In the following three cases the presence of metastases was confirmed post mortem.

1. A man, aged 60, after having failing vision for two and a half years, was admitted for detachment of the retina with tumour. The eye was removed by Mr. A. L. Whitehead. Nine years later he was admitted under Lord Moynihan for intestinal obstruction, due to a large melanotic growth involving the sacrum and rectum. At autopsy the liver was found to contain a few tertiary deposits.

2. A man, aged 67, had had six weeks' history of eye trouble previous to removal of the eye (Mr. Whitehead). Thirteen months later, at autopsy, secondary deposits were found in liver, lungs, and pancreas.

3. A third man had a blind eye for 11 years. He first attended the infirmary for symptoms of malignant disease of the liver (Dr. Wardrop Griffith). Post mortem extensive deposits of malignant melanoma were found in the liver and peritoneum, and a primary tumour in the eye.

These cases illustrate the varying malignancy of the growth, and the last the remarkable latency which has been observed so often. Cairns (1923) reports a melanoma of the scapula secondary to a tumour of the eye removed 18 years previously.

2. *Melanoma of Skin and Mucous Membranes.*—The sites of origin were as follows. Eyelid 1, cheek 2, parotid region 1, neck 1, trunk 6, thumb 2, forearm 1, buttock 1, instep 1, great toe 2, anal canal 1, vulva 1, gum 1. In one case the tumour was found in a gland of the groin, and no primary was ever discovered. A history of pre-existing pigmented moles is recorded in eight cases. Of 20 cases traced, two remain without recurrence after five and seven years respectively. Of the 18 who died, 12 are considered to have had metastases. In two this was confirmed at autopsy; in the rest, either the growth was incompletely removed at operation, or enlarged glands, ascites, &c., were observed before death. There was one instance of multiple secondary deposits in the skin. In two others the presence of secondary deposits at death is probable.

One of these patients had a growth of the great toe and enlarged glands of groin removed by Mr. Littlewood. Both primary and secondary showed microscopically a melanotic growth of epithelial type. He remained well for ten years, and then returned for examination, when he was found to have malignant disease in the groin glands and in the liver. There was no indication of a primary source other than the original tumour. The latency of malignant melanoma is apparently not confined to tumours arising in the eye.

Of the 18 patients, 7 died within one year of the first operation, 3 within two years, 4 within three, 2 within four, and 1 each at six and ten years. Trauma was noted in the case reports in four cases. (1) "A fall of coal caused a mole on the cheek" 20 years before the onset of malignancy. (2) The top of a mole on the back was knocked off by a cricket ball four years before malignant ulceration began. (3) A spark from an anvil injured the thumb, and "something was cut out" one year later. Seven and a half years later a melanotic tumour developed on the site with secondary deposits in the axillary glands. (4) A malignant melanoma developed on the site on a shrapnel wound of loin received eight months before. There had never been any moles on the site. The patient died four months later, and at post mortem Prof. Stewart found extensive metastases (liver, pancreas, testes, kidneys, heart, brain, bones, and gastro-intestinal tract). These cases may be compared with those of Eve (1903), where the tumour developed on the site of an injury received in one instance 20 years and in another 12 years previously. There is no record in this series of the probably more important factor of repeated slight trauma or irritation as emphasised by Dawson (1925), who noted in one case that simple repeated scratching of a mole was followed by rapid development of malignancy.

Comparison of Malignancy of Tumours of the Skin and of the Eye.—Out of 15 eye cases traced, five are alive and well, 10, 15, 18, 12, and 5 years respectively, subsequent to the removal of the eye. Out of 20 skin cases traced, only two are alive (toe five years, scapular region seven years). Taking deaths from all causes, it is found that ten eye cases survived operation for an average period of four years and two months, and 18 skin cases for two years and four months. Eve, judging from Lawford and Treacher Collins's cases of melanotic sarcoma of the eye, in which 20 out of 79 patients were alive three years after operation, states that the malignancy of this tumour is somewhat lower in the eye than in the skin. Broders and MacCarty report four eye cases in their series of 70 cases of melano-epithelioma, and reach the same conclusion. The lower malignancy of the tumours of the eye is probably not due to earlier treatment. These tumours metastasise by the blood stream, whereas the tumours of the skin usually affect the regional lymph nodes before generalisation. Protection of the eye from trauma and a less abundant blood-supply may be factors in the process. When metastatic or recurrent growth occurs, the rate of progress of the disease seems to be the same in both eye and skin cases. Thus in Lawford and Treacher Collins's series of 26 eye cases with secondary deposits the average duration of life after operation was two years and four months.

Total Duration of the Disease in Skin Cases.—The notes allow of an estimate of the total duration of the disease from the onset of malignancy (increased pigmentation of mole, increased growth or ulceration), in ten cases of melanoma of the skin with metastases. This period averages two years and ten months (shortest nine months in the case arising in a shrapnel wound, longest four and a half years in a melanoma of instep, both confirmed at autopsy). However, as mentioned above, one patient apparently survived 11 years in all. This finding is an agreement with Dawson, who states "the generalisation is said to average three years from the time of malignancy in the primary growth, but in my series it took place earlier in most of the cases."

Treatment.—The frequency of involvement of the regional lymphatic glands of malignant melanoma of the skin and the instance quoted of the patient who survived ten years after removal of glands invaded by growth, confirm the desirability of attacking the glands along with the primary tumour.

I am indebted to the honorary officers of the Leeds General Infirmary for permission to make use of their cases, and to Prof. M. J. Stewart for his interest and help.

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THE USE OF
GLYCERIN IN CÆSAREAN SECTION

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GLYCERIN is now recognised by obstetricians as a valuable drug. It is used for drainage in local uterine sepsis and for the control of postpartum hæmorrhage in deliveries by the normal route. Little, however, has been written about its use as a hæmostatic in delivery by Cæsarean section. This year, on the suggestion of Dame Louise McIlroy, it has been used almost as a routine in the obstetrical unit of the Royal Free Hospital and has been found to be most successful in controlling hæmorrhage. Glycerin is also valuable in that it promotes drainage of the uterus during the puerperium.

The technique is simple. After removal of the placenta the uterine cavity is swabbed out with gauze dipped in glycerin and held on a sponge holder. The uterus is wrapped in hot towels and the abdominal cavity and wound protected by mattresses. Retraction of the uterus nearly always follows at once.

It seems possible that this method may obviate the necessity for hysterectomy following Cæsarean section in the few cases where this is required, since it appears not only to control hæmorrhage but is of proven value in the treatment of local uterine infections. We have had no opportunity so far of testing this.

This method was used in the following seven cases, in all of which the classical operation was performed, the patients being in labour at the time of the operation.

CASE 1.—Primipara, aged 32. Antenatal condition normal; contracted pelvis. Labour, Jan. 29th, 1929: vertex presentation, membranes unruptured; one vaginal examination made. Cæsarean section for disproportion, hæmorrhage not excessive; glycerin used in cavity. Puerperium afebrile until sixth day when breast abscess developed.

CASE 2.—Multipara (2), aged 30. Previous children stillborn, died before labour began. Antenatal condition: toxæmia, poor general condition. Wassermann reaction negative. Admitted for some weeks before labour for rest and diet. Contracted pelvis. Labour, Oct. 22nd, 1928: vertex presentation, membranes unruptured; no vaginal examination made. Cæsarean section for disproportion; hæmorrhage very severe, controlled with the help of glycerine. Blood transfusion. Puerperium was febrile the first week. Temperature rose to 100·2° F. twice. Patient developed superficial abscess under left eye. Obstetrical condition satisfactory and no other cause found for pyrexia.

CASE 3.—Primipara, aged 27. Antenatal condition: *Bacillus coli*, pyelitis. Admitted for treatment; contracted pelvis. Labour, Nov. 25th, 1928: vertex presentation, membranes ruptured. One vaginal examination made. Cæsarean section for disproportion; hæmorrhage not excessive; glycerin and blue paint used in uterine cavity. Puerperium afebrile.

CASE 4.—Primipara, aged 22. Antenatal condition normal; contracted pelvis. Labour, Jan. 12th, 1929: vertex presentation, membranes unruptured; one vaginal examination made. Cæsarean section for disproportion; hæmorrhage profuse. Glycerin used—hæmorrhage controlled. Puerperium afebrile, involution somewhat delayed. Lochia normal. Glycerin drain on twenty-second day, after which uterus involuted normally. Toxic myocarditis.

CASE 5.—Multipara (2), aged 43. Previous children both stillborn after instrumental deliveries. Antenatal condition: toxæmic; admitted for rest and diet. Contracted pelvis. Labour, August 15th, 1929: vertex presentation, membranes unruptured. No vaginal examination made. Cæsarean section for disproportion; hæmorrhage fairly profuse, controlled by glycerin. Puerperium. Temperature 100·4° F. first night following operation, since afebrile.

CASE 6.—Primipara, aged 27. Antenatal condition normal; contracted pelvis. Labour, August 10th, 1929: vertex presentation; the patient ruptured her membranes four days before admission but had no pains and did not come to hospital; no vaginal examination was made. Cæsarean section for disproportion. Hæmorrhage profuse, controlled by glycerin. Puerperium was febrile for nine days. Maximum temperature 101° F. on seventh and eighth days. Lochia offensive. Glycerin drainage of uterus on eighth day. Temperature fell within 24 hours and has remained normal since.

CASE 7.—Multipara (2), aged 33. Previous children: (1) stillborn, (2) Cæsarean section for disproportion. Contracted pelvis. Antenatal condition normal. Labour, May 8th, 1929: Cæsarean section for disproportion, membranes ruptured; no vaginal examination made. Glycerin and flavine used in uterine cavity. Hæmorrhage not excessive; sterilisation performed. Puerperium. Temperature 101° F. once on the eighth day, otherwise afebrile.

The condition of all these patients and their infants were satisfactory on discharge. It is impossible to describe the rapidity with which retraction occurs when glycerin is used, but it is hoped that the account of these few cases will stimulate others to try this method for the control of hæmorrhage and for drainage of the uterus.

I am indebted to Dame Louise McIlroy for permission to publish these cases.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 613.)

SECTION OF PUBLIC HEALTH.

MATERNAL MORTALITY.

Dr. R. VEITCH CLARK (Manchester), who presided over the discussions of this Section, said that maternal mortality was rather overshadowed by the mortality from the great killing diseases, but that it had an even more disastrous effect on family life. Maternal mortality had for its incidence only the child-bearing women, whilst tuberculosis had for its incidence the whole population. If we took the ratio of deaths to risk we should find that childbirth mortality was three times as great as that of any other killing disease.

The opening paper by Dr. J. PARLANE KINLOCH, chief medical officer, Department of Health for Scotland, was based largely on the conclusions arrived at in the Report on Maternal Mortality in Aberdeen, 1918–1927.[1] Dr. Kinloch submitted the thesis that with our present knowledge a significant reduction in maternal mortality would be immediately attained by an extension of adequate antenatal services and the institution of the new midwife-doctor combination defined in the report named. It had been shown that 90 per cent. of the deaths from sepsis were due to the hæmolytic streptococcus, on which attention should be concentrated. Prevention and treatment could not be separated because early treatment of puerperal sepsis involved isolation and the prevention of further cases of sepsis by contagion. One of the advantages of the notification of puerperal pyrexia had been the earlier discovery and treatment of sepsis cases. In consequence, during the four years for which pyrexia had been notifiable, the incidence of puerperal fever had increased from 3 per 1000 births prior to 1925 to 12 per 1000 births in 1928. This earlier discovery must have a profound effect on the efficacy of treatment.

Mr. J. BRIGHT BANISTER (London) thought there was a danger of going too fast in revolutionising the practice of obstetrics, and that acrimony should not enter into this great problem. He considered that autogenous infection was more common than some authorities would admit. Eclampsia and toxæmia could be greatly reduced by antenatal treatment. He favoured delivery in institutions, wherever possible, and thought this custom was one of the causes of the low maternal mortality in Scandinavian countries.

Prof. D. DOUGAL (Manchester) said there had been much needless exaggeration which might almost lead one to believe that the process of coming into the world was as fatal as the process of passing out of it. It was, however, true that with our present knowledge 50 per cent. of the deaths need not occur. Sepsis was the greatest single cause. Some general practitioners still employed handywomen, and even nurses with the C.M.B. certificates had low ideals of asepsis. The asepsis of the general practitioner might be improved. Hæmorrhages could not be foreseen, but might be due to faulty conduct of labour. There should be a longer training of medical men with a view to more conservative midwifery. The relief of pain should receive attention, with a view to the avoidance of unnecessary operations. We had to consider how the general practitioner was to get experience if he did no normal cases in accordance with the new proposals. The training of the midwife should be improved and she should go through a pupilage. Handywomen must go. Sterilised outfits must be provided. The general practitioner's status would be improved if he were relieved of normal cases. A separate anæsthetist should be available and a consultant should be within call. *He favoured* the use of portable obstetric tables, and expressed his approval of the proposed midwife-doctor combination.

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[1] See THE LANCET, 1929, i., 85.

Dr. H. L. MURRAY (Liverpool) also advocated hurrying slowly. We were awaiting the result of the national inquiry. He spoke in favour of antenatal treatment and the acquisition of a surgical intranatal sense. The expectant sense had been to some extent lost. In some cases the midwife insisted upon the doctor operating. Sepsis sometimes occurred in an unaccountable manner. Doctors should only employ midwives, but he thought the doctor should be present at normal confinements.

Dr. A. K. CHALMERS (Glasgow) pointed out the advantages of a hospital on the pavilion system for the separation of clean from suspected cases. Antenatal examination should be made a condition of admission to a maternity hospital.

Dr. JAMES YOUNG (Edinburgh) expressed his approval of the scheme of the Association for a national midwifery service. He thought the bogy of autogenous infection had been laid and that the statistics of the East End Maternity Hospital proved that it was negligible. He agreed with Dr. Chalmers as to the advantages of pavilion hospitals and that they must not have normal and abnormal cases in one building. Cæsarean cases were liable to be infected by contagion.

Dr. W. H. F. OXLEY (London) said that the East End Maternity Hospital had been going for 40 years. *It was staffed by midwives who called in the general* practitioners in the neighbourhood. Much of the credit for the good work was due to the head midwife, Miss Anderson, whose enthusiasm had inspired her staff. They had been doing antenatal work before Ballantyne began. Their cases were booked early and a forward look-out was kept. They had almost stamped out eclampsia, as among the last 10,000 confinements there had been only one slight fit in the present year. By intensive indoor treatment for albuminuria and by induction in cases which did not clear up under it, they were going a stage further than preventing eclampsia, and had reason to believe that they were diminishing the incidence of recurrent toxæmia and of chronic nephritis. Their treatment for placenta prævia included as little manipulation as possible. Early turning was not always needed. They had had no maternal death from placenta prævia among the last 14,000 cases. He thought antenatal treatment might be carried too far and become too much of a "stunt." Antenatal care was the preparation for the battle and the main thing was wise midwifery at labour. Their midwives did not use gloves but a proper strength (1 in 1000) of perchloride of mercury. Several pupil midwives examined each case but with carefully disinfected hands, and no harm was done thereby. The primipara had a threefold risk of puerperal pyrexia, and he had satisfied himself that this increased risk was due to trauma of the cervix. No doctor with an obstetric conscience could be forced by a midwife to interfere or to use forceps. If he had not developed *such a conscience it was the fault of his teaching.*

Dr. FARQUHAR MURRAY (Newcastle-upon-Tyne) thought the pupil midwives, who were practically handywomen, should not be too numerous. The hospital cases should be divided into clean, suspect, and dirty, and there would be no rise of temperature in the "clean" wards. Consulting obstetricians were needed for domiciliary cases. In nursing homes a separate nurse should be provided for each case. Special nurses should be provided for cases with early signs of sepsis through a domiciliary nursing service of a maternity hospital. He thought antenatal examinations should be conducted at a special centre and not in a doctor's surgery. He also spoke against the abuse of lysol.

Prof. J. HENDRY (Glasgow) agreed in deprecating the abuse of lysol and of vaginal examinations unnecessarily and badly done by midwives. Refresher courses for midwives were very necessary. A larger proportion of the doctors' cases were abnormal, because they included primiparæ, those who had had difficulty in previous labours, and those who desired to have chloroform and forceps. If the puerperal temperature was charted four-hourly much more pyrexia would be shown.

Dr. ARTHUR GILES (London) thought that general practitioners should attend normal labours. They must not, however, apply forceps to save their own time, and they should have a maternity hospital available for their patients. He believed in boiled gloves rather than perchloride.

Miss FRANCES IVENS (Liverpool) said that they needed properly educated midwives and must see that they were properly paid.

Prof. C. G. LOWRY (Belfast) said they need not wait for research but could apply the well recognised principles adopted at the East End Maternity Hospital. A rise of blood pressure always preceded albuminuria. There had been no case of eclampsia for nine years in his hospital. He disagreed with Mr. Bright Banister with regard to autogenous infection. Morphia and hyoscine were useful for avoiding interference in labour. It might also be good to use similar sedatives for the relatives! He was somewhat surprised at the number of vaginal examinations permissible for pupil midwives at the East End Hospital. He believed that ill-washed hands and unnecessary separation of the labia minora were frequent causes of bad results. Antenatal work should be done by those who would conduct the labour.

Dr. MIDDLETON MARTIN (Gloucester) thought the B.M.A. report a very practical contribution. In Gloucestershire the services of obstetric consultants were available, and there were maternity beds in each cottage hospital.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

THE DIAGNOSIS OF FRONTAL TUMOURS.

Dr. JAMES COLLIER (London) opened the discussion. He said that from the very nature of the cerebral hemispheres the regional diagnosis of disease situated therein was often a matter of peculiar difficulty. In considering the possible signs of tumours within the frontal lobe, if we were to advance in knowledge, we must divest our minds of any idea of local function, mental or otherwise, peculiar to lesions of the prefrontal lobes. We must expect a varying clinical picture, and often one which was negative so far as *localising symptoms* were concerned. *It must be* borne in mind that there exists a great facility in compensation for local lesions within this region, so fully emphasised by Gowers 40 years ago, and also the disturbing effects that long-standing increase of intracranial pressure and hydrocephalus have upon the value of those signs which are used for localisation. We must strive to collect those signs which have been useful to us in the successful localisation of frontal lobe tumours. He might conveniently divide the signs which are used for the localisation of a tumour within the prefrontal lobes into five categories, thus: (1) the negative signs; (2) the contiguous signs; (3) the signs which have been deemed peculiar to, or especially marked in, prefrontal lesions; (4) the signs peculiar to lesions within the anterior fossa of the skull; and (5) the signs revealed by ventriculography.

Five Categories of Signs.

Negative Signs.—The negative signs were of especial importance, since tumours within the posterior fossa below the tentorium, and *those of the* occipital, parietal, central, and left temporal regions, except sometimes in their latest stages, gave unmistakable signs of their position. If no definite localising sign was present, therefore, it was often a matter of a prefrontal or a right temporal site.

Contiguous Signs.—The contiguous signs [illegible] those produced by the extension of some with the growth—pressure, œdema, or vascular disturbance—into the neighbouring ascending frontal gyrus and giving rise to motor weakness. Extension might occur into the insula of the left side, giving rise to interference with the execution of language, or into the paths converging to the anterior part of the corpus callosum and so producing motor apraxia. The motor weakness was usually seen first and most in the face, rarely in the arm, and almost never in the leg. It was perhaps the most important lateralising sign of a frontal tumour, but it did not distinguish a frontal tumour from a temporal tumour, which also frequently caused facial weakness as a contiguous sign. Difficulty in the exteriorisation of language was a certain lateralising sign of a left hemisphere lesion in a right-handed person, but it was also caused by tumours of the left insula and those of the anterior temporal region. It should be of the nature of a stammering defect or of a "pure aphasia" if due to a frontal lobe lesion. Pure executive apraxia appeared to be a certain sign of prefrontal involvement and to indicate a left-sided lesion. Presumably it pointed to a lesion extending deeply and far back in the upper two prefrontal convolutions.

Signs Peculiar to the Frontal Lobe.

Mental Symptoms.—Mental changes of a very variable order, from slight changes in the way of loss of reserve, childishness, and change of character, to severe disturbance such as megalomania, "witzelsucht," and dementia did result from tumours of the prefrontal region. Dr. Collier wished to ask whether the Section agreed with Cushing's very confident statement that mental changes were always much more conspicuous in left-sided lesions, for he, the speaker, was doubtful as to this point. Extensive lesions of the frontal lobe often existed without any obvious mental change. The explanation seemed to lie in the possibility of compensation, and whether the other frontal lobe was relatively intact as regards its callosal connexions, since bilateral frontal lesions always gave rise, both experimentally and clinically, to marked mental reduction. The point of importance was whether mental changes were of sufficiently higher incidence in prefrontal lesions, as compared with lesions of other regions of the brain, as to make them reliable symptoms when other localising symptoms were absent. The speaker wished specially to emphasise the early loss of memory and the mental reduction occurring in tumours of the splenium callosi, because it might be the key to the explanation of mental changes and their variability in cases of cerebral tumour. He suggested that in lesions of the prefrontal lobe mental changes were only conspicuous when the tumour extended deeply and cut the callosal and other transcortical paths.

Frontal tremors, more marked upon the homolateral side and sometimes confined to that side, like other signs at first described as indicating prefrontal lesions, had come to belong also to the temporal lobe.

The "*grasping and groping*" *reflex* was, as far as he, the speaker, knew, a certain sign of prefrontal location which had not yet been seen with lesions elsewhere. Dr. Gordon Holmes thought it was seen with very extensive frontal lesions, but the speaker disagreed with this opinion. Dr. M. Critchley associated it with lesions high up and far back in the prefrontal region.

Conjugate deviation of head and eyes, or of eyes alone, to the contralateral side, explained by the involvement of the frontal ocular area said to occupy Exner's region in the second frontal gyrus, had been repeatedly emphasised as of locating and lateralising value. It seemed to the speaker certain that every cortical region must of necessity be an origin for inducing conjugate deviation, considering the necessary association in life of conjugate deviation with every movement and sensation, and therefore conjugate deviation could not be in any way special to the prefrontal lobes; nor did he believe that there was any special region for this function. When present it was of certain lateralising value for tumours in any part of the hemisphere. It might be seen in the form of persistent deviation to the contralateral side, or of weakness and unwillingness in deviation to the homolateral side.

Loss or diminution of the trunk reflexes might be of great lateralising value and was said to be valuable in frontal location. But he held that it was much more characteristic of the temporal tumour.

Incontinence was sometimes very marked in frontal tumours, even when the mental aberration was inconspicuous. He thought he had seen it more often in temporal tumours.

Papillœdema was said by Mr. Leslie Paton to occur earlier and more severely with tumours of the hemisphere the farther forward these were situated. Recently Stopford had analysed another series of cases, and had come to the conclusion that the more posterior the situation the earlier and more intense the papillœdema. The speaker was inclined to agree with Stopford, although he did not think papillœdema was of any value either in localisation or lateralisation.

Lethargy of a deep but rousable kind had occurred many times in frontal tumour, and when existing without headache or papillœdema it had caused several cases to reach the post-mortem room with the label "lethargic encephalitis."

Fits of different kinds often occurred with frontal tumours. The convulsions he had seen had always commenced with conjugate deviation, which deviation had been a sure lateralising sign. Status epilepticus was an interesting frontal symptom. He had no knowledge of any other region of the brain in which a tumour had produced status epilepticus.

There remained for consideration certain phenomena, such as Meyer's reflex, Leri's reflex, and Hoffmann's reflex, which were said to be absent in prefrontal lesions, and Wessenberg's sign which was supposed to be found only when a prefrontal lesion was present.

Lesions of the Anterior Fossa.—Ventriculography.

Signs peculiar to lesions of the anterior fossa were those of pressure upon the olfactory tract, the optic nerve or chiasma, or upon the nerves and vessels passing through the sphenoidal fissure, and those of bony involvement. These were always certain localising and lateralising signs, but they only obtained with a hard tumour coming to the surface of the orbital lobe or with a growth of meninges or bone.

There remained the method of ventriculography, which in skilled hands had resulted in many brilliant successes in this and in other difficult regions of the brain.

Discussion.

Dr. W. J. ADIE (London) said that the "grasping reflex" had been of value in localising tumours of the opposite frontal lobe. The fully developed reflex was very striking but it also appeared in various incomplete forms; hence the term "grasping reflex" did not cover the entire phenomenon. In his opinion, it was not necessarily confined to extensive lesions. The fits seen in frontal lobe tumours might consist of some movement of the head, eyes, and trunk to the opposite side with simultaneous involvement of the limbs of the contralateral side. Such an attack, however, might also occur in temporal lobe tumours. A fit beginning with clonic movements of the eyes with deviation to the opposite side was of localising value in frontal lobe tumour; in fact, such movements might constitute the entire fit. Meyer's reflex was of great value, a unilateral exaggeration being a lateraliser to the opposite side and a localiser to the opposite frontal lobe. Dr. Adie considered that ventriculography was of great assistance in frontal lobe tumours.

Mr. GEOFFREY JEFFERSON (Manchester) considered that ventriculography could be well replaced by the method of "ventricular estimation." This consisted in the bilateral tapping of the ventricles by the occipital route, the withdrawal of cerebro-spinal fluid from each, and the comparison of the volume of the two fluids. He had not found the injection of dyes of great value. Mr. Jefferson then described certain cases of frontal lobe tumour which he had encountered, and illustrated his cases with admirable lantern slides.

Dr. L. J. J. MUSKENS (Amsterdam) said that he had also met with a case of frontal lobe tumour showing the sudden occurrence of status epilepticus without previous symptoms. Bruns had called attention to ataxia and vestibular symptoms in frontal lobe tumours. In 1917, he (the speaker) had pointed out that cats, after extensive right-sided lesion, and patients with right frontal tumours, tended to fall to the left. This observation was confirmed by Grossmann in 1919, who described six cases of frontal lesions from bullet wounds, all of whom fell to the contralateral side.

Dr. C. WORSTER-DROUGHT (London) considered that mental symptoms were more frequent in frontal lobe tumours than in those affecting other regions of the brain. In his experience the mental symptoms associated with right-sided lesions were slighter than those accompanying left-sided lesions; the former might consist of mental memory defects while the latter varied from euphoria to dementia. He agreed that involvement of the white matter of the brain was the important determining factor. Tremor he had found of no assistance, but the "grasping reflex" was a valuable sign when present; it was, however, often absent. Incontinence was a very frequent sign of frontal lobe tumours and might be the only symptom present or occur with only slight mental dullness. The absence of the epigastric and abdominal reflex on the homolateral side was also helpful. He had been impressed with the frequent absence of headache in cases of frontal tumour he had seen. Air ventriculography was of considerable assistance, but he had come to regard the procedure as somewhat risky in posteriorly situated tumours; he was, therefore, glad to hear Mr. Jefferson's opinion regarding the value of ventricular estimation.

Dr. J. GODWIN GREENFIELD (London) commented on the extraordinarily long history and the hardness of the tumour often met with in the astrocytoma type of frontal glioma. There was a greater tendency to degeneration and cyst formation in frontal lobe tumours; probably this resulted from some peculiarity of the blood-supply.

Dr. M. CRITCHLEY (London) stated that the phenomenon described by Adie and himself as "forced grasping and groping" had been originally reported by Janischewsky as the "réflexe de la préhension." The phenomenon was made up of several component parts. First, it comprised a slow and gentle flexion movement of the fingers on stimulation of the palm. The second phase consisted in a forceful and involuntary closure of the fingers when an attempt was made to withdraw an object from the patient's hand. The involuntary nature of the inability to relax the grasp was shown by the fact that a painful stimulus—e.g., a live electrode—still elicited an identical firm closure of the hand. After the object had been finally extracted from the patient's hand, the third phase of the phenomenon became manifest by a slow full extension of the fingers followed by a slight closure. In this way the patient's hand might again grasp the object that had just been withdrawn ("after-grasping"). In some cases a fourth phase was seen; during the examination of some other part, the patient's affected hand continually obtruded itself by clasping or groping towards the examiner's hands ("forced grasping"). It was now realised that the grasping phenomenon might affect regions other than the hand—e.g., the sole of the foot and the jaws. Although forced grasping and groping might be seen in various states of stupor and coma, and in some cases of diffuse cerebro-vascular disease, its presence in cerebral tumour usually indicated a frontal localisation. Although of great localising value, its importance as a lateralising sign required qualification. Cases have been noted in which the grasping phenomenon had occurred on the same side as the tumour, but in such instances there had been a severe degree of hemiplegia on the contralateral side. Presumably in such cases the tumours were large ones capable of producing bilateral signs.

Dr. F. R. FERGUSON (London) emphasised the importance of investigating all possible channels of information. Daily physical examination of the patient often revealed such variation in the physical signs that it was impossible to correlate them and localise the tumour. He instanced a case showing a marked right-sided "frontal tremor" but with other signs at one time indicating a left-sided frontal lesion and at others a right-sided. At autopsy a cholesteatoma was found exactly in the middle line at the posterior end of the corpus callosum. With regard to the localising value of the "grasp reflex," he mentioned a case with a right-sided grasp reflex in whom a left cerebellar tumour was found at autopsy. The cerebration and coöperation of this patient, however, were very poor and there was evidence of secondary hydrocephalus.

Mr. A. A. MCCONNELL (Dublin) considered that ventricular estimation was of more value in lateralising than in localising, and especially with frontal lobe tumours. A fallacy, however, was that frontal tumours might occlude the foramen of Monro and prevent the air reaching the opposite side.

SECTION OF OPHTHALMOLOGY.

Mr. J. GRAY CLEGG (Manchester) being in the chair, Mr. W. H. KIEP (Bradford) read a paper on a modification of

Lagrange's Operation for Glaucoma.

He referred to cases of late infection after trephining operations, and said it was obviously desirable that the membranous covering of any such fistula should be sufficiently thick to prevent entrance of organisms or their toxins. The operation he had adopted recently was a modification of Lagrange's; it had the merit of being easier to perform, and also of making a less extensive wound of the sclera. His own procedure was as follows: the conjunctiva and subconjunctival tissues were grasped with forceps 6 or 7 mm. above the limbus, and divided with scissors; Tenon's capsule was also divided, and a flap including these structures was reflected; a groove was cut in the sclera 2 to 2¼ mm. above the limbus, making a small furrow here; a keratome incision, of 3 to 4 mm., was made through this furrow; the keratome was withdrawn as quickly as possible in order to avoid any great loss of aqueous; the prolapsed iris was removed, securing a peripheral iridectomy; a small piece of the anterior lip of the incision was excised with scissors; the conjunctival flap was sutured with one stitch; it was practically always possible to get the iris back into position by manipulation without introducing any repositor into the anterior chamber; in this way further loss of aqueous was avoided. The drawback of the operation was that sometimes episcleral vessels of considerable size were cut. Otherwise he had found this operation no more difficult than Elliot's, and less difficult than Lagrange's. There was a minimum disturbance of intra-ocular structures. It was often possible to do it with little loss of aqueous. On an average, the anterior chamber regained its normal depth in from 48 to 72 hours after the operation. A fistulous orifice of 2 mm. width was obtained. There was ample protection from late infection. He had performed the operation successfully in one case where a large iridectomy had previously been done.

Mr. W. B. INGLIS POLLOCK (Glasgow) said that now for some years he had kept strictly to the Lagrange operation. Where the tension was much raised at the time of the operation he always did a posterior sclerotomy; the Lagrange operation could be done immediately after the posterior sclerotomy.

Mr. A. B. **Cridland** (Wolverhampton) said that after seeing Lagrange do his operation at Oxford in 1907 he had adopted it. There was no doubt that it was a difficult operation. An essential point was that you must "shave the base of the iris." Tension should first be brought down as low as 40. Any modification of Lagrange's operation that made it easier was to be welcomed. In 20 years he had never seen a case of late infection after it.

Mr. A. F. **MacCallan** (London) said that for the last five years he had never seen a case of late infection after trephining among his own cases or those of his colleagues. He had frequently seen superficial inflammation of the conjunctiva in trephined eyes without any infection of the deeper structures. Where hæmorrhage from episcleral vessels occurred he had found the application of a little dry wool moistened with adrenalin solution sufficient to arrest the bleeding.

Mr. H. H. **McNabb** (Manchester) mentioned a case of late infection which occurred 18 years after an Elliot's trephining operation.

Mr. E. E. **Maddox** (Bournemouth) described some modifications of Lagrange's technique which he had adopted. One of these consisted in slicing the crescent of sclera—i.e., making a series of transverse cuts in it with scissors.

The **Chairman** said he had adopted Elliot's trephine operation almost regularly, with slight modifications and had not seen late infection following it for a considerable time.

Mr. **Kiep**, in reply, said it was a matter of the utmost importance that the diaphragm of the eye should not be allowed to come forward. He had given up doing posterior sclerotomy, because he found that tension could be sufficiently reduced by medical means—bed, saline cathartics, eserine, dionine, and fomentations; and he had found Duke-Elder's method of reducing tension by intravenous injection of hypertonic saline solution very useful. In certain cases there was danger of hæmorrhage from posterior sclerotomy. As to the difficulty of Lagrange's operation, that was a matter of personal opinion. There were certainly some expert operators who found it presented difficulty. In his experience it was far easier to place the incision accurately with a keratome than with a Graefe knife. His own method involved only the minimum of fuss and hæmorrhage. He would not advise operation in cases of very high tension especially if it had been present for some days, particularly in old people with degenerated arteries. In such cases he would first reduce tension by Duke-Elder's method, and operate about a week after.

Mr. **Cridland** (Wolverhampton) then read a paper on

Minor Injuries of the Eye in Industry.

These injuries, he said, ranked high in the list of causes of blindness. Not less than 100 cases of total blindness per annum were due to this cause in the United States of America. Eye injuries, according to Prof. Collis, constituted 5 per cent. of all accidents in industry reported by certifying surgeons. Estimates of the proportion of cases of blindness due to accidents varied from 7·2 per cent. in Scotland to 13·5 per cent. in U.S.A. In this paper his object was rather to direct attention to the minor injuries of the eye, and especially to their economic effect, as well as the steps necessary for their prevention. At his own hospital at Wolverhampton 6880 cases of accident to the eye had been dealt with in 1928, as compared with 6040 other new cases due to disease or requiring refraction testing. In the last 20 years the proportion of accidents to other cases at this eye hospital had increased from 39 per cent. to 53 per cent. The vast majority of these were, of course, minor injuries, especially foreign bodies, mostly small, that did not penetrate the eye. In 1928 the giant magnet was only used in 12 cases. From the point of view of occupation these patients might be divided into three groups: (*a*) occupations involving exposure to small flying particles—e.g., from grindstones or emery wheels, 51 per cent.; (*b*) occupations involving exposure to chips of metal, 26 per cent.; (c) miscellaneous—miners, roadworkers, painters, plasterers, &c., 23 per cent. Injuries varied in severity from a simple foreign body on the cornea to burns of the eyelids, or lime in the eye. Foreign bodies on the cornea furnished no less than 90 per cent. of the cases. Abrasions of the cornea provided 5 per cent., and there were 5 per cent. of miscellaneous injuries including burns, contusions, &c. In regard to protection, the following facts were elicited, based on information in 406 cases:—

1. Protection was not available in 70 per cent.
2. Protection was admitted to have been available, but not used, in 19 per cent.
3. Protection had been made use of, but had not prevented the injury in 11 per cent.

As regards time lost from work owing to the accident a series of 426 cases were divided into three groups:—

1. Those who lost from 1 to 2 hours, comprising those presumed able to return to work at once—371 cases.
2. Those who lost from 2 to 8 hours—48 cases.
3. Those who lost from 8 to 24 hours—7 cases.

The above figures probably underestimated the time actually lost. All things considered, it would be within the mark to say that on the average three of these minor eye injuries meant that the employer lost a full day's work. From the point of view both of employer and employed it was a matter of urgency to prevent such injuries. There were two obvious ways of doing this: (1) to ensure that the flying particle did not reach the eye, and (2) better still, to eliminate the flying particle altogether. On these two essentials the three main principles of prevention were based: (1) mechanical guarding, (2) education of workmen and foremen, and (3) engineering revision. Under the first heading came goggles of various forms, machine guards and shields, face-masks, helmets, or hoods. Goggles of the right kind properly worn and kept in order were the most important of these. The difficulty lay in producing ideal goggles at a reasonable price. For workers at emery wheels, a cheap but very effective form of protection against light particles was a piece of silk gauze worn as a veil over the eyes. These could be supplied at 2*s.* a dozen. Workmen should be made to realise the risk they ran, and how best to avoid the danger. In the third method of prevention, engineering revision, lay the hope of the future; it sought to eliminate the underlying cause, not merely to cover up the danger points. This end might be attained by the changing of a process of manufacture, by the redesigning of a machine or tool, or rearrangement of the physical equipment of a plant, or changing of the method of work. The introduction of the automatic machine was one instance. In America some success had followed the employment of "safety engineers"—men whose duty it was to concentrate on engineering revision, and also to give special attention to the education of the workmen by propaganda and various ingenious and telling methods. For instance, in one workshop an enucleated eye was hung up in a bottle in a conspicuous place as a warning. The psychology of the workman must be considered. In this country, perhaps, education in this matter was more difficult owing to the spirit of indifference to danger, coupled perhaps with ignorance of the risks run. The subject was a very wide one, and each type of occupation called for special study and investigation. At present the economic loss from this cause was not realised.

Mr. N. **Bishop Harman** (London) mentioned that it was possible for flying particles to pass between the goggles and the face, and strike the eye—e.g., in overhead work.

Mr. T. **Aubrey Jones** (Stoke-on-Trent) spoke of the deeply rooted opinion among miners that glasses of any kind are an absolute danger when working down in a coal mine. He had seen very few injuries caused by wearing glasses. Many injuries in the mines would be prevented by wearing ordinary glasses. He thought Mr. Cridland's estimate of time lost by these injuries was too low.

Mr. H. L. G. LEASK (Glasgow) also referred to the miner's strong prejudice against glasses.

Mr. TUDOR THOMAS (Cardiff) said that in mines clouding of the glasses by dust and by sweat, especially in hot mines, might increase the liability to accident.

Mr. H. R. BICKERTON (Liverpool) said that each occupation required its own form of protection. It was useless to try to educate the workmen. They must preach to the employers and insurance companies.

Mr. CRIDLAND, in reply, said he had only touched the fringe of the subject. Ricochet would explain many of the cases where a flying particle got behind the workman's goggles. Side-pieces to the protective goggles had the objection that they were likely to cause sweating and dimming of the glass. In regard to miners, he did not think they would be induced to wear glasses, nor did he think it feasible that they should. All emery wheels ought to be fitted with proper guards. He wished to emphasise another aspect of these injuries—namely, the unnecessary burden thrown on the hospitals by the large number of these preventable accidents. In his experience insurance companies were very hard to educate in this matter.

Dr. T. L. DE COURCY (Liverpool) read a paper on the

Significance of Vitreous Opacities.

After referring to the work of Miss Ida Mann and Mr. Duke-Elder, he pointed out that any alteration in the metabolism might affect the vitreous. Many focal infections might show no other result in the eye but vitreous opacities—e.g., the dust-like opacities in the vitreous in syphilis. By careful ophthalmoscopic examination in three series of 100 consecutive patients he had found vitreous opacities in about 37 per cent. Few of these patients complained of any symptoms due to them. They were comparatively rare in children. Early cataract was frequently associated—and possibly the causation was the same.

Mr. MACCALLAN said that in a series of 100 cases, all of whom had normal vision with correction, he found vitreous opacities in a much greater percentage than Dr. de Courcy by examination with the slit lamp. In children with enlarged and septic tonsils the vitreous was never clear.

Mr. J. JAMESON EVANS (Birmingham) read a paper on

Blindness in Old Age,

based on some 700 cases examined with reference to their inability "to perform work for which eyesight is essential." This was the Government's definition of blindness. This series included 205 cases of cataract—of which 37 per cent. were certified as operable. There were 43 cases of retinitis pigmentosa. Among the optic atrophy cases 13 per cent. were due to syphilis, 10 per cent. were of cerebral origin, and the rest of unknown origin. There were nine cases due to ophthalmia neonatorum, and nine cases due to sympathetic disease. In myopic cases blindness was due chiefly to choroido-retinal degeneration.

Mr. HARMAN was surprised to hear that cataract headed the list as a cause of blindness in old age in these cases. His impression was that degenerative or inflammatory changes at the macula were the chief cause. 6/60 had been suggested as a definite standard for these cases. He was strongly opposed to any such stringent and rigid definition of blindness for certification for Government regulations. In each case the decision should rest with the ophthalmic surgeon. It must be remembered that they were not asked to certify that the patient could do his own work, but that he could not see to do *any* work for which eyesight was essential. Many domestic workers who had never worked outside their own families were now applying for pensions under these regulations.

Reviews and Notices of Books.

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE.

By various authors. Vol. III., pp. 413. By W. BULLOCH, P. FILDES, A. T. GLENNY, H. HENRY, R. T. HEWLETT, R. A. O'BRIEN, S. G. PAINE, G. F. PETRIE, MURIEL ROBERTSON, R. ST. JOHN-BROOKS, W. G. SAVAGE, A. C. THAYSEN, H. G. THORNTON, R. L. VOLLUM. London: H.M. Stationery Office. In 9 volumes. £8 8s. or £1 1s. per volume.

THE Medical Research Council have sponsored many notable contributions to scientific medical literature since the publication in 1915 of the first number in the special report series at the modest price of 3*d.* The familiar green books are to be found in laboratories and libraries all over the world, and include records of investigations which would never have been undertaken except under the auspices of the Council, and could scarcely have been published in any other form. The most ambitious literary project of the Council is the System of Bacteriology of which the first volume (Vol. III.) has just been issued. The system, which is to be published in nine volumes, is the work of some 100 British bacteriologists. The general editorship is in the hands of Dr. Paul Fildes and Prof. J. C. G. Ledingham, and Dr. Fildes has been assisted in the heavy work of organisation and preparation by Dr. Edgar Schuster. Probably few people are in a position to appreciate to the full the amount of work entailed in the editing of a complicated publication of this nature; it must have been immense, and the editors are to be congratulated on the manner in which they have performed their task.

There will be no two opinions as to the need for such a publication as this. There are numerous excellent text-books of medical bacteriology in the English language, but there is no really comprehensive work which takes cognisance of the whole range of bacteriology in its relation to medicine. As Lord Balfour points out in his general preface, the subject of bacteriology is so vast and covers so many fields of human activity that it is impossible for any one man to keep in touch with all its developments. Hitherto it has been difficult for any worker in one field to make himself acquainted with the progress being made in another; the medical bacteriologist, for example, may be profoundly ignorant of the important work being done by his veterinary colleagues or by the agricultural bacteriologist; and even in medical bacteriology specialisation has advanced to such a degree as often to isolate the pioneer. But with this system at his elbow it will be possible for everyone interested in the subject to form some general picture of the whole; and should he desire to go deeper into the matter he will find guidance to the original sources he should consult. Moreover, in a survey of this kind the gaps in our knowledge are likely to become apparent.

Vol. III., the first of the series to be published, deals with Economic Bacteriology, Plague, Anaerobes, and Food Poisoning. In Chapter I. A. C. Thaysen deals with the economic aspects of bacteriology, including baking, retting, decomposition of cellulose, the fermentation of indigo, coffee bean, tobacco, starch, and sugar, the decomposition of nitrogen compounds, and the bacteriological aspects of the formation of minerals, including coal. In Chapter II., H. Henry discusses the bacteriology of water and the examination of water-supplies. Chapter III., by R. L. Vollum, is devoted to the bacteriological aspects of the dairy industry, and in Chapter IV. W. G. Savage deals with other foodstuffs. Soil bacteria are considered in Chapter V. by H. G. Thornton; Chapter VI., Bacterial Diseases of Insects, is in the hands of R. St. John-Brooks, and in Chapter VII., S. G. Paine treats of the bacterial diseases of plants. These seven chapters occupy about a third of the volume; their subject matter is condensed and, indeed, treated somewhat superficially. Nevertheless they form an interesting and valuable contribution; the authors have shown considerable judgment in determining what to leave out, and the medical bacteriologist will be grateful for this résumé of a subject with which he is rarely familiar. In Chapter VIII., which deals with *Bacillus pestis*, we are on better-known ground. This section is contributed by G. F. Petrie and is preceded by a short historical note by W. Bulloch. After discussing the general bacteriology of *B. pestis*, the author turns to the problems of plague immunity, and then deals with the transmission of the infection by the rat-flea, natural plague in rodents and other animals, and bubonic and pneumonic plague in man. Dr. Petrie has written a very complete and satisfying account of his subject, but it is perhaps a pity that his contribution should have been separated from that dealing with the Pasteurella group, which is to appear in Vol. IV.

Miss Muriel Robertson deals in the next section with the organisms associated with gas gangrene, and as we should expect, gives an admirably clear and lucid summary of this very difficult subject. In a brief historical summary she shows how the complexities which have surrounded this group of organisms have arisen, and then proceeds to describe the more important and definite varieties. Pathogenic action, resistance, and immunity are next discussed, and the chapter closes with a section by R. A. O'Brien on the preparation and testing of toxins and antitoxins, and prophylactic mixtures. A serious omission in this article is the absence of illustrations, and this applies to the rest of the volume, excepting the chapter on soil bacteria which contains 13 charts and figures. Readers of the Council's special report series Nos. 12 and 39, which dealt with the anaerobic organisms, will recall the really beautiful illustrations which enriched these publications and will regret that they are not reproduced here. In Chapter X. Dr. Paul Fildes gives an admirable account of *Bacillus tetani*. Here again the article is conceived on the broadest lines, and much attention is devoted to the pathological effects of the organism, its portals of entry, the mechanism of infection and intoxication, and immunity. The organisms resembling *B. tetani* are briefly discussed, and R. A. O'Brien and A. T. Glenny contribute an account of the production of antitoxin for therapeutic purposes. The chapter is introduced by an historical note by W. Bulloch. Chapter XI., on *Bacillus botulinus*, is by R. Tanner Hewlett, with sections by W. Bulloch and R. A. O'Brien, and the volume ends with a short chapter by W. G. Savage on Bacterial Food Poisoning.

The general subject index is to appear in Vol. IX., and there is no index in this volume, but the table of contents is very full and complete. We have nothing but praise for the general format of the volume. It is dignified and workmanlike, and in every way worthy of what will be a notable publication.

LETTERS FROM ROME.

Letters from Rome on Certain Discoveries Connected with Malaria. By T. EDMONSTON CHARLES, M.D., Q.H.P. With Addenda, consisting of an article by S. CALANDRUCCIO, letters from ROBERT KOCH and A. LAVERAN, and a statement by Lord LISTER. Edited, with Preface and Remarks, by Sir RONALD ROSS, K.C.B., K.C.M.G., F.R.S. London: Ross Institute and Hospital for Tropical Diseases, Putney Heath. 1929. Printed by Harrison and Sons, Ltd. Pp. 78.

DURING the time when Sir Ronald Ross was investigating the connexion between mosquitoes and malaria, certain Italian observers, of whom Prof. Grassi was the leader, were also engaged in the experimental study of the problem. The priority of Sir Ronald Ross's discovery of the zygotes is no [illegible] notubt, but in order that it shall be finally [illegible] was o[illegible] has now published certain letters of [illegible]iew of occu[illegible] at the time by Dr. T. Edmonston Charles. The letters cover a period from Nov. 4th, 1898, to Jan. 14th, 1899, and are fully annotated by Sir Ronald Ross, who has also supplied explanatory postscripts. Other confirmatory documents are included in the book, and a list of the published literature immediately connected with the subject is set out in chronological order. Letters from Robert Koch and A. Laveran expressing disapproval of the attitude of the Italian school are also printed together with a statement, quoted from the *Times*, made by Lord Lister. Lister's reminder of the candour, openness of mind, and readiness to recognise the work of others shown by Ross is worth recording for the benefit of future generations, who may see only Ross's own writings, which will survive, but not the attacks to which they provide adequate answers.

THE TOXÆMIAS OF PREGNANCY.

By H. J. STANDER, Associate Professor of Obstetrics, Johns Hopkins University Medical School. London: Baillière, Tindall and Cox. 1929. Pp. 161. 13*s*. 6*d*.

THIS book, forming Volume XV. of the Medical Monograph series, is intended, as are its companion volumes, to provide teachers, clinicians, and laboratory workers with a critical digest of recent views in convenient and readable form. The first 15 pages are occupied with a description of the metabolic and other changes occurring in normal pregnancy, and the remainder of the book with a very full consideration of the toxæmias of pregnancy, amongst which ante-partum hæmorrhage is not included. A good discussion of the theories of causation of hyperemesis and of the chemical changes in the blood and urine is included. The author believes that all cases are based on an underlying toxæmia, though in some women the toxæmia may be so obscured by a predominating neurosis that one is almost entitled to make a diagnosis of neurotic vomiting; he has little doubt "that the changed metabolism accompanying pregnancy, which may so easily become perverted, as shown by the tendency towards acetonuria . . . is the underlying cause of all cases of vomiting of pregnancy." The best method so far available to restore the patient to a normal metabolism is said to be insulin and glucose. The value of complete isolation of the patient and of suggestion in these cases is stressed, and also the need for combating dehydration, if necessary by subcutaneous injection. The author proceeds to deal with the "low reserve kidney," a term first introduced by Stander and Peckham. This condition is ascribed to toxæmia, and is associated with a mild degree of hypertension, albuminuria, and œdema; it is difficult to see in what respect it differs from a mild form of the "pregnancy kidney" familiar to us all. The "low reserve kidney" invariably clears up after delivery; it may recur in successive pregnancies, but never in a more severe form or at an earlier period of the pregnancy—in short, permanent kidney damage is never sustained. Prof. Stander gives a helpful and comprehensive review of the various tests of kidney function. He believes that the urea-concentration test, as modified by Rabinowitch, will prove the most useful test in diagnosis and prognosis. He strongly advocates the termination of pregnancy in all cases complicated by chronic nephritis, unless decided and rapid improvement follows rest in bed with restricted low protein diet and plenty of fluid. If there is much œdema a salt-free diet is advocated. Forty pages are devoted to a discussion of the causation of eclampsia. Prof. Stander comments on the increased lactic acid in the blood in eclampsia, and considers the phenomenon of decreased or deficient oxidation "the most fundamental finding yet discovered in eclampsia." In treatment he advocates conservative tactics and describes the modified Stroganoff method now in use at Johns Hopkins. Venesection finds no favour, since high blood pressure may be a protective mechanism leading to increased elimination; but, if used at all, large quantities should be withdrawn (750–1000 c.cm.).

with the object of removing toxins. Radical interference should be practised, preferably under spinal or local anæsthesia, only if, in spite of conservative treatment, the patient becomes progressively worse. It is disappointing to find no reference to the remote prognosis of albuminuria and eclampsia; this should have attention in future editions.

The volume is a concise and reliable statement of the present position of our knowledge of the toxæmias of pregnancy, and deserves to be widely read. A bibliography containing over 700 references to literature is appended.

THE EXPECTANT MOTHER AND HER BABY.

By BODH RAJ CHOPRA, M.B., Ch.B. Edin. Edinburgh: W. Green and Son, Ltd. 1929. Pp. 148. 8s. 6d.

THIS book is apparently intended for circulation in India. It is divided into two parts which are unequal both in length and in quality. The second and larger part on the care of the child is so good that the defects of the brief section into which advice to the expectant mother is compressed are regrettable. Examples of assertions to which we take exception may be quoted. Under the heading "Mental Discipline," it is stated that "the mind of the parents, both generally and at the time of procreation, and also the subjects constantly heard by the mother during the period of pregnancy, influence the form, the attributes, and even the complexion of the child." We are told that the custom "prevalent among European nations" of spending the honeymoon in "places of natural charm" is designed to make the mother bring forth an "ideal offspring." The method of preparation of the nipples by hardening with eau-de-Cologne and spirits finds little favour amongst obstetricians in this country. Only 24 pages of the book are devoted to advice to the expectant mother regarding the care of her own health, and no counsel is given regarding the importance of such warning symptoms as hæmorrhage in late pregnancy, headache, visual disturbances, scanty urine, or œdema. These are serious omissions. Fourteen pages are devoted to "directions for the attendant" on the conduct of labour and care of the newly born child. This section is elementary, and is evidently intended for women with little training; for these it would be useful enough, although we deprecate the practice, in this country happily becoming extinct, of putting the forefinger into the baby's mouth in order to remove mucus. In the instructions regarding the care of the baby's eyes no mention is made of the prophylactic use of silver nitrate solution. The attendant is advised to bathe the eyes with boracic solution, and when inflammation sets in to send for a doctor.

The greater part of the book is given up to the feeding of the infant, artificial feeding, hygiene of infancy, the normal growth and development of the baby, ailments, and infectious diseases, with a final chapter on the mentally deficient child. This part is exceedingly well written. The advice given is sound and is expressed in concise and simple language. Much of it reflects the teaching of the late John Thomson, of Edinburgh, to whom the author expresses his indebtedness. If in future editions the first part of the book can be brought to the level of the last eight chapters, it should become a popular text-book.

GASES AND LIQUIDS.

By J. S. HALDANE, C.H., M.D., F.R.S., Fellow of New College, Oxford; Director of the Mining Research Laboratory, and Hon. Professor, University of Birmingham. London and Edinburgh: Oliver and Boyd. Pp. 331. 18s.

THIS contribution to molecular physics takes the reader into such various fields as the dynamical theory of gases and heat, gaseous diffusion, osmosis, the depression of freezing points of solutions, the internal pressure of liquids, and finally the steam engine and some other heat engines. The book is stimulating since it is the result of individual thought on the part of the author, who is vigorous in denouncing what he holds to be fallacious teaching in the realm of thermodynamics. It is possible that he is unfair to pioneers of the stamp of Clausius, Kelvin, and Clerk Maxwell. Their generalisations may well have been made with the mental reservation that their theories still left many phenomena unexplained.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS.

By HUGH ALISTER MCGUIGAN, Ph.D., M.D., Professor of Pharmacology and Therapeutics, University of Illinois College of Medicine. London and Philadelphia: W. B. Saunders Company, Ltd. Pp. 660. 28s.

IF we are to judge from the quotations in the preface of this book Prof. McGuigan has a profound belief in the necessity of the closest alliance between theory and practice, and with that in view he has attempted to correlate the facts of physiology, biochemistry, and pharmacology with clinical application. He has achieved only a fair measure of success, partly perhaps because he has undertaken a difficult and complex task; but mainly, we think, because of the unsystematic arrangement he has adopted in dealing with special pharmacology. The book breaks no new ground. It follows the general plan of most of the standard works on pharmacology and therapeutics, each drug being taken seriatim, its chemical characteristics described, its pharmacological action discussed, and its therapeutic uses mentioned. The information offered, particularly on the pharmacological aspect, is extensive, accurate, and up to date, and the introduction deals in a specially interesting way with the modes of action and the absorption of drugs. A number of excellent diagrams which have been reprinted from the author's well-known work on experimental pharmacology illustrate the seat and nature of action of important drugs. The book contains also a chapter on the pharmacological action of immune serums and notes on the pharmacopœial preparations and prescription writing. It fails only when it is judged on the standard of the author's own high ideals for such a text-book, and is at least as useful an adjunct to clinical work as are most other clear accounts of modern pharmacology.

PHYSIOTHERAPY.

Theory and Clinical Application. Second edition. By HARRY EATON STEWART, M.D., Director of the New Haven School of Physiotherapy. London: Humphrey Milford, Oxford University Press. 1929. Pp. 395. 34s.

THIS second edition of Dr. Stewart's book has the same general arrangement as its predecessor. It is divided into two main parts. In the first the author describes the nature, mode of action, and properties of the physical agents used in the treatment of disease. Electrotherapy, phototherapy, ultra-violet ray therapy, hydrotherapy, massage, remedial exercises, and muscle-training are considered in turn. The second part deals with the clinical aspects of physiotherapy. Dr. Stewart recommends the form or forms of physical treatment which are likely to produce benefit in different diseases, and describes the technique of their administration. The book concludes with suggestions for the treatment of miscellaneous maladies, postural defects, and some foot disabilities. The author deals with all forms of physiotherapy (excepting X rays), and as he has had considerable experience he is able to give impartial advice in the selection of appropriate methods. The perplexity of the beginner who has studied different branches of physiotherapy in separate books, and finds overlapping of the therapeutic fields mapped out for each kind of treatment, will thus be solved, and for this reason alone the book can be recommended. But there are other good grounds for reading it. For example, Dr. Stewart is a protagonist of the treatment of lobar pneumonia by diathermy, and has here summarised his experience in a convincing way.

In the pages dealing with high-frequency currents Dr. Stewart points out that there is risk in subjecting the brain to diathermy. Some patients have suddenly lost consciousness during the treatment without showing any premonitory symptoms. In the chapter on Exercise he speaks with authority of the value of athletics for the adolescent female, for he has been athletic director to secondary school girls and instructor in a normal school of physical education, and, later, physician and head coach to the American team at the first international track and field contest for women held in Paris in 1922. In his view the drastic change that has taken place in the physical life of the American girl during the last two decades has led to no harm and to much good, though he stresses the need for care in preliminary medical examinations and for competent supervision. He states that carefully followed up records of graduates of normal schools of physical training have shown menstrual and maternal histories better than those of the average woman.

Dr. Stewart's book can be confidently recommended to the student and practitioner of physiotherapy. It furnishes the reader with the American point of view of the subject, and at the same time gives adequate reference and credit to the work of European investigators.

THE TREATMENT OF CATARACT AND SOME OTHER COMMON OCULAR AFFECTIONS.

By Lieut.-Colonel HENRY SMITH, C.I.E., B.A., M.D., M.Ch., Indian Medical Service (retired) (London). With the collaboration of Lieut.-Colonel A. E. J. LISTER, F.R.C.S., I.M.S. (retired) (London), Dr. ARNOLD KNAPP (New York), and Dr. J. RUSSELL SMITH (London). Illustrations by Dr. DERRICK T. VAIL, University of Cincinnatti, and Dr. J. RUSSELL SMITH (London). Calcutta: Butterworth and Co. (India), Ltd. Pp. 287. 15*s.* 6*d.*

IN 1910 Lieut.-Colonel Henry Smith wrote a book on the treatment of cataract published by Messrs. Thacker, Spink and Co. We welcomed its appearance, since it enabled us to obtain a clear conception of the author's attitude to the classical method of extraction of cataract, as well as a detailed account of the intracapsular method which has been so successful in his hands and in those of his disciples. Colonel Smith has now entirely rewritten the monograph, which in its present form is published by Messrs. Butterworth and Co. Those ophthalmologists who wish to study the latest improvements devised by the author for his operation will find them described and clearly illustrated by numerous diagrams on pages 102 to 123. Colonel Smith believes that the new technique will put his original method into disuse. He claims, moreover, that the obstacle which in the past "quite rightly prevented the profession in the West from adopting it—that with its more limited opportunities for acquiring the necessary technical skill there was no method at its disposal from which it could hope to obtain success"—is now removed. The operation recommended has been reduced to a simplicity which, its originator believes, should enable it to be performed in relatively unskilled hands, not merely with a lower incidence of loss of vitreous than the capsulotomy operation when in the latter an adequate attempt is made to clear the eye of cortical lens matter, but even without that rupture of the hyaloid membrane which is a result of interfering with an after-cataract.

An interesting note on the historical aspect of the surgical treatment of cataract is included in the book, with a short account of lens couching as performed by the "rawals," a hereditary caste which originally sprang from a group of villages in the Punjab. A final chapter is devoted to the treatment of glaucoma and some other common ocular affections, and contains useful hints.

The FRENCH MEDICAL ANNUAL, *L'Année Médicale Pratique* (Paris: René Lépine. 1929. Pp. 621), appearing for its eighth year under the skilful editorship of Dr. Camille Lian, is well up to standard. This volume contains an adequate summary of the principal contributions to French medicine during the past year, and gives an interesting idea of the trend of continental opinion. The growing importance of all forms of radiotherapy is obvious in many sections; an able description is given by the editor of the treatment of angina pectoris by this means. The treatment of various forms of anæmia by liver diet or extract receives due notice, and an interesting account of the epidemic of dengue which raged in Athens during the summer of 1928 is included.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVI. July-September.—Dr. Fergus R. Ferguson and Dr. Macdonald Critchley contribute the first part of a paper, entitled A Clinical Study of Congenital Neurosyphilis, based on the records of cases at the National Hospital, Queen-square, during the last decade. The cases consisted of congenital G.P.I., congenital tabo-paresis, congenital tabes, and a heterogeneous group which included epileptiform convulsions, mental defect, meningitis, hydrocephalus, cranial nerve palsies, paralysis of the extremities, and examples of the so-called nervous child.—In a paper on the Nervous Complications of Whooping-cough, Dr. W. Gordon Sears reviews the literature and records three personal cases. He suggests the following classification: 1 (*a*) Convulsions and coma; (*b*) spasm of the glottis. 2. Paralysis: (*a*) cerebral type; (*b*) spinal type. 3. Meningeal syndrome and meningo-encephalitis. 4. Peripheral neuritis. 5. Mental and other nervous changes, including hysteria, hypochondria, melancholia, epilepsy, and dementia. Sears comes to the conclusion that the primary cause in all these types of nervous complications is toxic, and that a meningo-encephalitis is the primary lesion.—Dr. N. Gray Hill contributes a paper on Herpes and Varicella based on the study of cases of these two diseases at Queen Mary's Hospital for Children, Carshalton, since May, 1926. His conclusions are as follows: 1. Herpes zoster is an infectious disease, and persons suffering from it should be isolated. 2. Herpes zoster may give rise to either varicella or herpes in susceptible persons. 3. The cutaneous lesions of herpes zoster and varicella are very similar. Investigation of the spinal cord should be made to determine whether there is a similarity in the cord lesions of the two diseases. 4. An attack of varicella confers no immunity against herpes zoster. 5. Further investigation is required to determine if an attack of herpes zoster will confer immunity against varicella.—In a paper entitled Tracheotomy and Tuberculosis Dr. J. D. Rolleston shows from a review of the literature and his personal experience that there is no justification for Landouzy's statement that children who have undergone tracheotomy for laryngeal diphtheria are specially susceptible to pulmonary tuberculosis and that very few reach adult life. On the other hand, hoarseness and liability to bronchitis are not infrequent sequelæ of tracheotomy.—In a note on the Nature of the Milroy-Nonne Disease, Dr. F. Parkes Weber shows that Nonne's cases of congenital and hereditary elephantiasis, published in 1891, were of the same nature as the cases of hereditary œdema reported by Milroy in 1892. Although no anatomical or histological study has yet been made, the cause of the condition is probably a lymphatic obstruction of some kind due to an antenatal or postnatal developmental abnormality of lymphatics and connective tissue. In support of this view is the occasional association with the œdema of other congenital defects such as spina bifida occulta, dental abnormalities, and congenital heart disease.—The abstracts from current literature are devoted to nervous and mental diseases.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 28, 1929.

THE TRAINING OF MIDWIVES.

The report of the Departmental Committee appointed by the Ministry of Health in May of last year to consider the working of the Midwives Acts, 1902–26, will disappoint those who are more immediately concerned with the training of midwives for their practical duties than with the administrative control of their profession, or the adjustment of their place in a national maternity scheme. Less than a quarter of the report is, indeed, concerned with the training of midwives. The study of "conditions under which midwives are employed," which was included in the terms of reference, has proved so attractive that the Committee have made it the occasion for promulgating a scheme for a national maternity service, linked up with the National Health Insurance Acts. The scheme thus launched under official sanction bears a striking resemblance to that recently accepted by the representative meeting of the British Medical Association. We have already commented favourably on that scheme, and need now only record our fear that its proposals will attract public attention to the exclusion of the contributions which this report does in fact make to the difficult and complicated subject of the training of our midwives. This would be the more unfortunate, since the national scheme has allotted to practising midwives a rôle so important and so extensive that the question of their training and education becomes a matter of first importance to the State. The public will expect satisfactory assurances that the average midwife is really competent to discharge the grave responsibilities which will be placed upon her; the report assumes that nine-tenths of the half-million mothers who will come into the national scheme will be attended by midwives alone. The Committee do not express dissatisfaction with the present training of our midwives, or with the general standard of knowledge and efficiency which they attain on certification, though they do point out certain directions in which training could be improved. These are excellent as far as they go, and include (1) an entrance examination in reading, writing, and arithmetic, subjects in which it appears that a considerable proportion of our midwives are rather shaky; (2) a clinical examination before certification; (3) a post-certificate period of three months "hospital" experience, during which personal attendance on "at least five cases"—surely a very small number—is required: (3) post-graduate or "refresher" courses, at intervals, without expense to the practising midwife.

These changes, if they are carried out, will make no fundamental alteration in our present system of training. Under this system we take large numbers of almost uneducated women, who have had no training in general nursing, who are ignorant of the elementary facts of anatomy and physiology, and we attempt, in 12 months, to turn them into efficient midwives, to whose care the lives of our mothers may be entrusted. Where the raw material is sufficiently good, and where an intensive training can be given under the most skilled teachers, the task may be feasible; but only when clinical material is abundant. Unfortunately, however, the amount of clinical material available for teaching is woefully deficient, and in some of the largest institutions medical students and pupil midwives compete with one another for cases. Moreover, a considerable proportion of the cases available for pupil midwives are absorbed by those who do not intend to practise as midwives, but take the training because it is an essential qualification for the post of health visitor. The irony of the situation from the point of view of the midwife is that her work is liable to supervision by these very health visitors, who have never practised midwifery, and have never gained the experience which, under our present system, can only be acquired after training. The Committee suggest no drastic alteration of this system, which they propose to leave practically as it stands. They must be aware that it compares unfavourably with the practice of other European countries which utilise the services of midwives. There are 103 independent "schools" for the training of midwives in England and Wales, varying greatly in size, while nothing approaching a common standard of organisation or efficiency exists among them. Some midwives are accordingly well trained, others badly. No solution is offered in the report to the problem of the supply of clinical material for the pupil midwife. In fact, the needs of the medical student are recognised to be so urgent that the Committee conclude that the training of pupil midwives in hospitals attached to medical schools must suffer some restrictions; they add "students in a medical school area should have preference in the apportionment of material, and . . . . pupil midwives in that area should be allowed to make use of such material only in so far as it is in excess of the needs of medical students." If this recommendation is adopted, as on other grounds we trust it will be, the opportunities for pupil midwives to handle cases in hospitals attached to medical schools will greatly diminish. The fact that "the midwife occupies an exceptionally responsible position . . . . compared with women employed in allied branches of nursing" is admitted by the Committee, who, nevertheless, believe that the time has not yet come either to increase the length of the midwife's special training or to require a preliminary training or experience in general nursing.

It is clear that the opportunities and emoluments at present offered by the profession are not likely to attract highly educated women to its ranks, or to encourage others to undergo a long and arduous period of training to fit themselves for its practice. Moreover, fundamental alterations in an established system cannot be made in a day, but the Committee have missed a great opportunity of pointing out the directions in which the evolution of the midwife's training should be led, and the ideals which should be kept in view. The chief ideal is to provide for the country a body of midwives worthy to form the basis of a national scheme, composed of educated and highly trained women, animated by the esprit de corps of an honourable profession, and adequately remunerated for their work. Only in proportion as some such ideal as this is attained will a national scheme yield the expected result. One step towards this end would be to give midwives a larger share in the management of their own profession, thus developing their sense of responsibility and of the dignity of their work. The administrative changes proposed in the report tend, however, in the opposite direction. Generally speaking, the changes would place the midwives' profession under the control of medical officers of health and nominees of the Ministry, to the practical exclusion of practising midwives and teachers of obstetrics. The most alarming of the administrative changes proposed are indeed those aimed at the weakening of the Central Midwives Board. The main objections to these proposals are clearly set out in the Memorandum of Reservation, signed by Mrs. Bruce Richmond and Dr. J. S. Fairbairn. We trust that this memorandum will be carefully considered before any decision is taken to limit the scope of a body which has done invaluable public service in the past, and which, if it were made more fully representative and given wider powers, would be in a position to do still more useful work in the future.

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DYSENTERY IN GREAT BRITAIN.

Dysentery has left a trail of suffering and death all down the ages and still stands supreme as a scourge of armies and camps. A disease which, given suitable circumstances, will so rapidly break out in formidable epidemics, must necessarily have ways of subsisting when times are bad for it—unless we are to believe in spontaneous generation or in gross mutations whereby saprophytes suddenly acquire pathogenic properties together with an array of associated and distinguishing characters. If we follow orthodoxy and disallow such fascinating speculation it follows that the infecting organism must be kept alive in the lean years by a persistence in the carrier state or by a continuous though unobtrusive chain of endemic infections. The evidence for a true carrier state in bacillary dysentery is on the whole negative, and we are left with endemicity as the means by which the causal organism of this disease survives. It is common knowledge that asylums have long been depots of dysenteric infection—a state of affairs which is being coped with successfully by modern energetic measures inspired by a fuller comprehension of the problem. But apart from these, sporadic cases of dysentery and "ulcerative colitis" are far from uncommon in this country and the probability is now almost a certainty that the disease is endemic in many centres; masked, slumbering, and often unheeded, but none the less there. The bacillus survives and only the excellence of our hygienic equipment keeps it under control. In many parts of the Continent, and especially during military manœuvres and in barracks, the disease is a very much more serious menace than it is in Great Britain.

In our last issue (p. 626) we published an article in which Dr. J. A. Charles and Dr. S. M. Warren drew attention to a series of cases of dysentery in Newcastle-upon-Tyne. Their well-documented paper gives a full account of a quasi-epidemic outbreak of this disease in a city where, as Dr. Charles has previously shown[1] there is every reason to believe that it has been endemic for a very long time. Evidence of the kind here adduced makes one suspect that where dysentery has passed out of notice the reason is more likely to be found in a change of nosological fashion than in bacillary inactivity. If the writers of this paper may possibly be accused of a little exaggerating the lack of recognition accorded to the disease in this country—where almost every hospital bacteriologist certainly sees some cases in the course of the year—their criticism of current opinion is nevertheless well founded and they must be congratulated upon the thoroughness with which they have studied an unusually large and significant series of cases. These include 141 examples of proved bacillary dysentery observed between March 1928, and the end of June, 1929, most of them occurring in children between the age of two and the earlier years of school life. A considerably larger number of cases were encountered in which there was good reason to suspect bacillary dysentery but in which bacteriological proof was not obtained. Two types of case were met with: a mild form in which the patient recovered, and a fulminant form which proved fatal within 18 to 24 hours. The deaths, ten in all, were all in cases falling into the second of these categories.

The pathology of bacillary dysentery varies with the type of infecting organism and the acuteness of the disease. In fulminating cases in children the condition is pre-eminently an acute toxæmia and the lesions in the intestine are only trivial; in fact the rapidity of the process almost precludes their development. In adults, fatal cases, which are not common in this country, are most often of the Shiga type in which, if the acute phase is survived, death occurs at the end of an exhausting illness, the patient dying with widespread necrosis of the mucosa of the lower bowel, which is sometimes uniformly involved from the ileocæcal valve to the anus. Such infections are, however, comparatively rare and dysentery as now seen in Britain is usually of the milder Flexner, or the more recently described Sonne, types. There is a good deal of rather confusing detail in the descriptions of serological races of dysentery bacilli, but these are the main indigenous types, and they contributed to Charles and Warren's cases in the proportions of about 4 to 1, with a negligible number of cases due to other types. The Sonne bacillus was found to be somewhat less toxic than the Flexner organism; but the latter, though less virulent for adults than Shiga's bacillus, which is rarely encountered here, may cause a very dangerous infection in children. It is a somewhat curious and unexplained fact that in the series of cases we are considering the mortality was highest not in the very young children, but in boys of 5 to 15 years. In general the mortality was low (7 per cent.) in the proved cases, and this figure no doubt exaggerates the gravity of the infection, since it does not take cognisance of the many mild cases which escaped exact bacteriological diagnosis. It may be worth repeating that all cases other than the fulminating ones recovered; the forms of treatment relied on were salines and serum, and the much discussed bacteriophage was not administered. As regards the fatal cases it is of importance to note that the symptoms of acute fulminating dysentery in the child are sickness, fever, drowsiness, toxæmia, coma, death. The short drama is quickly over and the full intestinal syndrome may never be developed. It is well that this should be widely recognised and that the necessity of expert pathological and bacteriological investigation of all cases of dysenteric infection should be emphasised. The organism is amongst us, and it is a duty to the public and to ourselves to keep tally of it as closely as we may, whilst working steadily towards its elimination.

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[1] The Lancet, 1928, ii., 616.

THE CORONER'S AUTHORITY.

HAS a coroner too much power? Some may think so who are accustomed to other forms of judicial tribunal. Two solicitors, attending an inquest lately held at Bournemouth, may have been surprised when the borough coroner refused to allow them to cross-examine witnesses on behalf of parties concerned. The coroner was exercising an indisputable right; he is not only judge but also, so to speak, examining magistrate. He summons such witnesses as he thinks fit and, if he chooses, he can insist on questioning them himself. During the course of the proceedings it may happen to become clear that blame attaches to A or B in respect of the death of X; but A and B have no inherent right to make their defence in the coroner's court; they may even be found guilty of wilful murder on the verdict of the coroner's jury though they have neither been present in court nor been represented by any legal adviser. That is the chief anomaly of the inquest as a judicial tribunal.

The essential element in the proceedings is a dead body, not a specific charge against a named person. The coroner is engaged in collecting and sifting the evidence as a preliminary step to the framing of a charge. Hearsay and gossip are not to be ignored if they help him to reach the facts, nor are the technical rules of evidence to be rigidly followed. His inquiry being of a roving nature, the jury may be invited to range over topics of general interest rather than of strict relevance to the limited issue. Thus at a recent inquest upon the death of a patient in a mental hospital the coroner is reported to have said that it would be for the jury to say whether the hours worked by the hospital staff were not too long. If this meant that the death amounted to manslaughter, caused by the criminal negligence of the hospital management or personnel, it was correctly referred to the jury's arbitrament. If it merely meant that the jury should comment upon the hospital administration, it was one of the vagaries tolerated and encouraged in coroner's courts and in no other judicial tribunals. Anyone who made a collection of the riders attached to the verdicts of coroner's juries would obtain specimens of remarkable range. He would probably also detect similarities in the riders presented to a particular coroner. Sometimes a coroner has views of his own which he does not attempt to hide. Junior barristers, it is believed, when sent to attend an inquest professionally, are occasionally instructed by their more experienced seniors in these idiosyncrasies. The particular topic is respectfully kept in the foreground and the jury adds the appropriate rider.

In view of its autocratic character, the coroner's authority is happy in escaping adverse comment. An independent observer may sometimes be shocked at what he deems the unnecessary publicity and probing into personal affairs in cases of obvious suicide. The legal profession may raise its eyebrows at "coroners' quest law." The general public may wonder whether the inquest should not be brought more closely into line with our other judicial courts. But the inquest is an ancient institution; therefore it is popularly acceptable. The machinery works; therefore time need not be wasted in the invention of a theoretically more perfect process. The statute law was reviewed and amended only three years ago; therefore it is likely to be left untouched for another generation. The ample discretion entrusted to the coroner is not abused by coroners of discretion.

Annotations.

"Ne quid nimis."

NEGLECT OF THE DEAF.

THE National Institute for the Deaf, in its fifth annual report, has endeavoured for the first time in the social history of this country to place before the public in a concise form the full case of the deaf-mute and the deafened. It is evident that the Institute is doing a large amount of valuable work in the face of the severe handicap resulting from lack of interest and support, both from the public and from the Government. Deafness is the most widespread of all sensory disabilities, for the number whom it afflicts in this country probably reaches several millions. It is, therefore, surprising that the total contributions to organisations labouring for the welfare of the deaf and dumb and the deafened over school age should amount only to something under £40,000, while the State stands entirely aloof from such work. In contrast, more than ten times this sum is voluntarily contributed annually for the blind, whose total registered numbers are only some 40,000, while rates and taxes provide a further £600,000. Again, for the blind, the qualification for Old Age Pensions, already reduced to 50 years, will shortly be lowered to 40, but no such consideration is shown to the deaf. At present, education is the only service publicly provided for the deaf, but the Committee of the Institute believes it is certain that the majority of deaf children, despite their far greater need, do not receive an educational opportunity equal to that which is rigidly required for children who can hear. Further, the Committee has recently concluded an inquiry into the industrial position of the deaf and dumb, and has no hesitation in saying that the effects of the large expenditure on education have been, to a great extent, neutralised by the circumstances of post-school life. This is not the result of any lack of effort on the part of the schools or the welfare societies, but is due to the inevitable handicap of deafness in working life, which is increased by modern conditions of industry, by certain legislation affecting wages and insurance schemes, and by the regulations of trade bodies in several industries. As a result, 30 to 50 per cent. of deaf school-leavers remain unemployed. This industrial problem is a pressing one, and it is much to be regretted that the Government in 1928 refused to make any inquiry into the matter. The Institute is raising this question again, and regards it as urgent that an adequate and searching inquiry into the full conditions of the deaf and dumb and the deafened over school age shall be made by the Government in the near future. It is much to be hoped that the Institute will receive the general public support which it deserves.

DIAGNOSIS AND CURE OF G.P.I.

THIRTY years ago general paralysis of the insane was regarded as a definite clinical entity for which there was no cure. It was generally held to be a kind of cerebral exhaustion, due to excessive expenditure of vital energy on "woman and wine." While the diagnosis offered no great difficulty to the experienced alienist, it was made very cautiously, because the outlook was hopeless. The part played by syphilis was subsequently proved beyond reasonable doubt by Noguchi's demonstration of the spirochæte in paralytic brains, and since then the tendency has been to make diagnosis depend on complex laboratory tests for syphilis rather than on observation of the patient's demeanour. The possibility of cure by anti-syphilitic remedies, and recently by induced malarial pyrexia, stimulated efforts at early diagnosis, and thus led to a still greater tendency to diagnose on laboratory findings without waiting for the development of late and unmistakable mental and physical signs. The

Board of Control, having carefully investigated the results of five years of malarial therapy, is satisfied that lengthy remissions, tantamount to cure, have resulted in a goodly proportion of cases, and has definitely pronounced in favour of the method.[1] Malaria is being used more and more, and earlier and earlier; indeed, Dr. G. W. B. James has suggested that it may soon become as essential to do a lumbar puncture, if there is a single sign or symptom suggesting general paralysis, as to take an X ray photograph in a case of injury. But this apparently smooth progress of a new treatment towards universal recognition was interrupted some months ago by a challenge from Dr. John Brander,[2] who roundly questioned the validity of modern diagnosis, and—at the same time—of alleged success in treatment. He believes that serological methods have brought confusion rather than aid to the diagnosis of cerebral syphilis, and that many cases of syphilitic pseudo-paralysis or "insanity with gross brain lesion" are now classed as general paralytics. These, and not cases which would have been so diagnosed by the clinicians of 30 years ago, are the patients who respond to modern therapeutic methods. General paralysis, on the original criteria, is as incurable as ever it was.

To meet this challenge and debate the whole subject the Royal Medico-Psychological Association held a special discussion, and the report of it which has just appeared[3] reveals variety of opinion on almost every point; even the name of the disease is not generally accepted. Dr. Glen Duncan thought that to label any cases "general paralysis of the insane" hampered both psychiatric investigations in general and treatment of individuals, while Dr. James supported Sir James Purves-Stewart's suggestion of the term "progressive syphilitic meningo-encephalitis." The pathology is equally uncertain. While Dr. Nathan Raw's dictum, "no syphilis, no general paralysis" met with general agreement, the theory of the neurotropic stain of spirochæte was not looked upon favourably, Dr. W. A. Caldwell suggesting that the difference in the effects of syphilis depended rather on differences in the soil. Dr. Alexander Walk quoted the French view that ordinary forms of syphilis are allergic, while general paralysis, aortitis, and lingual leucoplakia are anallergic. Dr. B. H. Shaw thought that alcoholism might be the factor which determined whether or not a syphilitic would become a paralytic, while to Dr. F. A. Pickworth the long delay between syphilitic infection and the onset of general paralysis suggested the possible significance of sepsis—e.g., intestinal infection and sphenoidal sinusitis. On the subject of diagnosis there were as many different opinions as there were speakers. Prof. G. M. Robertson thought that no human disease could be diagnosed with such certainty, and based his assurance on a consensus of mental symptoms, physical signs, and laboratory findings. Dr. Hamilton Marr regarded it as a most difficult condition to diagnose, and believed that nine out of ten cases called "general paralysis" during the war were pseudo-paralysis. Prof. J. Shaw Bolton agreed, and pointed out how readily these cases had remitted and how well they had responded to treatment with arsenic and mercury. To some psychiatrists laboratory tests seemed quite unreliable, while others had confidence in some one test, and regarded the remainder with suspicion. Dr. R. M. Stewart had found no one test diagnostic, while Dr. T. S. Good often made his diagnosis on the examination of the cerebro-spinal fluid alone; Dr. Hamilton Marr believed that the colloidal gold test is the most reliable. Dr. Walk did not think there was any tendency nowadays to place too much reliance on laboratory findings; if clinical and laboratory observations could not be correlated, the tendency was to give the clinical side the predominance. Prof. Shaw Bolton laid stress on the existence of a certain degree of confusion of the well-known type as the only reliable mental sign. In the absence of this confusion the prognosis was fairly hopeful, and the disease might remit under any one of several kinds of treatment. Equally varied were the views on treatment. The advocates of malarial therapy pointed to their percentage of remissions. Dr. W. F. Menzies asked whether in the old days, eight successive cases had ever been known to improve, whether treated or not. Dr. B. H. Shaw imagined a history written in A.D. 2500 which dismissed malarial therapy as an amazing and almost incomprehensible obsession. Tryparsamide had its advocates, and in the opinion of Prof. Shaw Bolton had partly justified its claim as a spirochæticide. Between the advocates of malarial treatment there was a difference of opinion on the relative values of the "mosquito" and "blood" methods.

The reader of the report may well agree with Dr. G. Rudolf, as summarised by the President: "that it was impossible to explain the differences in the results obtained by different observers, and that a careful study of the subject made him satisfied that the fallacies were so numerous that nothing definite followed at all." Yet early diagnosis is of the greatest importance if early treatment offers the slightest prospect of cure. As Dr. A. A. Petrie observed, malaria is a dangerous treatment, and its employment is justified only in cases with a very grave prognosis. On the other hand, true general paralysis is such a terrible condition that any alleviating measure ought to be employed at the earliest possible moment. The Royal Medico-Psychological Association has appointed a special subcommittee to consider the treatment of general paralysis, and everyone will hope that this body may be able to reconcile opposing views.

THE INCIDENCE OF VASCULAR SYPHILIS.

NEW interest has been awakened in the pathology and treatment of syphilis by the important discussion upon this subject at Manchester in July.[1] The main points discussed at that meeting were the effects of syphilis upon the cardiovascular system, and there is no doubt that our knowledge concerning these lesions has greatly altered and increased in recent years. We have thus come to realise that syphilitic aortitis is far more common than was previously suspected, and have learnt to diagnose this condition with greater certainty than was formerly possible. In a review[2] of this subject Dr. Bergel and Dr. Rosenthal of Berlin have summarised modern views on the individual incidence of the various forms of syphilis and upon the all-important question of their curability. Collected statistics which they report from Germany covering approximately 70,000 autopsies show that more than 80 per cent. of the syphilitic patients presented involvement of the vessels, and particularly of the aorta. Most clinicians have noted that aortitis is more frequently present in association with tabes or general paralysis than formerly. Rosenthal as a result of careful investigation has no doubt that both syphilitic aortitis and aneurysm have markedly increased among women as well as among men in recent years. He believes, moreover, that the time interval elapsing between primary infection and the first evidence of aortic involvement has strikingly diminished. The cause for such variations in the character of syphilitic infection is not easy to determine. The suggestion that modern salvarsan treatment has tended to alter the disease in the direction of lessening skin affections and increasing nervous and vascular manifestations is supported by some neurologists, but it is clearly a problem that must depend largely upon the exact nature of the treatment employed, and upon the stage of the disease at which it was begun. The fact that both vascular and nervous lesions are now diagnosed at an earlier stage must also be remembered, though in post-mortem material this consideration does not, of course, arise. Prof. Warthin, in his opening paper at the Manchester meeting, stated that latent active lesions are found in the aorta of *every* male syphilitic and in the majority of female syphilitics. Clinically the diagnosis is far less common than this statement *would suggest. The Wassermann reaction is not* always positive in aortic lesions, nor may the signs and symptoms be at all distinctive. Precordial pain, not necessarily amounting to angina, discomfort or oppression over the sternum, a systolic murmur with a ringing aortic second sound but without a raised blood pressure, and X ray evidence of aortic dilatation are our best guides to diagnosis. In the presence of aortic regurgitation or actual aneurysm the difficulties are naturally less, and most clinicians would agree that the presence of an aortic aneurysm is more certain evidence of syphilitic infection than is a positive W.R. in the blood.

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[1] See THE LANCET, August 24th, p. 402.

[2] Ibid., 1929, i., 391.

[3] Published by Adlard and Son, Ltd., 21, Hart-street, W.C. 1929. Pp. 56. 1s.

[1] See THE LANCET, August 17th, p. 330.

[2] Bergel, S., and Rosenthal, O.: Med. Klin., 1929, vol. xxv., Suppl. 6.

Such high incidence of vascular lesions suggests a reconsideration yet again of the curability of syphilis, and the results of treatment as far as they are apparent to-day. There is general agreement that aortitis itself cannot be completely cured, and there is unfortunately no evidence that arsenical preparations have in any way reduced its incidence or mortality. Warthin remarks *that he has never seen at autopsy a case of* perfectly healed syphilis, and that search always reveals active latent lesions in aorta, heart, or other organ. Bergel concludes that syphilis is probably curable only in the first or sero-negative stage, after which true healing is unlikely; and that even with our present methods, though salvarsan is a most potent remedy, actual cure can never be established with any certainty. Even if recovery does take place, Bergel believes that no lasting immunity is conferred and reinfection may thus occasionally occur. It is clear that if this pessimistic attitude is accepted, our sole hope of treatment must lie in early antisyphilitic measures, which must be instituted in the stage of the disease in which the W.R. is still negative. Even at this time, however, a satisfactory percentage of cures can hardly be expected unless at least two full courses of combined arsenobenzol and mercury or bismuth treatment are administered. Such abortive treatment in good hands gives, according to different authors, complete success in between 76 and 100 per cent. of cases, though to a given patient it is never possible to make an absolutely certain reply to his question "am I permanently cured?" Dr. T. E. Osmond, who reviews in this issue the significance of the W.R. at various stages of the disease, states that a case in which treatment is started at the early primary stage will almost invariably continue to give a negative W.R. if the reaction has been negative for a period of one year. Patients beginning treatment at a late primary or a secondary stage may relapse even after giving a negative reaction for two years. It is clear that, as was emphasised by the openers of the discussion at Manchester, the true treatment of cardiac syphilis must be preventive.

NON-OPERATIVE TREATMENT OF SQUINT.

THE main object in the treatment of commencing squint in young children is, of course, to prevent amblyopia in the squinting eye. In the great majority of children Nature provides a safeguard against squint by the development of the impulse to fuse the slightly different images on the two retinæ so as to produce binocular perception. In certain individuals, however, this power of fusion is weak or develops late, and it may even be altogether absent. These are the children who are likely to develop a squint if other factors in the causation of that condition, such as hypermetropia, are present; if the squint is confined to one eye, and is constant, the tendency is for the child to suppress the image formed by the squinting eye. In young children the eye soon becomes amblyopic in the absence of treatment; when the onset of squint is deferred till the child is older the degree of amblyopia is less pronounced, but the longer it has persisted the more difficult it is to overcome. C. A. Worth found[1] that of 193 cases which were brought to him when the duration of the squint was only one-eighth of the life of the patient he was successful in preventing any degree *of amblyopia in 165. In cases where the duration* had been more than one-eighth but less than one-half of the patient's life, the corresponding cases of complete prevention were 73 out of 188, and in the cases where the patient had squinted for more than half his life the complete cures were only 14 out of 604. Besides occlusion of the non-squinting eye the non-operative treatment of squint consists in the training of binocular vision and of the fusion sense. Hitherto this has generally been attempted by means of stereoscopic views and of the amblyoscope, by means of which the child is encouraged to combine the two images presented separately to the two eyes. In practice, however, it is difficult to keep the child's attention on the pictures, however childish these may be. It is to Dr. E. E. Maddox, the inventor of the "Maddox rod," that we owe a new principle in this sort of treatment. By means of his "cheiroscope"[2] the child's hands, as well as his fellow eye, are made to assist in the development of binocular vision. He can trace the outline of a picture visible *to one eye only with a pencil visible to the other eye* alone, or he can play a game of catching a butterfly visible to one eye alone with a net held in the hand of the other side and directed by the other eye. Such devices in the hands of properly trained guides are without doubt a great advance on previous methods. In certain cases they may even effect a complete cure of incipient squint and forestall the necessity of an operation. We understand that a new department at the Royal Westminster Ophthalmic Hospital is about to be equipped with the new apparatus, so that it will have every opportunity of an efficient trial.

TONSILLECTOMY AND PULMONARY ABSCESS.

TONSILLECTOMY is so common an operation that serious complications, even if they occur only in a small proportion of cases, may be responsible for a large amount of serious ill-health. Perhaps the most usual complication is some form of pulmonary inflammation, and the way in which this is produced has often been studied and discussed. Of two main schools of thought one maintains that infected material is inhaled at the time of operation, and the other that the pulmonary lesions are caused by the lodgment of emboli from the site of operation in the pulmonary vessels. The former theory is the more widely accepted, and finds further support in an investigation published in America by Harkavy.[3] He begins by pointing out that one of the reasons cited in favour of the embolic theory is that it is hard to produce inflammation in the lungs of experimental animals by introducing septic material into the bronchial tree, and then he goes on to describe his own experiments in this direction. Using dogs in which the recurrent laryngeal nerves had first been divided and which were anæsthetised by intraperitoneal injection, he introduced, through a cannula passed down a bronchoscope into the terminal branches of the bronchi, 0·5 c.cm of mixed cultures of bacteria along with fresh sputum, both derived from patients suffering from pulmonary abscess following tonsillectomy. *Five out of 27 dogs so treated developed* pulmonary suppuration. The fact that a patient suffers from chronic tonsillitis indicates that he has a low resistance to the particular organism present, and therefore one would expect his lungs to be abnormally vulnerable to infection by such organisms by whatever route they were introduced. The dogs had no such chronic focus of infection from which organisms might be introduced into their lungs, and their resistance might consequently be expected to be higher. This factor may account for the relatively small incidence of suppuration which followed the experiments. Harkavy has certainly shown that it is possible to produce suppuration in the lungs of dogs by direct inoculation with septic material, but it is hard to see how this knowledge will reduce the incidence of pulmonary complications following tonsillectomy. As it is, every possible precaution is taken by surgeons to prevent the inhalation of septic material during these operations, because they are confident, without the reassurance of experiment, that it is a real source of danger.

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[1] Squint, its Causes, Pathology, and Treatment, 5th edition, 1921.

[2] Made by C. W. Dixey and Son, 10, Old Bond-street, London, W.1.

[3] Harkavy, J.: Arch. Int. Med., 1929, xliii., 767.

HOUSING IN THE IRISH FREE STATE.

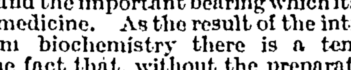
A CENSUS was taken in the Irish Free State in 1926, and that section of the report which deals with the relation of population to housing was published last week. Accepting as the standard of overcrowding the fact of more than two people living in one room, it appears that in the whole country 781,000 persons, or 27·2 per cent. of the population, live in overcrowded conditions. The comparative percentages for Northern Ireland, Scotland, England, and Wales are respectively 18·1, 43·3, 9·8, and 7·2. The Irish Free State is thus shown to be in a better position than Scotland in this respect, but compares unfavourably with Northern Ireland, England, and Wales. The overcrowding in Ireland is worse in the rural areas than in the smaller towns, and among rural areas the worst are those along the western coast, particularly the counties of Donegal, Mayo, and Kerry. It is noteworthy, however, that this overcrowding in the rural areas does not express itself in a higher death-rate. Mayo, for example, with 41·7 per cent. overcrowding has a lower death-rate than the combined 24 best-housed urban districts with an overcrowding of 15·2 per cent. In urban areas there are other influences deleterious to health which more than counterbalance any advantage that may arise from better housing.

EMBOLECTOMY.

To those who cherish the belief that medical practice is international, at any rate on the surgical side, it must come as a surprise to discover that certain operations are frequently practised in some countries while they remain almost unknown in others. The operation of embolectomy illustrates this point. Were it an exceedingly technical and difficult operation, or were there grave reasons for regarding it as undeserving the serious attention of the practitioner, it would be easy to understand why its employment is geographically so patchy. More than 20 years ago Mr. Sampson Handley attempted the removal of an embolus lodged at the bifurcation of the abdominal aorta, and restored for a time the blood current in the femoral artery. He placed the case on record[1] as "one of those pioneer failures on which ultimate success so often rests." His report led Sir Berkeley Moynihan to mention[2] a case under his care at the Leeds Infirmary four years previously, in which an embolus was removed from the popliteal artery and the artery sutured; the patient, who had mitral disease and granular kidneys, died with extensive infarcts five days later. But this work does not seem to have been followed up, and for the most part it has been Scandinavian surgeons at home or in the United States who have taken the lead in this field of surgery. The names of Häggstrom, Key, Lundberg, and Michaëlsson appear in the literature of the subject, and in the public hospitals of Scandinavia this operation has been increasingly performed during the last ten years, the general practitioners in these countries being sufficiently cognisant of the indications for, and prospects of, embolectomy to send their patients to hospital as soon as the correct diagnosis has been made. In *Minnesota Medicine* for May, 1929, the Norwegian surgeon, F. H. Wiese, publishes a case of embolism of the right brachial artery in a woman, aged 64, suffering from heart disease. She awoke one morning with severe pain in the right arm, which was pale, cold, and paralysed. But she was not medically examined till between 6 and 7 P.M., nor was the operation, under local anæsthesia, started until 10.40 P.M., at least 14 hours after the onset of symptoms. Yet the operation was successful, relieving her of severe pain, restoring movement to the arm, and saving her from the gangrene which would eventually have developed, had the operation not been undertaken. Her death seven weeks after the operation from embolism elsewhere in the body, complicated by a three-day attack of pneumonia, emphasises the fairly common observation that this operation is in a certain sense only a palliative. But even then the operation may be justified, as it relieves pain, saves the patient from the much more serious operation of amputation for gangrene, and restores the use of the limb. Dr. Wiese's paper includes a useful summary of the literature.

THE LATE PROF. W. H. PERKIN.

To many doctors the name of Perkin—especially in association with Kipping—will recall little more than a text-book on organic chemistry, which, in their student days, they were compelled, more or less unwillingly, to study. At that early stage of his career the medical student has little time, inclination, or knowledge to grasp the true significance of organic chemistry, and the important bearing which its methods have upon medicine. As the result of the introduction of the term biochemistry there is a tendency to overlook the fact that, without the preparatory work of the pure organic chemist, many of the outstanding achievements of biochemistry would still be in the realm of unsolved problems. The ability to establish the constitution of a complex carbon compound depends upon the skilful application of the methods of organic chemistry, and no sooner has the constitution of a physiologically important natural product been determined—be it hormone or alkaloid or what not—than attempts are made to synthesise it by those same methods. It is in this field of synthetic organic chemistry that the work of Prof. W. H. Perkin, who died last week, has been of such outstanding value. The son of Sir William Perkin, whose discovery of the first aniline dye from coal tar led to the foundation of the modern dye industry, Prof. Perkin was gifted with great technical skill and an amazing facility in overcoming experimental difficulties. He devoted most of his life to elucidating the constitution of some of the most complicated natural products and accomplished synthesis of many of them. At the beginning of his research career he set himself the problem of synthesising compounds containing three, four, or five membered carbon rings—



the possible existence of which was, at that time, scouted by such great organic chemists as Adolf von Bayer—his teacher, Victor Meyer, and Emil Fischer. In spite of this discouragement, which would have been sufficient to make other people hesitate, he persisted, and succeeded in producing such compounds. It would be impossible in small space to give an adequate account of Perkin's contributions to organic chemistry, but a few of his outstanding researches may be recalled, while he originally studied the synthesis of closed carbon chains for its own sake, the methods thus initiated came to be developed and applied to the synthesis of natural products; amongst these, the colourless precursors of the logwood dyes brazilin and hæmatoxylin claimed his attention, and resulted in his assigning to these substances their probable constitution. It is in the group of alkaloids, however, that in recent years he has achieved his greatest success; his work on berberine and cryptopine extended over a number of years, and culminated in the establishment of the constitution of both of these compounds, and in the synthesis of cryptopine. Berberine, as its name implies, occurs in the root bark of the barberry, *Berberis vulgaris*, but is fairly widely distributed in the vegetable kingdom, occurring in plants belonging to the natural orders of Papaveraceæ, Ranunculaceæ, and Rutaceæ among others. Cryptopine, on the other hand, is a much rarer alkaloid, being obtained only from opium, where it occurs in the filtrate remaining after the removal of morphine and thebaine. Two other rather uncommon alkaloids, harmaline and harmine, occurring in the seeds of *Peganum harmala*, which have been used in the treatment of malaria, were also investigated by Perkin, and after showing them to be derived from hydroxytryptophane he succeeded in synthesising both of them. In 1910 he proposed a formula for strychnine which was generally accepted, and placed this compound among the derivatives of quinoline; but last year he put forward a modified formula according to which strychnine becomes a derivative of *iso*quinoline. This derivation would, of course, have a profound influence upon the course to be followed in its synthesis—an object which it was Perkin's great ambition to accomplish. Perkin's charm of manner and natural gift for imparting knowledge to others endeared him to all with whom he came into contact. His relations with his colleagues were always cordial, and he was generous in acknowledging the help he received from them. Fortunately for chemistry in this country he has left behind him a number of his former pupils, who are imbued with his spirit and can be relied upon to carry on his work in a worthy manner.

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[1] Brit. Med. Jour., 1907, ii., 712.
[2] Ibid., p. 826.

VENEREAL DISEASE ON THE CHINA STATION.

VENEREAL disease is a serious matter for the armed forces of the Powers in China, where it attacks at least three or four times as large a proportion of the men as at home. We know relatively little about what happens among troops other than our own, and a paper [1] by Dr. Cazeneuve, on cases of venereal disease among the French in 1927, is therefore instructive. He gives the percentage prevalence of these cases in the French Squadron in China for several years, and to this we have added the similar figures from the Royal Navy, though it may well be that the methods of enumeration are not precisely the same, and the figures not truly comparable. They are as follows :—

—	French Squadron.	British Squadron.	Army at Shanghai.
1900	13·7	18·3	—
1903	12	16·9	—
1907	15·3	18·3	—
1925	12·9	21·2	—
1926	10·7	17·4	—
1927	20·2	13·7	22·3
Number of men in 1927	1551	13,200	8,079

We may add the stated differentiation of cases (not first infections) :—

Soft chancre	0·6	3·5	8·9
Gonorrhœa	8·1	8·4	11·6
Syphilis	2·5	1·8	1·6

Dr. Cazeneuve is concerned about the increase in venereal disease which he has observed during his service in China, and ascribes it primarily to the want of employment for men on leave and to the flooding of Chinese ports with prostitutes. Before 1911, he says, the Chinese kept their women away from the foreigner, but since the Revolution and the emancipation of women, excited young students, with "liberty" on their lips, are much in evidence, whilst the uneducated women of the poorer classes have adopted the new manners, and by reason of famine and poverty crowd into the foreign concessions. Japanese women have left China since 1914, but after the late war the Russians began to come down from Siberia, "many with no resources but their good looks"; they have had no one to take thought for them or look after them, and they it is who are the greatest danger to the sailor. Under these conditions venereal diseases themselves have become clinically more serious—a conclusion which Dr. Cazeneuve reaches because: (1) all three infections often result from a single risk; (2) some of the syphilitic cases are very severe; (3) chronic buboes follow 10 per cent. of the soft chancres; and (4) one-third of the hard chancres appear over the site of a soft chancre, suggesting simultaneous double infection. Much is done in the French Navy, he says, to prevent men from risking infection. Newcomers are warned, in classes of ten, that continence is the only true safeguard, and patients are enlisted as lay preachers in the same cause. Each man must take ashore the "nécessaire de poche" or prophylactic packet, but he is warned that these ointments protect less in China, where the disease is very infectious, than in Europe. Of 140 cases more than half professed they had availed themselves of the usual prophylactics, but of 233 who passed through the ablution chamber on board 75 per cent. escaped infection. Dr. Cazeneuve has great hope from the recreation room opened and the welfare work instituted for French sailors at Shanghai, though infections occur, of course, at other ports. Like many others he notes that the people who get themselves into trouble by indiscipline and carelessness on board are just those most liable to contract venereal disease ashore. What he says of the increase of prostitution in China is no doubt true, and when he says that venereal disease is there more severe than formerly he is in agreement with other writers; but it is to be noted that the time of each case under treatment and the proportional occurrence of all diseases but soft chancre have decreased in the Navy in the last four years reported (1924–27). This is probably due to the measures of welfare work he mentions, and to the accommodation of treatment to the local climatic conditions, but obviously it may be partly the result of special distribution of the ships in the various ports about the station, with a lessening of risk, for which no allowance can be made in the general statistics. That the figures are improving nevertheless raises our hopes that the toll taken by these serious diseases will further decrease, especially when medical officers have had time to study Dr. Cazeneuve's careful appreciation of the local situation.

THE PHYSIOLOGY OF MILK PRODUCTION.

THE National Institute for Research in Dairying has for its chief aim the creation of a healthy industry, and in its early days the Institute at Reading demonstrated the losses occasioned by faulty milk and the methods to prevent these losses. This work has been of value to the Ministries of Health and of Agriculture, providing the former with the means of establishing standards of cleanliness for milk, and the latter with the basis of an educational campaign. Dairymen are now beginning to recognise that a cleaner milk is worth more money and are paying for it on a quality basis. The farmer is thus reaping the benefits to be derived from a healthy industry and the consumer is getting a sounder food-stuff. The same policy has been adopted towards the problem of milk carrying disease, particularly tuberculosis. The Institute has demonstrated the grave losses caused by bovine tuberculosis and has investigated the means by which it is spread in dairy herds, and the need for the more extended use of the tuberculin test. The steadily increasing number of non-reacting herds throughout Great Britain, and especially within a short radius of the Institute, is gratifying evidence of the influence of this work. The annual report [1] of the Institute for 1928, while it recognises all this shows that more is necessary if a complete picture of the reasons for the varying constitution of milk is to be obtained. It has long been known that the proportions of fat and of solids-not-fat in milk of different breeds of cows vary widely, but it has now been shown that the variation is present in the milk of cows of the same breed, even when they are managed under the same conditions. It is probable, too, that the constitution of milk has a profound influence on the type of ripening which takes place in dairy products and may help to explain the differences which are found to occur in the maturing of cheese of the same character in different parts of the country. These considerations led to the study of the detailed constitution of milk, and one of the first discoveries was that in milk fever in cows the calcium balance of the blood is profoundly disturbed and that the administration of calcium has some value. Further work has made it possible to formulate a theory of secretion which will account for the high concentration of calcium in the milk as compared with that found in the blood of the cow. Since then the presence of calcium and its state in milk are of importance alike to the health of cattle and to the manufacture of many dairy products work was continued at the Institute on these lines. By feeding experiments it was shown that the presence of vitamin D increases the percentage of total calcium in milk, and in the laboratory that the relative proportions of diffusible and indiffusible calcium in milk are affected by even moderate heat. The latter observation may be of importance to the industry, since the curdling of milk for cheese is largely dependent on the quantity and state of the calcium which it contains. It may also prove more important to human nutrition than has been suspected hitherto. Many of the observations will hardly be fully explained until a more thorough study has been made of the physiology of milk secretion, and of the influence of the constitution of food-stuffs upon the final composition of milk. The report contains an urgent appeal, supported by many eminent physiologists, for means to set up a department of physiology within the Institute. We wish success to this effort in view of the importance to medicine of the work that is being done there.

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[1] Arch. de Méd. Nav., 1929, cxviii., 43.

[1] Which may be obtained from the Secretary of the Institute, Shinfield, near Reading.

TROPICAL FEVERS OF SHORT DURATION.

ALTHOUGH in prolonged infections the ætiological agents, such as the malaria parasite, the relapsing fever spirochæte, and the micro-organisms of undulant fever and the enteric group are readily isolated or identified, it is by no means always possible to ascertain the cause of fevers of shorter duration. The nature of these *febriculæ* varies considerably in different countries and the differential diagnosis is largely determined by geographical distribution. In fevers such as dengue, phlebotomus, and yellow fever, which may be extremely prevalent in a zone of military operations, the ætiological agent has not yet been recognised, so laboratory aids to diagnosis are confined to the more indirect reactions, such as the cytological response in the blood. A reduction in the total number of leucocytes may characterise all three of these infections, though the minor variations in the character, number, size, and shape of the different types of leucocytes may be actually misleading if too much attention is paid to them. A leucocytosis is found in relapsing fever, amœbic hepatitis, influenza, and less commonly in Weil's disease. The latter presents a special problem, for, although the leptospira may be abundant in the blood stream it cannot usually be demonstrated in a stained blood-film preparation, so that recourse must be had to animal inoculation and the reproduction of a disease with the characteristic pathology in the guinea-pig. Considerable assistance in diagnosis may, however, be obtained from microscopical examination of the centrifuged urine when the leptospira may often be demonstrated even in mild transient cases. Albuminuria occurs in Weil's disease as well as in yellow fever, but in the latter it is usually more intense; yet this well-known feature of differential diagnosis may be wanting in transient attacks of yellow fever unaccompanied by jaundice or the well-known stigmata of the disease, which, judging from the work of Hindle and other recent investigators of the yellow fever virus, probably precede and accompany every widespread epidemic. Serological reactions such as the specific agglutination of the organisms of the enteric group may be greatly delayed, especially in paratyphoid fevers, and no clumping of the organisms may be obtainable till convalescence has been well established. This is found usually in paratyphoid A infections, where the titre of agglutination may not be a high one and may appear only a week or more after the symptoms have subsided. In undulant fever of short duration, of which examples rarely occur, a further difficulty may present itself in what is known as the paradoxical reaction, or the zones of no reaction. Here no agglutination is obtained in low dilutions, but only in titres above 1 : 100, so that unless a suitable range of dilutions is made the diagnosis will certainly be missed. In typhus fever, even in mild and transient cases, the Weil-Felix reaction is of great diagnostic value, though the rationale of this reaction is by no means clear. By some it is held that slight degrees of insolation may produce pyrexia, and we believe this to be possible in susceptible individuals and especially in children. A certain proportion of cases, even in the most ideal conditions, will have to be given the depressing and well-worn label "pyrexia of unknown origin," though it might conveniently be replaced by that of "tropical fever of short duration." It was under this heading that the subject was fully discussed at the Fifth International Congress of Military Medicine and Pharmacy held in London last May. The official report of the Congress has now appeared and contains summaries of communications from medical officers from the Mediterranean stations, the French colonies in Africa, Greece, and Japan. Reports were also submitted by representatives of our own Army, Navy, and Air Force. The outcome of the discussions was, as would have been expected, that the correct classification of these fevers of short duration can only be obtained by due appreciation of the limitation of laboratory tests and the intelligent correlation of the laboratory findings with the clinical aspects of the case.

OUR CHANGE OF ADDRESS.

DURING the first 25 years of its life THE LANCET changed its home four times. For over 80 years, however, it has been published from the building at the corner where Bedford-street joins the Strand. The lease of this building having nearly expired, the proprietors of THE LANCET have acquired the freehold of an 18th-century house at No. 7, Adam-street, Adelphi, to which the offices of the journal will be transferred in the middle of next month. The Editor will be At Home on Wednesday, Oct. 16th at the new premises from 9 P.M. Admission will be by personal invitation, which will be sent if application is made to the Manager before Oct. 5th.

LAST week in the presence of representatives of the State of Hesse, a formal presentation of 4½ million marks, the equivalent of £225,000, was made to Nauheim Spa by an unnamed American in gratitude for her treatment there. The sum of 2 million marks is to go to a fund for endowing scientific work, an account of which will be given in an annual lecture of the Institute for which the remaining 2½ million marks is allocated. The Institute will include four sections: (1) for investigating patients sent to Nauheim under the social insurance scheme; (2) for statistical work into the causes of cardiac disease; (3) for social instruction on the causes and prevention of cardiac disease; (4) for experimental pathology and therapy. The Institute will give all the doctors in practice at the spa the opportunity of research, access to the newest medical literature, and a medical museum as well as a conference hall. The building is to be erected opposite Bath House No. 8, and is to be begun at once. Gratitude could hardly have taken a more beneficent form.

WE regret to announce the death, on Sept. 22nd, after a long illness, of Ernest Edward Glynn, late professor of pathology in the University of Liverpool and honorary pathologist to the Liverpool Royal Infirmary.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLV.

INTERPRETATION OF THE WASSERMANN REACTION IN ADULTS.

PART II.*—POSITIVE, NEGATIVE, AND DOUBTFUL REACTIONS.

Positive Results.

PROVIDED that a satisfactory technique is employed, and the test carried out by a competent pathologist a positive Wassermann reaction (+ + or +) means that the patient is infected with syphilis—recent or remote. The only exception to this rule is "yaws," which also gives a positive W.R. However, since this disease is almost unknown in this country, and very similar to syphilis both in its clinical manifestations and reaction to treatment, whilst the causal organisms are indistinguishable, the exception has little practical significance.

Most text-books give a list, more or less long, of diseases in which the W.R. *may* be positive. Amongst these are included fevers of all kinds, especially typhus, typhoid, and pneumonia; scarlatina, malaria, tuberculosis, Vincent's angina; leprosy, especially the nodular variety; diabetes, nephritis, jaundice, thyroid disease, tumours of various kinds, lead poisoning; various skin diseases, including psoriasis, urticaria, pigmentosa, erythema iris; a number of tropical diseases, including trypanosomiasis, relapsing fever, pellagra, tropical ulcer, and beri-beri. In addition also, positive results have been recorded during pregnancy and general anæsthesia, and in sera from persons in articulo mortis and from cadavers. With the exception of yaws, however, none of these gives a consistently positive W.R. The majority can be excluded either as occurring very rarely in this country or because the differential diagnosis is easy. Scarlet fever has been reported as giving as many as 5 per cent. of positives—but I have personally tested more than 100 in all stages of the disease without obtaining a single positive result. Malaria is said to be particularly likely to give the reaction at the height of the fever; I can only say that this is not my experience, either in this country or in India, though in the latter country I have obtained a number of doubtful reactions when working in very high temperatures where the reagents, particularly the complement, were unsatisfactory and of very low titre. Few diseases have not at some time or other been implicated, but none has stood the test of time; as the technique of the W.R. has been improved so gradually the list has tended to shorten. Where a positive result is obtained and confirmed by retesting in any of the above, it will nearly always be found that syphilis is present as well if a careful investigation is made into the history and clinical side of the case.

Skin diseases are the ones which tend to cause most difficulty because of their resemblance to syphilis; of the three mentioned psoriasis has given a number of border-line reactions in my hands, but I have no special experience of the other two; in most cases there should be little difficulty, because if the lesion is syphilitic the blood will almost certainly show the strongest positive reactions, whereas non-syphilitic lesions are not likely to give more than a very weak positive result. In such cases the therapeutic test may be employed; a few injections of arsenic will nearly always clear up a syphilitic skin lesion; those due to other causes will not be benefited. This procedure should only be adopted in the last resort, and by none but experienced workers. In this connexion it is well to point out that, with the exceptions stated, a positive W.R. means syphilis; but it does *not* mean that all the patient's signs and symptoms are due to syphilis. A syphilitic patient may suffer from other diseases, and failure to afford full recognition of this fact has tended to bring both the W.R. and antisyphilitic remedies into disrepute.

Another possible explanation of a "false" positive result is an error in technique. Even the most careful and experienced pathologist may make a mistake, particularly in so complicated a reaction as the Wassermann. Moreover, confusion of specimens may occasionally occur in the best managed laboratories. J. A. Kolmer[1] states that minute amounts of acid or alkali present in the tubes or pipettes used may be the cause of a false positive, owing to their effect on complement. Over a long series of tests the occurrence of false positives should not exceed 0·2 per cent. Kolmer gives his incidence as less than 0·1 per cent. During the last nine years I have tested an average of 8000 tests annually, and I have found less than one false positive in 800 tests.

For the above and other obvious reasons it is evident that no case should be labelled syphilis on the strength of a single isolated positive W.R. where the history and clinical signs are against such a diagnosis. The test should be repeated—preferably on another specimen—and if still positive should, if possible, be confirmed by one or more of the various flocculation tests, such as the Kahn or Sigma.

Negative Reactions.

A negative reaction—especially an isolated one—does not absolutely exclude syphilis, especially where the history or physical signs point to a diagnosis of this disease. Early syphilis, before antibody has had time to be formed, treated syphilis, and the congenital variety in adults may be expected to give a negative result. Alcohol has been stated by C. F. Craig to convert, temporarily, a positive reaction to negative; but in an experience of nearly 100,000 tests I have never met this. Kolmer states that it is not his experience. Pregnancy is also stated to be the cause of occasional false negative reactions.

Another important point in this connexion is the almost daily variation in the antibody response to syphilitic infection: the fluctuating W.R.—on one occasion positive, and on another negative—is now recognised by most workers. This and other considerations demand that a negative reaction should be obtained on at least two occasions before excluding syphilis. Two or more negative reactions may be expected to exclude *active* syphilis in at least 90 per cent. of cases. Where an unexpected negative reaction is given, a provocative dose of arsenobenzol may be given as described below, and one or more of the flocculation tests carried out.

Doubtful Reactions.

A doubtful or "border-line" reaction, variously recorded as weak positive, weak negative, ±, is not sufficient alone to establish a diagnosis of syphilis, but may usually be taken as an indication for a further investigation of the case, both clinical and pathological. It frequently occurs in the early primary stage—e.g., a few days after the appearance of a primary sore; fortunately it is usually possible to clinch the diagnosis in such a case by finding the

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* Part I., on Indications, Methods, and Notation, appeared last week.

[1] Serum Diagnosis by Complement Fixation, Baillière, Tindall and Cox, 1929.

Tp. pallidum either in the sore or in a neighbouring lymphatic gland. On the other hand, when such a reaction is given by the serum of a syphilitic patient who is having, or has had, treatment it is an indication for further treatment.

Where the diagnosis is in doubt, the test should be repeated, preferably after a "provocative" injection of arsenobenzol—e.g., 0·3–0·45 g. neosalvarsan given intravenously. The blood should be taken for retesting 2, 7, 13, and 21 days later; if only one retest is possible, the seventh day after the injection should be chosen. It is quite common to find that the provocative injection will convert a negative or ± reaction into a frank positive in a case of syphilis. This is probably intimately connected with the well-known Jarisch-Herxheimer reaction (a temporary exacerbation of the symptoms), which is said to be due to the destruction of spirochætes and liberation of their toxins. In any case, and more especially when the patient is under treatment for syphilis, it is well to confirm (or otherwise) a doubtful reaction with one or more of the flocculation tests. These reactions are for the most part more sensitive in treated cases than the W.R.

The following table gives the percentages of positive results found in the various stages of syphilis. It refers only to untreated cases, since the amount of treatment and the time elapsed since it was discontinued will vary, and the results would be of little value unless particulars were given in every case. The figures are the mean of those of a number of workers, including Kolmer, Craig,[2] L. W. Harrison,[3] and others.

—	Days after appearance of sore.	Per cent. positive.	—	Per cent. positive.
Primary S.	5–14	44	Tertiary S	80–97
	10–14	75	Latent S.	64–80
	21–28	82	Tabes	70–90
	28–42	94	G.P.I.	100
Secondary S.	—	98–100	C.S.S.	60–75

C.S.S. = Cerebro-spinal syphilis.

It is quite clear that in the very early stage of syphilis a large proportion of negative Wassermann reactions is to be expected, but none the less it is important that the reaction should be carried out *in every case* before commencing treatment, because the prognosis is so much better in a Wassermann-negative than in a Wassermann-positive case; it is as well to repeat the test a few days after the first or second injection of arsenobenzol, since these may convert a negative to a positive reaction (provocative effect). A negative W.R. in the presence of active syphilis is not unlikely to occur in pregnant women and in the vascular types of the disease, but in any stage of the disease a negative W.R. may be met with and the reaction should always be repeated in face of evident signs of the disease.

Effect of Treatment.

L. W. Harrison says: "There is no doubt that the Wassermann test, in conjunction with clinical signs, is a far better guide to the immediate effect of treatment than clinical signs alone." In the large majority of cases treatment may be expected to convert a positive W.R. to negative; generally speaking, when the treatment is begun in the early stages of the disease the W.R. usually becomes negative rapidly. Conversely, when the disease has existed for a number of years—e.g., in tertiary syphilis—very prolonged and energetic treatment is usually required. In primary syphilis the W.R. usually disappears in three weeks, and in nearly 90 per cent. of cases in six weeks; in secondary syphilis it is common to find the W.R. negative by the end of the first course (say 12 weeks). In later syphilis much more time and treatment are usually required, depending on a number of factors.

When the reaction has been converted to negative, it is of the utmost importance not to discontinue treatment but to follow up within a few weeks, because it is a common observation that a W.R. which relapses is extremely difficult to convert to negative again. The amount of treatment required must be determined individually for every case, but it is usually found that at least one course of treatment (say ten weekly injections of arsenobenzol and bismuth or mercury) is necessary after the W.R. has become negative. The sooner the W.R. becomes negative the better the ultimate prognosis, but it cannot be too strongly urged that a single negative W.R. must never be accepted as proof of cure of the disease. A ± or doubtful reaction occurring during treatment may usually be regarded as positive—that is to say, it means that more treatment is required; it should never be disregarded.

A Quantitative Test.

In order to observe closely the effect of treatment some form of quantitative test is desirable. Where at the end of a course of treatment the W.R. is reported as still + + (strongly positive), the clinician is in the dark as to what effect his treatment has had. For this purpose I have in the past tested out a series of dilutions of the patient's serum—e.g., 1/10, 1/15, 1/20, and so on, to 1/100—1/5 being the dilution ordinarily employed. In this way an end-point can always be reached. When a serum is reported as positive at 1/100 before treatment, positive at 1/50 after one course, and positive at 1/20 after a second course (though in each case the routine report would be "strongly positive"), both doctor and patient will be encouraged to continue with treatment. An even more satisfactory way of arriving at the same result is to have recourse to the Sigma test, which records results in units; thus under treatment a case of tertiary syphilis may fall from 20 units to 7·5 in three months, and in six months to 2·5 (1·5 units or more are considered positive for diagnosis, and 1·0 or more for test of cure). A quantitative test is not a necessity, but it is often of value in estimating the effect of treatment and in persuading the patient to persist in a treatment which may be long and irksome.

Effect of Different Drugs.

The drugs which have most effect on the W.R. are arsenobenzol (in its various forms), bismuth, and mercury (given by inunction or injection) in that order. Mercury by the mouth has little if any effect—and I believe the iodides have none. By this I do not mean that mercury or iodide should not be given by the mouth, but that they have no direct effect on the W.R.

Test of Cure.

In order to establish presumptive cure the W.R. should be consistently negative over a period of *at least* two years following cessation of treatment. It is usual to test the blood at the conclusion of treatment, and thereafter every three months during the first year, and six-monthly during the second year. The tests at the end of each year should be preceded by a provocative injection, and the last test should be accompanied by an examination of the cerebrospinal fluid. Experience has shown that an early primary case which remains negative for a year will almost invariably continue negative. A late primary or a secondary may relapse even after being negative for two years. If a patient has relapsed after a given amount of treatment or has not commenced treatment till a later stage than those mentioned above, no guarantee can be given that the reaction will not return if treatment is suspended for any considerable length of time.

What is of importance is that if a given patient is going to relapse he will usually relapse serologically before he does so clinically. Hence the value of repeated blood tests.

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[2] Craig, C. F.: The Wassermann Test, Henry Kimpton, 1921.

[3] The Diagnosis and Treatment of Venereal Diseases in General Practice. Third edition. 1926. Oxford University Press.

Persistent Positive W.R.

Not infrequently a patient will continue to give a positive W.R. after repeated courses of treatment, and the question arises will it *ever* be possible to convert the W.R. to negative? May not the patient be already cured? It is my firm opinion that a strongly positive W.R. means that *living spirochætes* are lodged somewhere in the patient's tissues. If quantitative tests of some kind are carried out it will usually be found that there is a slow but progressive fall in the strength of the reaction, so that if treatment is persisted in a negative result will generally be obtained in the long run. Kolmer says: "I have seen so many relapses follow the cessation of specific medication among those tired of the 'tyranny' of persistently positive reactions . . . that I believe a very heavy responsibility rests upon any physician . . . who deliberately ignores them in the treatment of the disease." Such patients require continued observation and periodic courses of treatment, even, in some cases, for the remainder of their lives.

The Influence of Pregnancy.

It has often been stated that false positives occur in pregnancy, but this is not my experience. Kolmer states that the opposite holds, and that pregnancy may be the cause of false negatives; and this also applies to the lactation period. A single negative, therefore, should not be trusted. A syphilitic mother with a negative W.R. may produce a syphilitic child.

Congenital syphilis in children has already been dealt with in this series of articles,[4] but it should be pointed out here that the W.R. *tends to die out* as they grow up, so that adolescents and young adults may show a negative reaction. Kolmer states that in young adults with latent syphilis 40 per cent. of positives may be expected, whilst those with skeletal lesions will give 70 per cent. of positives. He also states that 80 per cent. of the fathers and 60 to 90 per cent. of the mothers of syphilitic children give positive reactions. There can be little doubt that the mother of a syphilitic child is herself nearly always syphilitic, even though she may be apparently healthy. Both parents of a syphilitic child should always have their bloods tested.

Examination of Cerebro-spinal Fluid.[5]

The technique of collecting a specimen is hardly within the scope of this article. Like many other procedures, it is easy for those who are accustomed to do it, but often difficult for the uninitiated. It is not an operation to be undertaken lightly on account of the somewhat severe headache which may follow withdrawal of the fluid; moreover, it is not always convenient for the patient to keep his bed for at least two days as he should. On the other hand it should never be shirked where there are clear indications for its performance.

The special indications for testing the cerebro-spinal fluid are: (1) test of cure; (2) any suspicion of involvement of the central nervous system; (3) a persistently positive W.R. in the blood.

About 5 c.cm. is a convenient quantity to draw off and this should be clear and free from blood. The cerebro-spinal fluid usually contains much less Wassermann-reacting substance than the serum and therefore the W.R. is carried *out in rather a different* way. *Varying amounts of the fluid* are tested with fixed amounts of the other reagents, and the results are returned as 4, 3, 2, or 1, plus and negative. Four, three, and two plus are considered definitely positive, one plus as doubtful. It does not seem to be generally known that changes occur in the cerebro-spinal fluid not uncommonly in the early stages of syphilis. O. H. Mills, at Rochester Row, found changes in the fluids of 47 per cent. of secondary cases. It should also be remembered that a patient may have a positive cerebro-spinal fluid with a negative blood. Kolmer gives the following table of incidence in the various stages of syphilis:—

	Positive W.R. per cent. in C.S.F.
Late primary and secondary	30–40
Asymptomatic, early, untreated	30–40
„ late, ...	80–90
Tabes	90
Paresis	100
Cerebro-spinal syphilis	96–100

It is not suggested that it is necessary or even desirable to examine the cerebro-spinal fluid of every case of early syphilis, but the frequency with which the nervous system is involved is of interest. Under the influence of treatment the early cases quickly show a negative reaction; syphilis of the supporting structures is also fairly amenable to treatment. Tabes often *shows considerable weakening of the reaction,* but G.P.I. is most intractable except in the most favourable cases under the influence of malaria therapy combined with arsenobenzol.

A positive W.R. in the cerebro-spinal fluid is even more specific than in the serum, though there are often no changes in the fluid in cases of syphilitic arteritis of the cerebral vessels. Moreover, the W.R. is far superior in sensitiveness and specificity to most, if not all of the flocculation reactions.

It is customary to perform three other types of test on the cerebro-spinal fluid, since these help to confirm the W.R.

(1) Estimation of the number of cells, which are usually small lymphocytes. Less than 5 per c.mm. may be considered normal, 5 to 10 doubtful, and more than 10 positive.

(2) *Globulin* cannot be demonstrated in a normal fluid. Excess is commonly present in syphilis of the central nervous system, though it should be pointed out that excess neither of lymphocytes nor of globulin proves that the pathological process is syphilitic.

(3) *Colloidal reactions*, such as the Lange gold-sol, benzoin, and mastic reactions. Various curves are used to record the results of these, the most diagnostic being that attributed to G.P.I., in which there is precipitation of the colloid with the lower dilutions of the fluid, tailing off gradually to none with the higher dilutions. Tabetic and luetic curves are also described.

A negative fluid should be negative to all three of these types of test, as well as to the W.R., since these reactions tend to run parallel, though some react to treatment more readily than others.

Summary.

(1) The Wassermann reaction is highly complicated. Choose a sound technique, a reliable pathologist, and a good laboratory. For purposes of comparing results at various stages in the treatment it is better to keep to the same pathologist and the same technique.

(2) See that the specimen is ample in amount and of good quality.

(3) Give the pathologist all the information which may be helpful and ask for his opinion on the interpretation of the result.

(4) A positive result nearly always means syphilis. If there is a doubt it should be repeated and confirmed.

(5) One negative result does not exclude syphilis; two or more usually do.

(6) Mistrust "weak positives" and "doubtfuls" where the diagnosis is in question.

(7) When treating a case of syphilis have the blood tested frequently—a serological relapse precedes a clinical one.

(8) To establish a cure time is just as important as negative Wassermann reactions.

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[4] Nabarro, D. N.: THE LANCET, 1929, i., 90.

[5] This subject has been dealt with in detail in this series by Dr. J. G. Greenfield: THE LANCET, 1928, ii., 716.

either by training or experience, to be given complete freedom in the use of such drugs.

When a midwife has ceased to practise for a considerable period and desires to resume midwifery work, or where a midwife although in practice has attended an insufficient number of cases to remain efficient, the local supervising authority should be empowered to represent these facts to the Central Midwives Board, in order that the Board may determine whether the midwife should be required to undergo post-certificate instruction.

The local supervising authority should have power n cases of this nature to suspend the midwife from practice, pending the promulgation of the Board's decision.

Section E of the rules of the Central Midwives Board, whether or not retained in its position of statutory authority, requires to be revised and rearranged.

Administration.

Supervision of Midwives.—There is a lack of uniformity in the arrangements adopted by local supervising authorities for the supervision of midwives, due to the absence of any standard qualification for inspectors of midwives, and the following changes are desirable :—

Medical Inspectors.—(*a*) Wherever possible, every new appointment to the post of chief inspector of midwives should be given to a medical officer who has had actual experience of obstetric practice and who is engaged on other work of a similar nature—e.g., as an assistant medical officer for maternity and child welfare.

Non-medical Inspectors.—(*b*) Subordinate positions for routine inspections should be filled, when vacancies arise, by midwives who are trained nurses and have had long experience in the actual practice of midwifery. It would be in the interests of midwives if the Minister of Health were given power to prescribe the qualifications that should be held by inspectors of this class.

Midwives should have ready access to the medical inspector. The employment of health visitors with little or no practical experience of midwifery for the inspection of midwives is to be deprecated.

The dual routine inspection of particular midwives who practise in the area of more than one local supervising authority is highly objectionable.

Central Midwives Board.

This Board has dealt with the intricate problems confronting it with good judgment, but certain alterations in its powers and duties are desirable.

The present system of discipline under which midwives are punished for failure to comply with the rules prescribed by the Central Midwives Board, in view of the improved status of the profession, be altered on the lines indicated below :—

(*a*) The Board should be given general power (1) to suspend, or when necessary to erase from the roll the name of any midwife found guilty of a felony, misdemeanour, or offence which, in the Board's opinion, renders her unfit to practise ; and (2) to caution, suspend, or remove from the roll a midwife who, after due inquiry, is judged by the Board to have been guilty of conduct in any professional respect which makes her unfit to pursue her calling, or of a midwife who carries on her work in such a way as to endanger the health or life of the mother or child. (*b*) If the Board were given these powers the existing rules which regulate, supervise, and restrict the practice of midwives could be relegated from their present position of definite statutory authority and penal significance to a less commanding, but still important place. To this end the Board might issue to every midwife practising in England and Wales warning notices or instructions.

It would be an advantage if the Board were to appoint an independent legal assessor whose opinion would be available at penal proceedings.

Power should be conferred on the Board to subpœna witnesses and to require evidence on oath and the production of documents.

Where a local supervising authority represents a prima facie case of negligence, malpractice, or misconduct to the Board, the prosecution of the charge should rest solely with the authority ; it should be competent for any other interested body or individual complainant to bring a case before the Board in the same way. In a residuum of cases the Board must take action on its own initiative.

Existing arrangements for the approval and inspection of training institutions and teachers by the Central Midwives Board are unsatisfactory by reason of their extremely limited scope. The whole of this work should be placed in the hands of the Minister of Health, on whose behalf the majority of the institutions recognised as training schools by the Board are at present inspected by officers of his department, either in connexion with grants in aid of midwifery services or the training of midwives, or as part of the routine inspections of poor-law institutions. An advisory committee, consisting of persons appointed by the Minister of Health on the nomination of representative bodies (including the Central Midwives Board) should be formed to advise the Minister regarding matters coming within the scope of his inspecting and approving duties.

The duty of formulating the course and length of training should also pass from the Central Midwives Board to the Minister of Health.

In order to keep the work connected with the examining of pupil midwives apart, both in personnel and association, from the judicial functions of the Board, an examinations board should be appointed which should be directly answerable to the Central Midwives Board for the conduct of its duties. It would be of great advantage for the advisory committee to the Minister of Health to be represented on the examinations board.

If effect is given to these recommendations the functions of the Board, besides keeping the roll of midwives, would be mainly disciplinary, and it would then be possible and advantageous to constitute the Board with a small compact membership.

Members of the Board might serve for a period of five years and be eligible for re-election or renomination as the case may be.

Provision should be made to secure the payment to members of the Board of a specific fee for attendance at meetings.

Sundry Recommendations.

The scale prescribed for the payment of the *fee of a doctor* called in by a midwife in a case of emergency should be reconsidered by the Minister of Health in consultation with the local supervising authorities and the British Medical Association.

The time limit of two months imposed for the presentation of a doctor's account to the local supervising authority should be extended to three months.

The attempts which have been made by law to prevent the *practice as midwives of uncertified women* have largely failed in their object, and it would seem that the remedy for this abuse can best be found in the application of a State maternity scheme.

It is highly important that the nursing of women during the puerperium should, in general, be carried out by a certified midwife. The practice followed by certain hospitals of training women as maternity nurses is open to objection, and should cease as soon as possible.

The duties of a *home help* should be strictly limited to the ordering and care of the household as usually carried out by the mother herself. Nursing duties do not come within her province.

Use of Anæsthetics in Confinement.—It would be in the public interest if some professional body would take upon itself the responsibility for issuing at an early date some pronouncement as to the advisability and place in labour not only of anæsthetics, but also of analgesic and sedative drugs generally.

RESERVATIONS.

Dr. J. S. Fairbairn and Mrs. Bruce Richmond express assent to the report with the exception of certain recommendations concerning the Central Midwives Board. The points in which they dissociate themselves concern those recommendations that involve the splitting up of the functions hitherto assigned to the Midwives Board and their distribution between a reduced Board, the Ministry of Health, and an advisory committee. In their opinion the suggested changes are in no way essential to the midwifery service outlined in the report, and, if carried into effect, would be detrimental. The reasons which have led Dr. Fairbairn and Mrs. Richmond to make these reservations are set out on pp. 84 to 88 of the report. Their arguments are closely reasoned, and should be consulted. Among the points they make is that no evidence to justify the drastic changes contemplated was put before the committee. The proposal to effect them was submitted by the London County Council at a late stage, and there was no opportunity of testing the suggestions by reference to the bodies most affected by the proposed changes. Dr. Fairbairn and Mrs. Richmond would have welcomed a recommendation that the Central Midwives Board should exercise a wider and more general inspection than it has done, especially if poor-law institutions were included, and would have preferred the employment by the Board to a further degree of obstetric teachers of recognised standing, rather than the institution of a whole-time inspectorate.

"Dual inspection" appears to them to be a bogy that loses its terrors when closely examined. Not only do the reasons set out in the report fail to convince them of any advantage to be gained by the transference of the powers of approval to the Minister of Health, but the experience of the Central Midwives Board has shown that a similar transference in the past proved unsatisfactory and was given up. Training in all poor-law hospitals was removed from the purview of the Midwives Board at an early stage in its history. When the supervision of poor-law institutions was resumed by the Midwives Board in 1924, a large number were struck off the approved list because they were wholly unfitted to be training schools, and fell far short of the standard required of non-poor-law institutions.

In view of the considerable number of municipal and other maternity hospitals under the local health authorities—a number to be vastly increased shortly—and in view of the close relationship of the Ministry to these authorities, Dr. Fairbairn and Mrs. Richmond urge that an outside and independent body like the Midwives Board should have the decision as to their efficiency as training schools. They hold that this proposal to break up work that has been welded into a compact whole, and the distribution of its parts between an attenuated Midwives Board and a department of the Ministry of Health, with an advisory committee at its back, makes a dual control that is not likely to draw women into a profession already groaning under a weight of official supervision.

The midwives should have control over their profession at least equivalent to that exercised by registered nurses over theirs; a gradual increase in the elected representatives should be the aim, so that both, with some outside help from the medical profession and others, may ultimately be able, as other professions are, to determine conditions of training and entry and to maintain their own professional standards.

ROYAL WATERLOO HOSPITAL.—For the convenience of women and girls employed during the day, this hospital for children and women, in Waterloo-road, S.E., will from Oct. 2nd open its out-patient department every Wednesday evening.

BURY INFIRMARY.—Prof. A. H. Burgess, on Sept. 21st, opened an extension of the Bury Infirmary. This year it celebrates its centenary, having been founded in 1829 as a dispensary for the care of the "sick and injured poor." A bequest of about £66,000 from the estate of Colonel John C. Barlow has made extension of buildings and equipment possible. A sum of £30,000 is still required for endowment, and of this £17,000 has already been raised. Besides ordinary beds, 11 private nursing rooms in which patients of limited means can be accommodated and treated have been provided. These rooms are all provided with a light signalling device, which replaces the bell. The charge for these rooms is 6 guineas a week. There is also a ward with 10 beds for maternity cases. The new general ward for women has 22 beds. The extensions have increased the beds from 123 to 170, and a corresponding addition is required for the nursing staff, to be met by a new nurses' home for about 60 nurses.

THE FOSSIL MAN OF PEKING.

By Sir ARTHUR KEITH, M.D., F.R.S.,
CONSERVATOR OF THE HUNTERIAN MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

IT is possible that many readers of THE LANCET may be in two minds as to the most recent addition to the Gallery of Ancient Man: is "Peking Man" a genuine antique or is it, as has so often happened before, merely a cobwebbed modern replica?

Thanks to the generosity of Prof. Davidson Black, of Peking Union Medical College, I have had exceptional opportunities not only of following the steps which led to the discovery of Peking Man, but also of examining all the documents relating to his authority, and I can assure my readers that they may take Prof. Davidson Black's announcement at its full face value. Without doubt the portrait just discovered is one of the most valuable ever added to the portrait gallery of our fossil ancestry. It takes a place with four others — Pithecanthropus, discovered in Java; Piltdown Man (Eoanthropus), discovered in England; Heidelberg Man (Palæoanthropus), discovered in Germany; and Rhodesian Man, discovered in Africa. In one sense it is more important than any of those just named, because Peking Man reveals affinities to modern (neanthropic) man more than the others do, and has a better claim than they have to a place on the evolutionary line of descent which has culminated in man of the modern type.

A Genuine Antique.

That we have obtained a "genuine antique" there can be no doubt: the age at which Peking Man lived was fixed before his actual remains were found; the cave deposits in which his bones lay contain an abundance of fossil animal bones; these date the cave strata as early pleistocene, which on the most moderate of reckonings indicate an antiquity of at least a quarter of million years. Of true mankind at this stage of the world's history we had obtained but two glimpses—both in Western Europe. It is true we had a revelation of very ancient humanity in Java, but the early history of man in that vast region of the old world, which stretches from Western Europe to the furthest end of Asia, remained buried in darkness until Prof. Davidson Black made his first announcement in 1927. We now know what sort of beings lived in distant Asia in early pleistocene time. The characters of this ancient fossil form suggest that it is in Asia we are to find the evolutionary cradle of the European type. We have long wondered where the Cromagnons and other neanthropic peoples who invaded Europe and extinguished its Neanderthal natives came from. The Peking discovery points to Asia as the homeland of our palæolithic ancestors.

Let me outline the course of events which led up to the discovery of the Peking Man—Sinanthropus he has been happily named by Prof. Davidson Black. So long ago as 1903, Prof. Max Schlosser described a fossil tooth from Peking; he could not make up his mind whether it was that of a man or of an anthropoid—so blended in it were both sets of characters. This tooth was part of the stock of a Chinese apothecary, and would have, in the ordinary course of events, been ground to form medicine. In China they unwittingly consume the bones of pleistocene ancestors as medicine; in England we sometimes use them as road metal! Prof. Schlosser's publication simply drew attention to China as a possible home of ancient man; nothing more. The next step was taken in 1920. In that year Dr. J. G. Andersson, a Swedish geologist attached to the Government Survey of China, found himself among the hills to the south-west of Peking, and there at a place named Chou Kou Tien—only 25 miles from the capital—he observed an extensive cave deposit rich in animal remains. He wished to discover the nature and age of the contained fauna. An extensive collection of fossil bones was made, and early in 1926 Dr. O. Zdansky, a German palæontologist, was sent to Sweden with the collection to examine and identify its various fossil items in the laboratory of Prof. Wiman, of Upsala. While so engaged, in the summer of 1926, Dr. Zdansky came across two fossil human teeth—a lower premolar, an upper third (wisdom) molar. When news of Dr. Zdansky's discovery reached Peking, the Geological Survey of China, under an enlightened directorate, and the Peking Union Medical College, under the enthusiastic leadership of Prof. Davidson Black and the financial backing of the Rockefeller Foundation, placed an exploring company in the field early in the summer of 1927. A season's exploration ended on Oct. 16th, by Dr. Burger Bohlin finding, in the matrix of the deposit, a hard travertine rock—the unworn crown of a lower molar tooth—that of a child aged about seven years.

Characters of a New Genus.

That small specimen was all that was found of the ancient cave-dwellers during the first season's exploration. For Prof. Davidson Black it was sufficient. Those who know teeth recognise in them what ordinary men find in a human face—a multiplicity of features which provide sure guidance to racial identification. Prof. Davidson Black found features on this isolated unworn molar which had never before been seen in the molars of men, ancient or modern. Anthropoid and human features were blended; on the strength of this one tooth he created a new genus of humanity, naming it Sinanthropus, the local Peking representative becoming *Sinanthropus pekinensis.*

To those unfamiliar with dental anatomy this precipitate act of christening may seem both audacious and premature. But the anatomist's sagacity was justified by subsequent events. In the summer of 1928 an expedition again took the field, and an arduous season's work was crowned by the discovery of the following fossil parts: (1) Several large fragments of the cranial wall; these proved that Sinanthropus, like Piltdown Man, had already attained a human size of brain—a brain as large as is given to the lower living races of mankind. In the words of Prof. Davidson Black, "Sinanthropus was a large-brained form." (2) Almost the whole of the right body of a lower jaw—all save the part which supports the lower incisors. (3) The greater part of the lower jaw—including the chin region—of a child aged 7 or 8 years. (3) About 24 isolated teeth.

In the Direct Line of Human Descent.

Many of these fossil parts have still to be extracted from the rock-matrix, but enough has been exposed to justify all the inferences drawn by the anatomist from the single molar. In their actual dimensions and in their arrangement in the jaw, the teeth of Sinanthropus are not materially different from those of an Australian aborigine. The total molar length is 34 mm.—an extent often reached in the dental series of living races. The canine teeth are in no wise ape-like, as were those of Piltdown Man; as in the Heidelberg jaw, they have sunk to the level of their neighbours. Yet in the molar teeth simian features are apparent; some are also to be seen in the details of structure of the cusps and crown. A minute study of the cusps reveals to my eye certain changes which in their nature are identical with those to be observed in the molar teeth of neanthropic man. In spite of their simian features and individual peculiarities the molars of Sinanthropus make a nearer approach to those of modern man than do the teeth of any of other ancient type.

The bony framework of the lower jaw reveals stages in the passage from an anthropoid to a human form. The simian shelf is disappearing; the first rudiment of the true chin has appeared. We see the separation and differentiation of the two elements of the lower jaw—the alveolar element, which is concerned in the support of the teeth, and the basal bony framework, which supports the alveolar bone and gives attachment to muscles. In the ape the alveolar bone predominates and masks the basal element; in modern man the alveolar element has become reduced, thus exposing the enlarged basal framework on which the shelf of the chin is set. In the crudely fashioned mandible of Sinanthropus we have a transitional stage—one in which basal framework and chin are attaining a separate differentiation. The dental canal of Sinanthropus is altogether remarkable; it is very wide, particularly in front, and its walls are clearly differentiated as in the mandibles of anthropoids and as in that of Piltdown Man. As usually occurs in the lower jaw of anthropoid apes, the mental nerves escape by four foramina.

One Outstanding Feature.

Altogether the characters of Sinanthropus are such as we expect to find in an ancestral stage in the evolution of modern man. Only one feature makes me hesitate in placing him on the line of our ancestry. That is the large size of the pulp cavities of the molar teeth. Sinanthropus shows a considerable degree of that enlargement of the body of the molar teeth and of the contained pulp, known as taurodontism—about the same degree as is seen in the ancestral stage of Neanderthal man revealed by the Heidelberg jaw. Taurodontism reached its climax in the later forms of Neanderthal man. The molar teeth of modern man are not taurodont; they are the opposite; like those of anthropoid apes, they are "cynodont." The bodies of the teeth of modern man are low, and the pulp cavities are shallow. Prof. Davidson Black recognises the taurodont nature of the sinanthropic molars, and inclines to the opinion that taurodontism is a mark of early humanity. I cannot share this opinion; to me taurodontism is a form of dental degeneration. I cannot conceive that once this taurodont change had set in the process could have been reversed and cynodontism regained. Hence my difficulty regarding the position of Sinanthropus in the human family tree. I would place him right in a central position at the base of the branch which has given birth to modern races were it not for this feature of his molar teeth. If he is not to be given a position in the direct line of our descent, we must, to account for such characters as we now know he possessed, at least place him at the pleistocene root of the modern branch, and very nearly on the direct line of neanthropic descent.

The Peking discovery reflects credit on all concerned—on Prof. Davidson Black, Dr. J. G. Andersson, Dr. O. Zdansky, and Dr. B. Bohlin. Especially must we recognise the enlightened enthusiasm which brought to their aid the Geological Survey of China, the Peking Union Medical College, and the Rockefeller Foundation.

DONATIONS AND BEQUESTS.—Mr. J. R. Macfie, Glasgow, left £500 each to the Royal Cancer Hospital, and the Association for the Relief of Incurables in Glasgow and the West of Scotland.—Among other bequests the late Dame Edith Jane Durning-Lawrence left her library ultimately to the University of London and £10,000 to University College, with the request that this bequest should be applied in connexion with the equipment of the Physical and Electrical Chemistry Laboratory at that College, but if such be already completed, then for the endowment fund, of which the income should be used in connexion with research in medical sciences in the said College and its research laboratories; £10,000 to the University of London for the endowment of a professorship or chair at University College for the teaching of medicine according to the principles laid down by Hahnemann, the first occupant of such chair to be Dr. John Weir, if he should be willing to accept such office. If, however, the University does not accept this bequest, it is to revert to the British Homœopathic Association (Incorporated); £10,000 to the Victoria University, Manchester, for a John Benjamin Smith Fund as a memorial of her late father; £10,000 to the University of Liverpool for a Durning-Lawrence Memorial; £8000 to the London Homœopathic Hospital, Great Ormond-street, W.C.; £5000 each to the London Hospital and King Edward's Hospital Fund for London; £4000 to the Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.; £1000 to King Edward VII. Hospital, Windsor; and £200 to the Royal Victoria Nursing Home, South Ascot.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1929.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone, wherever resident, who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register. There may be some who have answered while this list is in the press. Those marked "(S)" should communicate direct with the Registrar of the Scottish Branch Council, 12, Queen-street, Edinburgh.

Abdel-Khalik, Ahmed K., M.R.C.S., 1925(E).
Allen, Charles P., M.B., 1926(E).
Armstrong, George R., L.K.Q.C.P., 1870(I).
Ashkenny, Roy F., L.M.S.S.A., 1925(E).
Atkinson-Fleming, Frederick C., *M.C.*, M.B., 1914(I).
Attale, Errol E. E., L.M.S.S.A., 1923(E).
Avetoom, Sarkies T., L.R.C.P.S., 1879(S).

Bailey, William H., L.S.A., 1884(E).
Barclay, Ruth M. C., M.B., 1927(Col).
Begg, Alexander C., *O.B.E.*, M.B., 1901(S).
Bickerton, John M., M.B., 1903(E).
Blackmore, William T. E., M.R.C.S., 1925(E).
Braham, George N., *M.C.*, L.R.C.P.S., 1909(S).
Bogan, James H., L.R.C.S., 1868(I).
Burke, Edmund T., *D.S.O.*, M.B., 1914(S).
Burt, Alida C., M.B., 1921(I).

Caselli de Pury, George A., M.B., 1918(S).
Clark, Walter I. M., M.B., 1900(S).
Coates, Ida, M.B., 1923(E).
Coffey, Thomas, L.R.C.P., 1910(I).
Contractor, Ardeshir K., M.B., 1910(E).
Corry, Matthew, M.B., 1896(S).
Cuthbert, John, L.R.C.S., 1885(I)

Dalal, Anandrai K., *O.B.E.*, M.R.C.S., 1911(E).
Dalal, Kharshedji A., M.B., 1875(S).
Dalzell, John M., L.R.C.P.S., 1912(S).
Danis, James T., M.C.P. & S., 1925(Col).
De Kok, Winifred M., M.R.C.S., 1920(E).
Dempsey, George A., M.B., 1922(I).
Dickinson, Charles M., M.R.C.S., 1905(E).
Dickinson, Thomas E., M.B., 1910(I).
Dimond, John L., M.B., 1900(E).
Duff, Howarth, M.B., 1924(E).
Dunbar, Gladys M. C., M.B., 1908(E).

Early, Edmund P. N. M., M.B., 1926(I).
Edwards, John A., M.R.C.S., 1927(E).
Ekins, Charles M., L.R.C.P., 1900(E).
Eland, Arthur J. C., M.R.C.S., 1923(E).
Ellis, George, L.R.C.P.S., 1892(E).
Enright, Maurice H., L.R.C.P.S., 1896(S).
Enright, Ruby, M.B., 1925(Col).
Evans, Grace O. D., L.R.C.P.S., 1921(S).

Falconar, William E., M.B., 1905(E).
Ferguson, Francis J., M.B., 1922(I).
Fernando, William H., L.M.S., 1921(Col).
Fitzsimons, James, M.B., 1920(Col).
Fleming, Evelyn M., M.C.P. & S., 1920(Col).
Fletcher, Leslie, M.R.C.S., 1903(E).
Ford, John C. C., L.R.C.P., 1899(E).
Forsyth, William D., M.B., 1901(S).
Frend, John A., L.R.C.S., 1877(I).

Ghose, Fokeer C., L.R.C.P.S., 1868(S).
Gibb, Edward A., M.R.C.S., 1918(E).
Gillespie, James, L.A.H., 1906(I).
Gray, Kate, M.B., 1920(E).
Green, Samuel L., M.R.C.S., 1914(E).
Griffith, William R., L.R.C.P.S., 1908(S).
Griffiths, Alfred T., L.R.C.P.S., 1898(S).

Harper, Frank S., M.B., 1897(S).
Higgins, Edward J., L.A.H., 1920(I).
Huxtable, Richard R., M.R.C.S., 1905(E).

Jackson, David, L.R.C.P.S., 1898(I).

Keith, Thomas S., M.R.C.S., 1912(E).
Kennedy, William W., M.R.C.S., 1891(E).

Lambert, John S., M.R.C.S., 1878(E).
Lautre, Max A., M.R.C.S., 1923(E).
Lowtas, Frederick G., M.R.C.S., 1919(E).
Lynch, Eugene G., M.B., 1926(Col).

McCreery, Arthur L., M.B., 1915(I).
McGrigor, Henry J., M.B., 1898(S).
McIvor, William J., M.B., 1905(I).
Maclurkin, Alfred R., M.B., 1900(S).
McMillan, Frederick W., M.B., 1914(S).
McPherson, George, *C.I.E.*, M.D., 1895(S).
Magner, James, L.R.C.P.S., 1910(I).
Massy-Westropp (Mrs.), Gladys (formerly Weatherill), M.B., 1923(I).
Miller, Ralph S., M.B., 1883(S).
Minchin, Edward J., L.R.C.S., 1884(I).
Mitter, Robert K., L.R.C.P.S., 1888(S).
Morton, Frank A., M.B., 1927(Col).
Muhammad Din, Khan, M.B., 1925(Col).
Murphy, Timothy M., M.B., 1922(I).

Nasmyth, Roy D., M.C.P. & S., 1920(Col).
Newton, Henry A., L.R.C.P.S., 1925(S).

O'Kelly, Robert, L.R.C.P., 1907(I).
O'May (Mrs.), Lily S., M.B., 1900(S).

Patchett, Reginald J., L.R.C.P.S., 1918(S).
Patterson, Edward C., M.B., 1921(I).
Paul, William M., L.R.C.P.S., 1890(S).
Pearse, Patrick S., L.R.C.P.S., 1897(S).
Perry, Arnold, M.B., 1925(Col).
Peyton, Thomas H., *D.S.O.*, M.B., 1906(I).
Port, Arthur W., M.B., 1893(E).
Prendergast, D'Arcy J., M.C.P. & S., 1926(Col).
Price, Alfred R., M.B., 1908(S).
Pryce, Daniel M., M.R.C.S., 1920(E).

Radich, John P., M.B., 1927(Col).
Raymond, James, M.R.C.S., 1925(E).
Reece, Charles, M.B., 1901(S).
Rees, Evan R., M.R.C.S., 1927(E).
Rees, Samuel, L.R.C.P.S., 1899(S).
Reeves, Thomas S., L.R.C.P., 1904(I).
Reid, Edmund L., *M.C.*, M.B., 1910(S).
Riad, Mohammed M., M.R.C.S., 1923(E).
Roberts, Frederick E., M.B., 1925(E).
Roberts, Llewellyn W., M.B., 1895(Col).
Roberts, Hugh C., M.R.C.S., 1893(E).
Robinson, John H., L.A.H., 1909(E).
Robinson, Lilian E., M.R.C.S., 1921(E).
Rodger, Nora A. M., M.B., 1923(S).
Ross, William G., M.R.C.S., 1873(E).
Rowland, Frank, L.R.C.P.S., 1899(S).
Rowlands, Annie E. G., M.R.C.S., 1925(E).
Russell, Audrey E., M.R.C.S., 1926(E).
Russell, Edmond F. B., L.R.C.S., 1887(I).
Rustomjee, Maneckshaw, L.R.C.P.S., 1925(S).
Ryan, William J., L.R.C.P.S., 1888(S).

Sabri, Ahmed, M.R.C.S., 1914(E).
St. Johnston, Adrian, M.R.C.S., 1914(E).
Segal, Kailash N., M.B., 1927(Col).
Shore, Lewis R., *M.C.*, M.R.C.S., 1918(E).
Simmonds, Francis M., L.S.A., 1898(E).
Simpson, Edwin, L.R.C.P., 1882(I).
Singer, Kildare L., M.R.C.S., 1917(E).
Smart, Thomas W., M.B., 1914(S).
Smith, Gerard H., M.R.C.S., 1870(E).
Smith, John K., M.B., 1914(S).
Smithies, Cyril M., M.B., 1921(E).
Sortain, Edwin L., M.B., 1889(E).
Steel, Henry G., L.M.S.S.A., 1912(E).
Stephen, Leslie D., M.B., 1909(S).
Strachan, Alan, M.B., 1917(S).

Thain, William B., M.B., 1897(E).
Thomas, John G. S., B.M., 1925(E).
Thomas, Rufus C., M.R.C.S., 1916(E).
Thomas, William, L.R.C.P.S., 1893(S).
Tredinnick, Ernest, M.R.C.S., 1876(E).
Trimmer, Francis I., L.S.A., 1902(E).
Trist, George M., M.R.C.S., 1919(E).
Tschesno, Ovsey, M.D., 1927(For).
Tugman, Mary C., M.R.C.S., 1920(E).

Uttley, William W., M.R.C.S., 1909(E).

Vaithialingham, Vethabanam, L.R.C.P.S., 1925(S).
Vatve, Gopal G., L.R.C.P., 1894(E).

Wadham (Mrs.), Elspeth V. D. (formerly Hewatt), M.B., 1925(I).
Wall, Kathleen G., L.R.C.P., 1913(I).
Walshe, Denis, L.R.C.P., 1871(I).
Waters, J. F. W., M.R.C.S., 1897(E).
Watkinson, Arthur A., M.R.C.S., 1917(E).
Watson, Frank H. C., M.B., 1912(S).
Weaver-Bridgeman, Harry M., M.R.C.S., 1891(E).
Whitcombe, Ernest G. R., L.R.C.P.S., 1889(S).
Will, William M., M.B., 1911(S).
Williams, John F., M.B., 1926(Col).
Willis-Bund, Henry D. H., *M.C.*, M.R.C.S., 1906(E).
Wilson, James D., L.R.C.P.S., 1899(S).

Young, Campbell, M.R.C.S., 1910(E).

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. P. Hingston is placed on the Retd. List with rank of Surg. Capt.

Surg. Capt. R. W. G. Stewart is placed on the Retd. List.

S. Jenkinson and N. J. U. Mather to be Surg. Lts.

The following appointments are notified: Surg. Lt.-Comdr. (D.) C. Williams to *Pembroke*, for R.N. Barracks, Chatham; Surg. Lts. E. E. Malone and G. A. Miller transferred to Permanent List.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg.-Comdr. T. B. Dixon is appointed Admiralty Surgeon and Agent for Bristol.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. H. B. Fawcus to be Lt.-Gen., and to be Dir.-Gen., Army Med. Services, War Office.

Lt.-Gen. Sir M. H. G. Fell retires on ret. pay.

Maj.-Gen. Sir A. P. Blenkinsop, retd. pay, is apptd. Col. Comdt., vice Maj.-Gen. Sir M. W. O'Keeffe.

Col. W. R. Blackwell to be Maj.-Gen., vice Maj.-Gen. H. B. Fawcus.

Maj. F. C. Atkinson-Fleming is placed on the half-pay list on account of ill-health.

Capt. H. G. P. Armitage to be Maj.

ROYAL AIR FORCE.

Flight Lt. J. Hill is granted a permanent commission in this rank.

Flying Officer G. T. O'Brien is promoted to the rank of Flight Lt.

Squadron Leader J. H. Peck relinquishes his short service commission on account of ill-health and is permitted to retain his rank.

INDIAN MEDICAL SERVICE.

Maj. S. Gordon retires.

Capt. Bodh Raj Chaudhri to be Maj.

Temp. Capt. Bhalchandra Kondopant Phatak and Temp. Lt. Jaswant Singh Anand relinquish their temp. commns.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of six administrative counties :—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Surrey .. .. (841,090)	14·2	10·2	0·66	1·53	1·2	1·7	47	21	4·0
Wiltshire .. (301,200)	15·7	10·8	0·61	1·61	1·1*	2·0	46	—	3·0
Norfolk .. (322,300)	16·4	12·1	0·73	1·76	1·2	2·0	56	17	2·8
Leicestershire (291,800)	17·4	10·5	0·88	1·21	1·2	1·7	55	19	4·7
Northamptonshire (215,170)	14·7	11·6	0·8	1·6	1·4	2·2	48	16	5·6
Holland .. (88,860)	20·6	11·2	0·71	1·56	1·4	1·5	46	19	4·4

* " Other respiratory diseases " not included.
— = Figure not available.

Surrey.

Dr. Andrew Davidson (deputy) presents the report and mentions as a notable feature the opening of the county sanatorium at Milford. On several occasions during 1928 the Surrey tuberculous patients in various hospitals and sanatoriums exceeded 400 in number. The new sanatorium accommodates 300, with two 50-bed pavilions for advanced and four 50-bed pavilions for intermediate and early cases. The site covers 110 acres in healthy open surroundings in the Guildford and Hambledon rural districts about 230 ft. above sea-level with a gentle slope to the south. The sanatorium was opened by the Minister of Health on July 20th, 1928. Over 200 patients were admitted during 1928, and by May, 1929, the institution was full. There were two outbreaks of small-pox—one in January of seven cases and a second in April of 22 cases. In both instances the infection appears to have been introduced by tramps. During the third quarter there was an outbreak of paratyphoid B, chiefly localised in the Epsom neighbourhood. The outbreak was synchronous with that which occurred in Kensington, and the M.O.H. of Carshalton and Epsom considered the probable source of infection was the cream-supply to which the London cases were traced.

The sum paid by the county council to doctors called in by midwives amounted to £1235 16*s*. 9*d*., of which £335 16*s*. was afterwards recovered from the patients. There were 169 notifications of puerperal fever and pyrexia, and 17 of the patients were admitted to hospital. The county council subsidises various maternity homes to which patients seen at the ante-natal clinics by an assistant county medical officer are admitted. During 1924 54 such patients were admitted, and this number has increased year by year to 219 in 1928. In addition to this the number of expectant mothers visited by the council's health visitors was 974, the total births in the administrative county being 11,911. A scheme for the dental treatment of expectant and nursing mothers will be in full operation in 1929. The children under 5 who received treatment for crippling defects at the five orthopædic centres in the county numbered 239. The number of new V.D. cases from Surrey dealt with under the London scheme was 773, and for the accommodation of patients in the more remote parts of the county V.D. clinics are in existence at Guildford and Redhill, and it is hoped that the clinic at the Royal Hospital, Richmond, will be re-established during 1929.

At the beginning of the year the county council had appointed a chief veterinary officer to deal with milk control and the Diseases of Animals Acts, and in March three full-time assistant veterinary surgeons were appointed. The number of the part-time veterinary staff has been reduced from eight to seven. In 15 instances complaints of tuberculous milk were received from outside sources. In one case the milk, though sent out from a Surrey dairy, was entirely produced in another county. Of the remaining 14 cases, 12 of the infected samples came from one farm, 1 from two farms, and 1 from three farms. In 7 of the 14 cases one or more cows were found suffering from tuberculosis and slaughtered. The veterinary staff carry out a quarterly inspection of the herds, which comprise nearly 15,000 cows in milk. Among the cows in milk they found in 1928 147 suffering from tuberculosis, of which 45 had tuberculosis of the udder.

At the end of 1928 711 blind persons were on the register, of whom 225 were employed and 402 unemployable. The county council augments the wages of blind home workers through the National Institute to the extent of 5*s*. per week, the total sum paid under this heading being £502 0*s*. 10*d*. It is considered that the provision of free wireless licences and the regular supply of Braille and Moon literature and music increases the readiness of blind persons to register under the Act.

Wiltshire.

Dr. Claude E. Tangye mentions that the staff has been strengthened by the appointment in August of Dr. J. B. Lowe as deputy M.O.H., and that his time has largely been occupied with the small-pox outbreak in the Swindon neighbourhood, which still continues (April, 1929). A deficiency in the tuberculosis scheme mentioned in the last report has been met by the appointment of Dr. P. St.J. Wilkinson as tuberculosis officer for the Swindon area, for which he already acts as V.D. medical officer. The county is well provided with isolation hospitals, but with modern ambulance facilities the number of these could be reduced with advantage. In spite of local opposition a ministerial inquiry was held early in 1929 with regard to a new water-supply for Ashton Keynes. The existing wells are polluted and are held responsible for the infection of the school-children by intestinal worms. The water-supply of Long Newnton has apparently caused cases of paratyphoid fever in that parish. A chlorination plant has been installed with satisfactory results, but the rural district council is being urged to provide a satisfactory permanent new supply. The analysts' reports on 34 sewage effluents showed 18 good results, five bad, and the remainder intermediate. Up to March 31st, 1929, financial assistance amounting to £3209 had been promised by the county council in respect of 37 premises under the Housing (Rural Workers) Act, 1926. At the same date £1319 had been paid for work completed at 14 dwellings, and in ten other instances the work was in hand.

The outside complaints of tuberculous milk numbered 15. In three instances the milk was consigned to London in bulk from large collecting depôts in the county, and in view of the large numbers of farms involved complete veterinary inspection was found to be impracticable. The remedy appears to be continuous sampling at the depôts of the produce of individual farms. The following-up of the remaining 12 infected samples resulted in the discovery of tuberculous cows in the case of 10 of the 12 herds inspected. Dr. Tangye expresses doubt as to the value of inspecting herds when the guinea-pigs die from acute infections other than tuberculosis. The work involved is considerable, and it frequently happens that nothing definite is discovered at the farm to account for the deaths of the guinea-pigs.

The county council pay midwifery subsidies to 81 nursing associations, and in two cases subsidies to individual midwives to enable them to attend cases in isolated parishes. Most of the midwives now possess pelvimeters for antenatal work supplied at reduced price through the county council. The county council paid £703 in midwifery fees to doctors and recovered £306 from the patients. The county orthopædic scheme, based on the Bath Hospital and with five out-clinics, is working successfully, and dealt with 1049 new cases as compared with 873 in the previous year. The scheme is being extended by the institution of remedial exercise classes at the schools in order to provide early corrective treatment for defects of posture. The education committee also has under consideration a comprehensive plan for the occupational training of cripples.

Norfolk.

Dr. T. Ruddock-West, who only took over his duties on June 1st, mentions that before the close of the year he had held conferences with the various district medical officers of health in order to discuss the needs of the county. Isolation hospital accommodation is inadequate, and a central hospital is indicated as the best means of serving unprovided areas. There were 42 cases of small-pox notified with two deaths. Forty-one of the cases occurred in the borough of King's Lynn. The county council is responsible for maternity and child welfare work for the administrative county, with the exception of King's Lynn, Swaffham U.D., and Forehoe R.D., and Dr. Ruddock-West thinks the notification of births should be made direct to the county M.O.H. In 105 of the 690 parishes no provision has yet been made for infant health visiting. There are seven child welfare centres established by the British Red Cross Society, which receive subsidies from the county council. There are, in addition, a number of smaller unsubsidised centres established by voluntary agencies, such as local nursing associations. Antenatal clinics are indicated as one of the needs. Eight outside complaints of tuberculous milk were received and investigated by the (part-time) veterinary officer. As a result six cows were slaughtered under the Tuberculosis Order. As the result of an adverse report by the Fishmongers' Company with regard to Hunstanton mussels marketed in London, samples of mussels, water, and mud were taken on Nov. 30th and examined in the county laboratory. The mussels proved to be 70 per cent. clean, and certain suggestions were made with regard to the discharge of sewage. Further samples of mussels examined by the Fishmongers' Company were found to be clean.

Leicestershire.

Dr. J. A. Fairer says that the total estimated increase of the county population during the last two years—viz., 12,100—is largely due to the migration of city dwellers to houses recently built in the surrounding districts. The recovery of the mining district in the north-west, after the coal stoppage of 1926, is slow and uncertain, and unemployment and distress are reflected in defective nutrition among the children. In the industrial district of the south-west the absence of the mother from her home does not apparently affect the children, and the infant mortality-rate for Hinckley was only 30·5 per 1000 births. Maternity and child welfare work was originated in the county by voluntary societies, and with a view to obtaining better medical supervision Dr. Constance Walters was appointed county medical officer for infant welfare during the year. There are now 30 centres under the administrative control of the council. Antenatal supervision is chiefly carried out by the county health visitors. There are a considerable number of hospitals and clinics at which orthopædic work is done, but up to now it has not been possible to institute a coördinating scheme by which a continuous and accurate record of each child will be kept. The county council has appointed Dr. J. M. Mackintosh to conduct the investigation into maternal deaths required by the Ministry. Dr. E. L. Lilley has repeated his successful series of lectures to the county midwives. The county council subsidises nursing associations for midwifery services in six sparsely populated areas. The midwifery fees paid to doctors totalled £314 2*s*., of which £175 16*s*. was recovered from the patients.

Dr. Fairer reports a considerable improvement in the condition of nearly all the sewage farms adversely reported upon last year. Grants were made amounting to £1015 in respect of 13 dwellings under the Housing (Rural Workers) Act, 1926. The outside complaints of tuberculous milk numbered 13. As a result 277 cows were inspected, the milk of 83 individual cows was examined bacteriologically, and seven cows were dealt with under the Order. The informal bacteriological examination of milk is apparently improving the standard of cleanliness; thus the percentage of "good" samples during the last three years has been 40·7, 47·1, and 58·8. The plans for the proposed new county sanatorium are nearing completion.

Mild small-pox made its appearance at the close of 1927, and during 1928 there were 25 cases, the last notified on Nov. 24th, with no deaths. There were 18 cases of ophthalmia neonatorum, in two of which vision was impaired.

Northamptonshire.

Dr. L. Meredith Davies records the occurrence of 20 cases of small-pox, chiefly among tramps. There were epidemics of diphtheria in Desborough U.D. and Crick R.D., and the county medical staff gave assistance in both cases in the tracing of contacts and the detection of carriers. A worker in a tannery contracted anthrax. The pustule was excised and he was also treated with Sclavo's serum and made a good recovery. There were 17 notifications of puerperal fever with four deaths. All the cases except one were sent into hospital and a special nurse was provided in one case before removal. There were 30 notifications of puerperal pyrexia, and no request for a special nurse was received for the 23 cases occurring in districts other than Kettering U.D. Four hospitals have been made available for the treatment of women suffering from these diseases. There were 21 notifications of ophthalmia neonatorum, and in one case both eyes were damaged. Arrangements have been made with three hospitals for the admission of both mother and baby and also for the supply of a special nurse. The county council make grants to three isolation hospitals, at Daventry, Kettering, and Oundle. Daventry Hospital has many needs. It has no trained nursing staff, no ambulance, and a very old type of disinfector. Kettering Joint Hospital has just been extended and improved. Oundle Joint Hospital treats so few cases (viz., 15 in 1926, 8 in 1927, and 1 case of small-pox for the first six months of 1928) that Dr. Davies considers its continuance is unjustifiable and that the board should unite with another district.

A scheme for tuberculosis care committees has been approved and will come into operation on April 1st, 1929. There will be one representative central committee and six area committees. Marked benefit is reported from light treatment for suppurating tuberculous glands and less notable benefit in glands without suppuration and lupus. The county council financed the admission of one patient to Papworth Colony. The claims received from medical practitioners called in by midwives numbered 113; the payments made amounted to £167, of which £51 was recovered from patients. Under the heading "Rivers Pollution" Dr. Davies gives extracts from the reports made on the conditions found at many sewage farms. The result may be summarised as "bad" in 21 cases, "good" in 4, and "intermediate" in 14. The investigation of six outside complaints of tuberculous milk resulted in the discovery of one tuberculous cow only. From Feb. 1st for 18 months an inspection of dairy cattle twice in each year by (part-time) veterinary surgeons came into force. As a result 29 tuberculous cows were found, including those with the udder affected. The veterinary surgeons are also appointed sanitary inspectors, and thus empowered to deal with unsatisfactory conditions found on the farms.

Holland.

Dr. H. C. Jennings reports that the work done in the county laboratory has been of great benefit, but would be of much wider service if a trained assistant were appointed. There were 26 cases of small-pox with no deaths. In 12 of the cases in Spalding infection was traced to a tramp. There were 12 notifications of ophthalmia with one case of impaired vision removed from hospital against medical advice. There were 52 deaths from pneumonia, and Dr. Jennings would like to have hospital treatment for all pneumonia cases. Two cases of encephalitis were notified and both died. The tuberculosis mortality was the lowest ever recorded; 355 new cases were reported and 184 contacts were examined. The 30 shelters available in the county were used by 46 patients during the year. More local nursing associations are needed to ensure adequate attention to mothers in childbirth. As it is, the problem of the "handywoman" is an ever-present one. The amount paid in fees to practitioners called in by midwives was £88 18s., of which £9 5s. was recovered from patients. The public analyst reports a sample of egg powder as "inferior." It consisted of starchy matter and a small amount of baking powder, and was coloured with an aniline dye. There is, however, no accepted definition or standard for egg powder. Under the Tuberculosis Order 86 animals were slaughtered, four of which were cows in milk with tuberculosis of the udder. Several of the districts in the south of the county have unsatisfactory water-supplies and are in negotiation with the Spalding U.D.C., which own bores at Bourne, from which an ample supply of pure water is obtained. In an appendix on the isolation hospital accommodation of Holland Dr. Jennings indicates that the ideal would be to erect one hospital in a central situation to serve the whole county. Unfortunately, the lack of a piped water-supply in the greater part of the area very much limits the choice of suitable sites.

MENTAL HOSPITAL REPORTS.

THE *Devon Mental Hospital* issues this year its eighty-third annual report, illustrated by two photographs, one of the ballroom and the other of the female private ward, made gay by a veritable herbaceous border of hand-made floral decorations. There were 1333 patients on the register on Dec. 31st, 1928, an increase of 110 during the year, so that on the female side the hospital is now overcrowded and in urgent need of extension. The increase in the admission-rate is largely due to the reception of patients on contract from Staffordshire, Birmingham, and Plymouth. These were chronic cases, yet the recovery-rate for the year reached 37·82 per cent. The death-rate was 7·6 per cent., and autopsies were held in all cases where permission could be obtained—72·34 per cent. The number of cases of pulmonary tuberculosis has been reduced by improved diet, and by ultra-violet ray and sanatorium treatment. In the autumn there were three cases of dysentery, but there has been no typhoid since the routine inoculation of all patients with "TAB" was instituted. The laboratory carried out a large number of routine and special examinations; the dentist visited fortnightly and examined 636 patients, and the visiting ophthalmic surgeon made 76 examinations. The visiting surgeon paid 40 visits, saw 107 cases, and performed 29 major operations. The visiting radiologist made 59 investigations, and 35 patients were treated in the light department. During the year 13 men and 2 women suffering from general paralysis were treated by malaria, 7 by mosquitoes, and 8 by direct inoculation of malarial blood. Three of the patients were sent home, 4 showed no appreciable change, and 4 died. In future, arsenical preparations are to be given as well as malaria, and the results will be compared with those following malarial treatment alone. Parole within the estate was granted to 80 patients; 46 were allowed outside and 55 were taken out by friends. As far as possible the open-door system is adopted. Char-à-banc picnics were enjoyed by 518 patients, and daffodil, primrose, and blackberry-picking parties were organised. The sum of £170 was raised at the annual patients' sports. The method, devised by the engineer, whereby the wireless can be transmitted through the telephone system, continues to work satisfactorily, and there is a portable set for wards not supplied with a telephone. The library has been completely reorganised in a central room, and the weekly illustrated papers are now circulated in folios made in the bookbinding department of the printers' shop. Bookbinding occupies two patients, weaving five, net-making three, and mat-making two. The brush- and basket-making department, served by eight patients, has turned out excellent work, and knitting, rug-making, and raffia occupy some of the women. In all, 271 patients have useful employment. At the out-patient clinic there were 63 attendances, nearly twice as many as in 1927. A new sterilising room was added to the operating theatre, and two new cottages were built for the male nursing staff. One nurse passed the final examination of the General Nursing Council, and 12 nurses and two attendants obtained their R.M.P.A. certificate.

The *Roxburgh, Berwick, and Selkirk District Asylum* had 368 patients, including four voluntary boarders, in residence on May 15th, 1929. The recovery-rate was 35·2 per cent. and the death-rate 7·9 per cent. Cause of death was verified by autopsy in 17 cases. During the year the hospital was fortunate in admitting more recoverable and fewer senile cases than usual. Apart from a sharp epidemic of influenza the health was excellent. The dental surgeons visited every fortnight. An occupational therapy class has been started, and a kinematograph apparatus has been installed. Thirteen members of the staff sat for the R.M.P.A. examination, and all but one were successful.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 14TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 96 (last week, 150); scarlet fever, 2015, diphtheria, 1100; enteric fever, 113; pneumonia, 500; puerperal fever, 50; puerperal pyrexia, 90; cerebro-spinal fever, 13; acute poliomyelitis, 12; acute polio-encephalitis, 3; encephalitis lethargica, 14; continued fever, 1; dysentery, 4; ophthalmia neonatorum, 119. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 17th–18th was as follows:—Small-pox, 121 under treatment, 16 under observation (last week 156 and 14 respectively); scarlet fever, 1417; diphtheria, 1524; enteric fever, 21; measles, 243; whooping-cough, 209; puerperal fever, 23 (plus 6 babies); encephalitis lethargica, 125; poliomyelitis, 3; "other diseases," 25. At St. Margaret's Hospital there were 22 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (3) from enteric fever, 9 (2) from measles, 2 (0) from scarlet fever, 27 (4) from whooping-cough, 24 (2) from diphtheria, 103 (17) from diarrhœa and enteritis under two years, and 22 (2) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (which have increased by one-third), 8 were reported from Liverpool, 7 from Gateshead, 6 from South Shields, 5 each from Birmingham, Hull, and Middlesbrough, 4 from Leeds; while Glasgow, Dublin, and Belfast, reported 7, 5, and 5 respectively. Two deaths from measles were reported from Stoke-on-Trent.

The number of stillbirths notified during the week was 205 (corresponding to a rate of 42 per thousand *births*), including 40 in London.

Correspondence.

"Audi alteram partem."

THE RELATION OF THE TONSILS TO RHEUMATIC CONDITIONS.

To the Editor of THE LANCET.

SIR,—The suggestive paper by Dr. Gray Hill in your issue of Sept. 14th (p. 571) upon the value of tonsillectomy in acute rheumatism, rheumatic carditis, and chorea raises the important question of the true relation between the tonsils and rheumatic conditions, and makes us ask ourselves whether we are not pursuing a chimera, and that it is necessary to pause and reconsider carefully the position. The tabulated cases upon which Dr. Hill's contention is based seem clearly to demonstrate that tonsillectomy, even when efficiently performed, has no influence upon the behaviour of rheumatism and is no safeguard against carditis or chorea, an opinion which supports those of Poynton, Vining, Hunt, Osman, MacSweeney, Boas, Schwartz, and Wilson as against the too enthusiastic assertions of Schichhold, Robey, Freedman, Kerby, Miller, and Thomson.

I think that many practitioners of experience will endorse me when I say that, apart from a certain general improvement that must necessarily accrue from the removal of a definitely septic focus, tonsillectomy has no influence upon the incidence or course of any rheumatic condition, either acute or chronic. This being so, it behoves us to look further afield, and to search for a more likely reason for the undoubtedly frequent concurrence of septic tonsils in rheumatic cases, and one which will also give us more certain indications for treatment. The first suggestion that occurs is that the rheumatic condition is not dependent upon the tonsil sepsis, but that both are in fact the result of a source of infection situated elsewhere.

I personally believe that the most frequent source of rheumatism, septic tonsils and septic teeth, lies in the chronic toxæmia which results from chronic intestinal intoxication. Research should lie in the direction of establishing a possible connexion between rheumatic conditions, or septic tonsils, or both, and the various pathogenic organisms occurring in intestinal toxæmia. Such a connexion would tend to give indications for prophylaxis and rational treatment.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., Sept. 19th, 1929.

DISPLACEMENT OF THE MANDIBULAR CARTILAGE.

To the Editor of THE LANCET.

SIR,—I have long been interested in the subject of the displacement of the mandibular cartilage discussed by Mr. Wakeley in your columns on Sept. 14th. I had to do with two patients of the late Prof. Annandale who was the first surgeon to treat recurring displacement of this meniscus by operation, as he was the first to operate for "displaced semilunar cartilage" of the knee-joint. A more intimate reason for my interest in this unusual accident was my personal experience of the extreme discomfort it can cause. I found a method by which I could reduce the displacement by manipulation. Ten years ago I contributed to the *British Journal of Surgery* (1919, vi., 385) an article designed (1) to make clear that the description of the meniscus in our anatomical text-books was not a correct one; (2) to indicate by original diagrams what I believed to be the characteristic shape and appearance of this structure; (3) to describe the sensations and symptoms which result from a recent displacement and how I conceived them to be brought about, as well as to describe my method of reduction by manipulation; (4) to record a case of constantly recurring displacement which I treated in 1911 by excising the meniscus. Mr. Wakeley's account of the condition does not appear to differ in any particular respect from my own, and it is gratifying to observe that the method which he describes as being "the best method of reduction" is that recommended by me. It is unusual to find one's statements on a subject in surgery so completely corroborated in every detail as mine have been by Mr. Wakeley without a reference to the original descriptions, especially when an accident is uncommon and has received scanty attention in the literature. However, since THE LANCET is extensively read by practitioners who may not see the more specialised journals regularly, it is all to the good that attention should be called to the condition in your columns.—I am, Sir, yours faithfully,

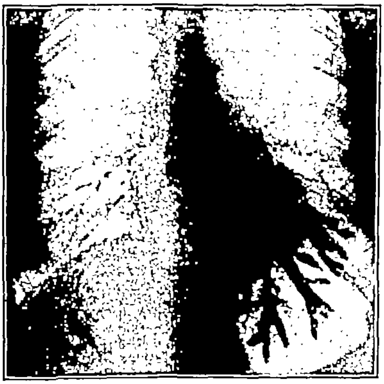
J. HOGARTH PRINGLE.

Peebles, Scotland, Sept. 16th, 1929.

RADIOGRAPHIC EXAMINATION OF THE LUNGS.

To the Editor of THE LANCET.

SIR,—On X ray examination of the lungs the bases are obscured by the domes of the diaphragm and abdominal contents. In cases of left-sided disease we give some sodium bicarbonate before the examination, in order that there may be gas in the stomach to render the bases of the lung more visible. The radiogram here reproduced shows a patient with left basal bronchiectasis and lipiodol in the dilated bronchi. It will be seen how clearly the condition shows up against the air bubble in the stomach.



Radiogram showing left basal bronchiectasis.

We are, Sir, yours faithfully,

L. S. T. BURRELL,
STANLEY MELVILLE.

Chandos-street, W., Sept. 10th, 1929.

THE AGE OF MARRIAGE AND OF CONSENT.

To the Editor of THE LANCET.

SIR,—In your leading article last week (p. 618) reference is made to the Hindu custom of early marriage. Therein is quoted a statement by Dr. Margaret Balfour and Dr. Ruth Young to the effect that this custom amongst the Hindus is founded on the principle that early marriage is likely to lead to chastity in the youth of both sexes. This statement appears to be of the nature of an *argumentum a* *posteriori*, and does not seem to be very convincing, or at least is true only to a very limited extent. Is not the explanation which the Hindus themselves put forward more reasonable and more in accordance with experience—namely, that the Muslim conquerors of India took the unmarried girls only into their harems? It thus became a question of national existence and national honour that to save the girls from this abduction they should be married at an early age. In order to bring about the general acceptance of this practice religious sanction was invoked from the ancient Sanskrit texts. It is to be remembered that early marriage was already a Muslim custom. I am, Sir, yours faithfully,

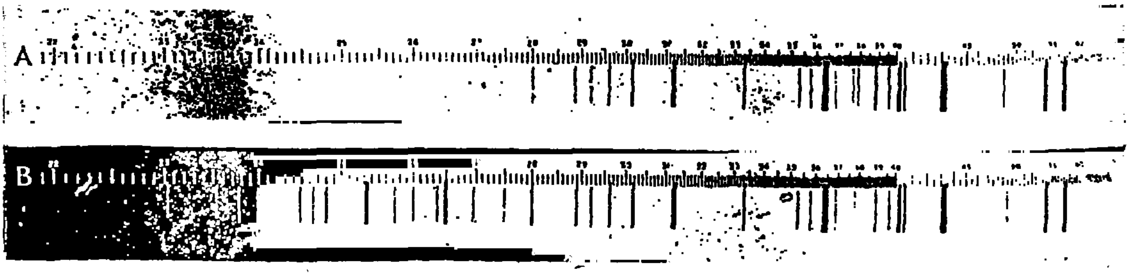
Birmingham, Sept. 23rd, 1929. G. A. AUDEN.

*** Since our article appeared the Child Marriage Bill, which provides that the age of girls at marriage shall not be less than 14 years and the age of consent not less than 16 years, has passed the Indian Legislative Assembly.—ED. L.

THE STABILISATION OF "VITA" GLASS.

To the Editor of THE LANCET.

SIR,—In an annotation entitled Special Glass in School Windows in your issue of August 24th (p. 398) it is implied that "Vita" glass tends to lose its special penetrability with time. I shall be much obliged if you will allow me to correct the erroneous impression thus conveyed. When "Vita" glass is exposed to the sun it undergoes a change, which consists of a slight diminution of the transparency to the sun's rays of the shortest wave lengths. This physical change does not in any way affect the appearance of the glass and is almost invariably complete within nine months, and often within a shorter period, after glazing. This period is called the period of stabilisation, and at the end of it no further change in transmission will take place.



Mercury-vapour lamp spectra: (A) screened by fully stabilised "Vita" glass; (B) unscreened.

The effect of stabilisation is shown by the following figures which give percentage transmission of a typical piece of "Vita" glass of 2 mm. thickness at wave length 3130 A.U.

	3130 A.U.
New "Vita" glass	72 per cent.
Stabilised "Vita" glass	64 "

The reading at 3130 A.U. is taken because this is approximately the wave length where the maximum therapeutic strength of sunlight lies, as found by Dorno. At this wave length there is a very strong line in the spectrum from a mercury-vapour lamp, enabling the determinations of percentage transmission through the glass to be done with great accuracy.

When this state of stabilisation is reached "Vita" glass still transmits to the limit of the sun's spectrum as is shown by the accompanying spectrographs made with:

(*a*) Mercury-vapour lamp unscreened.

(*b*) The same lamp screened by fully stabilised "Vita" glass.

The idea that there is serious deterioration in "Vita" glass has originated through the publications of investigators who have subjected the glass to radiation from mercury-vapour lamps, which irradiate it with wave lengths far shorter than any we ever receive from the sun. It has been proved that exposure to the mercury vapour lamp is no guide to the effect of solar radiation upon "Vita" glass. The year selected for the investigation by the Board of Education was an unfortunate one, because the readings of ultra-violet radiation for the whole of these 12 months are very much below the average, and it should not therefore be assumed that because the results were not all that one could wish for, they would not be so under normal conditions.

Some of your readers will have seen by this time actual demonstrations of "Vita" glass, which go to prove conclusively that "Vita" glass admits the health-giving rays of the solar spectrum, to which ordinary glass is opaque, and I should therefore like to emphasise that all demonstrations of this kind are carried out with glass which has been completely stabilised.—I am, Sir, yours faithfully,

R. R. BYRNE,
Director, "Vita" Glass Marketing Board.

Aldwych House, London, W.C., Sept. 13th, 1929.

*** We have independent testimony that the loss in transparency when exposed to natural sunlight—briefly called solarisation—is not as great as has been made out. The current number of *Nature* (p. 441) contains a report of investigations at the Crown Glass Works at St. Helens, which show that glass which has been solarised by exposure to the quartz mercury lamp may even regain some of its lost transparency when exposed to sunlight. In America some work at the Bureau of Standards, confirmed by Dr. G. W. Caldwell and Dr. R. H. Dennett (*Jour. Amer. Med. Assoc.*, June 22nd, p. 2088), indicates that solarisation is complete in a few weeks, after which the permeability of the glass does not change. Both papers presuppose the feasibility of keeping the surface of the glass free from deposit.—ED. L.

SCHISTOSOMA BOVIS IN SOUTH AFRICA.

To the Editor of THE LANCET.

SIR,—Eight years ago you published[1] a letter from me drawing attention to the fact that *Physopsis africana* in Natal was infested with cercariæ which developed into the adult *Schistosoma bovis*. The occurrence of ova apparently identical with those of *S. bovis* in some patients who had acquired bilharzia infection, whilst bathing in pools infested with this parasite, suggested that the schistosome occasionally would choose man as its final host. Dr. E. C. Faust, who has made an exhaustive study of South Africa's larval trematodes, regards *Cercaria octadena* as the larval stage of this schistosome and observes that the cow is not necessarily the common South African host. More recent work has shown that both oxen and sheep are infested with *S. bovis* in the Eastern Province of the Cape, and the parasite would appear to exist in the Pretoria district of the Transvaal as well as on the Natal coast.

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[1] THE LANCET, 1921, i., 250.

Mr. P. L. Le Roux, of the Veterinary Department at Onderstepoort, who has been engaged in a valuable study of schistosomiasis in South African cattle and sheep, now tells me that he has observed that, where massive doses of tartar emetic are employed in the treatment of schistosomiasis, the parasites are soon found in a dying condition in various portions of the lungs. This interesting observation may explain why patients are so predisposed to temporary "colds," when larger doses than they can comfortably tolerate have been administered in the series. In the experiments which Dr. H. H. Curson, M.R.C.V.S., kindly undertook for me with freshly dissolved tartar emetic in the treatment of some fluke-infested sheep, he showed that antimonium potassium tartrate was a relatively non-toxic drug, if skilfully applied to sheep, as it is when administered to man.

I am, Sir, yours faithfully,
F. G. CAWSTON, M.D. Camb.,
late Streatfeild Research Scholar.

Durban, Natal, Sept. 3rd, 1929.

Obituary.

EDWARD PETRONELL MANBY, M.D., D.P.H. CAMB.

WE regret to record the death of Dr. E. P. Manby, a medical officer of the Ministry of Health, which took place suddenly on Sept. 20th at his house in London, just after the completion of his sixty-fifth year.

Edward Petronell Manby came of a medical family, his brother, the late Sir Alan Manby, being for many years physician extraordinary to His Majesty the King and surgeon-apothecary to the Royal Household at Sandringham. Edward received his training at Cambridge, where he graduated in 1883, and at Guy's Hospital, taking the conjoint qualification in 1886, the Cambridge M.B., B.C. in 1887, M.D. in 1891, and D.P.H. in 1894. Early in his professional career he became a resident medical officer at the Fountain Hospital of the Metropolitan Asylums Board, a post which he relinquished in 1896 on appointment as assistant medical officer of health at Liverpool. His work there did not pass unnoticed at Whitehall, and in 1900 he was invited to become a medical inspector to the Local Government Board; on the constitution of the Ministry of Health in 1919 he became a medical officer of that Department. From 1891 to 1900 he was lecturer in public health in the Liverpool University, and later in his career he held examinerships in public health in the Universities of London, Leeds, and Liverpool.

Dr. Manby's service with the central health authority extended over a period of nearly 30 years. He took his share in the routine inspection of the areas of local sanitary authorities and was entrusted with special inquiries of considerable importance, notably one into the conditions under which milk is distributed in this country. For the last ten years he had been engaged in the supervision of poor-law institutions in London and the home counties, and his special knowledge of this field of work was so valuable, especially in view of the changes occasioned by the Local Government Act of 1928, that his period of service was extended beyond the ordinary age of retirement. His life was, in fact, as one of his colleagues writes, devoted to public service, for which he had many qualifications, chiefly perhaps a robust common sense, sound judgment, and a hearty dislike of fads of all descriptions. Display and a desire for limelight had no place in his composition. He knew his job and he could do it, and he was content to let the results speak for themselves. Though he never went out of his way to court popularity he was much liked and respected by those with whom he worked. Dr. Manby was an enthusiastic golfer and lawn tennis player, and it was no easy matter to defeat him in either game, even during his last summer. He was a man of wide interests and at one time something of an authority on old furniture.

Dr. F. N. Kay Menzies writes: "Dr. Manby's sudden death is an irreparable loss to the poor-law medical service, especially of London. It is made doubly so by the fact that his old friend and colleague, Dr. Meredith Richards, was compelled to resign his position at the Ministry of Health in the spring of this year owing to serious illness. Manby and Meredith Richards knew more about poor-law medical work than any other medical men in existence, and the fact that they have both been lost to the service within the last few months is nothing less than a national misfortune. At a time like this their wide and matured experience, wise discretion, and sound judgment would have been of incalculable assistance to all those medical officers of health who will shortly be called upon to undertake responsibilities in connexion with the transfer of poor-law medical work to public health authorities. Manby's knowledge and experience of poor-law medical problems in the metropolis was profound and intimate and he was held in high esteem by the medical superintendents of the infirmaries, by whom his loss will be deeply regretted. His duties were often of a most difficult nature, requiring great patience and wisdom. He was always easily accessible, and could always be counted upon to give of his best in any direction which might be helpful to his colleagues."

Dr. Manby leaves a widow and one son.

JOHN MALLET PURSER, M.D., D.Sc. DUB., F.R.C.P. IREL.

Dr. John Mallet Purser died on Sept. 18th at his residence in Dublin, being within two months of completing his ninetieth year. He had suffered some severe illnesses within the past few years, but his extraordinary vitality brought him through, and although he was somewhat enfeebled in body his mental abilities had remained unimpaired.

Purser was educated at Trinity College, Dublin, and took his medical degrees in 1863. He subsequently took the Licences of the King and Queen's College of Physicians of Ireland and of the Royal College of Surgeons in Ireland, and in 1876 was elected a Fellow of the King and Queen's College of Physicians. From the beginning of his career he was a teacher. He held at once the posts of professor of anatomy and physiology in the Carmichael School of Medicine and lecturer in ophthalmology in Dr. Steevens' School. In 1870 he was appointed surgeon to the City of Dublin Hospital, a post which he soon exchanged for that of physician to the same institution. His career, however, took a definite line with his election in 1874 to the King's Professorship of the Institutes of Medicine in the School of Physic, Trinity College. He held this post, together with that of clinical physician to Sir Patrick Dun's Hospital, until 1901, when he decided to retire from active work. Nevertheless, in 1917, on the death of Dr. James Little, he consented to accept the chair of the Regius Professor of Medicine in Dublin University. In 1925 he retired from this last official connexion with Trinity College. His interest in the College did not cease, however, for shortly afterward he made it a gift of £10,000 to be employed for the advantage of the School of Physic and the other science schools of the College.

A bare recital of the offices held by Purser gives no conception of the part he played in the development of the modern school of medicine in Dublin. At the time of his appointment to the chair of the Institutes of Medicine the Dublin School was still under the dominance of the purely clinical ideas of Groves and Stokes. The influence of the latter, great as it had been and useful in its time, had now become a check on the introduction of ideas from any other source than the bedside. There were, it is true, grumblings against the dead hand of observational medicine which prevented advance. Purser made his position clear immediately on his accession to the chair by indicating that he intended to interpret "the Institutes of Medicine" as physiology and histology. Prior to this there was no regular instruction in physiology in the Dublin school, the previous professors having lectured in medicine. To his instruction in physiology and histology Purser added a voluntary class in pathology, which he conducted, unpaid, for more than 20 years, until the teaching of pathology was put on a regular basis in the school by the appointment of Dr. A. C. O'Sullivan as lecturer. He retired from private practice but performed the duties of clinical physician at Sir Patrick Dun's Hospital. It is difficult to say whether he shone most as lecturer in physiology or as clinical teacher. His ideas were clear and distinct, and his exposition of them lucid. He did not overburden his lectures with experiments, though employing them when they served to illustrate his subject. He had an unusual gift of logical thought, which made it easy for any intelligent student to follow his lectures and to carry away a sound knowledge of the essentials of physiology. His clinical teaching was, in effect, physiology (and pathology) illustrated in the living subject. He had the gift of conveying to his class the reasoning by which he passed from the signs and symptoms to the underlying functional and anatomical changes. Medicine was to him, and to his disciples, a science, incomplete, it is true, but always approaching completion. In treatment he was a sceptic. He had little belief in drugs as therapeutic agents. He was known to have said a good word for opium, and to have admitted that quinine had its uses, but for most drugs he cared nothing. The kind of reasoning on which pharmacology was built at that time excited his scorn. Of a book by Lauder Brunton he wrote a devastating review. No man distinguished more clearly between hypothesis and established fact. One consequence therefrom is that little if any of his positive teaching of 40 years ago is to-day unsound; it has been supplemented by the advance of knowledge, but rarely has it been falsified. This attitude toward medicine is a far step from that of the great Dublin clinicians, and Purser is rightly regarded as the leader in, and father of, modern medicine in Dublin. It was fortunate for Irish medicine that such a man was found at the moment when the new step was necessary. It is true that he wrote little. For this there were two reasons. His teaching duties kept him busy, and he read enormously that he might be fitted to teach progressively. But, more important than this, was the critical attitude which prevented him publishing anything to which he could not assign a high positive value. He published an admirable "Manual of Histology" in the early 'eighties, but he never troubled to issue a second edition.

Personally Purser was reserved, retiring, and modest. He disliked every kind of publicity. For example, he declined nomination for the Presidency of the Royal College of Physicians of Ireland when it was offered to him, on the ground that he was a physiologist, not a physician. His students were afraid of his sharp tongue—for no one could rebuke pretence or presumption more effectively—but they respected his conscientious performance of duty and his great ability as a teacher and man of science. As they knew him better the fear diminished and the respect increased. Those who came to intimacy with him realised the generosity of temper, the clear simplicity, and the wide range of culture. His leisure—scanty as it was during his tenure of the professorship—was given to reading, to travel, to art. In 1901, when Purser resigned the King's Professorship, his old pupils established a medal in the school in commemoration of his tenure of office, and the John Mallet Purser medal is awarded each year to the best student in physiology. Dr. Purser was unmarried.

Medical News.

UNIVERSITY OF LONDON: *University College.*—Forthcoming public lectures include a Rickman Godlee Memorial Lecture, by Viscount Grey of Fallodon, at 5.30 P.M. on Thursday, Nov. 7th; one on Medicine in the Days of Shakespeare, by Dr. Herbert Spencer, at 2 P.M. on Monday, Nov. 25th; and four on Secretion of the Digestive Juices, by Dr. R. J. Brocklehurst, at 5 P.M. on Mondays, Oct. 14th, 21st, and 28th, and Nov. 4th.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Demonstrations of specimens will be given in the theatre of the College at 5 P.M. on Fridays, Oct. 18th and 25th, and Nov. 1st, by Sir Arthur Keith, F.R.S.; and at the same hour on Mondays, Oct. 21st and 28th, and Nov. 4th, by Mr. C. P. G. Wakeley. They will be open to advanced students and to practitioners.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—Courses of lectures have been arranged by the Institute from Oct. 10th onwards, and particulars may be had from the Director of Studies (Mr. Sydney Hooper), 88, Kingsway, London, W.C. 2. Forthcoming courses include six lectures on Mind and Nature, by Prof. L. J. Russell; six on the Interpretation of Development and Heredity, by Mr. E. S. Russell, D.Sc.; and a series entitled an Introduction to Philosophy, by the Director of Studies.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE will be held as usual during the first week-end of the autumn session. The 12 lectures, which are open to all medical practitioners without fee, will be held in the library of the Medical School (except the lantern lectures, which will be held in the Physiology Theatre) on Oct. 4th, 5th, and 6th. Particulars will be found in our Medical Diary.

HOSPITAL DINNERS.—The annual dinner of *King's College Hospital* will be held at the Connaught Rooms, Great Queen-street, London, W.C., on Wednesday, Oct. 2nd, at 7 for 7.30 P.M., with Dr. H. Willoughby Lyle, Dean of the Medical School, in the chair. As we have already announced, the centenary session will be opened at the Medical School, Denmark Hill, at 2.30 P.M. on the same day.—The *Westminster Hospital* dinner will be held at Grosvenor House, Park-lane, W., on Tuesday, Oct. 1st, at 7 for 7.30 P.M., with Mr. Stanley Dodd in the chair.

LONDON HOSPITAL MEDICAL COLLEGE.—The Schorstein Memorial Lecture will be delivered by Dr. A. F. Hurst on Friday, Nov. 8th, at 4.30 P.M., in the Bearstead Clinical Theatre. Dr. Hurst has chosen as his subject Precursors of Carcinoma of the Stomach, and all members of the medical profession are invited to attend.

ROYAL DENTAL HOSPITAL SCHOOL OF DENTAL SURGERY.—A conversazione and prize distribution will be held at this school, in Leicester-square, London, W.C., on Wednesday, Oct. 2nd, at 8 P.M., when Dr. William Hunter will preside and give an address to the students.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The Council have completed the purchase of a freehold island site on the north side of Queen-square, Holborn, London, W.C., where it is proposed that the new premises of the Institute shall be erected.

COURSES IN GENITO-URINARY DISEASES.—At St. Paul's Hospital, Endell-street, Shaftesbury-avenue, London, W.C., a series of lectures on genito-urinary diseases will be given at 4.30 P.M. on Wednesdays from Oct. 2nd to Nov. 27th. Practitioners or students wishing to attend these lectures or the practice of the hospital may get further information from the secretary.

UNIVERSITY OF BIRMINGHAM.—Sir Farquhar Buzzard will deliver an address to students, entitled Arrogance and Ignorance in Medicine, on the occasion of the annual distribution of prizes on Tuesday, Oct. 1st. The ceremony will take place at 4.30 P.M. in the medical theatre of the University, Edmund-street.

UNIVERSITY OF DURHAM, COLLEGE OF MEDICINE.—The Duke of Northumberland, Chancellor of the University, will address the students in the College of Medicine, Newcastle-upon-Tyne, on Oct. 11th, at 4.15 P.M., on Some Scientific Theories and their Foundations at the opening of the winter session. A dinner will be held the same evening at the Central Station Hotel, Newcastle-upon-Tyne, at 7.15 for 7.30 P.M., when the Chancellor will be officially welcomed by the governors, Council, and staff of the College, and the University of Durham Medical Graduates' Association.

SURGICAL INSTRUMENT MANUFACTURERS ASSOCIATION.—The annual dinner of this Association will take place at the Holborn Restaurant on Friday, Oct. 11th, at 6.30 for 7 P.M.

FOOT HOSPITAL FOR MANCHESTER.—A new foot hospital was opened on Sept. 21st by the Dean of Manchester. The hospital is in Upper Brook-street, and has been established by the Incorporated Society of Chiropodists. It will be open in the evenings to suit working people, and will be carried on entirely by voluntary workers.

POST-GRADUATE COURSE AT THE LONDON HOSPITAL. It has been suggested that a post-graduate course for old students of the London Hospital should be held during the week of the annual dinner, which is arranged for Thursday, Oct. 17th, at the May Fair Hotel. Such a course will be held if there is enough demand, and the probable dates are Oct. 16th, 18th, and 19th.

QUEEN ALEXANDRA HOSPITAL, COSHAM.—The Committee appointed by the Minister of Pensions to inquire into the administration of this hospital is willing to consider relevant statements by patients, ex-patients, and others. They should be addressed to the Secretary of the Committee, Mr. R. Herbert, at 18, Great Smith-street, London, S.W. 1.

MANCHESTER WELFARE CENTRES.—The Manchester Corporation Public Health Committee have asked the city council for authority to assume control of three child welfare centres at Withington, Chorlton-cum-Hardy, and Didsbury —the only welfare centres in the city which still remain under the control of the School for Mothers.

DUDLEY MATERNITY HOME.—Last week the Countess of Harrowby opened a new maternity home and a nurses' home erected at a cost of over £30,000 by the Dudley Board of Guardians. The maternity home is a one-storey building intended to form an integral part of the large hospital which it is hoped to erect on the site. There are 11 beds in three wards, and a single-bed separation ward. The nurses' home provides housing for 02 nurses and probationers.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 30th, to SATURDAY, Oct. 5th.—BETHLEM ROYAL HOSPITAL, S.E. Tues. and Sat., 11 A.M., lecture demonstrations in Psychological Medicine.—PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. Special Course in Gastro-enterology. One week only. Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Sept. 30th.—2.30 to 5 P.M.: Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY, Oct. 1st.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

FRIDAY, Oct. 4th.—11–11.45 A.M., Prof. F. S. Langmead: Graves's Disease. 12–12.45 P.M., Dr. T. C. Hunt: Recent Aids in Diagnosis of Some Common Diseases. 2.15–3 P.M., Mr. Aleck W. Bourne: The Action of Certain Drugs on the Uterus in Labour (Lantern Lecture). 3.15–4 P.M., Dr. A. Hope Gosse: Lantern Demonstration concerning Diseases of the Chest.

SATURDAY.—10.15–11 A.M., Mr. Duncan C. L. Fitzwilliams: Treatment of Malignant Disease by Radium. (With Epidiascope.) 11–11.45 A.M., Sir William Willcox: Catarrhal Jaundice. 12–12.45 P.M., Dr. Robt. Hutchison: Common Dyspepsias of Childhood. 2.15–3 P.M., Mr. T. G. Stevens: Retention of Urine in Women. 3.15–4.15 P.M., Dr. Albert Eidinow: Clinical Methods in Light Treatment.

SUNDAY.—10.15–11 A.M., Mr. R. M. Handfield-Jones: Pitfalls in Urological Diagnosis. 11–11.45 A.M., Dr. C. M. Wilson: Diabetes. 12–12.45 P.M., Mr. V. Zachary Cope: Abdominal Pain.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, Oct. 3rd.—5 P.M.: Dr. J. H. Stowers: Introductory Lecture.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Sept. 30th.—1.30 P.M.: Hearing Tests.

WEDNESDAY, Oct. 2nd.—1.30 P.M.: Examination and Diagnosis: The Sinuses.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Oct. 2nd.—4.30 P.M., Mr. H. P. Winsbury White: Stone in the Upper Urinary Tract.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 1st.—4.15 P.M., Mr. F. G. Wrigley: Acute Suppurative Otitis Media.

FRIDAY.—4.15 P.M., Dr. R. Prosser White: Some Problems in Occupational Dermatitis.

Appointments.

REDMOND, W. A., M.B., Ch.B. Dub., has been appointed Medical Officer, Ballyward Dispensary District, Co. Down.

SIMS, CARRIE, M.B., Ch.B. Birm., D.P.H., Medical Officer on the Staff of the Ministry of Health.

SPICKET, J. S., L.R.C.P. Lond., M.R.C.S., District Medical Officer, Haverfordwest Union.

THOMAS, D. M., L.R.C.P. Lond., M.R.C.S., Public Vaccinator for Greenwich District.

WILSON, H. F., Certifying Surgeon under the Factory and Workshop Acts for the Carnoustie District of the County of Angus.

Queen Charlotte's Maternity Hospital: DOLEMAN, F. T., L.R.C.P. Lond., M.R.C.S., Senior Resident Medical Officer; HUGHES, T. L., L.R.C.P. Lond., M.R.C.S., Assistant Resident Medical Officer; KINGSMILL, C. M., M.B., B.S. Lond., District Resident Medical Officer; and LIEBEN, C., L.R.C.P. Lond., M.R.C.S., Resident Anæsthetist.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. P. £250.

Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Albert Dock Hospital, Connaught-road E.—Surgeon.

Bath, Somerset and Wilts Central Children's Orthopædic Hospital, Coombe Park.—H.S. At rate of £120.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham, Dudley Road Hospital.—Jun. Asst. M.O. At rate £200.

Birmingham, Selly Oak Hospital.—Res. Physician. £100–£600.

Birmingham City Education Committee.—Asst. School M.O. £600.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Bootle Borough Hospital, Derby-road.—Hon. Asst. Gynæcological Surgeon.

Brighton, Royal Sussex County Hospital.—H.P. £150.

Bristol Dispensary.—Non-Resident M.O.

Cambridge, Addenbrooke's Hospital.—Hon. Asst. P.

Cambridge, Papworth Village Settlement.—Second Asst. M.O. £300. Also H.P. At rate of £100–£200.

Cardiff, Glan Ely Tuberculosis Hospital, Fairwater.—Asst. Res. M.O. £250.

Carmarthen Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. Chief Clin. Assts.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Eastern Dispensary, Leman-street, E.—Physician.

Exeter, Royal Devon and Exeter Hospital.—Hon. Physician.

Gloucester, Gloucestershire Royal Infirmary, &c.—Hon. S. to Ear, Nose and Throat Dept. Also First H.S. At rate of £135.

Great Yarmouth General Hospital.—Sen. H.S. £150. Also Jun. H.S. £100.

Grosvenor Hospital for Women, Vincent-square, S.W.—Res. M.O. At rate of £100.

Highgate Hospital, Dartmouth Park Hill, N.—Third Asst. M.O. £350.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Hospital of St. John and St. Elizabeth, Grove End-road, N.W.—Res. H.S. At rate of £75.

Hull Royal Infirmary.—Asst. H.P. At rate of £130.

Isleworth, West Middlesex Hospital.—Res. Asst. Med. Supt. and Asst. M.O. £150.

Kingston and District Hospital.—Third Asst. Res. M.O. At rate of £250.

Larbert, Stirling District Mental Hospital.—Third Asst. M.O. £250.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Liverpool Hahnemann Hospital, Hope-street.—Stipendary M.O. At rate of £125.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

London Homœopathic Hospital, Great Ormond-street, W.C.—Surgeon in charge of the Mechanotherapy and Orthopædic Dept.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. Radiologist. Also Hon. M.O. in charge of Actino-Therapeutic Dept.

London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. At rate of £175.

Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.

Newcastle-upon-Tyne Eye Hospital.—H.S. £200.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350 to £400.

Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150. Also Anæsthetist, £75.

Prince of Wales's General Hospital, Tottenham, N.—Sen. H.P. Sen. H.S., and Special H.S. Each at rate of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

Princess Louise Kensington Hospital for Children, North Kensington.—H.P. At rate of £75.

Rotherham Hospital.—H.P. £180.

Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. *£150. Also Cas. O. £150.*

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. Asst. Surg. Also Surg. Registrars. Each £105.

Royal Naval Medical Service.—Vacancies for Medical Officers. £452–£2350.

Saint Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

Sheffield, South Yorkshire Mental Hospital.—M.O. £400.

St. Peter's Hospital for Stone, Henrietta-street, W.C.—Radiologist. £25.

St. Stephen's Hospital, 369, Fulham-road, S.W.—Third Asst. M.O. £300.

Southampton Free Eye Hospital.—H.S. £150.

Stafford, County Mental Hospital.—Second Asst. M.O. £600.

Sudan Medical Service.—M.O. £E720.

Swansea Hospital.—H.S. £150.

West London Hospital, Hammersmith, W.—Hon. Registrar for Throat, Nose, and Ear Dept. House Officer for Children's Dept. At rate of £150. Asst. M.O. At rate of £450. Also three Jun. Asst. M.O's. Each at rate of £350.

Weston-super-Mare, General Hospital.—Res. H.S. £130.

Willesden General Hospital, N.W.—Ophthalmic S. Res. H.S. At rate of £100. Also Physician.

Winchester, Royal Hampshire County Hospital.—Res. H.S. At rate of £150.

Wolverhampton Royal Hospital.—Res. M.O. At rate of £150.

Woolwich and District War Memorial Hospital, Shooter's Hill, S.E. Res. M.O. £175. Also H.S. At rate of £125.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Ludlow (Salop), and Topsham (Devon).

The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Bath, Calne, Chippenham, Devizes, Frome, Hungerford, Malmesbury, Marlborough, Melksham, Newbury, Swindon, Trowbridge and Warminster County Courts (Circuit No. 52). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W., not later than Oct. 14th.

Births, Marriages, and Deaths.

BIRTHS.

Chapman.—On Sept. 20th, at Marine House, Bridlington, Yorks, the wife of P. D. H. Chapman, M.B., B.Ch., of a daughter.

Fitzsimons.—On Sept. 19th, at Albany-road, Cardiff, the wife of Dr. R. A. Fitzsimons, of a daughter.

Frazer.—On Sept. 22nd, at Mowbray-road, Brondesbury, N.W., to Dr. Kathleen Frazer, the wife of R. B. F. Frazer, L.R.C.P., Barrister-at-Law—a daughter.

Muir.—On Sept. 22nd, at Sussex House, Sutherland-avenue, W., the wife of J. B. G. Muir, M.B., B.S., F.R.C.S., of a son.

MARRIAGES.

Johnston—Rooke.—On Sept. 19th, at the Presbyterian Church, Camp Hill, Birmingham, William Macdonald Johnston, M.B., Ch.B., Crouch Hill, N., to Nancy Rooke, of Egbaston, Warwickshire.

Mitchell—McConnell.—On Sept. 4th, John Myles Mitchell M.B., B.Ch., B.A.O., to Adelaide Patricia, youngest daughter of T. E. McConnell, C.B.E., and Mrs. McConnell, of Belfast.

DEATHS.

Allan.—Thomas Sprot Allan, L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., Lieut.-Colonel R.A.M.C. (T.F.) (retired) late Surgeon R.M.S. *Appam*, Elder Dempster and Co., Ltd. Age 65, at the "Robert Davies" Nursing Home, Liverpool, on Sept. 16th after an operation. Interred at Allerton Cemetery, Liverpool, on the 19th inst.

Bowhay.—On Sept. 17th, at Yelverton, Devon, Albert Bowhay, M.D., late of Gunnislake, Cornwall, aged 67.

Coope.—On Sept. 24th, of acute poliomyelitis, Jean Rosemary, aged 5½ years, daughter of Dr. and Mrs. Robert Coope, of 13, Rodney-street, Liverpool.

Manby.—On Sept. 20th, at Palace Gardens-terrace, W., Edward Petronell Manby, M.D., Med. Off., Min. of Health.

Williams.—On Sept. 17th, at Richmond, Yorkshire, Howell Williams, M.D., aged 84.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of [illegible] *rriages, and Deaths.*

Births, Ma

Notes, Comments, and Abstracts.

"THE WEEKLY WEATHER REPORT."

From 1878 until February of last year a report on weather conditions was issued week by week by the Meteorological Committee. The place of these has now been taken by an annual volume which retains the original title. The first of these, now before us,[1] refers to the figures for the year 1928/29. The main feature of the report is a collection of statistics on the temperature, rainfall, and sunshine for a number of districts of the British Isles, from which long period normals for the different periods and districts have been calculated for each week of the year. The table of normals for mean temperature, number of rain days, rainfall, and daily duration of sunshine for each of the 12 districts of the British Isles and for each of the 52 weeks of the year is in fact based on observations for the 35 years 1881/1915. For each district the deviation from the normal during the year is shown in respect of temperature, rainfall, and bright sunshine. Observations at Kew Observatory for the 20-year period 1907/26, compared with the 35-year period 1881–1915, indicate that the summers in southern England have become cooler and the winters warmer in recent years. The records of bright sunshine, that is to say, sunshine sufficiently intense to make a charred trace on the card of a Campbell-Stokes recorder with a 4-inch spherical lens, indicate that smoke pollution may make itself felt at a considerable distance from its source. The sunshine expressed as a percentage of the possible duration for the year was in York only 28, while in Southport it was 33; for the winter the figures were 12 and 18 respectively. And this difference might be anticipated owing to the prevalence of westerly and south-westerly winds which carry the smoke of the industrial area away from Southport and towards York. This is only one example of the use to which the wealth of accurate information contained in this report can be put.

IRONSTONE AND LIGHTNING.

At an inquest at Worth on Sept. 10th, on two people who had been killed by lightning on the previous afternoon, the theory was advanced that the lightning was attracted by an under-crop of ironstone rock which is to be found in a large area of North Sussex. Four men were working in a field picking potatoes when the storm broke, and they ran to an oak tree for shelter. The tree was not struck but two of the men, one aged 25, and the other 42, were killed; also two dogs. One of the other men said his legs felt numb for some time, and the shock was as though his knees had been hit by a sledge-hammer. The fourth, a boy, was not much affected. Dr. A. Grayling stated that the cause of death was shock from lightning. Evidence of the lightning having struck the men was to be seen by the curious arborescent marks upon their bodies. Dr. Grayling added that in some parts of Sussex there were quantities of under-crops of ironstone rock, and that would attract electrical discharge. It was possible that in some parts of the particular field there was such an under-crop. Dr. E. F. Hoare, the East Sussex coroner, returned a verdict of death from misadventure.

A CAUTIONARY NOTICE.

Members of the medical profession often receive begging letters from persons claiming to be either widows or daughters of doctors. When such letters are forwarded to the secretary of the Royal Medical Benevolent Fund for inquiry it may be found that the person is known in the office of the Fund as one not deserving of charity. In the interests of medical charity the secretary of the Fund asks that letters *from persons unknown asking* for assistance should be forwarded to him at 11, Chandos-street, London, W. 1, for inquiry and report.

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[1] H.M. Stationery Office. 15s.

Asthma Research Council.—The Council's new address is 37, Russell-square, London, W.C. 1, and the telephone number Museum 3313.

New Casualty Department at Nottingham.—The great increase in the number of accidents has made it necessary to enlarge the casualty department of Nottingham General Hospital. There are now separate entrances for walking and stretcher cases, an anæsthetic room, surgeries for men and women, an operating theatre, and two recovery rooms.

An Address

ENTITLED

ARROGANCE AND IGNORANCE IN MEDICINE.

Delivered at the Birmingham University Medical School on Oct. 1st, 1929,

By Sir E. FARQUHAR BUZZARD, Bart.,
K.C.V.O., M.D. Oxon.,
CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL; REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD.

We cannot blind ourselves to the *fact* that the present position and reputation of the medical profession in the eyes of the public is unsatisfactory. We cannot remain deaf to the censure, sometimes good-natured, sometimes ill-natured, well-founded or baseless, so frequently passed in ordinary conversation on doctors and doctoring. It is not easy to treat as they deserve the cheap sneers which emanate so glibly from the judicial bench, nor to overlook the odious comparisons drawn between qualified and unqualified practice in the columns of our sensational and not too scrupulous newspapers. We are blamed, *almost in one* breath, for our conservatism, our radicalism, and our trades-unionism. There can be little doubt that, speaking generally, we live in an atmosphere which may be described as unsympathetic and suspicious, if not actually antagonistic. It may be that such an atmosphere is beneficial to our health, although I doubt it; at any rate we can do no harm and may do good if we investigate its properties and perhaps suggest such measures of ventilation as may appear to be desirable.

The charges laid against us are many, but they may be divided roughly into two groups, those of Arrogance and those of Ignorance. Let us examine the evidence which can be brought to support them, and if we are found guilty, as I have no doubt we shall be, let us hear what can be stated in mitigation. It might save the time of the Court if we plead guilty at once to both charges, and confine ourselves to pleas of justification or provocation.

ARROGANCE.

The indictment of Arrogance is laid in the following *terms*: "You are inclined to treat your patients as fools, to be too cocksure, and to lay down the law as if you were infallible; you won't listen to what we have got to say, and you are intolerant of the views of others."

The terms of such an indictment are general rather than specific, but certainly contain more than a grain of truth. The answer to them must also be general, and relies for its sufficiency on rather wide considerations which I must endeavour to formulate as briefly as possible.

It must be remembered, in the first place, *that at* the time of qualification a medical practitioner has spent at least seven years pursuing an educational curriculum which bears no resemblance to that through which the large majority of his patients have passed. In addition to mastering the principles of physics, chemistry, and biology, he has spent at least two years in the study of human physiology and anatomy, and at least three more years in acquiring some knowledge of pathology, medicine, surgery, midwifery, and a number of other special subjects. The load of information he has ingested is enormous, probably much greater than he has had time to digest, but that does not constitute the essential difference in his education from that of his future patients. During the whole of these seven years he has been trained in precise methods of investigation, has learnt to think scientifically, and to speak in scientific terms, to distinguish between facts and theories, to regard a priori conceptions with suspicion, to appreciate the value of experiments and controls, and generally has developed a critical faculty of which the lay mind is, perhaps mercifully, completely innocent.

Removed from his hospital, separated from his fellow students and teachers, and flung into practice, he finds himself in another world, where he is called upon to discuss medical matters with patients who, nominally educated, are not only ignorant of the rudiments of science, but who are often incapable of clear thinking *or clear expression. He finds that their answers* are unrelated to his questions, their beliefs are confused with facts, that the identity of post hoc with propter hoc is accepted without reserve, and that hearsay evidence is treated with the greatest respect. In short, he quickly realises that discussions on questions of health and ill-health are about the most difficult and exacting of the tasks with which he is confronted. If he is wise, and if he values the status of his profession, he will set himself to study this aspect of his work with the devotion he gave to his study of pathology. He will train himself to answer questions with the truth and nothing but the truth, even if he does not always feel justified in imparting the whole truth. He will learn to use language intelligible to his interrogators and he will never hesitate to express his doubts or his ignorance where his patient's welfare is at stake. Lastly, he will be prepared to give unlimited time and attention to practising the arts of listening and questioning, perhaps the most important part of his professional equipment.

Questions and their Answers.

If he is unwise and impatient he will evade inquisition, ask few questions, turn a deaf ear to stories which may be gold mines of information, and eventually justify the accusation of arrogance. It is not difficult to find excuses for this line if he has chosen it. It may be urged on his behalf that he has not the necessary time to give to the task, or that his attempts to accomplish it have always failed, his explanations having been misinterpreted and his opinions wrongly reported. Little wonder, perhaps, that he has taken the path of least resistance, although at the same time he has closed the door on the possibility of establishing that mutual confidence between doctor and patient which is essential to successful practice.

Although Medicine, year by year, is becoming more scientific in methods of investigation, no medical man can afford, and the profession cannot afford, to neglect the art of questioning or the art of listening. Therein lies an economic problem, the solution of which must some day be sought and found, but which would occupy more time than I can spare for its elaboration now. I refer to the fact that in general practice it is often impossible for a doctor to give to each patient the time necessary, not for physical examination, but for verbal cross-examination, and yet see a sufficient number of patients to earn a living wage. Skilful cross-examination will often define, and thus limit the field of, the necessary physical and chemical examination, but it requires time and perseverance, because what the doctor wants to learn, and *what the patient* thinks the doctor wants to learn, are rarely the same thing. The doctor may readily earn a reputation for arrogance if he cannot conduct his cross-examination with tact as well as with intelligence.

IGNORANCE.

And now for ignorance; our ignorance and that of the public. Ours is comparative, the public's is superlative. Our knowledge of the factors underlying health and disease, although comparatively small, is infinitely greater than it was even 50 years ago, and is steadily increasing. *This knowledge is the standard* by which we judge ourselves, but, in the public eye, our knowledge is measured entirely, and perhaps naturally, by our ability to cure. We are criticised, for instance, because we can cure neither cancer nor the common cold, and our critics assume that our ignorance of both conditions is something of which we may well be ashamed. Perhaps, but we can put up some kind of defence. In the first place, the criticism is based on an assumption, a relic of mediæval belief, that there are so many diseases for every one of which a cure exists, if we are clever enough to find it. Such an assumption cannot really be supported for a moment by any reasonable argument, and, in fact, the more we know of disease the more does it appear to lack foundation. The claims for prevention of disease, on the other hand, are becoming daily more firmly established, and the future of medicine surely lies in that direction.

The Public Demand for Cures.

A cure for cancer is loudly demanded by the public, and every effort has been and is being made to meet that demand by attempts to discover the cause or origin of that disease. In this case we are not justified in assuming that it can be cured or prevented, even if all its mysteries are revealed.

The common cold is on a different footing, and we may probably claim to know all the material facts about it. It is not curable, because it is only the manifestation of a battle royal between invading microbes and the tissues of their victim, and all we can do is to render aid to the latter in order to shorten the struggle and hasten his almost inevitable victory. It is probably preventable, but effectual preventive measures would produce such a social upheaval, and raise such an outcry from the public, that no Minister of Health is ever likely to risk his position or his parts by bringing them into force.

Diseases may probably be divided into several groups: (1) the curable, (2) the preventable, and (3) a group comprising those about which we know too little to determine the scope of their preventability. Of these three groups the smallest is the curable, and it is safe to predict that it will always remain so, while we may legitimately hope that the preventable group will gradually increase.

Let me add, in confidence, that there is yet another group of diseases, by no means insignificant in size, which are never cured, but which almost invariably disappear without, and sometimes in spite of, medical treatment. I might go further and point out that there are many diseases afflicting mankind to which the idea of cure is not, nor is ever likely to be, applicable. Take, for instance, "infantile paralysis" or acute poliomyelitis. Seeing its lamentable results, the public naturally assumes that we know nothing about it. If we did, we ought and should be able to cure it. But that is not the case. We know a great deal about it, and the more we know the less likely does it appear that a cure will ever be forthcoming. That it is preventable, that under certain circumstances it may be possible to arrest it, are well-founded beliefs, which we are justified in holding, but a cure for the disease can only be hoped for by those who really *are* ignorant of its pathology.

Response to the Demand.

We need not lie awake and fret about this aspect of our ignorance, provided we do not as a profession claim to cure disease. That is a claim we may well leave to quacks and charlatans, who will always find a public ready to believe them. On the contrary, it should be our object to make our methods of practice and our claims so different from those of quacks that the public should have no difficulty in distinguishing them. Therein we fail, and thereby we must plead guilty to a charge of ignorance. How can we expect to be acquitted of such a charge when we see the profession taking up, and following like a flock of sheep, each new "cure-all" stunt as it is offered to it? Sour milk, hormones, all forms of electricity, and lastly, ultra-violet rays, to mention only a few, have all been exploited by the profession with so little discrimination that a public cannot but fail to distinguish between qualified and unqualified practice. Without diagnosis and without dignity have doctors applied such measures, each in its turn, to every known ailment, with the result that our wisdom and our honesty, as well as the merits of the curative agent itself, have often become discredited. And our only defence is based on the statement that patients insist on having the newest thing in the way of cures! A very poor excuse, and one quite unworthy of the profession whose scientific status we are anxious to raise.

Perhaps my indictment is drawn in somewhat strong terms, but I should not be exaggerating very greatly if I said that I never see a patient nowadays who has not already been lavishly exposed to artificial or natural sunlight—not a very good advertisement for Old King Sol, or his synthetic offspring!

Psychological Training.

Yet another aspect of our ignorance on which stress is often, and not always undeservedly laid. It is, perhaps, again the fault of an overcrowded curriculum that the psychological side of our work does not receive the attention which is its due. Every patient is an individual with his own idiosyncrasies and with his own reactions. We are accused of treating them as if they were all alike, and of ignoring their personal characteristics or peculiarities. The art of recognising such features is not an easy one to acquire, but time and labour spent in that direction is not wasted, even if the results obtained may sometimes upset the lessons we have learnt from clinical signs or from boiling test-tubes. A doctor is apt to be classed as ignorant, perhaps even arrogant, if he has not earned the title of "understanding."

THE TRUE RÔLE OF MEDICAL MEN.

I cannot here exhaust the whole sum of our iniquities, but I hope to have indicated some of the lines along which future generations of doctors may count to correct the mistakes of their misguided predecessors. In order to dissipate any gloom I may have produced, I would like to add a few words of reassurance and encouragement. The criticisms, just and unjust, to which I have referred are levelled at professional practice as a whole, rather than at doctors individually, each of whom has it in his power to earn the respect, gratitude, and affection of his patients. The personal status of the doctor depends, not so much on his knowledge or ignorance, his modesty or arrogance, as on his willingness or unwillingness to place all, or more than all, his resources at the disposal of those who seek his help. If I were permitted to coin a motto, appropriate alike to consulting-room and surgery, it would be "Give and do more than is required of you."

Let me close with a short but true story. A few weeks ago I was staying at an hotel in the south of England, and one evening I received a message to the effect that Lord Mersey, an old and eminent judge, who has since passed away, would like to have a few words with me. He greeted me in the following way: "I wanted to make your acquaintance because I knew and greatly respected your father. Many years ago, towards the end of a long illness, he was asked to see me. After consultation with the other doctors, he came back to my bedside and said, 'I don't know what is the matter with you, but I am confident that you will make a complete recovery.' He was quite right, and I have never forgotten the comfort and hope with which his words inspired me."

To the unthinking my father's words might have sounded like a confession of ignorance. To a great lawyer they appeared to be based on knowledge. There was no claim, no promise, to cure; only confident prophecy, born of experience. If our profession as a whole is to attain its rightful position let it cease to profess to cure, and be content to show the public that its knowledge and experience, limited as they yet must be, are assets of value on which reliance can be safely placed.

YORKSHIRE VOLUNTARY HOSPITALS FUND.—The East and West Ridings Voluntary Hospitals Committee has now been enlarged by the inclusion of the North Riding, which has hitherto had a separate committee. The purpose is to accomplish for Yorkshire what King Edward's Fund does for London, and the new fund will be known by the name of Princess Mary, who is the patron; Lord Lascelles will be the President. During the financial year just ended the old committee raised nearly £8000.

ON THE ALLEGED

EXPERIMENTAL PRODUCTION OF MALIGNANT TUMOURS IN THE FOWL.

By A. M. BEGG, M.B., CH.B. N.Z.,
AND
W. CRAMER, PH.D. BERLIN, D.Sc. EDIN.,
M.R.C.S. ENG.

(From the Laboratories of the Imperial Cancer Research Fund.)

IN recent years statements have appeared repeatedly in the cancer literature to the effect that it is possible to transform normal fowl cells rapidly by a simple experimental procedure into malignant cells. The first statement of this kind was made by Carrel, who claimed to have obtained a malignant tumour of the fowl by injecting a normal fowl with normal embryo emulsion and certain chemicals, such as arsenious acid, indol, skatol, and tar. One of these tumours is still being propagated in various laboratories and appears in the literature as "Carrel's indol tumour." Later Carrel's procedure was modified by his pupil A. Fischer and his collaborators, who cultivated normal fowl cells in vitro together with various chemical substances such as arsenious acid, and claimed to have produced a transformation in vitro of normal cells into malignant cells, so that the tissue cultures, when injected into normal fowls, produced a malignant new growth. In one of these experiments, published from Fischer's laboratory by Laser, the transformation was effected by cultivating normal cells of the fowl in the serum of another fowl which had received injections of tar. Even simpler was the procedure of Haagen, who cultured normal monocytes of the fowl in the ordinary way in vitro, and on injecting these cultures, together with dilute arsenious acid into six fowls, obtained, after three weeks in four of these animals, large, rapidly metastasing tumours, which, according to the description, were typical Rous tumours No. 1.

The experiments of Carrel, which are technically the simplest to perform, have been repeated in many different laboratories by experienced workers (Deelman, Roussy, Pentimalli) with uniformly negative results. Although the failure to confirm these results has been published, Carrel has not communicated any further experiments confirming his positive results.

At the International Congress of Cancer in 1928 A. Leitch and J. B. Murphy reported that they had been able to produce a malignant new growth in fowls by the injection of materials derived from normal fowls. Leitch obtained this result with the extract of a normal fowl's pancreas, while Murphy claimed to have succeeded with material obtained from a normal fowl's testicle. In the Annual Report of the British Empire Cancer Campaign for 1929 Leitch reported that, in spite of numerous repetitions of these experiments, he had been unable to confirm either his own result or those of Murphy. Murphy himself has not published a confirmation of his preliminary communication.

One curious feature of these observations is that the malignant tumour produced in all these experiments is always of the same type—namely, a sarcoma closely resembling in its histological appearance and its biological characters, such as filtrability, rate of growth, the Rous tumour No. 1. This is the filtrable tumour of the fowl which is being propagated in all the laboratories from which claims as to the alleged transformation of normal cells of the fowl into malignant cells have been published. But the spontaneous appearance of this type of tumour is by no means a particularly frequent event. Rous himself described over 40 tumours of the fowl; of these only six were filtrable, and of these six tumours only one (No. 43) had the same histological appearance and biological character (rate of growth, &c.) as Rous tumour No. 1, while two other filtrable tumours (Nos. 18 and 33) resembled each other, but differed in their histological appearance quite definitely from the tumour No. 1. Fujinami has described 32 carcinomata and seven sarcomata occurring in fowls, and of these only one resembled in its histological appearance and its biological characters the Rous tumour No. 1. Pentimalli has described 18 spontaneous tumours of the fowl, of which one was a carcinoma. None of the 17 sarcomata resembled the Rous tumour No. 1. In our laboratory, in which a large number of fowls of all ages have been under observation during the last five years, five spontaneous tumours have been found. Of these, two developed the property of filtrability, but both differed widely from each other and from the Rous tumour No. 1 in their histological appearance and their rate of growth. In this connexion we may also refer to a hitherto unpublished result obtained by our late colleague, Dr. B. R. G. Russell. By repeated subcutaneous injections of tar into fowls he succeeded in producing a hard tumour in one fowl after more than a year. Histologically it was a fibrosarcoma; transplantation with living cells gave negative results, and it showed no resemblance to the Rous tumour No. 1.

It is clear, therefore, that so far as the spontaneous development of malignancy in fowls is concerned, the same degree of variability exists as in mammals, and that the Rous tumour No. 1 does not represent a particularly frequent type of malignancy in fowls. The fact that the *alleged* experimental transformation of normal cells of the fowl into malignant ones always leads to the same type of tumour is, therefore, a feature which requires explanation, especially when one takes into consideration that the experimental conditions under which this same type of tumour was *apparently* produced from normal cells differed widely both as regards the normal cells and the material which was allowed to act upon them.

A Source of Fallacy.

During the last three years repeated attempts have been made in this laboratory to test the validity of the contention put forward by Carrel and his pupils. Quite recently experiments have been carried out to test also the results obtained by Leitch with material obtained from the pancreas of normal fowls. All of them have yielded negative results. But one of these experiments has accidentally disclosed an experimental fallacy adequate to account for the positive results which have been recorded. In view of the importance which attaches to experiments of this kind in regard to our conceptions of the ætiology of cancer, this experiment will be described in detail.

It is well known that malignant tumours of the mouse, or extracts prepared from them, do not cause malignant disease when injected into fowls. Our own experiments have also convinced us that pancreas or pancreatic extracts of a normal fowl when injected into a fowl do not produce a tumour, and the recent report of Leitch referred to above is in agreement with this. An experiment was therefore planned in which extracts from a mouse tumour were inoculated repeatedly into a normal fowl, which was subsequently to receive an extract from the pancreas of a normal fowl.

In this experiment five chicks of Exp. A had received injections once a week for three weeks of an extract from mouse carcinoma 63. The extract was made by rubbing the carcinoma in a mortar with sand and Ringer's solution, and after spinning the turbid extract filtering it through a Berkefeld filter. The last injection of the mouse tumour extract had been given on May 30th. On the same day a new experiment was started, and the same extract of carcinoma 63 as that given to the five chicks of Exp. A was injected into two new chicks (Exp. B). Four days afterwards the five chicks of Exp. A received an injection of a pancreatic extract from a normal fowl; the two chicks of Exp. B did not receive this pancreatic extract.

A fortnight after the last injection of the carcinoma extract all the five chicks of Exp. A and the two chicks of Exp. B had developed tumours at the site of inoculation of the mouse carcinoma extract. The tumours grew very rapidly, histologically they were identical with the Rous tumour No. 1; they could be transmitted by extracts to other fowls. In fact, the result was exactly as if these seven chicks had received an injection of an active filtrate of Rous tumour No. 1.

It is clear that the positive result, which resembled those obtained by Carrel, Leitch, Murphy and others, had nothing to do with the injection of the pancreatic extract, because the tumours formed equally well in the two chicks of Exp. B which had received the injection of the mouse carcinoma extract only. The formation of these tumours was therefore clearly associated with the injection of the mouse carcinoma extract on a particular date—namely, May 30th. As soon as this was realised the experimental conditions obtaining on that day were reconstructed from the protocols, with the following result. The experiment just reported had been carried out in the afternoon. In the morning another experiment had been carried out in which an extract had been made from three different Rous tumours and inoculated into fowls. The routine of this laboratory is that the mortars used for preparing these extracts after washing and drying are sterilised. Three sterile mortars are available and all the three mortars had been used in the forenoon. They had then been washed in running water and dried, but there was no time to sterilise them for the experiment in the afternoon. The mortar used in the afternoon for the extraction of the mouse carcinoma had therefore been used in the morning for the extraction of a Rous sarcoma. Sterility of the mortar from *bacterial* contamination was not essential in preparing the extract, as it was passed through a Berkefeld filter before injection. The possibility that the mortar was still contaminated with the Rous "agent" in spite of the washing was not taken into consideration, but the result shows that in spite of the washing it still contained active material from a Rous sarcoma, which must have exhibited virulence of a high order. The virulence of the Rous sarcoma extracts show very wide fluctuations, as was shown by Gye and Andrewes, and has since been confirmed. Baker and McIntosh, for instance, state that filtrates of the tumour give sometimes positive results after the injection of as little as 0·001 c.cm. of the extract contained in 0·5 c.cm. saline, while at other times 1 c.cm. of the extract has failed to produce a tumour.

This experiment emphasises the necessity for all laboratories in which the Rous tumour No. 1 is being propagated of subjecting all apparatus used in experiments on fowls to a process of sterilisation which will ensure the destruction of the "agent." Unless this precaution is observed the inoculation of material which in itself is inactive may by contamination produce a typical Rous tumour No. 1. The experiment here described has been repeated five times, observing the precaution just mentioned. The results were uniformly negative.

Conclusion.

The alleged experimental transformation of normal cells of the fowl into malignant cells by simple chemical substances is based on isolated experiments, in which the tumours produced always had the histological appearances and biological features of Rous tumour No. 1. In view of this peculiar feature and the failure to confirm these results, they must be ascribed to an experimental error similar to that responsible for the positive results obtained in the experiment described in this paper.

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THE ULTIMATE PROGNOSIS IN CASES OF ECLAMPSIA AND ALBUMINURIA OF PREGNANCY.*

By JESSIE C. B. SYM, M.D. EDIN.

ECLAMPSIA has long been recognised as one of the formidable risks of child-bearing. From the Registrar's reports for England, Wales, Scotland, and Ireland it appears that, on an average 600 women die annually of eclampsia in these islands. The fœtal mortality is extremely high and, since the disease often appears while the child is still premature, must remain so. The neonatal death-rate is also high. Williams estimates the fœtal mortality at 50 per cent., but considers that not more than one-third of the children leave hospital alive. Further, as 70 per cent. of the eclamptic mothers are pregnant for the first time, 400 women die annually with their first child, and the majority, had they lived, would probably have had other children. Eclampsia, therefore, though a relatively rare disease, is of importance to every community in which it occurs. Moreover, if the surviving mothers are incapacitated, either totally or partially, for further child-bearing, its importance is increased, both to the community and to the individual.

Eclampsia is always severe, but the severity of albuminuria of pregnancy varies from a mild albuminuria in the later weeks to "pre-eclampsia." The prognosis for the mother is fairly good under efficient treatment, but for the fœtus, owing to the frequency of premature labours and stillbirths, it remains poor. Albuminuria is extremely common in pregnancy; excluding the physiological albuminuria of labour it occurs in 3·5 per cent. of all pregnant women. If it affects the health of so large a percentage of child-bearing women it is a serious disease, especially if any ill-effects should persist after pregnancy. If it impairs the ability of the woman to bear future healthy, full-time children, it is from the point of view of the race perhaps more serious than eclampsia.

An attempt has therefore been made to find out what health a woman has after suffering from one of the late toxæmias of pregnancy, and how she fares in subsequent pregnancies.

Eclampsia.

A record has been made of 74 women who had eclampsia and recovered in the Royal Maternity Hospital, Edinburgh, not less than three years ago. All those now surviving have been interviewed and examined. At the time of having eclampsia the average age was 27 years; 58 per cent. were primiparæ and three had eclampsia in two pregnancies. Of the 77 pregnancies which ended in eclampsia only 14 were under medical supervision, which in many cases was of a very perfunctory and inadequate kind. In only 8 cases was there no history of warning symptoms, and it is reasonable to suppose that some of the 63 women who had no antenatal care might, under medical supervision, have been prevented from developing eclampsia. Œdema was the commonest and earliest symptom; headache was the next. The average length of gestation was 38 weeks. All the patients had albuminuria and all had convulsions. The fœtal mortality was 38·96 per cent.

Previous Gestations.—Thirty-one of the 74 women were multiparæ when they developed eclampsia, and they had among them 108 gestations. Of these, 83 were normal, 14 ended in miscarriages, and 11 were complicated by albuminuria. That is to say, six women out of 31 had albuminuria in a pregnancy previous to an eclamptic pregnancy.

Deaths.—Three patients have died—one of a second attack of eclampsia and one of pulmonary embolism after a subsequent pregnancy. The cause of the third death could not be ascertained.

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* Part of a thesis accepted for the degree of M.D. at the University of Edinburgh, 1928.

Result of the Examination of the 71 Surviving Patients.—Thirty-nine women appeared to be in good health. Defects noted in the remainder were as follows: anæmia, 12; chronic constipation, 6; advanced pyorrhœa, 7; bronchitis, 1; enlarged thyroid, 2; myxœdema, 1; enlarged chronically inflamed tonsils, 3; dyspepsia, 1; neurasthenia, 1; hemiplegia (result of cerebral hæmorrhage), 1.

All patients examined are of hospital class and therefore the number who have anæmia is high. Nearly all had some oral sepsis. Special attention was given to the cardiac, renal, and vascular systems. The urine was examined, blood pressure readings were made, the blood-urea was estimated, and the urea-concentration test was done. In two (2·8 per cent.) of the patients a diagnosis of chronic nephritis was made. Ten gave at least one result which was below par in one or other of the tests employed (10·0 per cent.). In five cases (8 per cent.) the tests were incompletely done and no deductions could be drawn. The hearts, arteries, and kidneys of 54 patients (76 per cent.) were healthy.

The following list shows how the 12 patients, A to L, whose renal and cardiovascular systems were judged unsatisfactory, fared in pregnancies subsequent to eclampsia.

Pregnancies Subsequent to Eclampsia.

A. 1 normal. 1 albuminuria. 1 in progress, normal.
B. 1 normal. 3 albuminuria. 3 miscarriages.
C. No subsequent pregnancies.
D. 1 albuminuria.
E. 1 albuminuria.
F. No subsequent pregnancies.
G. 1 albuminuria.
H. 1 miscarriage.
I. No subsequent pregnancies.
J. 1 albuminuria.
K. 1 albuminuria. 1 miscarriage.
L. No subsequent pregnancies.

These patients all complained of vaguely unsatisfactory health.

It has been shown that if a woman has an impaired renal and cardiac vascular system, her post-eclamptic pregnancies will almost certainly be complicated, but that is far from saying that those whose kidneys are satisfactory have had healthy pregnancies after eclampsia.

Subsequent Pregnancies.—Of the 74 women, 42 were pregnant after eclampsia and had between them 67 gestations. Seven of these gestations are in progress; 6 ended in abortions or miscarriages. There have therefore been 54 labours, of which 48 (88·89 per cent.) ended in live births, and 6 in stillbirths. Four of the stillbirths occurred in cases of albuminuria, one in recurrent eclampsia.

Type of Subsequent Gestation.—Of the 42 women who again became pregnant, 17 (40 per cent.) showed late toxæmia in subsequent pregnancies at least once. Of 67 gestations, 10·45 per cent. are in progress, 53·73 per cent. were normal, 26·87 per cent. were complicated by late toxæmia (22·39 per cent. by albuminuria and 4·48 per by cent. eclampsia), and 8·96 per cent. ended in abortions or miscarriages.

Of these 42 women who have been pregnant after eclampsia, 40 have been pregnant again once, 12 twice, 4 three times, and 1 each four, five, six, and seven times.

Of the 40 *first-subsequent* pregnancies, 25 (62·5 per cent.) were normal, 11 (27·5 per cent.) were complicated by albuminuria, and 2 (5 per cent.) by eclampsia, whilst 2 (5 per cent.) ended in abortion or miscarriage.

Of the 12 *second-subsequent* pregnancies, 9 (75 per cent.) were normal, 2 (16·7 per cent.) were complicated by albuminuria, and 1 (8·3 per cent.) ended in miscarriage.

Of the four *third-subsequent* pregnancies, 1 proceeded normally, 1 was complicated by eclampsia, and 2 ended in miscarriage.

The one *fourth-subsequent* pregnancy was complicated by albuminuria, the one *fifth-subsequent* pregnancy was normal, the one *sixth-subsequent* pregnancy was complicated by albuminuria, and the one *seventh-subsequent* pregnancy ended in miscarriage.

Albuminuria of Pregnancy.

A similar investigation was made of 81 patients who had albuminuria of pregnancy, for which they were treated in the Royal Maternity Hospital, Edinburgh, at some time during the same period—i.e., March, 1921, to March, 1926. The average age of the patients when they first developed albuminuria of pregnancy was 29·6 years, and 69·5 per cent.—58 women—were primigravid when they had their first attack.

Previous Pregnancies.—The 23 multiparæ had had 81 previous pregnancies between them before their attack of albuminuria. These were all normal gestations.

Previous Illnesses.—A record was made of any illness from which these women had suffered before their first attack of albuminuria.

	Patients.
Scarlet fever	17
Diphtheria	2
Other exanthemata ..	26
Tuberculosis	3
Bronchitis, pneumonia, pleurisy.	9
Rheumatic fever, chorea	3
Influenza (severe) ..	2
Anæmia	4
Appendicitis	1
Typhoid	2
Syphilis	4
Dysmenorrhœa ..	2

Deaths.—Of the 81 patients, 3 (or almost 5 per cent.) have died, one of a gastric ulcer, another of antepartum and postpartum hæmorrhage—this patient was a 3-para and both previous pregnancies had been complicated by albuminuria—and the third of a cerebral hæmorrhage two months after delivery.

Result of the Examination of the Surviving 78 Patients.—Thirty-three are in good health and seven have poor health. Five of these react unfavourably to the renal and cardiovascular tests; one has active tuberculosis and one refuses to have any examination made. Four patients volunteered the statement that their health "was good except when they were pregnant," at which time they have an indefinite feeling of tiredness from the fourth month onward. All these patients show good renal test results and each has had albuminuria in every pregnancy she has undergone. Thirty-eight patients have indifferent health, which was found to be due to one of the following causes: anæmia, syphilis, heart lesions of rheumatic origin, pituitary deficiency, hyperthyroidism, toxic goitre, dysmenorrhœa, menopausal symptoms, cervicitis, menorrhagia, uterine fibroids, tuberculosis, neurasthenia, bronchitis, advanced pyorrhœa, chronic constipation.

The same attention was given to the cardiac, vascular, and renal systems as in the women who had had eclampsia, and the same tests were done. In six cases a diagnosis of chronic nephritis was made and five more cases gave poor results in at least one test in each case. This result may be compared with that obtained in the eclamptic series:—

	Good results of tests.	Poor results of tests.	Tests incompletely done.
	Per cent.	Per cent.	Per cent.
Eclampsia series ..	76	16·9	8
Albuminuria series ..	81	13	6

Table I. shows how the 11 patients whose renal and cardiovascular test results were considered unsatisfactory fared in their pregnancies.

It will be seen from this table that once an abnormal pregnancy has occurred it has only been followed in one instance—and that a doubtful one—by a normal pregnancy. Patients who fail to react to these tests are almost certain to fail under the test of pregnancy, in this series as in the first. Only two of these 11 cases have had scarlet fever.

As in Series I., therefore, patients with unsatisfactory tests develop toxæmia when pregnant, but, again as in Series I., the fact that the non-gravid, post-toxæmic patient has satisfactory test results does not mean that she will pass normally through a subsequent pregnancy. This is even more obvious in the second series.

Type of "First Abnormal" Pregnancies.—Of the 81 women who were pregnant, 3 miscarried and 53 of the 78 labours were spontaneous. Premature labour occurred in 31 cases. 76 children were born (twin pregnancy occurred thrice in the series), and 18 (i.e., 23·7 per cent.) were stillborn.

Risks to Mother in Subsequent Pregnancy.—Of the 81 mothers, 30 did not become pregnant again after one attack of albuminuria. The remaining 51 women have had altogether 90 subsequent gestations, and 2 (or 3·92 per cent.) have died.

TABLE I.

	Pregnancy—						
	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh
A	Alb. + +	Alb. + + +	Alb. + +	—	—	—	—
B	Misc.	Alb. + + +	Alb. + +	—	—	—	—
C	Norm.	Norm.	Norm.	Alb.	Misc. c. alb.	Alb. +	—
D	Norm.	Norm.	Norm.	Norm.	Norm.	Alb.	—
E	Alb. +	Alb. + +	Alb. +	Misc. c. alb.	Alb.	—	—
F	Norm.	Alb. + + +	Alb. + + +	Alb. + +	—	—	—
G	? Alb. +	Alb. + +	? Alb. + + +	? Norm.	Alb. + + +	Alb. + + +	Alb. +
H	Norm.	Norm.	Norm.	Norm.	Norm.	Alb. + + +	—
I	Alb. +	Alb. + + +	—	—	—	—	—
J	Norm.	Norm.	Norm.	Norm.	Alb. + +	—	—
K	First ten pregnancies, normal; eleventh, miscarriage; twelfth, albuminuria.						

Alb. = Albuminuria. Misc. = Miscarriage. Norm. = Normal.

Risk of Mother Developing Albuminuria Again.—Of the 51 women who became pregnant after one attack of albuminuria, 28 (i.e., 55 per cent.) showed late toxæmia in at least one of their subsequent pregnancies.

Chance of Living Child in a Subsequent Gestation.—Of the 90 subsequent gestations, 6 are in progress and 14 ended in abortion or miscarriage. Of the 70 subsequent labours, 61 terminated in live births and 9 children were stillborn (12·9 per cent.). All cases of stillbirth were associated with albuminuria.

Types of Subsequent Pregnancies.—There have been 90 gestations subsequent to one attack of toxæmia. Of these, 44 were complicated with albuminuria (5 doubtfully), 26 were normal, 14 ended in abortion or miscarriage, and 6 are in progress (5 normally, 1 abnormally). Albuminuria has therefore occurred in 48·89 per cent. of these cases and abortion or miscarriage in 15·56 per cent., while 28·89 per cent. were normal and 6·6 per cent. are in progress.

First-subsequent Pregnancies.—Of these 51 gestations, 21 (41 per cent.) were normal, 24 (47 per cent.) were complicated by albuminuria, 5 ended in abortion or miscarriage, and 1 is in normal progress. In the 45 labours 7 stillbirths occurred, all in association with albuminuria.

Second-subsequent Pregnancies.—Of 22 gestations, 5 (22·5 per cent.) proceeded normally, 10 (45 per cent.) were complicated by albuminuria, 3 are in normal progress, and 4 ended in abortion or miscarriage. Stillbirths occurred in 2 of the 15 labours, both in association with albuminuria.

Third-subsequent Pregnancies.—Of 10 gestations, 1 proceeded normally, 5 were complicated by albuminuria, 3 ended in abortion or miscarriage, and 1 is in normal progress.

Fourth-subsequent Pregnancies.—Of three gestations, one was complicated by albuminuria and one ended in miscarriage. The third is in progress and the patient has albuminuria. Thus only one gestation has terminated in labour, and the child was stillborn.

Fifth-subsequent Pregnancies.—Both gestations were complicated by albuminuria.

Sixth-subsequent Pregnancies.—Of two cases, one ended in miscarriage and one was complicated by albuminuria.

The chance that albuminuria will recur in a subsequent pregnancy is thus seen to be very great. There is a definite predisposition to recurrence after one attack, but in only a small number of those who develop the disease—even of those who develop it several times—is it possible to detect any renal or other impairment when the patient is non-gravid. More than half the gestations subsequent to one attack of albuminuria of pregnancy are abnormal; more than half the women who become pregnant after one attack develop toxæmia again. But the women, like those of Series I., appear and remain well for the most part so long as they are not pregnant.

The figures obtained in the two series may be compared (Table II.).

TABLE II.

Gestations subsequent to first attack of toxæmia.	First series (per cent.).	Second series (per cent.).
Albuminuria	23·39	48·89
Eclampsia	4·48	—
Normal	53·73	28·89
Abortion or miscarriage	8·96	15·56
Gestations in progress	10·45	6·6
Chances of a living child in subsequent gestations (calculated per 100 labours)	88·89	87·1

Comment.

It has been shown that recurrence of late toxæmia is commoner after albuminuria than after eclampsia, but if the two series are taken together 37·9 per cent. of the subsequent gestations are complicated by late toxæmia. As toxæmia of this type occurs in roughly 2·5 per cent. of all pregnant women, there is a definite predisposition to a recurrence after one attack, especially when it is remembered that two-thirds to three-quarters of all toxæmic conditions are found in primiparæ. First pregnancies form from one-quarter to one-fifth of all pregnancies; thus the liability to toxæmia is ten times as great in primiparæ as in multiparæ.

In only a small number of cases can the tendency to develop toxæmia be explained by the presence of nephritis.

The prognosis for a woman who has suffered from eclampsia is—as far as further childbearing goes—better than that for a woman who has had albuminuria.

Among the cases grouped as "albuminuria of pregnancy" various types are found. If these could be differentiated the difference in prognosis would be further stressed. Amongst them are:—

(1) *Cases with an Undoubted Renal Basis.*—Renal impairment is present before, aggravated by, and persists after, pregnancy. Subsequent pregnancies increase the damage. A stillbirth or a miscarriage is the probable end of the pregnancy.

(2) *Cases of Acute Toxæmia.*—The prognosis as regards the future of these cases is the same as that for cases of eclampsia. Could these cases be eliminated from the series of albuminuria of pregnancy the percentage of recurrence of toxæmia in the remainder would be increased.

(3) When cases belonging to the two foregoing groups have been excluded a large number of *cases of unknown origin* remain. During the toxæmic pregnancy the kidney may be apparently greatly damaged, but its capacity for recovery is apparently very great and all signs of disease disappear in the puerperium. No signs appear unless the patient is pregnant again. That is to say, if the criterion of cure is the ability of the individual to remain healthy in a subsequent pregnancy, cure is incomplete. Under the stress of pregnancy the kidney will again show signs of disease. If permanent traces of kidney damage do at length remain in the puerperium these are indistinguishable from ordinary nephritis of the "mixed" type.

The practical outcome of an inquiry such as this is to emphasise the importance of the work of the antenatal and postnatal clinics. While knowledge of the changes which occur in the normal pregnant and puerperal woman are so scanty, knowledge of the toxæmic and post-toxæmic patient can only be incomplete. The benefit to the toxæmic patient herself cannot be overestimated. The incidence of eclampsia is enormously reduced in the presence of antenatal care, though fulminating cases still occur. Mild forms of toxæmia are dealt with and discovered early. A precise knowledge of the time and mode of onset of a toxæmia is invaluable in assessing the dangers of continuing the pregnancy. It is also invaluable in classifying the toxæmia—a classification which can only be made by the postnatal observer.

No accurate ultimate prognosis should be attempted without it, and, if future pregnancy occurs, it is also very valuable information.

The work of the postnatal clinics is no less important. If the return to normal is incomplete, succeeding pregnancies will certainly not be normal and, should pregnancy occur, the patient's chances of bearing a live child are much poorer than those of the healthy woman. If the return to normal is slow it is likely that a subsequent pregnancy will be abnormal. Even if the return to normal is rapid the possibility that the succeeding pregnancy will be toxæmic is greater than in a woman who has had normal pregnancies or who is a healthy primipara. For the furtherance of knowledge, as well as for the benefit of the individual patient, all post- and antenatal information should be laid side by side.

In view of the danger which the toxæmic patient runs the value *of induction of labour must* be emphasised, particularly induction after viability of the child has been reached in a patient who is known to have had one toxæmic pregnancy. In this case the child's interests march with the mother's. Non-interference gives little practical gain and may result in great loss. It is impossible not to think that many cases of albuminuria are carried on foolishly long. An obstetrician should always seriously consider induction in every case of albuminuria which has persisted, despite treatment, for over three weeks, even if the case presents no acute features.

Scheme for Observation of the Toxæmic Case in the Puerperium.

1. Patients should be kept in hospital for at least three weeks postpartum. Regular urinary analysis and blood pressure readings should be made. Before discharge the fundi oculi should be examined and a urea-concentration test done. If any of these results are abnormal blood analysis should be made. The patient's general condition should be noted and a tentative diagnosis made of the type of toxæmia.

2. Three months postpartum the patient should report at the postnatal clinic. Her general condition and her symptoms, if any, should be noted. A urinary analysis and a blood pressure reading should be taken and, in the presence of abnormality, a blood analysis and an ophthalmoscopic examination as well. The diagnosis should be reviewed and corrected if necessary.

3. If the patient has apparently recovered completely at the time of the second examination, she should report again one year *after* delivery. If she shows any abnormality she should report 6 and 12 months after delivery, and each time the same examination should be made. Changes which persist for a year may be regarded as permanent and the patient classified accordingly.

4. In the event of a subsequent pregnancy all postnatal data should be placed, with the diagnosis of the type of toxæmia, in the hands of the attending obstetrician.

5. All patients who have had late toxæmia of pregnancy of any degree should be instructed to report to the antenatal clinic if they know, or suspect, that they are pregnant.

Long-continued observation of the post-toxæmic patient is necessary for an accurate classification of the toxæmia, for an accurate ultimate prognosis in the individual, and for an effective guide to treatment in future pregnancies.

Summary.

1. About a quarter of the pregnancies which occur after eclampsia are complicated by some degree of toxæmia. 2. Almost half the pregnancies which occur after albuminuria are complicated by some degree of toxæmia. 3. The earlier albuminuria begins in pregnancy and the longer it persists the more likely is it to cause renal damage and to recur in a future pregnancy. 4. Recurrence of toxæmia occurs in the absence of any detectable trace of renal impairment. 5. If traces of renal damage are absent, and if patients do not become pregnant they remain in good health.

I am much indebted to the medical staff of the Maternity Hospital, Edinburgh, for access to records of cases, and for permission to examine patients at the hospital.

THE CLINICAL PICTURE PRODUCED BY
SUBACUTE MENINGOCOCCAL SEPTICÆMIA.

BY C. LAWSON STOTE, M.B. CAMB., M.R.C.S. ENG.

RECENT bacteriological investigations have shown that meningococcal meningitis may often be preceded or accompanied by a septicæmia of relatively short duration and of secondary importance. On the other hand, primary meningococcal septicæmia may occur with or without meningeal involvement, the septicæmia being the striking clinical feature. These latter cases may be classified in the following way:

1. *Acute Septicæmia.*—Localisation of meningococci in the meninges occurs a few days after the onset of septicæmic symptoms. The onset is sudden, there are very marked septic symptoms, great prostration, and usually a petechial rash. Death occurs in a few hours or a few days. Meningococci may be cultured from the blood. Andrewes in 1906 was one of the first to describe a case of this type.

2. *Subacute Septicæmia.*—This group includes cases of meningococcal septicæmia which run a course of from one to several months' duration. They may be further subdivided into: (*a*) those cases which eventually show meningeal involvement; (*b*) those associated with infective endocarditis; (*c*) those exhibiting the features of a pure septicæmia without metastases.

It is the clinical picture presented by this second group of subacute cases that I wish to describe, particularly those which show a pure septicæmia without metastases. The reason for treating these cases separately is that they all reveal themselves by a well-differentiated clinical picture, which renders their diagnosis comparatively easy. The condition has not received much attention in this country, and though it is probably rare it seems likely that the majority of cases are unrecognised.

Rolleston, in an extensive survey of all types of meningococcal infections, briefly shows that "intermittent meningococcic fever" due to septicæmia may (*a*) last for weeks without any meningitic symptoms, or (*b*) may follow meningitis, or (*c*) show transient meningitic symptoms, or (*d*) terminate in meningitis, but states that a correct diagnosis is seldom made in the absence of meningitic symptoms.

Graves, Dulaney, and Michelson, in publishing a case of chronic septicæmia in which meningococci were present in the blood and cerebro-spinal fluid and which recovered after about three months' pyrexia, state that 13 cases of subacute or chronic meningococcal septicæmia have been described in the American literature. Of these, three, ending in death, had associated endocarditis (those of Warfield and Walker, Cecil and Soper, and Dock); four had septicæmia with a secondary meningitis for a varying length of time and recovered, while the remaining six had septicæmia without involvement of the heart or meninges. These last, which were described respectively by Bray, Herrick, Morgan, Bloedorn, Neergaard and Marlow, all had intermittent temperatures for two to five months, but eventually became quite well. The authors state that subacute or chronic meningococcal septicæmia shows a triad of symptoms consisting of intermittent fevers with rigors, skin eruptions, and arthropathies. The eruptions come in crops with a rise in temperature, and may be either purpuric, macular, or papular.

The joint pains are usually slight, without physical signs, but there may rarely be the formation of fluid.

In March, 1928, O. Herman and M. Eifschitz recorded a case in a man aged 30 who had remittent fever, erythematous eruptions on the limbs, no physical signs, and a relatively good general condition. A pure culture of meningococci was obtained from the blood, and the man made a spontaneous recovery. These authors quote Friedemann and Deicher as stating that the characteristic features of meningococcal septicæmia are:

1. Nasal, pharyngeal, or bronchial catarrh.
2. Fever, remittent at first and then irregular, lasting from one to several months.
3. Erythematous eruptions.
4. Protracted course without physical signs.
5. A relatively good general condition.

G. Mahieu in 1928 collected seven cases which appeared to be subacute meningococcal septicæmia. In three of these meningococci were present in the blood and there was no meningeal involvement, in one case the organisms were recovered both from the blood and the cerebro-spinal fluid; and in two the blood culture was negative, but the organisms were obtained from the cerebro-spinal fluid. In the seventh case no organisms were isolated but the symptoms were analogous to those of the other six. All these cases showed remittent temperature running a subacute course (from two to five months), accompanied by joint and muscular pains without physical signs, and erythematous eruptions, especially on the limbs and face. All the cases made a complete recovery.

Two New Cases.

I wish to describe two cases of subacute meningococcal septicæmia I had under my care at the London Hospital while I was house physician. By a remarkable coincidence I admitted both cases from the receiving room on the same day, and as they were in the same ward throughout their illness I had a unique opportunity of noting the similarity of the two. Both were boys; they came from entirely different neighbourhoods of London and had not been associated with each other outside. There was no epidemic of cerebro-spinal meningitis at the time. I am greatly indebted to Dr. Robert Hutchison for giving me permission to publish these two cases, and also to Dr. G. T. Western for allowing me to quote the results of the blood cultures.

CASE 1.—A schoolboy, aged 7, was admitted to the London Hospital on Nov. 17th, 1927.

History.—His mother said he had been quite well until five weeks before, when he had gone off his food and begun to feel unwell. At the same time a rash had appeared on his hands, arms, legs, and face. This had consisted of scattered, non-irritating spots, none of which had appeared on the trunk. Some spots had faded, while new ones had made their appearance in crops ever since the onset of the illness. All this while (five weeks) he had been kept in bed and the doctor stated that he had had a swinging temperature, up to 103° F. at night. Pains had been present all the time in the large joints of the arms and legs. These had never been severe, and flitted about from joint to joint, rarely being more than a day in any one joint. The joints had never been red or swollen. He had vomited after food every day until a week before, but not since. These had been ordinary food vomits. The bowels were regular and there was no diarrhœa. At no time were there any headaches, sore-throat, backache, or earache. There had been no discharge from the eyes or nose, and no shivering attacks were noticed. The only previous illness he had had was measles when 2 years old. The mother and father were alive and healthy. There were five other children alive and well, and three had died, two of pneumonia and one of scalds.

On admission he appeared as a slightly-built little boy, somewhat pale but not anæmic or under-nourished. The tongue was moist and clean and the throat clear. The eyes were not inflamed. There was no evidence of nasal or bronchial catarrh. There was a pink papular eruption copious on the face, arms, and legs, sparse on the buttocks and back, and absent from the chest and abdomen. Each papule consisted of a uniformly coloured, slightly raised, rose-pink area, varying in size from that of a pin's head to that of a threepenny piece. A very few had punctate purpuric centres. They were not irritating. There was no pain or swelling of any joint. The spleen was not palpable and nothing abnormal was found in the abdomen, heart, or lungs. Nothing abnormal was found on examination of the central nervous system and there was no clinical suggestion of meningeal infection.

Course of Illness.—The temperature was 100·5° F. on admission. For the next ten weeks the temperature was swinging between normal and 102° to 103°. The highest temperature usually occurred in the evening, but occasionally in the morning. Every now and again a period varying between one and four days would pass without pyrexia. During the following three weeks (Jan. 20th to Feb. 15th) there was an occasional rise up to 100° F. After this the temperature settled. The pulse-rate throughout remained at just over 100 per minute, and the respiration-rate at a little over 20.

Throughout the period of pyrexia the patient appeared remarkably well, considering the temperature he was running. He would sit up in bed all day long, play with his toys, laugh and joke with the other boys in the ward, and sleep and eat well. It was only for a few hours every second day or so that he would appear tired and rather ill, and would lie down, become quiet, and lose interest. These periods would always coincide with a "peak" in the temperature chart and usually with the complaint of joint pains, either in the legs or arms. The day following would usually yield a fresh crop of spots. The rash had the same characteristic throughout and never completely vanished until the temperature finally settled. One crop of papules would start to fade three or four days after its appearance and then be succeeded by a second. The rash was chiefly confined to the limbs and face, was sparse on the buttocks and back, and never appeared on the chest or abdomen. At times a very few of the papules would show a definite punctate purpuric centre. The spleen became just palpable at the beginning of December (the eighth week of the disease). The edge could be felt quite distinctly for a day or two, but was not felt again after this. The heart sounds remained normal throughout. There were no signs at all indicating any meningeal infection. The slight headaches complained of at times were never severe. Joint pains would come and go from day to day. One of the large joints of the arms or legs would be affected for a day at a time, causing pain on movement, but no swelling or redness. The pains were never very severe and would not keep him awake at night. They disappeared with the fall of temperature.

When he was discharged from hospital on May 15th, 1928, there were no physical signs of disease and he appeared quite well in himself.

The following *special investigations* were undertaken while he was in hospital. The blood culture on Nov. 17th and Dec. 31st, 1927, and on Jan. 10th and 24th, 1928, yielded a Gram-negative diplococcus which from all its characteristics appeared to be the meningococcus. It was agglutinated by meningococcal serum, group 4. The blood culture was sterile on Feb. 26th, after the patient had been afebrile for 14 days. Lumbar puncture was performed on Nov. 30th. The fluid was clear, not under excessive pressure, and on microscopic examination showed no cells or organisms. There was no excess of protein and the cultures were sterile.

A blood count on Nov. 17th showed: 4,800,000 erythrocytes and 6850 leucocytes per c.mm.; hæmoglobin, 72 per cent., and a colour-index of 0·75. A differential count of the white cells showed: polymorphonuclear leucocytes, 68·5 per cent.; small lymphocytes, 30 per cent.; large lymphocytes, 8 per cent.; and large hyalines, 3 per cent. The Wassermann reaction in the blood on Nov. 23rd was negative. The urine remained clear throughout.

An autogenous vaccine was prepared from the organisms from the blood culture and was given as follows: Dec. 16th, 25 minims; 22nd, 25 minims; 30th, 50 minims; Jan. 14th, 100 minims. No reaction followed any of the injections.

CASE 2.—A shop errand boy, aged 15, was admitted to the London Hospital on Nov. 17th, 1927.

History.—For the preceding two months he had had a rash which had first appeared on his chest and had spread after one week to his limbs. It had gradually cleared from the body, but remained on the limbs. It had consisted of rose-red, non-irritating spots up to 1 cm. in diameter. He had not felt well in himself but had remained at work until one week before, when he had had a sore-throat and been in bed for one day. Four days earlier he had begun to have pains, moving from joint to joint, starting in the ankles, and then going to the knees and wrists. There had been no swelling of the affected joints. His appetite had remained good throughout and his bowels normally opened. There was no history of any discharge from the ears, nose, or penis, and no headaches or shivering attacks. He had had "fits" when a baby up to the age of 3 years. From this age onwards until he was 9 years old his eyes had given him trouble, for which he had attended a hospital and had injections for treatment. His mother and father were alive and healthy and there were five other healthy children.

On admission he appeared a rather pale, definitely ill-nourished lad, with a white-coated tongue. Each eye showed scars of central corneal ulcers, and there was a certain amount of catarrhal conjunctivitis. There was no evidence of congenital syphilis. The tonsils were slightly enlarged but not infected. There was a rash on the arms, legs, and thighs consisting of a sparse, diffuse papular eruption, the spots being slightly raised rose-pink papules up to 1 cm. in diameter. None was purpuric and they were not irritating or painful. There were no spots on the face or trunk. There was pain on movement of the knees, ankles, and wrists, but no swelling or redness. There were no rheumatic nodules. The spleen was not palpable, and there was nothing abnormal in the abdomen, heart, or lungs.

Course of Illness.—He had a temperature of 101° F. on admission, but this came down within three days and remained normal for four days. For the following four days he had a swinging temperature—98° F. in morning and up to 103° F. at night—culminating in a rigor on the evening of the tenth day after admission. There was a swinging temperature for the next ten days (up to 102·6° F. at night), and it then settled to normal at the beginning of the fourth week after admission (the twelfth week of the disease). There was no further pyrexia. The pulse-rate varied between 70 and 86, and the respirations averaged 20 per minute throughout. The rash on the face and limbs disappeared within three or four days with the fall of temperature, and at this time he appeared quite well in himself. Within a week increasing temperature at night was accompanied by a fresh crop of papules on the limbs and face and a few on the buttocks and back. The rigor on the twelfth day was followed by a third crop of papules—the last to appear—and these faded gradually and disappeared within ten days. Throughout the pyrexial period the patient remained well in himself, would sit up in bed, amuse himself by drawing, and talk and joke with the others in the ward. A few hours before and after the rigor he was quiet, went off his food, and lay listlessly in bed. The joint pains that were present on admission disappeared in three to four days and no definite joint pains were noticed after this. On Dec. 6th (the twentieth day after admission) he had quite a severe backache which lasted all day and radiated downwards to both thighs. There was some pain on movement of either hip-joint. The heart remained clear throughout and the spleen was never palpable. A few days before he was discharged he developed a phlyctenular ulcer at the edge of the left cornea. Otherwise he was well.

No treatment by drugs or vaccines was attempted.

The following *investigations* were carried out.

The blood culture on Nov. 25th, 1927, yielded a Gram-negative diplococcus identical with that obtained from the first case. On Dec. 20th (after the patient had been afebrile for ten days) the cultures were sterile.

On Nov. 30th lumbar puncture gave a clear fluid, not under pressure. It contained no cells or organisms and the cultures were sterile.

A blood count on Nov. 25th showed 4,900,000 erythrocytes; a hæmoglobin percentage of 78; a colour-index of 0·79; and 12,400 white cells; of which 66 per cent. were polymorphonuclear leucocytes, 21 per cent. were small lymphocytes, 6 per cent. were large lymphocytes, 6 per cent. were large hyaline, and 1 per cent. were eosinophils. The Wassermann reaction on Nov. 22nd was negative. The urine was clear throughout the illness.

The symptoms and physical signs in the two cases were closely similar in all important respects. Also, the course which the disease pursued was almost identical in both boys. In both the blood culture grew typical meningococci during the height of the disease, and in both the cultures became sterile as the disease subsided. In neither was there any alteration in the cerebro-spinal fluid, nor were any organisms found in it, while in no single symptom was meningeal involvement suggested. There was nothing pointing to any other infection or localisation of disease. It is thus reasonable to suppose that the symptoms and physical signs present were due directly to meningococcal septicæmia and to this alone.

The Clinical Picture.

The signs and symptoms in each case formed a clinical picture different in many essential respects from that shown by other septicæmias. As there was no involvement of the central nervous system, neither clinically nor bacteriologically, and no other signs usually associated with the ordinary meningococcal infection—i.e., meningitis—one is justified in regarding this condition of subacute meningococcal septicæmia as a well-differentiated disease, running a definite course. Arguing from the close similarity of these two cases, one obtains the following picture of the condition.

The onset is insidious, and the first indication that a grave disorder is present may be the swinging temperature, which is remittent in character, with a daily variation of 5 or 6 degrees Fahrenheit or less. Rigors may occur. Apparently the temperature continues for a few months—in one case it was three months, and in the other four and a half—finally, becoming normal as the other symptoms subside. Probably the most striking feature is the relatively very good general condition of the patient. With such a temperature one would expect the general condition to be definitely bad, but both these patients were bright, lively, and cheerful throughout, and there was no "ill-look" about them. The rash seems to be fairly characteristic, but in some respects resembles erythema nodosum. The distribution is peculiar, being almost confined to the limbs and face. The spots are scattered, rose-red papules, appearing in crops usually corresponding to extra high "peaks" in the temperature chart. They are non-irritating and disappear without leaving any discoloration. The joint pains are transitory, not very severe, and unaccompanied by any physical signs in the joints. They occur in any of the large joints of the limbs, passing from one joint to another and not remaining more than a few days in any one joint.

In all these particulars these two cases exhibit similar symptoms and follow similar clinical courses to the cases of subacute meningococcal septicæmia recorded by other observers.

Conclusions.

1. Subacute meningococcal septicæmia, when uncomplicated by metastases, gives a clinical picture which is peculiar to the condition, forming a definite clinical syndrome.

2. It is characterised by: (*a*) remittent fever, lasting from a few weeks to several months; (*b*) a rash, consisting of small papules which come out in crops, especially on the limbs and face; (*c*) joint pains, moving from joint to joint, appearing with a rise of temperature and disappearing during defervescence; (*d*) absence of physical signs; (*e*) relatively extremely good general condition of the patient; (*f*) an excellent prognosis.

3. Meningeal infection need not occur during a meningococcal septicæmia of this type.

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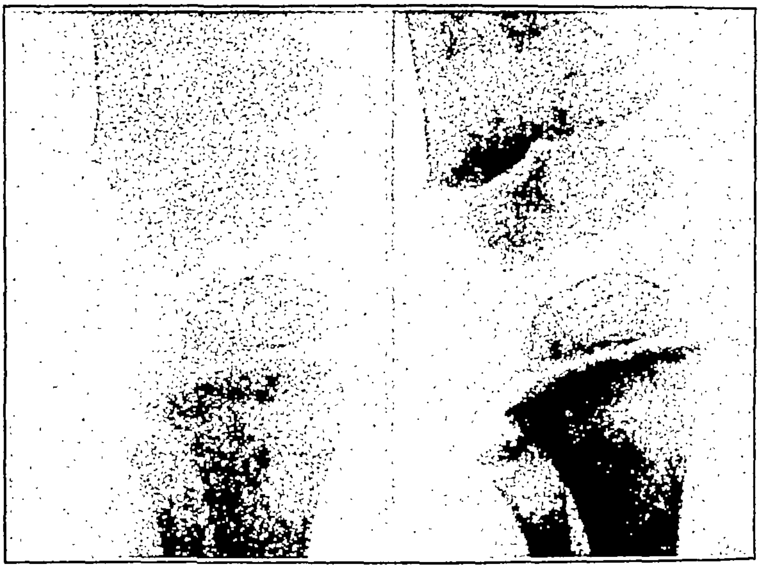
ST. MARY'S HOSPITAL.—It is pointed out in the annual report that the recent extension has necessitated the employment of a larger number of nurses, and that since there is no room for them they have been temporarily housed in the isolation ward. The need of additional accommodation for the nursing staff is consequently urgent. There are now 303 available beds, 263 of which during the past year were constantly occupied. The 4575 in-patients stayed an average of 22 days, and cost £14 10*s.* 0*d.*; there were 40,440 new out-patients, who cost 6*s.* 1*d.* each. The tuberculosis dispensary continued to do good work; there were 231 new cases.

No medicinal or other measures were employed, with the exception of an occasional mild laxative medicine (syrup of figs) to counteract the slightly constipating tendency of the dietary. For the first few days little food was taken owing to gastric disorder. The extreme muscular feebleness of the child precluded the necessity of any measures being required to ensure rest to the limbs. The radiographic appearances were those of advanced florid rickets.

Within a fortnight the improvement in the general condition of the child was striking, this being associated with a notable improvement in the X ray appearances of the limbs. At the end of six weeks, when the radiographic appearances of the joints were almost normal, additional measures were employed in the form of splints and massage to keep the child at rest and favour correction of the pronounced curvature of the limbs. Complete elimination of the severe curvature was not effected, and it is probable, in view of the unfavourable environment of the child, that this will not be obtained without surgical assistance at a later date. A remarkable feature of the case was the coincident improvement which took place in the mental development of the child. From being unable or unwilling to speak and being generally inanimate, the power of speech, an interest in his surroundings, and all the mental traits of the average child manifested themselves. This improvement in the psychological state did not noticeably develop until after three weeks' treatment.

FIG. 5. FIG. 6.

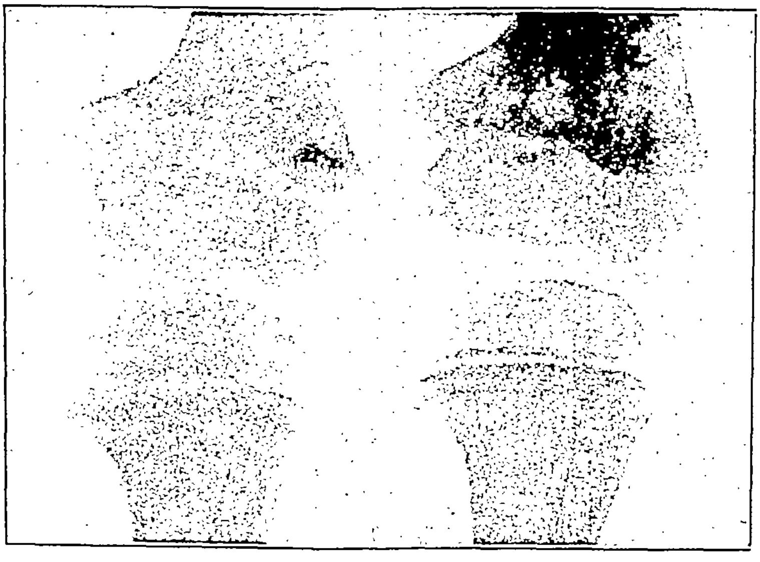


Case of rickets before and after one month's treatment with irradiated milk. The change from the very indefinite and irregular metaphysis to the normal regular dense line is well shown.

CASE 2.—This is recorded as one of four cases selected as specially suitable for the investigation. He had been an in-patient in the Victoria Home for five months for the treatment of rickets, but had proved unusually refractory to treatment, the general condition of the child and the radiographic appearances of the joints being still unsatisfactory, and the lesion still active. Besides a careful antirachitic dietary, which included 18 oz. of high-grade milk and orange-juice daily, a course of various special antirachitic remedies had been given. This included irradiated ergosterol (95 tablets), ostelin (8 oz.), exposure to ultraviolet rays, &c. All medicinal and other special measures of treatment were stopped, the dietary in use was continued with the exception that 6 oz. of irradiated milk of Certified standard replaced 6 oz. of the Grade A (tuberculin tested) milk ordinarily supplied to the home.

Under this regimen an improvement in the clinical condition was striking and rapid. The favourable influence of the treatment is indicated in Figs. 7 and 8. Fig. 7 illustrates the condition of the wrists after five months' indoor treatment, before the administration of the irradiated milk was begun. Fig. 8 depicts the same joint after four weeks' treatment with irradiated milk. The radiographic appearances were then practically normal, the clinical condition having proportionately improved.

FIG. 3. FIG. 4.



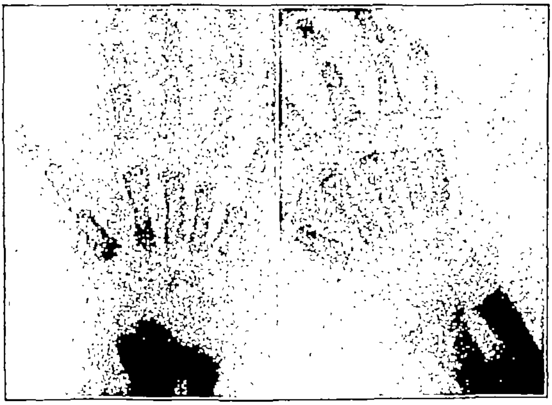
Case of florid rickets. Note the wide epiphyseal lines with irregular striation throughout the cartilage. There is also typical "flaring" of the metaphysis with irregularity of the edge. Fig. 4 shows the condition of the same bones after one month's treatment with irradiated milk. Note the rapid approximation to the appearance of a normal joint.

It is noteworthy that this recovery (and similarly in the other three cases) was effected merely by substituting 12 pints of irradiated milk for 12 pints of milk of similar quality unirradiated, all medicinal and other special therapeutic measures being withheld. It is important to note that the cost of the special irradiated medicinal products (excluding ultra-violet rays) administered in the previous five months—with very restricted success—would be, at retail rates, approximately 18s. As our experience leads us to believe that there could be no justification for the price of irradiated milk exceeding that of unirradiated by more than 1*d.* per pint, the total cost of the special treatment—and of the recovery—over the four weeks' period was 1s. On the economic side, therefore, the advantage lies markedly on the side of treatment by irradiated milk.

A Word of Caution.

A word of caution is necessary about the use of irradiated milk. It is essential, in view of its profound influence on the growing bones, to keep in view the possibility of overstimulation leading to premature ossification. This danger can be easily avoided. With our present limited knowledge it is, in our opinion, essential that irradiated milk should not be considered a complete substitute for good fresh milk. In a series of adult subjects to whom we administered the milk to the extent of 8 pints daily over a period of six weeks no untoward symptom of any kind was observed. In view, however, of various experimental results that have been recorded in animals from the use of highly irradiated products, in the form of abnormal calcification in the cardiovascular and renal systems, the milk should be used with care and discrimination. It may be accepted, beyond any possibility of doubt, that the recent discovery of the value of properly irradiated milk is one of very far-reaching importance alike to the practitioner, the physiologist, biologist, and the student of nutrition generally. The question of the standard of irradiation, and the possibilities of its application in conditions other than rickets, may be briefly referred to.

FIG. 7. FIG. 8.



Wrist of child aged 3. After five months' hospital treatment, rachitic changes are still present in Fig. 7. Note "cupping" of the ulna. In Fig. 8, after one month's treatment with irradiated milk, no rachitic changes are detectable.

Standards.

In this country irradiated milk can only be sold under license from the patent holders. Under this arrangement the licensees agree that "their irradiated milk shall not contain less than two (2) ostelin (vitamin D) units per gramme of butter-fat as determined by the pH drop test under conditions laid down in the papers by Jephcott and Bacharbach (*Biochem. Jour.*, 1926, xx., 1351, and 1928, xxii., 60), or alternatively eight (8) Pharmaceutical Society's units per gramme of butter-fat as determined by the line test employed by the Pharmaceutical Society." With fuller knowledge time may show that these tests may require modification. We have at present no assurance that the butter-fat supplies a complete and reliable guide. The material point for the profession and the public at the present time, however, is the fact that under the existing standards milk can be successfully irradiated so as to impart to it a very valuable additional therapeutic property in the prophylaxis and cure of rickets. A further question that naturally arises is the possibility of irradiated milk proving of value in conditions other than rickets. While no authoritative statements can be made on this subject it may be useful to indicate some directions in which evidence may reasonably be looked for.

Irradiated Milk in the Treatment of Other Disorders.

In the past few months a series of observations have been made on the feeding of children in the Craiglockhart Parochial Hospital, Edinburgh, under the direction of Dr. R. W. Dawson, resident physician. The cases observed showed the very severe malnutrition commonly seen in patients in these institutions. The results, more especially in the case of children over one year old, have been very gratifying, the gain in weight and improvement in the general condition of the children having been very satisfactory. The possible value of irradiated milk in the treatment of various disorders of pregnancy and lactation, associated with derangements in calcium metabolism, has been referred to in medical literature, but adequate data on the subject are still lacking. Through the kindness of Mr. F. E. Jardine, surgeon in charge of the special sanatorium under Edinburgh Corporation for the treatment of tuberculosis and other disorders of an orthopædic classification, we have had an opportunity of testing the effects of irradiated milk in a series of four cases of advanced tuberculous disease of the knee-joint of three to five years' duration. The favourable results obtained have been very striking. These amply justify the recommendation that a thorough and prolonged investigation should be made in this direction. To this end it is, in our opinion, desirable that the whole subject should be investigated under the ægis of a specially appointed scientific body, whose opinions and recommendations, on scientific and clinical questions, would commend themselves to the profession.

Conclusions.

1. The claims of numerous German writers concerning the value of irradiated milk in the prevention and cure of rickets are amply confirmed. 2. Irradiated milk should not be regarded as a complete substitute for good fresh untreated milk. 3. In rickets, between 2 and 5 years of age, excellent results have followed its use when the milk has been used in strengths varying from 1 part irradiated to 2 parts unirradiated, up to equal parts of the two preparations. 4. The cure of the disease is established more quickly, effectively, and economically by the use of irradiated milk than by various irradiated commercial preparations. 5. There are indications that irradiated milk may prove of outstanding value in the treatment of certain disorders other than rickets—notably *disorders incidental to pregnancy and lactation, the* climacteric, malnutrition, injuries and surgical diseases of bone, and certain forms of tuberculosis. 6. There is need for the establishment in this country of a scientific body to initiate and direct the work, both on its strictly scientific and clinical sides, called for by these new facts about nutrition, and the influence of ultra-violet rays upon it.

We have pleasure in expressing our indebtedness to Dr. Woodburn Morison, of the Radiological Department of the Royal Infirmary, Edinburgh, for his cordial coöperation and assistance; also to the British Hanovia *Quartz Lamp Co. (Scholl apparatus), and Food Irradiation Co. (Scheidt apparatus), for their courtesy in putting apparatus at our disposal for the investigation.

THE board of management of Birmingham General Hospital have accepted the offer of an anonymous donor to establish a studentship in diabetic research of the value of £250 a year. The studentship will be held in connexion with the hospital's diabetic clinic.

Clinical and Laboratory Notes.

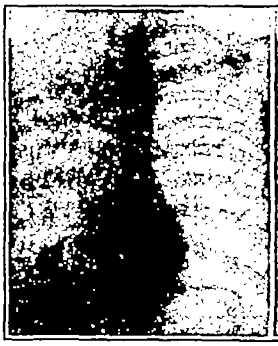
A CASE OF ADENOCARCINOMA OF BRONCHUS.

By L. S. T. Burrell, M.D., F.R.C.P. Lond.,
PHYSICIAN TO THE ROYAL FREE HOSPITAL AND TO BROMPTON HOSPITAL FOR CONSUMPTION.

The patient, a man of 29, complained of pain on the right side of the chest, dyspnœa, cough, and sputum which was often blood-stained.

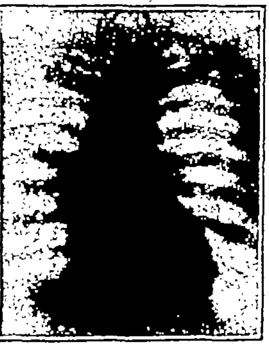
He dated the symptoms from an accident in November, 1928, when he broke a tooth, and it was thought that he might have a piece of broken tooth in a bronchus. On examination in April, 1929, no breath sounds were heard on the right side of the chest which was found to be completely dull, and the heart was slightly displaced towards the right side. A diagnosis of collapse was made, and this was confirmed by radiography (Fig. 1); but as no foreign body was seen the presence of a tumour was suspected. In May the patient was examined through a bronchoscope by Mr. V. E. Negus at King's College Hospital, and a red, rounded, smooth mass was seen projecting from the posterior wall of the right bronchus just above the orifice of the upper lobe bronchus into which it was sucked during inspiration. A lot of fœtid pus was aspirated, and the tubes cleaned in order to make subsequent operation more satisfactory.

FIG. 1.



Collapse of right lung. Heart slightly displaced to the right.

FIG. 2.



The right lung has now re-expanded and the heart has returned to its normal position.

A few days later Mr. Negus again passed a bronchoscope, and painted the growth with cocaine and adrenalin. It now appeared as a mere bulge from the bronchial wall, but had a definite pedicle, and he was able to remove it with biting forceps, leaving the base as a small excoriated area. It was then possible to see clearly down the right lower lobe bronchus. The tumour looked like a soft fibroma, but on section it proved to be adenocarcinoma.

Radiographic examination ten days after the operation showed partial re-expansion of the right lung. The note on percussion was still impaired on the right side, but it was not dull and air could be heard entering the lung. The patient left hospital much improved and had very little dyspnœa. Fig. 2 shows the condition at the end of July, 1929, ten weeks after the operation. The patient was then free from all symptoms and felt perfectly well.

This case is similar to the one I published in THE LANCET (1927, ii., 1180), but in that patient the tumour was a simple fibroma, and when I last heard from her in May, 1929, she was quite well and had had no further symptoms since the tumour was removed. In the present case it is probable that the carcinoma will spread, although it is possible that the whole tumour has been removed.

The patient was referred to me by Dr. Malcolm Hutton, of Stamford, and I am indebted to him for permission to publish this paper, and to Dr. Ulysses Williams for the skiagrams.

A CASE OF CICATRICIAL STENOSIS OF THE ŒSOPHAGUS.

By Kenneth Heritage, M.B., F.R.C.S. Eng.,
LATE RESIDENT SURGICAL OFFICER, ANCOATS HOSPITAL; RESIDENT MEDICAL OFFICER, MILLER HOSPITAL.

The following case illustrates the importance of œsophagoscopy as a means of diagnosis in œsophageal obstruction.

A married woman, aged 42, first attended Ancoats Hospital, Manchester, on March 9th, 1929, with a history of six days' complete œsophageal obstruction; she was unable to retain even small quantities of water. For two years previously she had suffered from progressive difficulty in swallowing—solids, meat, &c., having to be minced for her. Being of a rather nervous disposition this had been treated for a time by her doctor as a case of hysteria.

On examination I found an anæmic wasted woman, very weak, and scarcely able to walk. Her weight was 6 st. 2 lb., which was 2 st. less than it had been six months previously. Fluids and solids were returned unchanged from the œsophagus. Routine screening of the chest excluded thoracic neoplasm and aneurysm, and a barium meal revealed complete œsophageal obstruction at the level of the eighth thoracic vertebra. The Wassermann reaction was negative.

Before œsophagoscopy the patient had denied the possibility of having swallowed corrosives, but on going into the matter further with the relatives afterwards it was discovered that, at the age of 3, she had swallowed "lye" (caustic soda) in mistake for ginger-beer.

After combating the patient's dehydrated condition with subcutaneous and rectal saline I passed an œsophagoscope under general anæsthesia, and found, 20 cm. from the edentulous gums, a hard fibrous lip surmounting a pale white annular stricture. No foreign body was present. Complete obstruction was due to stenosis alone. With difficulty a filiform bougie was introduced under direct vision, and left in situ for several hours. The stricture was subsequently dilated with graduated gum-elastic bougies under direct vision, at three sittings under anæsthesia, and was shown to be solitary. Later, the patient having become accustomed to instrumentation, it was found preferable to pass the œsophagoscope without anæsthesia, by the method described by Abel,[1] and this has proved a good method of examination and treatment of this condition. She is now able to swallow anything and is rapidly gaining weight in consequence.

The case is unusual in view of the long period (37 years) between swallowing caustic in infancy—an event forgotten by the patient—and the onset of definite dysphagia two years ago. The complete nature of the obstruction when first seen is also noteworthy.

Treatment by gradual dilatation under direct vision through an œsophagoscope passed under local, or without, anæsthesia, forms in my opinion the ideal method of maintaining patency in the case of simple œsophageal stricture. "Blind bouginage" can only be condemned by the dictum of Trousseau, that "sooner or later all cases of stricture of the œsophagus die of the bougie." Other methods, such as those of Plummer and Tucker, demand the presence of a gastrostomy over a prolonged period in a patient who is able to swallow the thread guide.

I am indebted to Mr. F. Holt Diggle, from whose clinic this case is reported.

CHRONIC PARASITIC FUNICULITIS IN EGYPT.

By Dr. M. F. Sorour,
ASSISTANT PROFESSOR OF PATHOLOGY, FACULTY OF MEDICINE, CAIRO.

Ten years' experience in examining pathological material sent from Government hospitals all over Egypt has shown that chronic nodular masses, of varying size, are not uncommon lesions in the spermatic cords of the Egyptian fellaheen (peasants).

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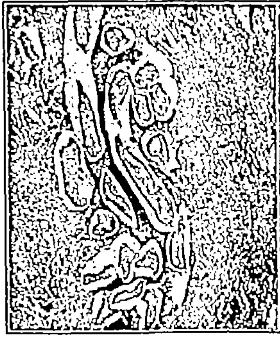
[1] Abel, A. L.: Œsophageal Obstruction, London, 1929, p. 39.
[2] Sewell, Lindley: THE LANCET, 1928, i., 1008.

These nodules vary in size from a hazel-nut to a pigeon's egg, and are, as a rule, painless, or only slightly tender. Two varieties of this condition have been met with, due respectively to two different parasites—namely, filaria and bilharzia.

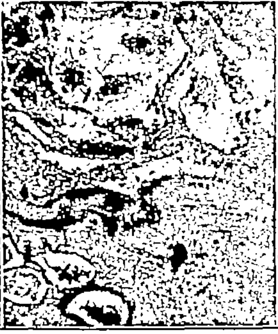
(1) *Chronic Filarial Funiculitis.*—For many years I had received spermatic cord nodules, which, in sections, showed: Chronic fibrosis, with very heavy eosinophil cell infiltration, enclosing thickened walled blood-vessels, whose lumens were narrowed, or completely obliterated, by organised thrombosis. I named these lesions "chronic eosinophilic funiculitis"; and although no bilharzia, ova, or worms had been found in them, I suspected a worm infection. In 1927 I received a spermatic cord nodule from the Government hospital at Zagazig, which, on section, disclosed, besides the histological changes above described, a large lymphatic vessel cut very obliquely, show layers of endothelial proliferation, containing many multinucleated cells. In its lumen was an intact filaria worm, cut in many places and directions. In the very oblique, almost longitudinal, sections of the worm were ova and embryos.

1



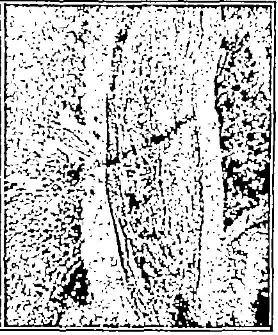
Lymphatic vessel containing filaria worms, cut in different situations and directions, and surrounded by a cellular mass.

2



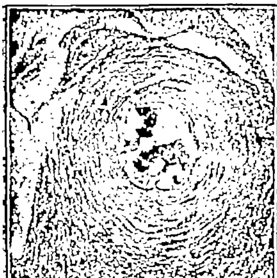
Filaria worms in lymphatics from another case.

3



High magnification of part of filaria worm, showing embryos inside the mother worm.

4

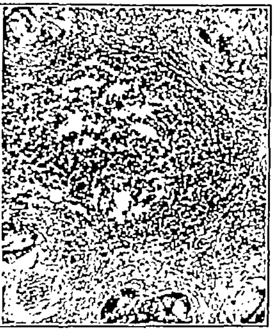


Remains of degenerated worm inside fibrosed, obliterated lymph vessel, in a chronic case.

5

Heavy eosinophil cell infiltration in tissue of a nodule from an early case of filarial funiculitis.

6



Bilharzial funiculitis showing heavy eosinophil cell infiltration, and many bilharziomata with ova and giant cells.

The worm was surrounded by a heavy cellular mass of endothelial cells, many polynucleated cells, and eosinophil cells. At one end of the obliquely cut lymphatic were filaria embryos lying intermixed with the cellular elements surrounding the worm. In serial sections the same lymph vessel in its part beyond the worm was occupied by similar cellular contents much intermingled with filaria embryos apparently on their way to the blood stream. The long-standing suspicion thus confirmed, I went back to the old collected and preserved spermatic cord eosinophilic nodules, and on serial sectioning found, in each case, direct evidence of filarial infection, either in the form of intact filaria worm; or of degenerated worm inside a fibrosed lymph vessel; or of lymph vessels obliterated by endothelial and eosinophil cells with filaria embryos amongst them; or of calcified remains of the worm. These findings established, for the first time, the existence of *chronic filarial funiculitis* in Egypt. I think that the acute endemic funiculitis which occurs in Egypt and frequently goes on to suppuration is engrafted on a chronic filarial lesion. The analogy is with the acute febrile inflammatory attacks which occur repeatedly in the course of chronic elephantiasis of leg, scrotum, and breast.

(2) *Bilharzial Funiculitis.*—This, the second type of parasitic funiculitis met with in Egypt, is due to

lateral spined, or to terminal spined, or to both kinds of ova lying in the tissues of the spermatic cord. The lesions are characterised by round, oval, or cord-like hard fibrous tumours, easily shelled out from the surrounding tissue. Histologically they consist of fibrous tissue densely infiltrated with eosinophil cells, and with many bilharziomata embedded in the mass. The bilharziomata are small, tubercle-like structures, consisting, when recent, of one or two central bilharzia ova, surrounded immediately by huge giant cells, and peripherally by layers of large endothelioid cells. In older bilharzioma the outer endothelioid layers are replaced by hyaline fibrous tissue, which may increase concentrically until the whole is a mass of whorls of hyaline fibrous tissue, with the central ova calcified, or, the ova having been devoured by the giant cells, only a chitinous capsule or spine remains to tell the story. In the older lesions the eosinophil cells become few or vanish from the fibrous tissue surrounding the bilharziomata, with the death of the ova which invited and maintained their presence.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 665.)

SECTION OF PATHOLOGY AND BACTERIOLOGY.

TUMOURS OF THE INTESTINE.

WITH Prof. J. S. DUNN (Manchester) in the chair, a discussion on the Relation of Malignant Disease to Benign Tumours of the Alimentary Tract was opened by Prof. MATTHEW STEWART (Leeds). He drew attention to the frequency of the casual finding of such benign tumours post mortem, many of them of little importance per se, but a few being attended with serious complications. Such tumours he classified into (1) connective tissue, (2) epithelial. The first group consisted of lipomata and leiomyomata. The former were rare and of small size; the variety occurring in the stomach was submucous while those of the intestine were usually subserous. Leiomyomata were more common and were flat and button-like. These latter occasionally became sarcomatous, but whether the tumours were innocent at first with subsequent malignant degeneration or whether they were sarcomatous from the outset was difficult to determine. Myosarcoma was more frequent in the stomach than in the intestine.

The epithelial tumours, said Prof. Stewart, were of much greater importance. They were usually adenomatous with a tendency to become polypoid and might attain a very large size. Their polypoid form was believed to be due to the mechanical action of the gut, and the pedicle was often quite definitely not composed of tumour tissue. He suggested that the submucosal thickening which occurred in relation to these tumours was mechanical rather than inflammatory. Other simple epithelial tumours described were adenomyomata and pancreatic heterotopia. There is no evidence, said the speaker, that either of these is specially liable to malignant change. With regard to adenomatous polypi, Dukes had found such tumours in 25 out of 33 consecutive surgical cases of carcinoma of the rectum. In the case of the stomach there was also a growing tendency to associate malignant with benign tumours. Analysing 11,000 autopsies at Leeds Royal Infirmary, Prof. Stewart found 47 cases of polypi of the stomach and about a quarter of these were associated with carcinoma. The total number of cases of carcinoma of the stomach, however, in these post-mortems was 263, so that only 4·9 per cent. were associated with polypi. Although polypi must be accepted as precursors of malignant disease of the stomach in a small percentage of cases, the association was much more intimate in the large intestine.

The speaker next reviewed the criteria of early malignancy in gastro-intestinal polypi. Invasion of the muscularis mucosæ he considered the most important single phenomenon. In earlier cases where there was only irregularity and de-differentiation of cells the diagnosis was more difficult, but such cases must be regarded with grave suspicion. Carcinoid tumours occupied an intermediate position between the simple and malignant. They were locally infiltrative, but never developed the characters of frank carcinoma. A review of the experimental results of many workers revealed very little of positive value concerning the point under discussion. Ishibashi and Otani (1921) had produced papillary adenomas in the stomach of animals by means of submucous injections of tar. Leitch had obtained negative results by injection of tar per rectum. Menetrier had succeeded in producing squamous carcinoma in the stomach of a rat by administration of tar, while Schabad had obtained negative results in mice with similar experiments.

Prof. ARCHIBALD LEITCH (London) described four cases of benign tumour of the small intestine, but on account of the extreme infrequency of malignant tumours in this situation he considered the relationship between innocent and malignant tumours here was hardly worth discussing. In the case of the large intestine the number of museum specimens kept to show benign and malignant tumours occurring together tended to produce a wrong conception of the importance of benign tumours as precursors of cancer. In experimental work and in the study of cancer in various parts of the body it had been shown that simple tumour formation occurred in numerous foci with only one or a few of these becoming malignant. He would like to believe that such a condition occurred in the intestine, but observation on a large number of cases of carcinoma of the colon led him to think that such a process was quite uncommon. He doubted the importance of the extremely small papillomata so often described, and he believed that such tumours should be neglected in an observation of this kind. Lack of controls greatly reduced the value of many observations. When, however, there were definite adenomata in the intestine there was a great tendency for these to become malignant. He was unable, however, to support Dukes's theory of retrogression. In his experimental work Prof. Leitch had used tar and the products of putrefaction with negative results. His general conclusion was that the case had been overstated and that in reality benign tumours were of little importance as precursors of cancer in the large intestine, although when adenomata do occur there is a great tendency for them to become malignant.

Dr. CUTHBERT DUKES (London) described the last 75 cases of cancer of the colon that he had examined. He classified these into (*a*) those in which malignant growth had infiltrated the submucous coat but had not reached the muscle coat; (*b*) those in which the muscle coat was invaded but without spread by direct continuity into the perirectal tissues; (*c*) in which spread had occurred into the perirectal tissues. In group (*a*) was only one tumour and this was associated with papillomata. Group (*b*) consisted of 18 tumours, half of them being associated with papillomata which were only present in less than a third of the 56 cases in group (*c*). Dr. Dukes concluded that papillomata are more common in early than in late cases of cancer. The speaker suggested that the rarity of occurrence of papillomata in group (*c*) could only be explained by the supposition that some sort of immunity developed as a result of cancerous invasion, and this led to a retrogression of the epithelial proliferations in the immediate neighbourhood. The frequency of papillomata in early cancer lent support to the view that adenomatous polypi preceded cancer of the rectum. Indeed in cases of familial polyposis of the intestine this almost invariably occurs. The diagnosis of papillomata was made only when these were visible at first glance and when several were present. Cases in group (*a*) were characterised by epithelial proliferations heaped up above the surface of the surrounding mucous membrane, whereas in group (*c*) the cases had excavated ulcers with raised margins. Group (*b*) cases were intermediate between these two. These were not different types of growth but different stages in the development of malignant growth. In the early stages epithelial proliferations projected into the lumen of the bowel and the tumour had the structure of an adenoma or villous papilloma. The onset of malignancy was marked by invasion of the submucosa and this was followed later by ulceration. If the tumour was removed before there was evidence of invasion it would be classified as an adenoma, if after invasion as a carcinoma. Thus, in the precancerous or pre-invasive period the epithelial proliferations in carcinoma and adenoma were indistinguishable. It was not possible to express statistically the frequency with which cancer developed in a pre-existing papilloma compared with its origin from a flat region of the mucous membrane, but malignant degeneration of an adenomatous polyp was met with commonly, and the earliest cancers in museum collections were usually of this type. Dr. Dukes concluded that adenomata and carcinomata in the colon were often related phases in the incidence of malignant disease.

Dr. WILLIAM SUSMAN (Manchester) analysed and classified simple and malignant tumours of the alimentary canal found in 883 autopsies at Manchester Royal Infirmary. In 38 cases there were polypi of colon, associated in every case with hyperplasia of the mucous membrane. They were twice as common in males as in females and were found most frequently between the ages of 40 and 60. In some cases polypi were limited to one or other segment of the colon without there being any predominant distribution. In other cases polypi were distributed throughout the large intestine. Single polypi were present in nearly half the cases. In 17 of these 38 patients there was associated cancer; in 10 of them this was situated in the colon, 2 in the stomach, 2 in the œsophagus, and 3 elsewhere. The speaker concluded that polypi were definitely associated with malignant disease of the colon, and that the polypi underwent changes analogous to those observed in the skin of the mouse during tar treatment. Solitary polypi might and multiple polypi were very likely to be potentially malignant.

Dr. J. S. YOUNG (Leeds) pointed out that skatol and indol injected subcutaneously had been found to produce simple hyperplasia; since these substances were increased in constipation he suggested a possible relationship to tumour development. Dr. Young had also shown that bile-salts have a marked action in producing epithelial hyperplasia and this opened up another field for investigation.

Prof. STEWART summing up said that the speakers were agreed that papillomata of the colon were sinister manifestations and frequently developed into malignant tumours. There was some difference of opinion as to the relative importance of benign tumours in cancers of the intestine taken as a whole and it seemed that much depended upon the criteria of the diagnosis of polypi.

Dr. D. F. CAPPELL (Glasgow) read a paper on the

Reticulo-endothelial System as Studied by Intravitam Staining.

This system, he said, consisted of cells which were widely scattered throughout the body and possessed certain physiological properties in common. They were concerned in ingestion and storage of particulate matter and substances in solution as well as the phagocytosis of micro-organisms. They became prominent in certain pathological conditions, especially in cases of excessive blood destruction, when excess iron was stored, and in cases of perverted lipoid metabolism. The distribution of reticulo-endothelial cells might be determined by the injection into animals of various dye substances which were taken up by the cells. Particulate matter such as india ink was taken up rapidly while dyes in solution, such as trypan-blue, required to be present in the circulation for some hours before staining was intense. The distribution was described as (1) cells lining the vascular channels of the liver, spleen, bone-marrow, and lymph glands; (2) reticulum cells of the spleen, lymph glands, and bone-marrow; (3) histiocytes occurring in all connective tissue except that of the central nervous system; (4) a few mononuclear cells in the circulating blood. Vital staining might be applied to the study of cells occurring in inflammatory processes. Using a dye such as trypan-blue it was not possible in this way to distinguish histiocytes originally present in the tissues from macrophages which had entered the inflammatory focus from elsewhere, but by employing a blue vital stain before inducing an inflammatory process with a subsequent red stain when the lesion had developed it was possible to distinguish the original reticulo-endothelial cells from those which had subsequently developed the characters of phagocytes. It was possible also to recognise in an inflammatory lesion monocytes which were derived from the blood stream by previous injection of india ink, since these cells took up the black particulate matter. The method of intravitam staining could also be used, said Dr. Cappell, in the study of so-called reticulo-endothelial blockade. He believed that it was impossible to produce such a condition by injection and splenectomy, so great was the cell regeneration.

Prof. LORRAIN SMITH (Edinburgh) pointed out that Dr. Cappell had described the occurrence in inflammatory tissue of unstained macrophages even after injection of vital dye. He wished to know where these came from.—Dr. CAPPELL in reply stated that certain cells of the reticulo-endothelial system failed to stain and these he regarded as immature but potential macrophages.

Prof. J. S. DUNN asked whether Dr. Cappell could state what was the relationship between monocytes in the blood stream to the other varieties of cells described, and whether the small mononuclear could be distinguished from lymphocytes.—Dr. CAPPELL replied that the small mononuclear differed somewhat in mitochondrial structure, although he believed both types of cell to be capable of further development if they left the blood stream and entered inflammatory tissue.

SECTION OF ORTHOPÆDICS.

OPERATIVE TREATMENT IN TUBERCULOSIS OF THE LARGER JOINTS.

Mr. G. R. GIRDLESTONE (Oxford), who opened the discussion, explained that the field of debate had been restricted to the use of operations in the actual course of the treatment of tuberculosis, so as to exclude the wide field covered by operations for the late complications and for diagnosis. The latter were a necessity in certain early cases, where the diagnosis could be made in no other way; but even after an arthropsy had been made a few tubercle bacilli might cause great disturbance of a joint though hard to find in a piece of synovial membrane. Prof. Dreyer had suggested that the bacilli might at times be in a non-acid-fast condition and difficult on this account to observe. Mr. Girdlestone quoted a letter from Prof. Osgood of Harvard in which he referred to the risks of starting sinus formation by the exploration of a joint.

The aims of treatment were, he said, twofold: (1) to save the life of the patient; (2) to restore a safe and useful limb, suitable for the ordinary stresses of life. The dangers to life were from continuance of the tuberculosis, whether in the joint itself, or in deep lymphatic glands, whose involvement was apt to be forgotten, though probably of the first importance. It was from the lymphatic focus that the joint was first infected and that secondary infections occurred, and this focus was easy to heal in children by general hygienic measures, whereas it was rare to get it healed in adults. On the other hand, the joints of children healed with extreme difficulty, while radical operation quickly healed the joints of adults, but left them at the mercy of the lymphatic focus, so that they usually died from various secondary foci in the late stages of their ailment. In children the dangerous period occurred soon after the diagnosis was made in the early days of hospital treatment. There was, he went on, a fallacy in regarding quiescence of a tuberculous joint as cure, for even when the lesion gave no sign of activity with Thomas's tests, it might yet light up directly it was subjected to the ordinary wear and tear of life. Such a joint might do well enough for the well-to-do living a sheltered life, but it was useless to a working man. In the majority of cases treated for prolonged periods in an open-air hospital, it was only this quiescence that was obtained in the larger joints, more particularly the hip; the study of remote as opposed to immediate hospital results during the last few years had made this clear. Operative treatment was therefore advisable for quiescent joints which did not regain the full normal range of movement and did not keep it with unrestricted use; small degrees of movement simply invited strain and resultant flare-up.

Speaking of the operations suitable for various joints, Mr. Girdlestone remarked that the type of excision and radical operation which gave useful function in the upper limb seldom provided the stability essential for the lower limb, where arthrodesis was usually the operation of choice. For the knee he advised immediate arthodesis in adults and in children with destruction of cartilage demonstrable by X rays, or whose knees remained persistently inflamed after thorough conservative treatment; but he preferred to delay the operation in them till the age of 12 or 14 years. The hip presented a problem of its own on account of the varied strains to which it was subject and because the shape of the joint made intra-articular arthrodesis difficult to achieve. In the adult he advised combining the intra- with the extra-articular operation, as a mere graft was likely to break with strain. In a child with a strong fibrous ankylosis and upward subluxation, the extra-articular graft of Hibbs might be sufficient; but if much granulation tissue filled the joint, the graft was apt to be absorbed. He expressed approval of the method suggested by Wilson of Boston in bringing down a large osteo-periosteal flap from the ilium, which had a much better blood-supply than the femoral graft.

Mr. Girdlestone concluded by showing lantern-slides illustrating various types of operations with their results, and the healing of chronic sinuses by the method of wide, lateral drainage with suture of the skin to the periosteum.

Discussion.

Sir **WILLIAM WHEELER** (Dublin) disagreed with Mr. Girdlestone as to the cause of death which he thought depended on the size of the joint rather than on the condition of any deep lymphatic focus. Few cases of tuberculosis in the finger died, whereas the mortality from hip and sacroiliac disease was high; moreover, some of the worst cases were cured rapidly, when the joint focus was removed by amputation. Conversely, cases diagnosed as rheumatism and treated by heavy massage might quickly absorb bacilli from the joint and die of meningitis. The facilities available to the patient must, he said, be borne in mind in planning treatment; each joint presented a separate problem. He agreed that the surgeon should aim at bony ankylosis in any tuberculous joint in which the full range could not be obtained. Diagnosis was difficult and he suggested that the metaphyseal foci described by Stiles might result from a mixed pyogenic and tuberculous infection. There were fashions in treatment and he would like speakers to discuss the place of arthroplasty in late cases of tuberculosis of the knee, and of early osteotomy to ensure rest in active tuberculosis of the hip. He demonstrated such a result in his lantern-slides of X rays before and after joint operations. In reference to one of them, he pointed out the need for wide resection of bone in excising a tuberculous wrist.

Mr. **ALEXANDER MITCHELL** (Aberdeen) associated himself with previous speakers in finding diagnosis difficult; but without it no rational treatment could be planned. The type of ankylosis ordinarily obtained was unstable, but he had seen admirable results in Hibbs's cases at the White Plains Hospital, New York, following the "extra-articular fusion" operation. He did not think there was much shock associated with this operation. He referred to the successive fashions in the treatment of these cases: (1) operative (frequent excisions); (2) fixation by splinting for years; (3) movement by Rollier's system; (4) and now arthrodesis combined with open-air treatment. He would himself divide tuberculous joints into four types requiring different methods: (1) the synovial type with no X ray evidence, where arthropsy presented the only means of making a certain diagnosis; (2) the epiphyseal lesion well shown in the X ray, but scarcely involving the joint itself, likely to heal well and not requiring operation; (3) the case with pain and spasm well marked and with obvious involvement of the articular surfaces; and (4) the case with extensive bone destruction. The two latter types required resection or arthrodesis. In elderly persons the joint should simply be amputated.

Miss **M. FORRESTER-BROWN** (Bath) referred to the technical difficulty, in extra-articular arthrodesis of the hip, of turning the graft upside down, as advised by Hibbs; she had found it better merely to slide the graft upward and fix it in a bed, prepared by thoroughly rawing the neck of the femur, by means of catgut sutures through the muscles over it. This safeguarded the blood-supply. She also referred to the difficulty of knowing at what stage a patient with a quiescent joint would tolerate operative interference.

Mr. **H. A. T. FAIRBANK** (London) advised radical removal of the disease from the adult knee, using a tourniquet which he thought reduced the risks of generalising the infection. He had found the sulphur method of value for some of the secondarily infected joints. He did not believe in grafting for sacroiliac disease.

Mr. **WHITCHURCH HOWELL** (London) related some very late results of treatment which he had met with—e.g., a case with 9 inches of shortening of the lower limb after excision of the knee in childhood; and a woman who had survived to the age of 75 years in spite of a sinus discharging since the age of 5 years.

Mr. **A. W. ADAMS** (Bristol) asked for figures of the frequency of generalised dissemination after operations on tuberculous joints, and also whether arthritis should not be anticipated by removal of epiphyseal foci.

Mr. **W. ROWLEY BRISTOW** (London) said that examination of the synovial fluid seldom gave positive evidence in tuberculous cases, even when, as was his practice, three guinea-pigs were injected; hence a negative result was of no value. He did not consider removal of a piece of synovial membrane for diagnostic purposes dangerous. Like other speakers, he had been much impressed with Hibbs's results by fusion operations, including that on the knee, where no radical removal was attempted. He did not fear shortening from operations on the knee in childhood, as the epiphyseal line need not be reached; prolonged and careful after-treatment was necessary to prevent bending during growth. If this precaution was observed no precise age limit need be fixed. He deprecated any attempt to divide the profession into two schools of treatment, operative and non-operative; each case should be dealt with on its own merits.

Mr. **D. MACRAE AITKEN** (London) hoped that the treatment of the future would be by anticipation and prevention of tuberculosis. He agreed that the essential principle of rest for an inflamed joint could be carried out, not only by splints, but also by such operations as extra-articular fusion of the hip, osteotomy, and amputation.

Sir ROBERT JONES (who presided) also begged that there should be no attempt to form two camps with opposing methods of treatment. While he had awful memories of the old surgical epoch in the treatment of tuberculosis, he was prepared to recognise that such an operation as extra-articular arthrodesis of the hip, by providing effective rest for the joint, complied with the principles he advocated—namely, adequate fixation of the affected joint, prevention of recurrent deformity, fresh air, and general treatment. He found it hard to follow the American statistics, quoted by Mr. Girdlestone, in which only 2 out of 150 cases were completely satisfactory after three or more years of conservative treatment. Such figures would have seemed ludicrous to Hugh Owen Thomas working under conditions much less favourable.

Mr. GIRDLESTONE, in reply, said that he did not fear dissemination after operations on tuberculous joints, because the body was accustomed by then to deal with recurrent doses from the lymphatic focus. He regarded the use of a tourniquet as a safeguard and agreed that osteotomy might produce healing, although he preferred arthrodesis. He did not advise arthroplasty for tuberculous cases.

Demonstration at Grangethorpe Hospital.

At an afternoon demonstration Mr. R. OLLERENSHAW (Manchester) showed a series of cases, illustrated by simple diagrams of technique; among them, three cases of foot-drop treated by Campbell's posterior block method, some excellent results after various hip operations, and a series of congenital deformities with problems successfully overcome. A case of congenital dislocation of the hip, diagnosed as two months old, had been reduced (after Putti) without manipulation by persistent abduction of the lower limbs. Some spastic cases on whom Royle's operation of sympathectomy had been done some years previously showed only temporary improvement; better results had been obtained by Stöffel's peripheral nerve division. In a case in which synostosis of the radius and ulna had followed a forearm fracture in a child rotation of the forearm had been restored, after union of the fractures in good position, by Baldwin's method of resecting a small piece of the ulna near the wrist, so that the radius carried the ulna styloid process with it when it rotated.

Dr. H. POSTON (Manchester) exhibited results of compound fractures involving joints on which primary excision of the wound had been done within a few hours of the accident, followed by swabbing and skin infiltration with 1 per cent. mercurochrome and fixation in plaster-of-Paris. The only drainage had been down to the sutured capsule for the first 48 hours.

Dr. MARGARET GREG demonstrated a series of cases of renal rickets with dwarfing and of adolescent rickets with somewhat similar bone changes, as seen in skiagrams.

Dr. J. G. JOHNSTONE showed cases illustrating various difficulties met with in the treatment of congenital dislocation of the hip, including the development of osteochondritic changes in the head of the femur and recurrent subluxation. One case was walking well after reduction at 0 years old.

Mr. HARRY PLATT (Manchester) demonstrated transplants of the trapezius for deltoid paralysis, in which there was good stabilisation of the joint during abduction. A case of vertebral osteochondritis shown has been used by Calvé to illustrate his recent article. In two cases the power of opposition had been restored to the thumb by transplantation of the sublimis tendon of the ring-finger into the flexor longus pollicis.

Dr. S. POPE (Manchester) summarised a thesis on the experimental production of birth palsies. By using 24 dead fœtuses and extracting them from a machine by methods imitating those of obstetrics, with varying conditions of resistance, he had succeeded in producing a number of lesions of the brachial plexus and tears of the sternomastoid which correspond to those met with clinically.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of four large towns, with widely differing industries:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality, from childbirth, &c.
Sheffield .. (515,400)	16·4	11·8	0·94	1·37	1·0	1·0	73/38	41	6·0
Leicester .. (340,000)	16·2	11·9	1·24	1·42	1·5	1·8	71/31	16	3·5
Nottingham . (266,600)	17·7	12·8	1·10	1·44	2·8	1·5	85/40	28	5·5
Blackburn .. (125,100)	13·8	12·2	0·82	1·30	2·5	2·7	80/38	28	6·3

Sheffield.

Dr. F. E. Wynne draws attention to the altering age-constitution of the population and to the possibility of a progressive rise in the death-rate from all causes in the coming years. He gives a table comparing the age-constitution of the population of Sheffield at the censuses of 1911 and 1921, which shows that in the latter year there was a decrease in the population at 0–10 years, an increase at 10–20, a decrease at 20–40, and an increase at 40–80. Environmental sanitation has been improved by the completion, during 1928, of the scheme for the conversion of privies into water-closets and attention is now being turned to the substitution of modern water-closets for trough closets and waste water-closets, and of sanitary bins for the old insanitary ash-pits.

There were 61 notifications of small-pox with no deaths. The notifications of pneumonia numbered 2603, of which 328 were removed to the city hospital for treatment. The death-rate from pulmonary tuberculosis among the grinders may have been reduced by unemployment in their trade, but, however that may be, it is very satisfactory that the Sheffield death-rate from all forms of tuberculosis is the lowest of the 18 great towns of England and Wales with populations exceeding 200,000 with the exception of Plymouth (0·90) and that the Sheffield rate for pulmonary tuberculosis (0·745) is lowest of all these towns with the exception of Portsmouth (0·744). Dr. John Rennie, tuberculosis medical officer, emphasises the fact that their efforts are directed towards a decrease in the proportion of infectious cases among the notifications and the establishment of a diagnosis of tuberculosis in the earliest stage of the disease. The cases on the register at the end of 1928 numbered 5007, of which 1134, including nine children under 15 years, were "open" cases. Ninety-three per cent. of the pulmonary cases notified were examined by the dispensary staff. The number of notifications of tuberculosis of the lung was about five times the number of deaths, and the deaths were about the same in number as the notifications of "open" cases. The medical practitioners sent 2509 "suspect" cases to the dispensary for diagnosis, and in addition 2371 contacts were examined. The diagnosis of "suspects" and "contacts" often entails observation for long periods and residence in the observation beds. Thus only 124 of the suspects and 1575 of the contacts were definitely classed, without a period of observation, as non-tuberculous. The beds allotted for the treatment of tuberculosis appear to have now reached a maximum figure and waiting-lists for institutional treatment are things of the past. For respiratory tuberculosis alone there are 504 beds.

Dr. C. Lee Pattison, surgical tuberculosis officer, reports that the period of stay in the King Edward VII. Hospital for non-pulmonary tuberculosis has been reduced to an average of 275 days by securing the patients at an earlier stage of the disease. Provision has now been made for adult patients with bone or joint tuberculosis at Nether Edge Hospital. As regards light treatment, which has been continued both at the King Edward Hospital and the dispensary, Dr. Pattison says: "In some types and with certain degrees of activity of the disease, ultra-violet light treatment is indicated and proves definitely beneficial, but in other instances it should be avoided as in them it appears to be useless or even harmful. At the hospital irradiated foods have been found beneficial in some cases and may prove useful when cod-liver oil is not well tolerated. During the year a clinic for lupus has been started and up to the present the results obtained from general radiations with ultra-violet light and local treatment with a Kromayer lamp have been very gratifying.

It is still impracticable to apply all the powers contained in the Housing Acts, and there is much overcrowding. Progress has been made with reconstruction schemes. Thus in the case of three schemes, involving 173 houses, all the areas have been cleared, and the tenants moved to the Wybourn Estate, and in another area, involving 126 houses, condemned in 1928, a considerable portion has been cleared. Proceedings are pending with regard to two other areas involving 95 and 174 houses respectively. During 1928 an interesting departure was made by the allocation of 26 municipal houses to families living under unsatisfactory conditions, among whom there was an "open" case of tuberculosis. Twenty-three families have been rehoused under this scheme and their members have been examined at the dispensary, and a striking improvement in the health of the children has been noted since rehousing.

A table given by Dr. Wynne shows that the maternal mortality from childbirth has been considerably higher during recent years. Thus in 1923 it was 4·02, and in the five succeeding years 4·53, 4·93, 5·99, 7·27, and 6·04. The puerperal sepsis rate alone during the last three years was 2·33, 3·64, and 3·79.

Leicester.

Dr. C. Killick Millard gives a survey of the small-pox experience in his city which for 40 years has "set the compulsory vaccination law at defiance." During that period 90 per cent. of the children born in Leicester have not been vaccinated. Up till last year there were four small epidemics—namely, in 1892–93 with 358 cases and 21 deaths; in 1902–03 with 394 cases and 21 deaths; in 1903–04 with 321 cases and 4 deaths; and in 1925 with 72 cases and no deaths. The last mentioned was of the mild type which apparently breeds true and Dr. Millard goes on to describe the epidemic of 1928–29 which was also of the mild type. On May 11th, 1928, small-pox was introduced by a tramp and from that date there were other introductions of the disease, generally by missed cases, causing spread of the infection with intermissions up to June, 1929. In all there were 90 cases in 1928 and 107 in 1929. There were no deaths. The vaccinated cases numbered 23 and the unvaccinated 174. Medical practitioners were encouraged to visit the small-pox hospital to familiarise themselves with the signs and symptoms of the "mild" disease. Some who had not been recently vaccinated refused—unwisely, says Dr. Millard, as every doctor may have to attend a small-pox case and should surely protect himself by vaccination. Vaccination was pressed in the case of "house" contacts, but not so much so in the case of "outside" contacts. Of 542 house contacts, 303 submitted to vaccination, whilst of 237 outside contacts 103 were vaccinated. A great point is made in Leicester of close supervision of contacts. Exclusion of contacts from work rested with the employer and the amount paid in compensation to contacts kept from their work was £153. The number of new cases occurring was included in the weekly returns sent to the press, but there was no attempt to induce the public to get vaccinated. Apart from the contacts the vaccination figures were lower than usual. Dr. Millard throws out the suggestion that when the administration of the Vaccination Act is handed over to the health authorities, it might be made the subject of local option. He states that there has never been a case of encephalitis following vaccination in Leicester, but points out that such an occurrence would be rather unlikely when there is so little vaccination.

The year 1928 was epidemic for scarlet fever. There were 1071 cases with four deaths, and Dr. Millard points out that the "new treatment" was very successful in cutting short the disease and preventing complications. Dr. H. Stanley Banks, the medical superintendent of the hospital, described this treatment by the intravenous injection of antitoxin in a paper in THE LANCET of Feb. 23rd, 1929. The cases treated in hospital were divided into two groups. Group I. included all the more severe cases numbering 404. They were all treated intravenously, had a complication rate of 3·2 per cent., with one death, and their average stay in hospital was 17·7 days. Group II. included 458 cases who had no antitoxin and 102 who had it intramuscularly. This group included all the milder cases. They had a complication rate of 23·7 per cent. and their stay in hospital averaged 26·8 days, and there was also one death among them. Dr. Banks is most enthusiastic about the treatment and considers the whole outlook in the hospital treatment of scarlet fever has been altered thereby. Scarlet fever wards under the new treatment may be almost surgically clean. There are practically no complications and scarcely any medical or nursing treatment is needed after the first few hours. Hospital beds go twice or thrice as far.

Dr. Banks has also made a trial of the sanocrysin treatment of pulmonary tuberculosis in 22 cases. He thinks the type which did best was the middle case, neither early nor too advanced, which did not appear to respond well to routine sanatorium treatment. Fourteen of this type were treated; in six the results were remarkably good, and in eight they appeared to be favourable. He points out that there has been no opportunity to speak of any but immediate results and that the late results will probably depend on the patient's ability to conform to the rules of the tuberculous life. The cost of sanocrysin for the first course is about £3, and for the second course £2 6s. 8*d.* per case, and the considerable labour involved in giving the injections, making tests and examinations, and keeping records makes the treatment expensive. The Leicester special clinic for the early diagnosis of cancer which was started in July, 1927, and restricted to women and affections of the breast and uterus, has now been extended to all forms of cancer in either sex.

Municipal houses, Dr. Millard points out, have done little or nothing to benefit the class most in need of relief, and he commends the solution of the problem put forward by the Housing and Town Planning Council of Great Britain in their report entitled "A Policy for the Slums." This report advocates a children's rent allowance scheme. Dr. Millard also emphasises the fact that the municipality can safely build a larger proportion of houses with two bedrooms, seeing that as landlord it has the power to control their use.

Blackburn.

Dr. V. T. Thierens, in his first annual report, says the year has been one of great industrial depression, with consequent unemployment. The death-rates from respiratory diseases and from pulmonary tuberculosis among the cotton operatives were lower than in 1927. During the year 94 municipal and 41 private enterprise houses were built, and at the end of the year 60 municipal and 70 private enterprise houses (none of which was State-aided) were under construction. The housing problem in Blackburn is less urgent than in other towns. The population is actually less than it was in 1910 to 1924. There are no real slums, although there are some areas of unsatisfactory property. There were, however, 471 Blackburn residents living in rooms, who were on the waiting-list for municipal houses at the end of 1928. There are 88 houses let in lodgings, housing about 1000 persons, with poor accommodation and excessive rents. In some instances the rent for two partly furnished rooms exceeds that asked for houses on the corporation estates. At the end of the year there were 57 caravans in use as human habitations. There are 181 factory chimneys, 103 of which have smoke-preventing appliances. Blackburn's effort to prevent industrial smoke does not appear to be energetic. The permissible limit of black smoke for a furnace serving one boiler is 4 minutes in the hour, or twice that of Sheffield. The limits for 2, 3, and 4 boilers are 5, 6, and 7 minutes respectively. During the year 103 observations were taken and in 54 excessive smoke was emitted. The only action mentioned is the service of 21 informal and two statutory notices.

The veterinary inspector, Mr. E. J. Burndred, reports that as the result of regular inspection of the cattle aided by examination of milk samples, three cows in the borough farms were found with tuberculosis of the udder, and seven cows were slaughtered and one died which suffered from advanced tuberculosis. The number of milk cows stalled in the borough is not mentioned. There are three farms supplying Certified milk to Blackburn, two local and one some distance away. The price of this milk ranges from 7½*d.* to 4*d.* per pint. There are 18 farms in the district producing Grade A milk, five of which are in the borough and 13 in the county. The price is from 3½*d.* to 4*d.* per pint. Two dairies, one in the borough, are licensed for pasteurised milk, and a new dairy is being established in the neighbourhood by a number of coöperative societies for the pasteurisation and bottling of milk, so that in the near future a much larger proportion of Blackburn's milk will be pasteurised. During the year 446 samples of milk were examined for the presence of dirt. The samples taken from producer-retailers in the borough were better as regards contamination than those taken from producer-retailers outside the borough and those taken from retailers in the borough, who procured their supplies from outside, were much worse than the two classes first mentioned. A standard has been laid down for the equipment to be required from milk retailers in the borough. A specimen plan is given in the report, showing the arrangement of the two rooms needs for washing and storing the utensils and for storing the milk respectively. At the end of the year about 12 of the 50 retailers had complied with these suggestions. The seventh clean milk competition extended over the whole year. The competitors are divided into two classes, one for Certified and Grade A milk, and the other for all other milk. There were 13 entries for the one class and six for the other, but the ordinary milk producers do not yet take much interest in the competition.

There were 104 notifications of diphtheria with a case fatality of 10·49 per cent. Twelve of the 18 fatal cases received no antitoxin treatment for 4 to 12 days after the onset of the disease. There were ten notifications of small-pox, all of the mild type. A table is given showing the condition at the end of 1928 of the patients discharged after treatment for pulmonary tuberculosis from Meathop Sanatorium. Of 20 patients discharged in 1909 or before, 12 are dead, 7 untraceable, and 1 is in full work with no symptoms. Of 30 discharged in 1916, 15 are dead, 5 untraceable, and 9 in full work and 1 unable to work. Of 24 discharged in 1923, 8 are dead, 4 untraceable, 3 at full work with no symptoms, 4 in partial work, and 5 alive. Of 17 notified cases of ophthalmia neonatorum one became totally blind and two were left with serious and disabling impairment of vision. In five of the cases domiciliary nursing was undertaken by the Nursing Association under agreement with the corporation. A bed is now available at the corporation hospital for in-patient treatment.

Nottingham.

Dr. Philip Boobbyer informs us that in 1916, 20 months after the outbreak of war, the city council discontinued printing annual health reports and gave instructions for the statistical and other records to be prepared in manuscript. The document just issued is therefore a survey of the 13 years for which printed annual reports are lacking. It is also Dr. Boobbyer's farewell report after 40 years' service as medical officer of health of Nottingham, and is commented on elsewhere in this issue.

MENTAL HOSPITAL REPORTS.

OF the two *Kent County Mental Hospitals*, that at *Barming Heath, Maidstone*, had 1925 patients in residence on Dec. 31st, 1928. This was an increase of 72 on the previous year, despite the transfer of 40 men. The medical superintendent hopes that the shortage of accommodation will be met by the provision of an admission block. The admission-rate for women was a record for the hospital. The recovery-rate was 24·7 per cent. and the death-rate 7·1 per cent. Autopsies were held in 80 out of 87 cases. Eighteen patients are under treatment for tuberculosis, but the death-rate from this cause was half that of the average in mental hospitals. There was one case of dysentery, the first for three years, two cases of erysipelas, eight cases of scarlet fever, and some influenza. The occupation therapy department had a very successful year; the printing and bookbinding department supplied bound periodicals for the wards. Parole is given freely. A kinematograph apparatus has been fixed in the recreation hall. Forty-one attendants and 49 nurses are certificated or registered, and 18 women nurse in the male wards. Twelve nurses arrived from Denmark last year for a six months' course of training in this hospital. At *Chartham Downs, Canterbury*, there were 1854 patients at the end of last year, 40 cases having been transferred from Barming Heath. Here also the medical superintendent hopes for a new block for recent and curable cases. The recovery-rate was 28 per cent. and the death-rate 8 per cent. Post-mortem examinations were held on 90 of the 127 patients who died, and the pathological department carried out over 2000 routine examinations. The hospital was entirely free from both influenza and dysentery, but the death-rate from tuberculosis is rather higher than the average. A verandah was added to the female tuberculosis ward, and plans for a new operating theatre have been passed. More accommodation is needed for the nursing staff, and plans are under consideration. Thirty-eight attendants and 23 nurses are certificated or registered; no women nurses are employed on the male side.

Barnwood House Hospital for Mental and Nervous Disorders, Gloucester, records a successful year of work in 1928. On Dec. 31st there were 152 patients, including 10 voluntary boarders. There was a recovery-rate of 35 per cent. and a death-rate of 8 per cent. The general health was good. Three of the five new bedrooms were provided with "Vita-glass" verandahs. The city having extended an electric cable past the hospital, the committee at once made arrangements for securing a supply of current. The 33 acres of land purchased in 1926 have now been taken over as additional farm land. Eight patients of each sex were allowed out of the grounds, and a seaside house for the summer was taken at Tenby. Members of the staff have held classes in rug-making and other handicrafts. A physician, a surgeon, a pathologist, and a dentist attend when required. Of the attendants 63 per cent. and of the nurses 41 per cent. are certificated, seven having obtained their R.M.P.A. certificate during the last year.

At the *City of Birmingham Mental Hospital* there were 2071 patients on the books on March 31st, 1929. Lack of accommodation is being met by the inclusion of an adjoining fever hospital and private house, the former for female patients and staff, and the latter for male convalescents. As usual, research has played an important part in the year's work, and the chief medical officer submits a preliminary report from the three institutions together. The dental surgeon notes that, as in former years, not more than 2 per cent. of the patients admitted can be said to have a healthy dentition. More conservative dentistry is found in the younger patients, and this is held partly responsible for the greater amount of focal sepsis. Septic conditions of the upper air passages were found in half the cases admitted, the commonest condition being a multi-sinusitis. The tonsils were diseased in 52 per cent. of the cases investigated, and adenoid vegetations were removed from 10 per cent., all adults. The ear, nose and throat surgeon performed 230 operations during the year, and, together with the director of the research laboratory and chief medical officer, has published a report on the relation of sinusitis to mental disorder. Another communication submits that disease extending from the sphenoidal sinus may cause symptoms indicating disorder of the pituitary gland. Gynæcological disturbances were found in 67 per cent. of the women admitted, but the septic condition was only serious in one case. Most of the women suffered from chronic infections of the cervix. A number of displacements and other gynæcological conditions were corrected. Further evidence was collected during the year to associate mental disorder with influenza. A striking absence of noise and excitement in the wards is attributed to the early and systematic treatment of septic conditions. In Birmingham they have no doubt that ultra-violet rays have value when suitably applied to mental disorder.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 21ST, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 119 (last week 96); scarlet fever, 2322; diphtheria, 1237; enteric fever, 116; pneumonia, 624; puerperal fever, 31; puerperal pyrexia, 91; cerebro-spinal fever, 13; acute poliomyelitis, 18; acute polio-encephalitis, 3; encephalitis lethargica, 26; continued fever, 2; dysentery, 30; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Sept. 24th–25th was as follows:—Small-pox 122 under treatment, 19 under observation (last week 121 and 15 respectively); scarlet fever, 1533; diphtheria, 1645; enteric fever, 18; measles, 204; whooping-cough, 203; puerperal fever, 27 (plus 7 babies); encephalitis lethargica, 125; poliomyelitis, 4; "other diseases," 13. At St. Margaret's Hospital there were 24 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 15 (5) from measles, 8 (2) from scarlet fever, 24 (2) from whooping-cough, 27 (2) from diphtheria, 144 (27) from diarrhœa and enteritis under two years, and 17 (3) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (which have again increased by one-third) 12 each were reported from Birmingham and Liverpool, 6 from Sunderland, 5 from Hull, 4 each from Walsall and Middlesbrough, while Glasgow, Dublin, and Belfast reported 5, 8, and 9 respectively. Two deaths from measles occurred in Manchester. Three from scarlet fever and 4 from whooping-cough in Liverpool. The death from enteric fever was reported from Leeds.

The number of stillbirths notified during the week was 238 (corresponding to a rate of 38 per 1000 births), including 49 in London.

Reviews and Notices of Books.

OSTEOMYELITIS AND COMPOUND FRACTURES AND OTHER INFECTED WOUNDS.

Treatment by the Method of Drainage and Rest. By H. WINNETT ORR, M.D., F.A.C.S., Chief Surgeon of the Nebraska Orthopedic Hospital. London: Henry Kimpton. 1929. Pp. 208. 21*s.*

IN this book Dr. Orr describes his original method for the treatment of osteomyelitis and compound fractures. In cases of osteomyelitis the infected bone is incised early with adequate opening into the medulla, and the cavity is packed with vaseline gauze. The limb is immobilised in correct alignment by plaster casts or adequate splints. Dressings are done at infrequent intervals and only in consequence of rise of temperature, odour, or other special reasons. In compound fractures the principle involved is the maintenance of correct length and alignment by extension, whether by adhesive moleskin straps or by ice tongs or pins, incorporated into a plaster cast. Fixed extension having been achieved, the wound is treated by adequate drainage, and vaseline packs with very infrequent dressing. Dr. Orr's book contains much special pleading, but his thesis has both reason and results behind it, and its adoption would do much to improve the treatment of infected bone lesions. Chapters on antiseptics and on the lessons of the war illustrate the way in which Dr. Orr has reached his present views, and case-histories of patients treated by this method by the author and by other surgeons make convincing reading.

That Dr. Orr's general principle is right we have no doubt at all, and in establishing it he has achieved a notable surgical advance. Whether the details of his technique are all equally commendable is not so certain, but is of less moment. In osteomyelitis cases particularly the thoroughness of the primary operation must be of paramount importance, and the author appears to us to underrate his surgical skill in his anxiety to give full credit to the principle of his method. On the whole, however, he has put his case fairly, and his book should be read by every surgeon. Dr. John Ridlon contributes a delightful introduction. We doubt whether the general surgeon is quite so black as Dr. Ridlon paints him, but feel sure he will enjoy such witty castigation. Dr. Ridlon quotes Talleyrand's saying, "Be zealous; but don't be too damned zealous"; that remark could be applied to his own defence of the orthopædist as well as to the alleged officiousness of the general surgeon.

SLEEP.

The Treatment of Its Disorders. By R. D. GILLESPIE, M.D., M.R.C.P., D.P.M., Physician and Lecturer in Psychological Medicine, Guy's Hospital. London: Baillière, Tindall and Cox. 1929. Pp. 276. 7*s.* 6*d.*

THIS addition to the Minor Monograph Series is intended to indicate to the practitioner the various means by which insomnia may be treated, together with a rational basis for the methods of treatment recommended. Since no comprehensive monograph on the subject of sleep and its disorders has appeared in English for some years the book supplies a definite demand, and it gives an entirely up-to-date presentation of the subject. The first section considers the several physiological mechanisms such as variations in the depth of sleep and the state of the reflexes, circulatory, respiratory, and excretory systems during sleep. Recent work shows that the basal metabolic rate is 15 per cent. less during sleep than in the waking state, and the investigations of A. Waller, Farmer, Richter, and others indicate that the electrical resistance of the body is a measure of the depth of sleep since the resistance rises during sleep and falls towards the onset of the waking state. The effects of sleeplessness both in man and animals are next discussed. It is comforting to read the result of a review of the available experimental evidence; the conclusion is reached that by no known method has it been possible so far to demonstrate any but trifling physical or mental changes after prolonged insomnia in man. At present all that can be said is that the signs are entirely subjective and that they can be abolished after as many as 115 hours of insomnia by a single and not unduly prolonged period of sleep. It has often been maintained that sleeplessness may lead to mental disorder, but it is true that the examples usually cited are those of anxiety states, schizophrenic, or one of the common "functional" syndromes. If insomnia were the direct cause of mental disturbance it would presumably act by virtue of definite nerve-cell changes, and the resulting mental disorder would be of the "organic" type such as delirium, impairment of memory, and so forth. Such states, it is considered, are the only relevant types of reaction to insomnia and are rare. Most people will agree that anxiety and worry regarding insomnia are more potent in aggravating an anxiety state than the actual loss of sleep, and that sleeplessness in mental disorder is more symptomatic than causative.

Dr. Gillespie divides the various types of sleep disorder into three main classes: 1. Qualitative alterations, such as decrease (insomnia) and increase (somnolence). 2. Alterations in the incidence of sleep—e.g., attacks of sleep (narcolepsy), and the reversal of sleep rhythm, such as occurs in encephalitis lethargica. 3. Abnormal interruption of sleep—hypnagogic hallucinations, tendon-motor shocks, nightmares, night terrors, somnambulism, &c. From the therapeutic standpoint the types of insomnia are classified as follows: 1. Sleeplessness due to physical disease—(*a*) of the central nervous system, (*b*) of other parts of the body. 2. Sleeplessness due to external irritation—e.g., climatic conditions. 3. Sleeplessness resulting from mental causes. This classification appears unnecessarily complex, and the simpler method adopted by other authors which divides the causes of insomnia into two main groups—(1) physical and (2) psychical—would include all the above. The difficult subject of treatment is admirably dealt with in this book and the various hypnotics in use are discussed. The author has been lucky in finding that "paraldehyde in doses of two to three drachms is often effective" in cases of sudden excitement and delirium tremens. The exceptional instances mentioned—in which the dose has to be repeated in an hour or so—in our experience are more often the rule. The judicious use of the barbitone series of hypnotics is rightly defended. Finally, the various theories as to the nature of sleep are reviewed in an interesting manner, and especially that relating to the possible presence of a sleep-controlling centre in the region of the third ventricle and Pavlov's view which identifies sleep with widespread cortical inhibition.

The book may be read with pleasure and profit by students and practitioners.

OTOSCLEROSIS.

A Résumé of the Literature to July, 1928. Compiled under the direction of the Committee on Otosclerosis, American Otological Society. New York: Paul B. Hoeber. 1929. Two vols. Pp. 724. $15.00.

THIS work, which is claimed to be the first comprehensive survey of the literature on this subject ever made, is a résumé of all the literature on otosclerosis down to July, 1928. The compilation has been carried on under the supervision of Dr. Arthur B. Duel as part of a programme of research in this disease begun by the American Otological Society under a grant of $90,000 made by the Carnegie Corporation. The Committee have begun their work in the right way, for it is essential that a research of this nature should start with a full record of past investigations. The work is well edited and arranged, and is supplied with a full index of subjects and another of personal names, repeated in each volume, while the second volume also contains a complete bibliography arranged alphabetically under the names of authors. The first volume deals with the pathology and ætiology of otosclerosis, and the second with symptoms, diagnosis, and treatment. Treatment is discussed under the heads of local surgical measures, local non-operative measures, and general treatment, and, being largely historical, is partly concerned with methods which have been tried and abandoned. It forms somewhat melancholy reading, for it tells a story of therapeutic efforts ranging from removal of the stapes to the use of radium and X rays, some of which have been launched with enthusiasm only to be relinquished on further trial. Further research is urgently needed, for there is at present no reliable method of treating this widespread and serious affection.

The work is a compilation to which the editors have refrained from adding comments of their own. As a work of reference it should be in the hands of every otologist.

MEDICINE: ITS CONTRIBUTION TO CIVILISATION.

By E. B. VEDDER. London: Baillière, Tindall and Cox. 1929. Pp. 398. 22*s*. 6*d*.

Colonel Vedder has put together an excellent account, for popular and semi-popular consumption, of the causes of disease and of what has been achieved in disease prevention and what is to be aimed at and hoped for in the future. The first part gives a sane and sensible discussion of diet, exercise, ventilation, &c., and adequately describes the important features of infectious diseases. The second part summarises the facts of the decline in the death-rate and analyses the components of the increase in the average expectation of life which is the triumph of modern sanitation. He draws the sound conclusion—if combined and sincere effort can do so much, it can doubtless do much more, and at a small cost. The queer thing about the book is its title; the contribution of medicine to material well-being is obvious enough, but has it done nothing for the mind and spirit as well?

AN INTRODUCTION TO THE HISTORY OF MEDICINE.

With Medical Chronology, Suggestions for Study and Bibliographic Data. Fourth edition. By FIELDING H. GARRISON, A.B., M.D., Lieut.-Colonel, Medical Corps, U.S. Army, Surgeon-General's Office, Washington, D.C. London: W. B. Saunders Company, Ltd. 1929. Pp. 996. 55*s*.

Garrison's "History of Medicine" needs no introduction to English readers. It is seven years since the appearance of the last edition, and while there may not be very much to add to the earlier sections on the history of medicine, many developments which occurred during the decade following the war had to find a place. It is in the later chapters, therefore, that the reader must look for changes; the chronological *section* has been increased *nearly twofold*. A new chapter on medicine in prehistoric times has been added and forms the second chapter of the present edition. In dealing with the history of recent advances the author has wisely confined himself to giving salient examples, realising that to attempt exhaustive handling would be premature and confusing to the reader. In view of the amazing complexity of the subject praise is due to Colonel Garrison for the way in which he has dealt with his material; nothing of importance seems to have been omitted, and the student will find in this volume an excellent epitome of medical history. Anyone interested either in the works of the fathers of medicine, or in the men themselves, or in the history of epidemics or diseases will find information in this book, and if it is not full enough for his purpose he can refer to original sources to which references are given. In order to keep the size of the book within reasonable bounds it has been necessary to print some of the sections in smaller type, but the printing and paper are so good that no strain is thrown on the eyesight of the reader.

Laboratory Manual for Comparative Anatomy.

By Malcolm E. Little and Rudolf T. Kempton, New York University. New York: The Macmillan Company. Pp. 286. 10*s.*

This book is written as a practical guide for students in American laboratories, a fact which renders it in some ways less apt for English students. Alligators, for example, are not common objects in laboratories over here, nor do we often see Necturus or Cryptobranchus given out, as one may distribute frogs, to waiting classes. But these details need not be considered seriously. The book, wherever we have tested it, gives accurate information, and the directions are likely to be of practical value in laboratories where the help of a demonstrator is available if required. When one realises that the book is intended as a compromise between systemic and systematic teaching, and is divided into distinct parts allowing change of order, one's first sense of slight confusion in arrangement is dispersed. The usefulness of a laboratory manual depends largely on the text-book employed at the same time. This book seems to us to provide a good course for students if used in conjunction with a suitable larger book.

The Visceral Nervous System.

En oversikt over den kliniske undersökelse av det viscerale nervesystem og en kritikk av de forskjellige prövers praktiske verdi stöttet paa egne undersökelser. By Dr. G. Langfeldt. Bergen: J. W. Eide's Boktrykkeri. 1929. Pp. 134.

This monograph includes a review of the clinical examination of the visceral nervous system and a criticism of the practical value of various tests of its functions. Dr. Langfeldt has been awarded Prof. Skjelderup's gold medal for the work here published, which is based on studies undertaken in Hamburg and Bergen, the experiments being carried out at the Friedrichsberg Hospital in Hamburg and the Haukeland and Neevengaard Hospitals in Bergen. In his introduction the author produces physiological and anatomical evidence which shows that there is no absolute functional antagonism between the sympathetic and parasympathetic systems. Much space is devoted to tests with atropine and pilocarpine, as well as to physical tests, such as Aschner's reflex. Many of the conclusions to which the author comes are negative, and he has found that the subcutaneous tests with various drugs (pilocarpine, &c.) are worthless in the diagnosis of chronic encephalitis, dementia præcox (of which alone he examined 71 cases), and various other mental diseases. Summaries in German and English are appended, but there is no bibliography—a rather unconventional omission.

Bacteriology and Sanitary Science,

By Louis Gershenfeld, Ph.M., B.Sc., P.D., Professor of Bacteriology and Hygiene in the Philadelphia College of Pharmacy and Science, Philadelphia. Philadelphia: Lea and Febiger. 1929. Pp. 432. $4.00.

This is a relatively short text-book on bacteriology. The subject is treated mainly from the general hygienic and epidemiological points of view, and in consequence the descriptions of individual species and of their pathogenic effects are reduced to a minimum. The book is primarily written for students in pharmacy, chemistry, and allied sciences, but it is nevertheless dominated by the pathogenic micro-organisms, both human and animal, and only brief reference is made to the field of industrial bacteriology. On the whole a very fair account of these aspects of the science is presented, without many details of technical procedures. The Wassermann and Widal tests are described in general terms, from which the reader will gather their import and their application, but without necessarily realising that "complement" is in practice usually synonymous with guinea-pig's serum. This example is intended not to criticise but to explain the scope of the book. The allocation of 40 pages to the technique of culture and staining do not accord with the disregard for technical detail which pertains elsewhere. A similar lack of balance is observable in other places. Thus the virus diseases are allotted only ten pages and suffer badly from this compression, whilst diseases of plants are hardly worth mentioning if less than a page can be spared to them. It does not help the reader to be told that "the following three methods are employed in making microscopic examinations of milk: Prescott-Breed method, Stewart-Slack method, and the Doane-Buckley method" if the significance of this imposing concatenation of proper names is not explained to him. The arrangement of the book is curious. Why should the bacteria be separated from the higher bacteria by an article on sterilisation, and that article separated from the allied subject of insect extermination and insecticides by chapters upon animal parasites and venomous reptiles? The chapters on sterilisation and disinfection are amongst the most comprehensive in the book. Apart from these minor matters of detail the book is well adapted to give the students for whom it is designed a sound conception of bacteriological principles and to the practising pharmacist a clear conception of the nature and rationale of many of the products he is now called upon to sell.

Handbook of Bacteriology.

Second edition. By Joseph W. Bigger, M.D., Sc.D. Dub., Professor of Bacteriology and Preventive Medicine, University of Dublin. London: Baillière, Tindall and Cox. 1929. Pp. 452. 12*s.* 6*d.*

This excellent handbook has now reached its second edition and has been very completely revised. We confirm the favourable opinion expressed at its first appearance; it is one of the best students' text-books of bacteriology on the market. It is short, concise, and well written, and the author has succeeded in avoiding the sacrifice of essentials to brevity and the cramped, unreadable style familiar in books which have been too drastically cut down. At the same time we note that the present edition seems slightly fatter than its predecessor, and we trust that Prof. Bigger will sternly repress any further tendency to expansion, since in its present form and bulk the student can study the book at his convenience.

Food, Health, Vitamins.

New edition. By R. H. A. Plimmer, D.Sc. Lond., Professor of Chemistry in the University of London at St. Thomas's Hospital Medical School; and Violet G. Plimmer. London: Longmans, Green and Co. 1929. Pp. 120. 3*s.*

This is a new and considerably enlarged edition of the book by the same authors previously published under the title of "Food and Health." The expansion of the book has been made necessary by recent developments in our knowledge of the vitamins, and it now supplies in simple language a valuable summary of modern views on this subject. A new chapter has been added dealing briefly with the general principles of dieting in pregnancy, old age, and obesity. Two weekly menus for standard-sized families are included to illustrate how simple diets containing balanced quantities of the essential food constituents can be prepared at a minimum cost. The authors perhaps take up too uncompromising an attitude on the pathological consequences of minor degrees of vitamin B deficiency, since this question is still highly controversial. In other respects their book can be recommended as furnishing sound advice to the layman who wishes to know what kinds of food are most likely to promote his general well-being.

THE LANCET.

LONDON: SATURDAY, OCTOBER 5, 1929.

MENTAL HEALTH IN 1928.

> "Insanity is . . . only a disease like other diseases . . . and a mind diseased can be ministered to no less effectively than a body diseased. But the old conception of insanity dies hard, and its traces are still persistent. The modern conception calls for the eradication of old-established prejudices and a complete revision of the attitude of society."

THIS quotation from the Report of the Royal Commission remains the text of the Fifteenth Annual Report of the Board of Control, Part I. of which has just been published.[1] The sentence would provoke no dissent if the single-lettered word "a" were omitted. Insanity is disease like other diseases, but to call it "a" disease is to overlook the fact that it is nothing specific but due to a multitude of disorders of body and mind. Hospitalisation of all institutions for the mentally afflicted is the Board's great aim, although homes will still be needed for the chronic and infirm cases. Much has been accomplished; much remains to be done. Many institutions still fall short in greater or lesser degree of the standard set by the best, and the best could be still better. Many local authorities take a conservative position towards modern developments; while recognising the reasonableness of a cautious attitude towards new "cures," the Board feels strongly that in treating mental disease experiments should be made freely. Even if statistical results are disappointing, the patient and his relatives obtain an incalculable psychological benefit from the feeling that everything possible is being done, and that there is always hope. The only direction at present in which there is definite therapeutic advance is the malarial treatment of general paralysis, to which we referred in a recent issue[2] It is a regrettable and rather surprising fact that in all other departments of mental disease the average recovery-rate—30·84 per cent. for last year—has remained practically constant over a long period of years. This may be partly due to a higher standard of recovery nowadays, but whatever its cause, it must combine with the greater longevity of chronic cases, and the increase in general population, to produce a steady increase in the number of persons under care. The average annual increase of such persons is, in fact, just over 2000, and the total number on Jan. 1st, 1929, was 141,080. The Board points out that this increase by no means indicates an alarming increase in mental disorder, but it does mean a disquieting shortage of accommodation. To increase the number of beds in an existing institution, or to build a new one, may cost £500 per bed, and makes a heavy demand on the finances of the local authority. For this reason it is a true economy to spend money on the various hospitalisation schemes which make for the most intensive use of beds already available.

On this ground the Board strongly deprecates understaffing on either the medical or the nursing side, and welcomes the progress made during the year in the provision of restful and comfortable accommodation for nurses. It regrets the unsettled conditions of training in mental nursing and the difficulty of securing women nurses of good type and anxious to seek a qualification. It notes, however, the paradox that hospitals which set a high standard have the least difficulty in obtaining probationers. It urges the appointment, wherever possible, of a special occupation officer, citing the experience of the Dutch hospitals, Gantpoort and Maasoord, which emphasises afresh that there are many patients, including violent types, who benefit considerably and become far more amenable if trouble is taken to find the occupation best suited to the individual. This task demands experience, skill, and time, which an overworked medical and nursing staff cannot be expected to devote. Another measure which can be confidently expected to reduce the need for beds is a well-staffed out-patient centre. To overcome the foolish tendency to postpone treatment until concealment is impossible, the Board invokes the coöperation of the press. Adequate advance in new methods cannot be made without coördination, and the Report urges local authorities to encourage scientific research in such therapeutic reinforcements as ultra-violet and other light treatment, electrotherapy and hydrotherapy. Much of the work which is already being done would have its value greatly enhanced if the results were recorded under a uniform and approved schedule. A committee of the Medical Research Council is taking steps to associate certain mental hospitals in a scheme of this kind. The Board notes with pleasure an increase in the number of mental hospitals that are linked up with medical schools, for it feels that nothing could be worse for psychological medicine than any tendency to divorce it from other branches of medical study. Another development worthy of every encouragement is the organisation by the Royal Medico-Psychological Association of study tours of foreign hospitals. The Board suggests that a report of these tours by the Association would be of great value to those who are unable to participate in them. One suggestion coming from abroad is the appointment of a skilled psychiatrist as after-care officer. This experiment has been made with great success at Maasoord, Rotterdam, which has a markedly lower readmission-rate than other Dutch hospitals which have no such official. Another valuable appointment would be that of a social worker as almoner, to supplement the admirable work which is now done by the Mental After-care Association in tempering for the discharged patient the shock of return to a stressful and often temperamentally difficult workaday world. But when all is said and done it is the accumulation of the chronic insane, especially cases of dementia præcox, which constitutes one of the urgent social problems of the day. The cost and the wastage is terrific. Concentrated effort is needed—and will justify large expenditure of public money in research; research, that is to say, into causes, into a group of therapeutic methods, intensive experiment with occupation therapy, and any other kind of therapy, so long as conducted in a limited field and on lines that render it possible to estimate results. It would, we think, be worth while to offer valuable prizes for essays outlining details for research; not for the research itself, but for grounds for expecting useful results from further study. The public wants awakening to the gravity of this problem.

The outstanding events of the year in the field of mental defect were the passing of the Local Government Act and the publication of the Report of the Mental Deficiency Committee. The Board's Report reviews the relevant sections of the Act and points out the benefits which may be expected to result from uniform control. It is hoped that both ascertainment and classification will be greatly improved. The figures given in the Wood Report make it highly probable that the increased accommodation made available by the Act will still be inadequate. The older type of poor-law institution is only suitable for the untrainable and unemployable classes, but a great many defectives of this type are still occupying space in mental hospitals, and their transfer to a poor-law institution would release beds urgently required for curable cases of mental disease. For the educable defective new colonies are still badly needed, and little was done during 1928 to meet the shortage; Hampshire and West Riding County Councils opened new colonies, and three other new institutions also became available. Several designs for big schemes are now, however, well advanced, and the Board is of the opinion that every local authority ought to have a central colony or a share in a colony where there is enough land for workshop and field employments and recreation. Although the actual amount of new accommodation—625 beds—falls so short of urgent requirements, yet it is nearly double that of 1927, and a large number of local authorities are taking steps in the face of many difficulties to fulfil their statutory obligations. While taking a guarded attitude towards sterilisation, the Board definitely recommends the prohibition of marriage of defectives. Shortage of accommodation, therefore, the key-note of the reports on mental deficiency for many years past, is still the principal trouble to-day, and has extended to mental hospitals also. Most of the hospitals are overcrowded and many have already been expanded to the uttermost limit. The position is serious; a modern mental hospital takes time to design and construct, and no local authority can afford to postpone serious efforts to meet the problem until the strain on their existing hospital has become acute.

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[1] H.M. Stationery Office. 1929. Pp. 93. 1s. 9d.

[2] THE LANCET, August 24th, p. 402.

CURES AND PREVENTION.

THE author of a new American handbook on "The Common Head Cold and its Complications"[1] explains that if the information he has to offer is not altogether satisfactory "it is because our scientific knowledge is not in all respects final." As Regius Professor of Medicine at Oxford Sir FARQUHAR BUZZARD would doubtless agree with this statement, but in the address published on p. 695 he suggests that we know enough about colds to feel hopeless about them. The common cold is not curable, he said; and as for prevention, the necessary measures would be so troublesome and onerous that the public would never put up with them. He advised his audience (in the manner of Mr. BELLOC) to answer, as they took their fees, there is no cure for this disease, Henry will very soon be well.

While it is quite true that the symptoms of infectious diseases are mostly the signs of a battle between parasite and tissues, we cannot agree either with his statement that "all the material facts about" the common cold are already known, or with his pessimistic outlook that no cure for that complaint will be found as relatively effective, for example, as antitoxin in diphtheria. It seems evident that there is some "material fact" about these infections of mucous surfaces which has not yet been ascertained. No one so far has hit upon any theory or any empirical procedure which will enable us to kill the microbes or prevent their injurious action on the tissues. But no cheerful believer in the intelligence of man can seriously doubt that there is a solution somewhere. Bacteriology is only just getting into its stride and immunology has hardly begun to totter on its first steps; the golden age of catarrhs is surely only just round the corner.

Meanwhile what is to be done? Sir FARQUHAR BUZZARD urges very truly that if we cannot cure a disease we should give our minds to prevention, and that we should frankly recognise that some conditions, such as the paralyses of poliomyelitis, are in effect incurable. With such doctrine no one can possibly quarrel. Medicine has always put prevention in the front of its programme, its main triumphs are hygienic rather than therapeutic, and it is along these lines that it will progress. But it remains true, and probably will always remain true, that the daily work of the medical man will be chiefly therapeutic. Prevention will sometimes fail, and the diseases of old age are, as far as we know, unpreventable; with our ageing population they will become relatively more frequent. One has, too, to recognise that a man or woman who is incurably diseased is by no means as good as dead. From their own point of view, and often enough from the world's point of view, they are as much alive as anyone else, and much of the kindly art of medicine will, we hope, always be devoted to making the rest of their pilgrimage as easy and effective as it may be. It is questionable whether medical men ever do anything more really useful, though the theory and practice of helping those who are irretrievably maimed does not perhaps play any large part in our curriculum. Medicine is not wholly materialistic: it would discharge its functions sadly if it had nothing in view but a healthy body. Let us have that by all means if we may, but if we cannot let us bear in mind that comfort and cheerfulness do many people good besides the sick man. When prevention and cure have failed, there is much left to do which is worth doing.

WORLD HEALTH ORGANISATION.

COMPETENT observers of the Tenth Assembly of the League of Nations have detected in its proceedings an unusual insistence on active progress and increased achievement. The note was heard in all directions, not only on the promotion of peace and disarmament, but in the discussions of such diverse matters as tariff barriers, international communications, child life protection, control of drugs of addiction, and even the internal organisation of the secretariat. Among them the Health Organisation of the League—a term which includes the medical director and his staff, the health committee, and advisory health council—came under review in its place. If we may judge from the discussion of its work in the Second Committee, reported in the *Assembly Journal* of Sept. 18th, and by the subsequent approval by the Assembly of the report submitted to it by the Czecho-Slovakian delegate, Mr. FIERLINGER, it emerged not only with credit, but with as much enthusiasm as the Assembly can be expected to show over an undertaking which has so far gone its way without producing political repercussions or national controversies. The output of the Organisation in terms of its publications continues to grow, while the steady increase in the variety of subjects with which it deals is made evident when the last annual report of the medical director is contrasted with those which he presented only a few years ago. The compilation and issue of returns about notified infectious diseases and similar data from the different countries of the world continue both at

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[1] By Walter A. Wells, A.M., M.D., F.A.C.S., Professor of Otolaryngology, Georgetown University, Washington, D.C., with an introduction by Hugh S. Cumming, M.D., Surgeon-General United States Public Health Service. New York (obtainable in England from Messrs. Macmillan & Co., Ltd.). Pp. 225. 10*s*. 6*d*.

Geneva and at the branch health office of the League in the Far East, which has been established at Singapore. The International Health Year-book, comprising notes of the principal happenings in different countries, has taken a new form and its last issue has been so enlarged that it makes quite a formidable volume of reference. New handbooks have been prepared regarding vital statistics and the public health administration of different countries.

In the more important field of international expert study some notable contributions have lately been made to the science and practice of preventive medicine, particularly the reports of the International Conference on sleeping sickness[1] and on the radiological treatment of cancer of the uterus.[2] To these should be added a comprehensive survey which has just appeared of the measures taken in different countries for the welfare of the blind. The rapporteur laid special stress on the progress of combined investigations into particular aspects of syphilis, malaria, and the causes of infantile mortality. The successive conferences on the first subject have focused national studies of the technique of serum reactions, and have undoubtedly led to greater accuracy and comparability of all the diagnostic tests employed for syphilis. A similar comparison of the efficacy of modern preparations in the treatment of this disease is now proceeding on a large international scale. The inquiries which have been pursued by the Malaria Commission, extended in the present year to India, have resulted in a series of authoritative reports which are doing much to determine the wise selection and economic application of different antimalarial measures according to the circumstances and resources of the countries affected. In the case of infantile mortality a standard pattern of inquiry has been set up which each country can adopt, and those countries which have already adopted it have found that it affords an invaluable guide and stimulus to national effort. Claims such as these made on behalf of the League's work are substantiated by the facts, and their recognition should be gratifying to the medical officers of our own Ministry of Health and other British technical representatives who have not only taken their share in the conferences and committees, but themselves have provided a very essential part of the material and research which has made these several investigations fruitful. In the debate in the Second Committee some delegates advocated the still greater increase of investigations of this kind—for example, the institution of an intensive world study of influenza—while others hinted at the danger of the Health Organisation trying to do too much without a more systematic programme. Both contentions have force, but provided the inquiries are well thought out by the responsible body, the Health Committee, before they are put in hand, and the principle is followed that there should be only one quality of work—the best—their increase should be universally welcomed.

At the Assembly the public health work of the League has now come to make an exceptional appeal on the ground of the universality of its application. While disarmament, tariffs, and opium control affect some nations vitally but leave others indifferent, there is no country in the League which cannot benefit by consultation on one or other of its health problems. In some instances it is evident that these are political and administrative rather than purely technical. The recent application of Greece to the League for a Commission to advise on the reorganisation of its sanitary services is an instance in point. This Commission, of which Sir GEORGE BUCHANAN was the British member, laid down a scheme which the Prime Minister of Greece informed the Assembly that his Government has already adopted. In pursuance of it the services of one of the principal medical officers of the League, Dr. NORMAN WHITE, have now been lent to the Greek Government, while Mr. VENIZELOS himself, in order to further the scheme, has added the portfolio of a Minister of Health to his other offices. The League has just received a similar request from Bolivia for advice on the organisation of its health administration; while much attention was attracted at the Assembly to communications received from the Government of Nankin, as a result of which the medical director, Dr. L. RAJCHMAN, with other members of the secretariat, will almost immediately visit China and the Chinese ports. The Assembly indicated its satisfaction with the principle of these requests by voting a special credit for the purpose, additional to the normal public health budget and to the income furnished by the Rockefeller Foundation. From the point of view of hygiene, as well as of its effect in extending the influence of the League of Nations, the results of these new and highly responsible undertakings will be followed with attention and interest.

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BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.

THE Board of Trade has approved the scheme submitted for its approval last March, and on Sept. 13th the incorporation of the British College of Obstetricians and Gynæcologists was completed and with it the inauguration of a movement for the advance of the twin sciences of obstetrics and gynæcology which should turn to great good. Chief among its objects is the design to increase the prestige of this branch of medicine, to provide a better training and a severer test for medical students in these subjects, along with fuller opportunities for learning them. In giving our support to the movement in the spring we pointed out then what compelling force was given to it by the continuance of the high rate of mortality in childbirth. We recognised in passing the validity of the practitioner's plea that it is economically impossible for him to follow out the rules which his teachers impress upon him for the conduct of labour. These are evils whose roots go deep into social problems, but the work of the new College should be helpful in their solution. Following on the incorporation of the College the first meeting of the Council was held in London on Sept. 25th, when Prof. W. BLAIR BELL (Liverpool) presided and the following were elected members of the first general Council. For London: Dame Louise McIlroy, Dr. T. Watts Eden, Dr. J. S. Fairbairn, and Mr. L. C. Rivett. For the Provinces: Prof. A. Donald (Manchester), Sir Ewen Maclean (Cardiff), Prof. Carlton Oldfield (Leeds), Prof. M. H. Phillips (Sheffield), Prof. Beckwith Whitehouse (Birmingham), Dr. Farquhar Murray (Newcastle), and Mr. Leyland Robinson (Liverpool). For Scotland: Prof. R. W. Johnstone (Edinburgh), Prof. Munro Kerr (Glasgow), Dr. W. F. T. Haultain (Edinburgh), and Dr. R. A. Lennie (Glasgow). For Ireland: Prof. C. G. Lowry (Belfast), Dr. Bethel Solomons (Dublin), and Dr. T. M. Healy (Dublin). Under Article 40 of the Constitution the following were coöpted on the Council for the purpose of organisation—

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[1] League of Nations Health Organisation Report, C.H. 743. Report of the Second International Conference on Sleeping-Sickness, Paris, November, 1928.

[2] Ibid., C.H. 788. Reports submitted by the Radiological Sub-Commission, Geneva, June, 1929.

viz., Prof. R. J. Johnstone (Belfast) and Dr. Eardley Holland (London). Proceeding to the election of officers, Prof. Blair Bell was chosen president, Prof. Munro Kerr vice-president, Mr. Comyns Berkeley (London) treasurer, Prof. W. Fletcher Shaw (Manchester) and Dr. H. Russell Andrews (London) secretaries. Sir Francis Champneys was appointed vice-patron of the College in recognition of his service to obstetrics and gynæcology, and especially to the College during the process of its formation. Finally, the following were elected members of the Executive Committee—viz., Prof. Blair Bell, Mr. Comyns Berkeley, Prof. Munro Kerr, Mr. Rivett, and Prof. Fletcher Shaw.

Annotations.

"Ne quid nimis."

MEDICAL DEFENCE.

THE tendency of recent years to add more and more scientific tests and standards to the practice of medicine has had at least one real disadvantage to the medical profession. It has made it increasingly difficult to get patients to appreciate the fact that medicine can never be an exact science. They are every year more apt to judge the results of treatment by an arbitrary and sometimes grotesque standard, usually infused by natural but undue optimism. If the standard is not reached they promptly blame the doctor, and woe betide him if he has omitted to call in the aid of any modern scientific measure applicable to the case. The absolute necessity of a precautionary X ray in any case of injury which might conceivably involve fracture has been urged again and again, yet Sir Herbert Waterhouse, in his presidential address at the annual general meeting of the Medical Defence Union on Thursday of last week, had to report once more that most of the cases causing his Union anxiety had been those involving failure to advise radiography. "Unless we are in a position to prove," he observes, "that such advice has been given, the defence of our member becomes a matter of great difficulty or even impossible." There are, however, other risks attendant upon the practice of medicine. As the solicitors, Messrs. Hempson, point out in their report, there is the unscrupulous type of person who thinks that he may escape payment if he only voices his dissatisfaction loudly enough and threatens to charge a professional man with negligence. Against such there is no immunity, either in consulting work or in the public health service. There is also the possibility in public health or other whole-time employment of disputes with employers or complaints by ratepayers or other members of the public. The risk is certainly in the minds of a growing proportion of the profession, and we are glad to learn that the membership of the Medical Defence Union now stands at 15,045 and that its financial position has never been better. Its work covers a very wide range of service to medical men and women; defence against action plays a relatively small part. The counsel of experienced advisers can often avert proceedings, and prompt attack may be the best form of defence. The Union may be said to handle every variety of difficulty connected with the practice of medicine. Perhaps the most outstanding case of the year was that, reported in our columns at the time,[1] in which a medical man was held liable for the hire of a car ordered by him for the transport of a patient. This was one of the two cases in which the Union suffered defeat, and at any rate should do service to the profession by calling attention to the importance of disclaiming personal liability when giving an order on behalf of a patient. In the other case the failure was due to the injudicious conduct of the member after action had been threatened; this illustrates again the importance of consulting the Union early and of abiding faithfully by its advice throughout. Another feature of the year's work was the action taken to maintain the professional standard by referring to the General Medical Council the conduct of certain registered practitioners. In every case the Council found the charge proved, and in one case ordered the removal of the name from the Register. More cases than usual have been settled out of court because the Union had no hope of successful action. There were nine of these cases: two involved the loss or partial loss of the sight of one eye, one owing to instillation of the wrong drops and the other to leakage of anæsthetic; three were cases in which a swab or instrument had been left in the body at operation; one patient had been burned during treatment by diathermy; in two cases there were obviously mistaken diagnoses under circumstances in which it might have been difficult to prove that reasonable skill and care had been exercised, and in the ninth case the practitioner had been carried away by sympathy for relatives and had signed an urgency certificate without actually examining the patient. The policy of the Union, however, is strongly opposed to the settlement of claims out of court, and every possible avenue of defence is thoroughly explored before compromise is admitted. In the last 15 years 1641 cases have been handed over to the solicitors by the Council of the Union and the total cost of subsequent litigation was £14,076. In the 63 heaviest cases the average cost per member was about £381. It seems almost incredible that there are still thousands of practitioners who are unwilling to pay £1 a year or a life sum of £25 to insure against this risk. In the words of the solicitors: "It is no exaggeration to say that no medical man is free from this risk, and that every case he attends is a source of possible danger... however small the risk the results may be disastrous and peace of mind is cheap at £1 a year." Membership of one of the defence societies is the only way of securing it.

FLUKE INFECTIONS OF MAN'S BILIARY PASSAGES.

DURING the past year some significant observations have been made in Russia on infection by flukes of the bile-ducts and gall-bladder of man. P. Sdrudowski, of Baku, on the Caspian Sea, and his assistant, F. Jaguboff, have reported that, in fæcal examination of 900 persons, ova of liver-dwelling flukes were found four times—those of *Fasciola hepatica* and those of *Dicrocoelium lanceatum* each being noted twice. All four patients had such hepatic symptoms as jaundice and a large and tender liver. K. Plavtov, of Nakhi-Chevan, at the head of the Sea of Azov, reports on a herdsman who passed eggs of *F. hepatica* without symptoms, and on eight other persons passing those of *D. lanceatum*, of whom one at least was ill with an intense anæmia, but without anything to point to the liver as a seat of infection. Again, N. Karibow, of Tiflis, saw two boys of about 11, from different Georgian provinces, of whom one was without symptoms and the other suffered from biliary colic, while in both the eggs of *F. hepatica* could always be found not only in the fæces but by duodenal catheter. Since in most of these cases where fluke's eggs were discovered symptoms of hepatic disturbance were present, there is little doubt that true parasitism existed. That this *need not be so is evident from observations* by S. M. Koulaguine,[1] who was struck by finding that of 40 persons in whose fæces he found eggs of these parasites, 38 seemed perfectly healthy. He suspected, therefore, that the trematode eggs which he had seen had been swallowed with food, and he was indeed able to observe instances in which a meal of boiled liver infected by these two flukes resulted in the evacuation of their eggs in the fæces over the next three or four days. He confirmed this observation on his own person, having first satisfied himself that he was free from the infections. Even when liver was boiled, roasted, or baked the eggs appeared to be unaltered, and it may be concluded that with imperfect cooking eggs may be passed alive in the fæces of the man who has swallowed them. It is clear, then, that when hepatic symptoms are absent a diagnosis of infection by these flukes, based on the finding of their eggs in the fæces, may well be a mistake. They should be sought for repeatedly by duodenal catheter, unless the ingestion of infected liver can be completely excluded. This observation should bring about a careful scrutiny of cases of supposed infection by these occasional parasites of man.

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[1] THE LANCET, 1928, ii., 1145, and 1929, i., 1258.

[1] Russian Jour. Trop. Med., 1929, vii., 131.

PERCEPTION OF MOVEMENT.

IT is supposed by some that the perception of moving objects, together with a crude light sense, represents a primitive type of vision, in some respects differing from the vision of stationary objects. In order to throw light on the problem some experiments have been carried out [1] by Mr. Myer Salaman, M.A., on the vision respectively of moving and stationary objects in the periphery of the visual field. The first experiment was planned with the object of discovering whether, when a moving object is observed peripherally, a perception of discontinuous change of position is ever obtained without perception of movement. An apparatus was employed by means of which the speed of a horizontally moving object and its angle of eccentricity could be exactly regulated, and numerous reports were obtained from six trained observers. All observers complained of the extreme vagueness of the perceptions, but the majority agreed in reporting change of position of the spots at eccentric angles at which no movement was perceived. This applies most decidedly to slow movement of under 0·2° of visual angle per second. When the rate of movement was more rapid it was, of course, more easily perceived. A second experiment had for its object to discover whether discontinuous change of position of an object, observed peripherally, is ever perceived as movement. In this experiment half of the observers never obtained any illusory perception of movement at all. Of the rest the only ones who gave any but negative results were those who had knowledge of previous work on the subject and of the nature and purpose of the experiment. The conclusion suggested is that the illusory perception of movement was in these cases subjective and psychological, not the outcome of any physiological process connected with the retina. The author is far too cautious to deny what others have maintained—that there may be a special physical basis for the visual perception of movement, but at any rate he shows that no conclusions can be drawn from experiments on the subject in which the psychological factors are ignored.

THE DOSAGE OF INTRAVENOUS GLUCOSE.

THOUGH intravenous glucose is recognised as a serviceable agent in conditions of exhaustion, toxæmia, or dehydration and is widely used, dosage and general technique are apt to be rather casually determined. Dr. P. Titus and Mr. H. D. Lightbody, working in the Department of Obstetrics and Gynæcology of the St. Margaret Memorial Hospital at Pittsburgh, set themselves to ascertain the quantity, concentration, and rate of injection of glucose which would yield the best results. They were chiefly concerned with the toxæmias of pregnancy and sundry gynæcological conditions, but their conclusions[2] have wide medical and surgical applications. They plead at the outset for as much care in calculating the dose and in controlling the administration of intravenous glucose as is used in the giving of any potent agent. They attribute clinical failure and "reactions" to faulty technique or dosage, and remark that ill-effects would certainly be observed if in morphine therapy the dosage was casually arrived at anywhere between grs. 5 and one-hundredth of a grain. To establish their data the authors seized on the cardinal fact that intravenous glucose causes a rise in blood-sugar up to a certain point, with a subsequent sharp and inevitable fall. This fall is, of course, of the highest importance, since hypoglycæmia is probably the cause of the convulsive reactions reported from time to time. It is almost certainly due, according to the charts presented, to an over-stimulation of the pancreas by the excess glucose and an over-production of endogenous insulin. Proceeding along clinical experimental lines the authors tackled separately the three problems of quantity, concentration, and rate of injection. The first consideration is the therapeutic dose. As a general rule probably too little is given. Indeed underdosage, combined with a too rapid rate of injection, may well account for the disrepute into which glucose falls from time to time. On the other hand, overdosage will lead, as has already been stated, to a paradoxical hypoglycæmia with the possibility of convulsions. It seems that the best quantity for an average sick adult is 75 g. The concentration of the solution should be decided upon after a review of the clinical condition. For example, in pneumonia when the patient has a weakened heart muscle, strongly hypertonic solutions should be chosen, so as not to overload or strain the right ventricle; while in a case of dehydration from vomiting and diarrhœa a weaker hypertonic solution is preferred. It will surprise many English readers to learn that 50 per cent. is recommended for the stronger, 10 per cent. for the weaker solution. For the rate of injection the authors fall back on the determinations of R. M. Wilder and W. D. Sansum,[3] who concluded that the rate should not exceed 0·8 g. of glucose per kilo of body-weight per hour. This is very much slower than the rate used in many hospitals and the disadvantages of rapid injection should therefore be emphasised. A certain sequel is the immediate loss of the substance by heightened urinary excretion before it has had time to act; a probable sequel is an over-stimulation of the pancreas, leading to endogenous over-production of insulin similar to that following overdosage. According to Dr. Titus and Mr. Lightbody, a basis for the administration of glucose to adults should be 75 g. of glucose in 300 c.cm. of water given over a total period of one and a half hours. The injection need not be continous but may usefully be given by instalments throughout the day. In children proportionately smaller quantities of sugar should be given but the time of injection should not be reduced.

CHANGES IN LOCAL GOVERNMENT.

THE end of September saw the expiration of the period allowed to the county councils and county borough councils for the formulation of their plans for taking over the public health and administrative work of the boards of guardians. On the last day of March next those bodies will automatically be dissolved and their successors will receive a large addition of dignity and importance, tempered by the obligation to perform extensive and often complicated functions familiar, in most instances, to a minority only of their members. So great a change in our system of local government entails careful and minute arrangements for smooth working, but in the main they must necessarily bear a family likeness. To what extent they differ it is impossible to say, since many scores of schemes have had to be prepared. The general outlines are, however, familiar. From April 1st the councils of counties and county boroughs —that is to say, all the great towns, and some that are not so great—will be responsible for poor-law finance, indoor and outdoor relief, and the maintenance of poor-law institutions, so long known as workhouses, and poor-law infirmaries.

This is a heavy load of work to place upon the shoulders of authorities which grow busier every year, but the Local Government Act of 1929 provides for it to be met by delegation. Even as the councils appointed education committees when they took over the functions of the school boards, so will they now appoint public assistance committees that will absorb the paid officials of the guardians. These bodies will have the general supervision of all poor-law work, subject, of course, as the education committees are, in matters of principle, to the approval of the councils. The composition of these committees is of great practical importance. They may consist only of elected councillors, and in some places that course has been followed, or they may include coöpted persons to the extent of not more than one-third, some of whom must be women. The borough public assistance committees may and, as a rule no doubt will, appoint subcommittees consisting mainly of elected councillors, but here again, if outsiders are coöpted, women must be among them. In the counties subcommittee are compulsory, for the obvious reason that it is impossible to administer relief from a single centre. These guardians' committees will do work for which local knowledge is necessary, such as interviewing and investigations. They will consist of members of the subsidiary councils, in the area, nominated by those councils, members of the county council representing the area, and male and female coöpted members—this is compulsory—to the extent of not more than one-third. The inclusion in this category of as large a number as possible of the old guardians and others with poor-law experience is very necessary, and even where elected councillors only have been chosen it is probable that some of them are, or have been, members of boards of guardians.

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[1] Medical Research Council. Some Experiments on Peripheral Vision. By Myer Salaman. H.M. Stationery Office. 1929. Pp. 47. 2s. 6d.

[2] Amer. Jour. Obst. and Gyn., August, 1929, p. 208.

[3] Arch. Int. Med., 1917, xix., 311.

It is probable that, in most instances, the difficult and complicated question of the most effective means of coöperation between the poor-law hospitals and the voluntary hospitals has, as yet, been settled only in broad outline, even if so much has been done. The details of such coöperation are necessarily intricate, and whatever is arranged must needs be subject to the test of experience. The primary object must be to prevent waste and overlapping, and that crowding of one institution while a neighbouring one has beds to spare which has been so serious a weakness of the old system. Not less important will it be to create something like a uniform standard of efficiency, which was virtually impossible so long as we had two hospital systems existing side by side, one of which was, so to speak, under a cloud. From the point of view of the public health the councils have a great opportunity and, with goodwill on both sides, the voluntary hospitals ought to be the stronger for the adoption of rationalisation in quite a new sphere.

ANAEROBIC TOXÆMIA IN ACUTE OBSTRUCTION.

MICRO-ORGANISMS, like people, have their phases of popularity. The bacillus of gas gangrene, for instance, was long regarded as of no significance except in foul wounds, but M. Weinberg,[1] in France, followed by B. W. Williams[2] in this country, has endeavoured to establish its importance in acute intestinal conditions, and in America it is being advanced as a cause of pernicious anæmia. As regards its action in obstruction of the intestine and acute peritonitis, Weinberg has urged that it produces an infection, and Williams that it forms toxins which are absorbed. In a case lately published by J. Sailer, G. M. Laws, and J. Eiman[3] the afebrile collapse of a woman patient after appendicectomy suggested to the authors the toxæmia of "gas gangrene." On her death *B. welchii* was found in the small intestine and proved lethal to rabbits. The reporters of this case apparently believe it to be unique, but it is of the type described again and again by Weinberg and Williams. The whole theory of the absorption of this toxin from the gut in acute obstruction has lately been traversed, however, by A. W. Oughterson and J. H. Powers,[4] who have repeated Williams's experiments on a much larger scale. Eleven dogs were given acute obstruction and the contents of their small intestines were filtered and injected into the peritoneal cavity of mice. An equal number of mice received the filtered intestinal contents plus a *B. welchii* antitoxin of established quality, and the results seemed to be quite arbitrary. Few mice died, protected or unprotected; in many cases more protected mice died than unprotected. A second series of dogs were then given acute obstruction and the intestinal contents were this time injected into rabbits. It was hoped to find evidence of anti-hæmolysin to *B. welchii* hæmolysin, if it was present, and as a control a sample of known *B. welchii* toxin was similarly injected. The results were negative, however, save in the control rabbit. Lastly, cats were given acute obstruction, and it was found that no relief of symptoms was afforded in the group to which antitoxin was given. The usefulness of the antitoxin treatment of acute obstruction in practice has been emphasised by many writers, including J. O. Bower and J. Clark,[5] but the original theory of intestinal absorption requires confirmation before it can be held to be established. The therapeutic value of the method has not so far been denied in any publication, but the theoretical basis of the method, already resting on two contradictory arguments, is decidedly uncertain.

THE RIPENING OF BEEF.

IT is estimated that those English butchers who supply the wealthier classes sell only 25 per cent. of a beef carcass for roasting purposes, the remainder being destined for stewing, boiling, or pickling. In industrial districts over 54 per cent. of the carcass is sold for roasting, the cheaper and usually tougher joints, such as silverside, topside, aitchbone, and middle ribs, being disposed of for this purpose as well as the sirloin and fore-ribs. It is obviously desirable that the palatability of the cheaper joints should be raised to as high a standard as possible. With this end in view the Department of Scientific and Industrial Research recently undertook an investigation on the effect of hanging, or conditioning, upon the palatability of meat, and their report on the subject has just been issued.[6] The investigation consisted essentially in a comparison of the palatability of samples of hot and cold roast beef derived from carcasses which had been stored at suitable temperatures for varying lengths of time. The palatability was assessed by teams of experts who allotted marks to each sample for such qualities as tenderness, flavour, texture, juiciness, and colour. Joints from one-half of each carcass were cooked and tasted three days after the slaughter of the animal; the other half of the carcass was stored at a temperature of 41° F. for a further 4 or 14 days, after which interval corresponding joints from this half were similarly cooked and tasted. In almost every case there was a marked progressive improvement in the palatability of the samples with the increase in the period of storage, due mainly to an increase in tenderness. The increase in tenderness was more pronounced with the coarser joints than with those of the first quality, and was sufficiently constant and striking to lead the authors of the report to suggest a scheme for the conditioning of beef at central depôts such as municipal abattoirs. Under such a scheme the dressed carcasses would be cooled for one to two days at a temperature of 31–33° F. (short of actual freezing) and then stored for 10 to 12 days at a temperature of 36–38° F. Before removal to the retail shops, or at least before being cut up into joints, the carcasses should be stored for about 24 hours at ordinary temperature, or in summer at some controlled temperature round about 40–45° F. The possible objections to a procedure of this kind, such as increased liability to putrefaction and diminished attractiveness of the joints by loss of bloom and sweating of the surface, are shown to be without foundation, providing due attention is paid to the temperature and degree of humidity of the storage chambers. Now that it has been proved that beef, and especially the cheaper cuts, can be rendered more palatable by the process of ripening or conditioning, what chance is there that this process will be applied generally to the meat prepared in this country? The first and most important step in this direction is the creation among the public of an appreciation of conditioned meat and a demand for it. In the opinion of the writers of the report the coöperative societies have unique opportunities for educating the public in this matter, for in the majority of cases they already possess, or contemplate the erection of, abattoirs fitted with cold storage accommodation where the conditioning could be carried out. Every member of the meat-eating population who is informed of the facts could help to create the necessary demand by reiterated requests to his own butcher for the supply of conditioned meat.

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[1] Ann. de l'Inst. Pasteur, 1928, xlii., 1167.

[2] Brit. Jour. Surg., 1926, xiv., 295; THE LANCET, 1927, i., 907.

[3] Amer. Jour. Med. Sci., 1929, clxxviii., 309.

[4] Cushing Birthday Volume, 1929, p. 1085.

[5] Amer. Jour. Med. Sci., 1928, clxxvi., 97.

[6] Food Investigation, Special Report, No. 36. Post-mortem Changes in Animal Tissues: the Conditioning or Ripening of Beef. H.M. Stationery Office. 1929. Pp. 64. 2s.

THE RADIUM COMMISSION.

It is now six weeks since the Radium Commission was appointed, and although the holiday season has intervened good progress has been made with work preparatory to the important matter of distribution. It is unlikely that more than three grammes of radium will be available in suitable containers before the end of the year, and it will task the National Physical Laboratory at Teddington, to which the supplies are to be consigned for safe keeping, to test and measure this quantity. In addition it is hoped that a loan of four grammes in the form of a so-called bomb may be available on loan from the manufacturers, in the same way as the Haut-Katanga Mining Company has for a long time past loaned to the Institut du Radium and other research centres in Paris a large quantity of the radium element at its disposal. No decision has yet been taken as to the particular institutions to which the radium will be distributed, although it has been agreed in principle to give preference to centres where treatment is combined with teaching and research. The Commission will, of course, require detailed and uniform records to be kept of the use to which the radium is put, especially as the loans will be made on terms which will simply recoup the Commission for the expenses incurred. Prof. Sidney Russ, D.Sc., has been appointed scientific secretary to the Commission, the offices of which are at 5, Adelphi-terrace, London, W.C. 2, where communications should be addressed to the secretary.

THE SEQUELS OF TOXÆMIC PREGNANCY.

It used to be said at one time that there is no great risk of permanent damage after a toxæmic pregnancy, and as recently as 1924 Whitridge Williams in his book, "Obstetrics," stated that one attack of eclampsia *confers immunity against further attacks* in subsequent pregnancies. Among writers who have lately contradicted this is C. H. Peckham,[1] who found that 23 per cent. of 77 cases of eclampsia treated at the Johns Hopkins Hospital had chronic nephritis when examined a year later. Equally remarkable figures have been brought forward by James Young[2] in Edinburgh and by G. F. Gibberd[3] at Guy's Hospital. Young found that more than half the pregnancies which followed a toxæmic pregnancy were pathological, but noted that the incidence of chronic nephritis after a toxæmic pregnancy was low—namely, 3 per cent. after eclampsia and 8 per cent. after albuminuria. He rejects the common view that there is a definite type of toxæmia, sometimes called the nephritic type, and he thinks that all types of late pregnancy toxæmia may be recurrent. Dr. Jessie Sym in our present issue records a further investigation of the series of cases that Young examined, and gives some more statistical details. These show that the danger of subsequent toxæmic pregnancy is considerably greater after "albuminuria of pregnancy" than after eclampsia; thus she finds that 27 per cent. of subsequent pregnancies after eclampsia are toxæmic and 49 per cent. after albuminuria—not to mention many others in which abortion takes place in the early months. Twenty-five of the women in Peckham's series were under observation in their next pregnancies and 14 (56 per cent.) of these proved pathological. Gibberd regards all first attacks of albuminuria in previously healthy patients as due to a primary toxæmia, any renal insufficiency being purely secondary. In estimating the fate of ten such patients he says that one will suffer so much damage to the kidneys that she will develop a frank chronic nephritis, whilst four will recover their renal function completely and afterwards have normal pregnancies. The remaining five—i.e., half those who originally had toxæmia—will, he thinks, have a recurrence of albuminuria fairly consistently with all subsequent pregnancies. Although their kidneys are not obviously damaged they have nevertheless a permanent occult nephritis and will show signs of insufficiency when put to the strain of pregnancy—"the most delicate test of renal function that we possess." It has been shown that the length of time the initial toxæmia lasts is of considerable importance *in deciding whether occult nephritis will follow*, and although, as Gibberd rightly points out, "this is not the whole question," it is reasonable to conclude that signs of toxæmia during pregnancy should be treated energetically without delay. Failure to react to treatment is an indication for ending the pregnancy, whilst in future pregnancies the prognosis must obviously be guarded and careful watching of the patient will be required.

A CHAPTER IN PUBLIC HEALTH.

Dr. Philip Boobbyer's retirement after 40 years of strenuous work for the citizens of Nottingham is a noteworthy event in the history of British public health. The first half of his tenure of office belongs to the period when sanitation was chiefly environmental and directed towards improved conditions of life for the community as a whole. The report, which he has just issued, deals with the last 18 years during which the measures for the benefit of individual health have taken form. The original maternity and child welfare centre was established in Nottingham early in 1908 by voluntary agency with material assistance from the municipality, and was second only to the St. Pancras centre opened in the previous autumn. Here, as elsewhere, the voluntary scheme assumed official status, and now nearly 50 per cent. of the children born in the city come into touch with the welfare centres and about 10 per cent. of the expectant mothers attend the antenatal clinics. Dr. Boobbyer pays a tribute to the midwives who attend 70 per cent. of the births, and notes the fact that the civic authority does not yet provide or subsidise maternity hospitals. Since 1921, however, no baby has been totally blinded by ophthalmia neonatorum, although 12 cases of impaired vision from this cause have been reported. Antituberculosis work began in Nottingham with the provision of beds at the isolation hospital in 1903 and culminated in the establishment of a tuberculosis dispensary and the appointment of a tuberculosis officer in 1913. The mortality from tuberculosis in the city has fallen by nearly one-half during the last 50 years, the drop being continuous except for the war years, when the setback was chiefly among adult females. In 1928 the deaths from tuberculosis numbered only 8·5 per cent. of the total deaths, and existing institutional accommodation may be regarded as adequate except for advanced cases. Dr. Boobbyer considers that the venereal disease scheme has reduced the prevalence of syphilis in Nottingham by more than 52 per cent. but he attributes the lesser grade of success with gonorrhœa to the growing laxity of public morals and the lack of a specific remedy. Since the war the Nottingham Corporation have built or ordered 7000 houses and cleared or adopted schemes for the clearance of nearly 28 acres of slum property. From 1868 to 1912 Nottingham was a pail-closet town; in April, 1912, it was decided to adopt water-carriage, and by the end of 1923 all the 40,000 pail-closets had been converted. The water-supply, which used to be entirely from deep wells and borings in the Bunter sandstone, with a total hardness of 18·4 degrees, has been supplemented to the extent of 33 per cent. by a soft moorland supply from the head waters of the Derwent. The new sewerage, when completed, will render Nottingham one of the best-drained cities in the country; a public abattoir and a crematorium are in prospect. Dr. Boobbyer describes the special activities of the war years; how the comparative freedom of the civil population from infectious diseases enabled much hospital accommodation to be put at the disposal of the War Office; the provision of war creches for the children of munition workers, and temporary expedients such as delousing stations and a venereal diseases prophylactic centre for the allied troops. The outbreak of mild small-pox in 1921–22, 113 cases with no deaths, is attributed to the visit of seven Mormon missionaries from Utah. Nottingham has been less severely attacked than many towns by encephalitis lethargica; 74 cases with 27 deaths occurred in 1924–26. Only two cases of post-vaccinal encephalitis have come to Dr. Boobbyer's knowledge since 1920. The survey should interest both Nottingham citizens and others.

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[1] Bull. Johns Hopkins Hosp., September, 1929, p. 176.
[2] Brit. Med. Jour., 1929, i., 91.
[3] Ibid., p. 674.

BLOOD-PLATELETS IN WERLHOF'S DISEASE.

THE conception of the "morbus maculosus of Werlhof" as an essential thrombopenia has attracted a great deal of attention since it was introduced some years ago by Frank, and has largely influenced the treatment of hæmorrhagic states. The suggestion is that the basis of this particular manifestation of the hæmorrhagic diathesis is a shortage of platelets, either acute or chronic. It was as a result of the observation that splenectomy, both in man and animals, is followed by an increase of the platelets that Kaznelson recommended and practised the surgical removal of the spleen in this condition, and many cases are now on record in which this operation has been followed by the happiest results, though in others it has been a failure. Faith in the theory on which the operation is proposed has been somewhat shaken, however, by the observation that even in cases in which hæmorrhages cease after splenectomy the platelet count, after an initial rise, often returns to its original low level. The whole question has recently been reconsidered by Prof. Roskam, of Liége, who records[1] cases clinically characteristic of Werlhof's disease in which there was no diminution of the platelets, and on the strength of this observation calls into question the whole of Frank's conception of the pathology of the disease. Roskam draws attention to the frequent presence of the "brassard" sign—namely, the occurrence of petechial hæmorrhages after constriction of the arm by the brassard of a sphygmomanometer at a pressure between the systolic and diastolic. This he regards as evidence of capillary damage, and he points out that the amount of hæmorrhage produced in this way may be different in the two arms, which suggests that one portion of the body may be more affected than another. Eventually he comes to the conclusion that Werlhof's disease is more correctly regarded as a disease of the vessels than of the blood itself. That there may be concomitant thrombopenia he does not deny, but he looks on it as secondary to the vascular lesion and not causative of the hæmorrhages. No attempt is [illegible] this paper to explain the beneficial results of [illegible] certain cases. It is evident on present knowledge, however, that the original hypothesis of Frank cannot be retained in its entirety, and that the whole question of the hæmorrhagic diathesis and the rôle of the platelets in its causation is very far from being settled.

THE BALANCE BETWEEN MALARIA AND THE VENEREAL DISEASES.

IF there was ever a time when malaria was of interest to practitioners in the tropics only, that time passed when Wagner-Jauregg began to use it purposefully in the treatment of late syphilis. And now it appears that the interest extends to another venereal disease. When Dr. Max Rosenburg first reached Acre he was surprised to find, he tells us,[1] that some cases of gonorrhœa in Palestine cleared up much more quickly than others. These short cases had, he found, been through a malarial infection, and the association was so constant that it could be used in forming an opinion of probable progress. Perhaps, he suggested, the high temperature of malarial pyrexia weakens the gonococcus, and it may be recalled that John Hunter a century ago noted in his Treatise on the Blood "the suspension or cure of a gonorrhœa by fevers." Spiethof, Leuzman, and Hofmann are quoted by Rosenburg as having in the last five years used artificial malarial infection in the "thoroughly successful" treatment of gonorrhœa in the adult female, and we are familiar in this country with the treatment of such infections of the uterus by the local application of heat. It would be of interest in the first instance to obtain reports from other practitioners in tropical countries. The average length of time spent in hospital by cases of military gonorrhœa is 55·7 days at home, 51·33 days in India, and in West Africa, where the malarial incidence is heaviest, only 46·7 days. These figures might be looked into more closely in the light of Rosenburg's suggestion. He goes on to ask for an explanation of the increasing prevalence in the tropics of neurosyphilis in towns, but not in the villages. He questions the validity of the reasons currently given—viz., over-dosage of salvarsan by native physicians, negative phase and lesser immunity in town dwellers; and a lowering of tone by cocaine, alcohol, and the like, in townsmen newly come from the villages. Here again he regards as significant the greater prevalence of malaria in the villages, where probably 70 per cent. of the inhabitants are infected, while in the towns the proportion falls as drainage and preventive measures advance. Should his view prove correct the future will have in store a great increase in neurosyphilis among the peoples of Asia and Africa as they drift townward.

THE annual Harveian commemoration will be held at the Royal College of Physicians of London on Friday, Oct. 18th, being St. Luke's Day, when Sir Wilmot Herringham will deliver the Oration at 4 P.M., to be followed in the evening by a "general feast" according to the instruction of William Harvey when he gave his patrimonial estate to the College.

ON Sept. 27th the eightieth birthday of the veteran physiologist, Prof. Ivan Pavlov, the Soviet Government, in honour of his work, assigned 100,000 roubles (£10,000) for the re-equipment of his laboratory in Leningrad. In thus recognising Prof. Pavlov's important services to medical science, the Government has disregarded his political views.

Summer Time, which commenced in Great Britain, Ireland, the Channel Islands, and the Isle of Man on April 21st, will cease on Sunday next, Oct. 6th, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer time will thus be followed by the hour 2–3 A.M. Greenwich time. France and Belgium make the change at the same week-end. Thereafter travellers to the continent will not need to adjust their watches until they reach the German, Swiss, or Italian frontier.

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[1] [illegible]g, 1929, iii., No. 5.

[1] Arch. für Schiffs-u. Tropen-Hygiene, September, 1929, p. 463.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLVI.

THE MICROSCOPIC EXAMINATION OF FÆCES.

PART I.*—CYTOLOGY AND ANIMAL PARASITES.

WHEN a medical practitioner seeks the aid of a pathologist in elucidating a case by examining the fæces, there are certain conditions which must be fulfilled in order that the result may be of value. It is disappointing to the pathologist, who has spent time and material on the tests applied, to have to submit a negative report couched in some such terms as the following:—

> "The specimen contained mucus, a few disintegrated pus cells and some degenerated epithelium; no protozoa or parasites were found, and no pathogenic organisms were recovered."

It is also disappointing to the clinician who receives the report; but, more important, it may be misleading if the result is negative only because the material sent for examination was unsuitable in character or arrived too long after collection, since quite a different report might have been received had the proper conditions been fulfilled. In this and the succeeding communication an endeavour will be made to show what material should be submitted for examination on different occasions, what results may be expected in the report, and what inferences may be drawn from these results, and applied to the management of the case.

Collection of Specimens.

The coöperation of clinician and pathologist is of such importance that a few words first on the selection of suitable specimens for examination are appropriate. To identify and estimate all the bacteria in a specimen of fæces, for instance, is a laborious process which may be undertaken for purposes of research or of training students in bacteriological technique, but the results would be of no practical value or application in the present state of our knowledge. There are certain routine investigations which the pathologist will make on each specimen submitted; but he has a right to expect an indication of the special features to be investigated. A short note of the clinical state and of the suspicions aroused in the mind of the medical attendant should accompany the specimen. The material sent to the laboratory should be as fresh as possible, since most of the parasitic organisms, both protozoal and bacterial, tend to die quickly when cooled to room temperature, and are readily overgrown by mere saprophytes. Further, as most of the bacteria in formed fæces are dead, it is preferable to work with a semi-solid or liquid stool. Liquid paraffin should be avoided, because the fæces containing it give messy preparations on microscopic slides, and the minute refractile oil globules are confusing when amœbæ or their cysts are being looked for. The best stool for the pathologist is the fresh liquid evacuation following a saline aperient. Recently passed mucus is the best material in which to find the entamœbæ of amœbic dysentery to be described later. Muco-pus obtained by direct vision of the lining of the bowel with a sigmoidoscope is a better material for examination, both for protozoa and pathogenic bacteria, than mucus passed with the fæces.

The fæces should be collected separately from the urine. The bladder should always be emptied before the stool is passed, in order that it may be free from urine. A chosen part of the motion should be submitted for examination, except where worms are suspected, when it is necessary to have a whole motion, so that the minute head of the tapeworm or ova may be searched for by concentration methods. In these cases the motion should be passed into a wide-mouthed jar, or pickle-jar with screw-on top. A small amount of boiled water still warm may be put into the jar, which should then be securely fastened and properly labelled as mentioned below. In other cases a portion of the semi-solid stool and any pieces of mucus or muco-pus should be sent in a small sterile and tightly corked phial. Specimen bottles with metal or glass spoon for picking up suitable material are obtainable from the laboratories where the examinations are made. The label should contain the patient's name or an appropriate identification mark, the date, the time at which the motion was passed, a note of the examination required, and the doctor's name. No time should be lost in getting the specimen to the laboratory. If it is necessary to send it by post, a little sterile normal saline solution or 1 per cent. bicarbonate of soda may be added. The postal authorities require that it should be so packed that risk of breakage in transit is reduced to a minimum, and it must be labelled distinctly as pathological material. The packet, which should be marked "*fragile, with care*," should be sent by letter post, not by parcel post.

Cytology.

Small amounts of *mucus* in the fæces are common, and are not of pathological importance. A little mucus occurs on the surface of the motion in constipation, or mixed with diarrhœic stools, and is frequent in those of patients taking aperients. This mucus is uncoloured by bile and contains no cells; it is probably from the lower bowel. Larger quantities indicate irritation of the bowel, and masses forming strings or casts occur in *mucomembranous colitis.* At times these casts are several inches or more in length; the mucus is glassy-white or grey in colour, and contains some epithelial cells. Mucus from the large intestine is usually white or uncoloured; when it arises from the small bowel it is often bile-stained. *Sloughs* or mucus containing plaques of intestinal epithelium arise from necrosis in an ulcerated area and may be found characteristically in the stools of typhoid fever patients during the third and fourth weeks.

Muco-pus, leucocytes and pus cells mixed with mucus, may have been swallowed from the nasopharyngeal or bronchial tracts; when it arises from the bowel, it indicates an ulcerative condition of the colon, dysentery, chronic ulcerative colitis, or diverticulitis. The pus cells are usually degenerated.

Fresh pus in separate masses arises from the rectum or sigmoid, and may come from a fistula-in-ano, a proctitis of simple origin (e.g., from enemas) or a tuberculous, syphilitic, or gonorrhœal proctitis, or from an abscess which has burst into the lower bowel. In females the pus may have come from the vulva or vagina, and the possibility that a little bright blood or blood-stained mucus may become added to the motion during menstruation must be remembered.

Blood.—Bright blood-clot with intact blood corpuscles comes from rectum or anus, usually from hæmorrhoids; it is found streaking the surface of the motion or forms a little pool apart from it. Blood corpuscles mixed with mucus or muco-pus indicate an ulcerative lesion of the colon; the small motions produced with straining in dysentery and the summer diarrhœa of children may consist of little else than blood-stained muco-pus. In cancer of the colon the blood is often uniformly mixed with the mucus, forming a pink jelly, whilst in cases of ulcerative colitis the blood tends to lie on the surface of the mucus in little pools. When the blood comes from higher up in the bowel or has remained longer in it, it becomes changed, and may be recognised by spectroscopic or chemical tests. The tarry stools following considerable hæmorrhage in the upper part of the alimentary tract are recognisable by the naked eye. The significance of blood in the fæces was dealt with in a previous article in this series (THE LANCET, 1928, ii., 1353), and the chemical changes of blood into acid hæmatin and hæmatoporphyrin were described. These substances are recognised with the spectroscope, and acid hæmatin in small quantities is also detectable chemically as "occult blood." The spectroscopic test is not delicate; the colour tests are very sensitive, but are given by other substances such as meat and green vegetables. With the chemical colour tests, therefore, a negative result is significant, with the spectroscope a positive is informative. With proper precautions, and when preceded for two or three days by a diet free from hæmoglobin and chlorophyll, a positive chemical test for occult blood shows that bleeding is taking place into the upper part of the alimentary tract. Search may reveal oozing gums, slight epistaxis, or blood-stained sputum, but usually the blood is coming from an ulcer, simple or malignant, in stomach or duodenum.

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* Part II., on Bacteriology, will appear next week.

No clear inferences can be drawn from an attempt to differentiate the varieties of *epithelium* found in the stools. The casts of mucous colitis often contain some columnar epithelial cells and eosinophil leucocytes. In ulcerative colitis and dysentery degenerated columnar epithelium is found, also rounded or polygonal cells with a large, round easily seen nucleus from the deeper layers of the intestinal wall.

Parasites.

Tapeworms.—*Tænia solium* and *T. saginata* are the commonest forms, the latter occurring more frequently in these islands. The diagnosis is made by finding parts of the worm, often isolated segments, in the fæces, and the species of tapeworm is determined by the differences in structure. As the ova are not often passed free in the motions, a negative report does not exclude the presence of these worms. In the case of a third tapeworm, *Bothriocephalus*, not so common, however, the ova are abundant in the stools and a diagnosis is readily made. The procedure recommended is milk diet for a day or two, then an anthelmintic followed by a purgative. The motions should be passed into a vessel containing warm water, without straining if possible, the object being to secure the worm unbroken. The head, no bigger than a large pin's head, must be searched for carefully. If it is not found, a doubt remains as to the treatment having been effective, though the worm may have been killed and the head digested. But as the head, if left alive will grow again, treatment should be repeated in three months' time in case of doubt.

Roundworms.—Infection with *Ascaris lumbricoides* is often multiple. On finding a worm or ova in the fæces, treatment with santonin, oil of chenopodium, thymol, or calomel is carried out, and repeated later. In threadworms, *Oxyuris vermicularis*, the eggs in the rectal mucus already contain an embryo and auto-infection occurs. Anthelmintics should be used, combined with lavage of the bowel with hypertonic (20 per cent.) salt solution or 1 per cent. santonin. With these roundworms, as with *Trichuris trichiura* (*Trichocephalus dispar*), a common parasite, reinfection readily occurs through the fingers becoming contaminated by scratching and conveying the eggs to the mouth. Careful prophylaxis is necessary, by applying an antiseptic ointment (mercury or calomel) locally, and by suitable clothing to prevent contact of the fingers during restless sleep.

The *hookworm*, *Ankylostoma duodenale*, is a rare parasite in Great Britain. Its eggs are readily found and the infection calls for energetic treatment. Cases suspected of being ankylostomiasis must be notified to the Chief Inspector of Factories, Home Office, London, S.W.

Flatworms.—The ova of the liverfluke, *Distoma hepatica*, a rare infection occurring in sheep-breeding districts, and of bilharzial dysentery, *Schistosoma mansoni*, an introduced disease, may appear in the fæces. Treatment is indicated with preparations of tartar emetic by the mouth and intravenously, also in the latter disease, by bowel lavage.

Amœbæ.

Entamœba coli is a non-pathogenic inhabitant of the large intestine. In routine examination of fæces it has been found in up to 50 per cent. of patients in Europe, though in an ordinary civilian population in Great Britain it is much less common. During and immediately after the war it was more prevalent than nowadays. There may be mucus in the stools from irritation of the large bowel, but a report of muco-pus calls for further specimens of fresh stools in order that search may be made for the amœba of dysentery.

Entamœba histolytica, the amœba of dysentery, is a finding which must be taken up at once. The disease is notifiable, and calls for energetic treatment by amœbicides, emetine intravenously, tartar emetic and its derivatives, stovarsol or yatren by the mouth, or by intestinal lavage. Repeated examination may be necessary in some cases, but one positive finding by a pathologist experienced in this work is diagnostic. A report of dead or doubtful amœbæ should be followed up. The patient should take a saline aperient, and any mucus passed should be taken for examination at once, if necessary by special messenger, or preferably examined at the bedside. In a number of cases of subacute or chronic dysentery the diagnosis may thus be cleared up and appropriate treatment instituted. The amœbæ tend to occur in showers during exacerbations, and in the intervals cysts may be found in the more solid or partly formed stools. A report of *E. histolytica* cysts may be accepted in convalescents from dysentery and in the search for possible carriers, but it must be remembered that other amœbæ which are non-pathogenic have four-nucleated cysts resembling those of *E. histolytica*. The finding of such cysts is therefore not enough, and in doubtful cases it may be necessary to test their pathogenicity by infecting cats. Some of the figures showing a high incidence of dysenteric infection in England which were based upon finding these cysts, are therefore to be accepted with caution.

Infusoria.

Certain *flagellates* may be found in the stools. They are usually of no significance, but in some cases seem to set up irritation and to give rise to symptoms. *Trichomonas* may be found in patients who already have dysentery, and may sometimes itself set up a watery diarrhœa with collicky pains. Treatment by bowel lavage with ⅛ per cent. silver nitrate solution relieves. *Giardia (Lamblia) intestinale* may be pathogenic in some 10 per cent. of the cases in which it is present, giving rise to an enterocolitis, diarrhœa with mucous stools containing blood. Bismuth salicylate or salol, thymol, santonin, or stovarsol may be used by the mouth; and intestinal lavage with 1 per cent. methylene-blue or ⅛ per cent. silver nitrate solution.

A ciliate, *Balantidium coli*, more common since the war, is sometimes associated with symptoms of chronic dysentery. It can be controlled by intestinal lavage with ¼–⅛ per cent. solution of quinine; or by thymol or stovarsol by the mouth. Mention may be made of a vegetable parasite frequently reported, *Blastocystis hominis*, which is now regarded as of no pathological significance; stovarsol is said to cause it to disappear. Patients with these infusorial infections are often found to have subacidity of the gastric juice and to respond favourably when weak hydrochloric acid is given by the mouth.

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Special Articles.

INTERNATIONAL PHYSIOLOGICAL CONGRESS.

THE MEETING AT BOSTON.

THE thirteenth International Physiological Congress met at Boston, Mass., under the presidency of Prof. W. H. HOWELL, of Johns Hopkins University, on August 10th. The American Physiological Society, with the Federation of American Societies for Experimental Biology, entertained the foreign members and their friends, and showed a lavish hospitality. The large meeting was organised with such forethought that though over 1000 members were enrolled from 42 nations, its progress was smooth in every detail, and expressions of admiration and gratitude were heard from all sides. Over 500 members attended from the Old World, and the journey afforded opportunities of forming new and cementing old friendships. Most of the British members travelled by ss. *Minnekahda*, on which boat physiologists from twenty-two countries were represented. During the ten days occupied in the voyage many contests in sport between national and international teams formed a happy prelude to the more serious contests of the scientific sessions in the Harvard Medical School.

The Progress of Physiology.

The opening meeting was held on Monday evening, August 19th, in Sanders Theatre, Memorial Hall, Cambridge, where addresses of welcome were given by Surgeon-General Hugh S. Cumming, of the United States Public Health Service, on behalf of his Government; by Lieutenant-Governor William S. Youngman, on behalf of the Commonwealth of Massachusetts; by President A. Lawrence Lowell on behalf of Harvard University; and by the President of the Congress. These were followed by an address entitled "The Progress of Physiology," by Prof. August Krogh, Director of the Zoophysiological Laboratory at the University of Copenhagen. After directing attention to the rapidity with which the science of physiology was expanding, an expanse which was largely due to an increasingly close contact with the allied and fundamental sciences, Prof. Krogh pointed out that the unwieldiness produced by this growth made it impossible for any single human being to be familiar with modern physiology in all its branches, in the sense in which the great teachers of twenty or more years ago were familiar with the physiology of their time. The splitting up of physiology into more or less separate and independent sciences was inevitable, and we were confronted with the problem of finding the right lines of cleavage. Physiology as a science had taken its origin from the necessities of practical medicine, but most of the work done in physiological laboratories had no direct relation to medicine. The line of development which Prof. Krogh advocated was the establishment in one direction of a branch of physiology more intimately in contact with practical medicine, and in the other direction a branch which was much more independent. The time had come when special chairs and laboratories should be established for the physiology of disease, morbid physiology, or experimental medicine, if that name be preferred. The leaders of such laboratories should have no regular duties connected with the treatment of patients, but they must have at their disposal a small number of beds for the temporary study of selected cases, and facilities for studying disease experimentally on animals. The other line of development advocated was the creation in the science schools and in close coöperation with the departments of zoology, of chairs and laboratories for comparative physiology, animal physiology, or zoophysiology. Prof. Krogh's criticism of much of the work done to-day was that too many experiments and observations were being made and published, and too little thought was bestowed upon them. Facts were, of course, necessary, but unless fertilised by ideas, correlated with other facts, and illuminated by thought, they were to be considered only as material for science.

Scientific communications and demonstrations were given on August 20th to 23rd, six sections running concurrently in the auditoria of the Harvard Medical School, the High School of Commerce, and the Peter Bent Brigham Hospital. The communications numbered over 450 and the demonstrations nearly 80. We may refer briefly to those which have a more immediate bearing on the problems of medicine.

New Work on the Alimentary Tract.

L. R. Dragstedt and J. C. Ellis showed that the severe alkalosis following œsophago-duodenal anastomosis with gastrostomy in dogs was unaccompanied by any signs of tetany. W. N. Boldyreff, working with fistulæ in dogs, observed a rapid fall in the red cell count following the absorption of acid from the gut. Repeated introductions of 0·5 per cent. HCl, or 1·25 per cent. lactic acid into the stomach caused in two to three weeks a drop in the erythrocytes of more than 1,000,000 per c.mm., with the appearance of pathological forms. Cessations of such introductions was accompanied by a return to a normal count in a few weeks' time. Excess of acid in the digestive tract was thus shown to be responsible for the advent of anæmia resembling an anæmia of the pernicious type. The results of interesting and important work on fat absorption were communicated by F. Verzár. It was shown that the reaction of the contents of the small intestine is such that the higher fatty acids cannot exist there in the form of soaps. The bile acids, however, combine in watery emulsion with the fatty acids, and the resulting combination dissolves clearly in water even at pH 6·5 and diffuses readily through parchment membrane. The combination is a molecular one, and an explanation is thus afforded of the absorption of the higher fatty acids under the physiological conditions obtaining in the small intestine.

The Kidney.

E. K. Marshall reported that fish such as the toad-fish and goose-fish, whose kidneys were aglomerular, secreted urine of essentially the same composition as those provided with glomerular kidneys. The aglomerular kidney differs from the glomerular one in showing a specificity (similar to that exhibited by the salivary gland) in the elimination of substances not normally present in the urine. Thus phenol red is readily excreted in concentrated form by the aglomerular kidney, while sodium carminate and glucose are not excreted. All of these substances are eliminated by the glomerular kidney. The excretory function of the tubule would appear to be of a kind similar to that exhibited by secretory glands such as the liver, pancreas, and salivary glands. Studies in the composition of glomerular urine have been extended by A. N. Richards and his colleagues, who have now shown by means of quantitative analysis that the composition of this fluid approaches so nearly to that of an ultra-filtrate of the blood plasma as to leave very little doubt that the glomerulus is the seat of a process of filtration.

Dry heat as an effective means of increasing the elimination of urea and of chloride by the skin is recommended by F. N. Allen. This form of treatment can be used in suitable nephritic cases to produce four litres or more of perspiration daily, over long periods, and without prostration. Large reductions in the blood-urea may be brought about by this means—e.g., from 180 to 60 mg. per 100 c.cm.

Cardiovascular System.

C. Heymans reported the results of experiments which were in close accord with the fundamental work of H. E. Hering, on the rôle of the sinus caroticus in the control of the general arterial pressure. By perfusion of the innervated sinus of one dog by means of another, Heymanns was able to show that the bifurcation of the common carotid artery was the seat of receptors sensitive to changes in blood pressure, and the site of origin of impulses engaged in the reflex control of cardiac rate, of the arterial blood pressure, and of the secretion of adrenalin. All the cardiac, vasomotor, and adrenalin-secretory phenomena which had generally been attributed to a direct action of changes in blood pressure on the medullary centres were shown to be of a reflex nature.

W. Raab provided evidence that a hyperexcitability of the vasomotor centre to the CO_2 tension in the blood was to be regarded as a pathogenic factor in essential hypertension. The CO_2 tension in such cases was not greater than normal, but slow deep breathing was followed by a fall in the tension of this gas and in the blood pressure. Breathing a mixture consisting of 3 per cent. carbon dioxide and 97 per cent. oxygen produced a fall in neither, from which it was concluded that the fall in blood pressure encountered before was due to the accompanying fall in the CO_2 tension in the blood. The effect is absent in hypertension associated with nephritis.

Pharmacology.

C. H. W. Lucas and V. E. Henderson reported the results of a study of the anæsthetic properties of cyclopropane. This gas produced rapid anæsthesia in cats in a concentration of 11 per cent. in oxygen. No depression of the medullary centres was observed, but a fall in blood pressure occurred when the concentration of the gas was raised to 25–30 per cent. Animals were anæsthetised on three successive days, for periods of two hours without any toxic effects being manifested.

Sodium amytal has been used by L. G. Zerfas, H. A. Shonle, E. E. Swanson, and G. H. A. Clowes as an intravenous anæsthetic in man. Like other barbituric acid derivatives, this salt undergoes hydrolysis, and ultimately decarboxylation when held in solution. It should be highly purified and its solution (10 per cent. in distilled water) accurately adjusted to an appropriate pH value, if used for producing anæsthesia in man. There is frequently a somewhat prolonged period of post-anæsthetic sleep, which in dogs could be successfully counteracted by the intramuscular injection of ephedrine and caffeine. The highly purified and accurately adjusted preparation has been used successfully for human anæsthesia in upwards of 1000 cases.

A. E. Koehler, L. Eichelberger, and A. B. Hastings reported that they had succeeded in separating from the suprarenal gland an epinephrine-free substance which was capable of elevating the basal metabolic rate and producing improvement in various clinical types of asthenia. These effects were obtained by oral administration of the extract.

Carbohydrate Metabolism.

A number of communications were read on the subject of insulin, but few had any present application to medicine. It is interesting that intrafœtal injection of commercial insulin in the goat caused a lowering of the maternal blood-sugar. In the depancreatised dog, absorption of insulin from the intestine was very materially increased by the presence of various liver products such as bile, or salt solution suspension of liver pulp.

The question of glycogen storage and combustion of carbohydrate in the absence of insulin has received attention, with some novel results. In the eviscerated rat (according to the work of the Cori's), injection of glucose causes no rise in the respiratory quotient (corr. value 0·71 throughout), and presumably no extra combustion of carbohydrate, but leads to a definite increase in the muscle glycogen. In the depancreatised dog (complete removal verified post mortem) survival without insulin has occurred for as long as three weeks. After the first few days the diabetic symptoms abate, the respiratory quotient creeps back to 0·9, the D : N ratio drops below 1, and the acetone bodies diminish markedly. If insulin is now given and then stopped the usual severe diabetic symptoms return once more. This work was reported by Soskin and Campbell, working at the Toronto laboratories.

Muscle.

The physiology of muscular exercise was the subject of nearly 30 communications. Two workers reported successful preparations of isolated involuntary muscle which behave regularly. Bozler, using the retractor pharynx of the snail, *Helix pomati*, has studied the relations of heat production and tension and found this plain muscle to differ only in the time relations of these quantities from the skeletal (voluntary) muscles of the frog. McSwiney and Robson have prepared sections of mammalian stomach muscle with vagus and sympathetic innervation, and studied the effects of stimulation of these nerves under various conditions.

Shaffer and Grünbaum have measured the excretion of lactate as a result of exercise (rowing, football, &c.), both in the urine and in the sweat, and record that in certain circumstances, notably in warm weather, the excretion is mainly through the skin. With the aid of cinematography, Fenn has analysed the movements of running men, and calculated their efficiency. 22½ per cent. of the chemical energy liberated was developed as mechanical energy. The relative values of wind-resistance, gravity, and the checking of limb movements, as sources of energy loss, could be estimated.

A neat technical advance was that of Sosnowski, who has constructed a tension recording-lever for small muscles, based on the piezo-electric properties of quartz crystals. It is claimed that tensions developed in truly isometric twitches can be measured.

The Final Days.

The closing address of the Congress was given by Prof. Léon Fredericq, President of the Second International Congress which met at Liege in 1892, his subject being "Souvenirs des premiers Congrès de Physiologie." An invitation to hold the next meeting of the Congress in Italy was accepted with acclamation.

The foreign members of the Congress were conducted to Woods Hole, where they were entertained at the Marine Biological Station, which is situated in beautiful surroundings. The party then visited New York, where they were the guests of Columbia University for a week, during which time many excursions to medical centres, research institutes, and other places of interest were made.

From New York 200 of the visitors went up the Hudson River to Albany, where they were met and conveyed by motor coach to the laboratories of the New York State Department of Health. They were made welcome by the staff, entertained to an informal supper, and taken in small parties over the laboratories. Within four hours they were travelling on to Canada, but those four hours were a memorable example of quietly efficient and kindly American hospitality. At the Niagara Falls the party halted for a day to view the Falls and the famous rapids. Prof. Best escorted the party down the Niagara River and across Lake Ontario to Toronto, where the University lent its dormitories for the accommodation of members for two days. Though one of these days was a national public holiday, the laboratories were kept open, and the delegates were able to see the work in progress. Prof. Henderson and his energetic committee entertained the party to lunch, the Prime Minister of Ontario and his Cabinet to dinner. Continuing their journey across the Lake and down the St. Lawrence River, the delegates reached Montreal, where they were received by a joint committee of the universities of Montreal and McGill. The Biological and Medical buildings of McGill were open to inspection by the delegates, as also was the Royal Victoria Hospital, and they were entertained by the city of Montreal and the province of Quebec.

The party left on the evening of Sept. 6th by the ss. *Doric*.

Opening of the Medical Schools.

SEVEN of the London medical schools inaugurated the winter session during the past week with a formal ceremony. We print below in abridged form the opening addresses delivered to the medical students of Guy's, St. George's, Middlesex, Royal Free, and Westminster Hospitals. The prize-giving at Charing Cross Hospital takes place this (Friday) afternoon.

GUY'S HOSPITAL.

SIR HUMPHRY ROLLESTON, BART., G.C.V.O., K.C.B.,
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE.

MEDICAL SOCIETIES: THEIR ORIGIN AND VALUE.

[Sir Humphry spoke of the traditions of the Medical School of Guy's Hospital, and of the fine men and great books which had emanated from this school. Great as were its traditions, he said, Guy's did not live on its inheritance, for its *Reports*, so unobtrusively inspired by Dr. A. F. Hurst, the senior physician, were not only the oldest in London but, like vintage wines, progressively improve. In yet another direction the school of Guy's Hospital has played a pioneer part—namely, in the growth of medical societies, and thus furthering medical education and progress, general understanding, and unity. He then noted the connecting links between the Physical Society of Guy's Hospital, which flourished from 1771 to 1852, and the Medical Society of London, which was its junior by two years. The success of the Physical Society, though followed by flattering imitation, had carried with it a penalty, for the competition of younger societies killed it. Its declining years were cheered by watching the activities of its offspring—the Pupils' Physical Society, which dated from 1830. and had always been confined to students of Guy's Hospital, members of the staff being eligible as honorary members only. He continued :]

Medical Clubs.

The evolution of a full-blown medical society can easily be traced; the embryonic stage is found in medical friendships and the gregarious nature of the human man—an attractive feature more frequent and effective in early than in later life. In due course the initiative of some energetic spirit creates a medical coterie or club, and meetings for the reading and discussion of papers follow. By expansion and systematic organisation a medical club may, like the transformation of a financial syndicate into a company, give birth to a society with a more catholic membership; for example, the informal "Moorfields Club," which met in the house surgeon's room for the discussion of ophthalmological cases and problems as far back as 1866, in 1880 took steps to establish the Ophthalmological Society. Sometimes, on the other hand, the club stage is short-lived or is practically short-circuited—for example, in the formation of the Association of Physicians of Great Britain and Ireland, in which William Osler, Richard Douglas Powell, William Hale-White, Wilmot Herringham, and others were the true begetters.

Medical clubs differ from medical societies mainly in their less formal and more private character, in the more personal element, especially in the election of members, their limited membership, and usually in not possessing a library, which is such an essential asset to a medical society. To some extent this serious want may be met by a subscription to a circulating library, and in some instances the book-club element forms the basis and covers all the educational activities of a medical combination. Medical clubs very rarely publish their proceedings, but the Charaka Club of medical bibliophiles, mainly resident in New York, has brought out a number of volumes containing the papers read at its meetings. A medical club is the organised outcome of a group of men working in unison; these clubs flourished long before the word team-work became popular in connexion with those engaged in original research, but the same fundamental principle that inspires the research workers is shared by clubs or small societies designed for mutual education. Medical clubs differ much in their objectives, the prominence of the scientific and social characters varying widely. Some starting with high educational intent have become more social and postprandial, so that later the members are chosen rather for their clubbable attractions than because they are pale students. Such a lapse from the ideal of high thinking to high living is, it must be feared, more frequent in clubs made up of prosperous qualified men than in those whose members are *in statu pupillari*.

[Sir Humphry Rolleston then discussed the advantages of medical clubs in providing opportunity for the informal, private, and critical discussion of new work in a pre-publication phase, for visiting clinics at home and abroad, and in promoting friendly feeling among co-workers. A valuable and instructive, though often evaded, function of a medical club was the obligation on each member in turn to contribute a paper or demonstration; for this provided a training in the art of accurate argument and exact expression. If medical writers and speakers were compared, it was noticeable that the successful writers had more often been physicians, as the Guy's traditions proved; whereas real oratory, a rare accomplishment, seemed specially related to surgical eminence, as was so remarkably shown by the succession of William Lawrence, James Paget, William Savory, and Henry Butlin at St. Bartholomew's Hospital, and by other Presidents of the Royal College of Surgeons of England. A further debt to the early medical societies was that their publications preceded and led to the evolution of medical journals. He proceeded :]

Medical Societies.

By those who do not attend medical societies, and may perhaps regard this devotion as a youthful indiscretion, the reason confessed for their abstinence is sometimes not indolence, but a delicate disdain for self-advertisement. Modesty is indeed an admirable virtue, particularly in our rivals; but the English are somewhat prone to an excess of this fine trait, and men too diffident or hypercritical of their own work, or too much impressed by the verse expressing a desire that "mine adversary had written a book," may delay publication of their observations indefinitely so that they remain mute and inglorious, and thus may perhaps delay the progress of knowledge. The wisely modest man remains a student all his life, and recognises a medical society as a means of easily obtaining post-graduate instruction. With the passing years the habit of attending meetings wanes, and eventually is given up altogether, ostensibly on account of the increasing calls and fatigues of professional life; as a result the individual necessarily loses touch with what is going on, though with the unconscious failure of mental elasticity he may remain blissfully self-sufficient. He may excuse himself by saying that he can read it just as well and more quickly; but, even if he remembers to do so, the effect of the written word is not always the same as that of the spoken address. Further, and this is not very rare, laziness when disguised, like a wolf in sheep's clothing, under the cloak of modesty, may exert an unwholesome influence; a cynical attitude to societies in a senior tends to counteract the benefits that may be obtained from the give and take of debate; it may discourage others from speaking and sharing in the stimulating contest of wits which by a flash may create new ideas and strike out hypotheses worthy at least of being tested. At first public speaking is a nervous experience, and with many, even the best-known speakers, this is always the case; as Mr. T. P. O'Connor, the father of the House of Commons, and so an authority, has said. As the restless anxiety is felt before rather than during delivery, the intending speaker may easily be inhibited by the unkind, perhaps whispered, suggestion during a meeting that the speakers are bores; but he should estimate the significance of the snub by consideration of his critic, for it may be a case of:

> "So have I heard on Afric's burning shore
> Another lion give a grievous roar,
> And the first lion thought the last a bore."

That those prominent and keen at societies possess the faculties which make for professional eminence and success is well shown by the records of the Royal Medical Society, run by the students at Edinburgh, the Presidents of which so often reach the seats of the mighty both in the Northern Athens and in the capital of what the Scots have modestly called the southern peninsula of their country; Richard Bright, for example, was President of the Royal Medical Society before he left Edinburgh in 1813 for Cambridge, where he spent two terms before returning to Guy's. Another instance of early activity at societies as an omen of future success was seen in London about fifty years ago, when no medical meeting was said to be missed by "the three G's"—Sir James Goodhart, Sir William Gowers, and Prof. W. S. Greenfield, of Edinburgh, who reached the highest places in general medicine, neurology, and pathology respectively.

In addition to the educational advantages of merely listening to papers and following the discussion, there is the inestimable benefit, already mentioned, that writing a paper confers on the author, for it should entail a thorough review of the subject and the critical marshalling of data, ideas, and the results of his own experience. Without some stimulus of this kind, such as lecturing in a medical school or writing a book, the habit of *not* reading systematically easily gains the dominion over us, and we, though at first imperceptibly to ourselves, thus begin to drop behind in acquaintance with progressive medicine.

ST. GEORGE'S HOSPITAL.

EDMUND I. SPRIGGS, M.D., F.R.C.P.,
SENIOR PHYSICIAN, RUTHIN CASTLE.

DOCTOR AND PATIENT: FOUNDED ON 33 YEARS OF MISTAKES.

IT is perhaps not unfitting to-day to scan and set forth the relation between patient and doctor in the same way as we describe a disease in its various aspects; beginning with the history and passing on by way of ætiology, method, and complications to the prognosis and treatment.

The written history of the relation between doctor and patient shows that you are the recruits of a great army of men who have served this art, and inherit the fruit of their labours. You are more fortunate than they in many respects, of which I shall mention two. The first is that of intellectual freedom. The second respect is that as compared with even recent days, the means of controlling and arresting disease are fuller than ever before and growing daily.

Ætiology and Pathology.

As regards the *ætiology* of the relation between doctor and patient, it is, of course, the sick person who sends for the doctor. The method of selection is various. If you are chosen because you are known to be competent, live reasonably near, or have succeeded the former doctor, well and good. If you do your part there is a fair chance that the relationship will last. But if you are chosen because your patient's dinner or dancing partner told her that you were absolutely the only man for the nerves, or the gapes, or whatever it is—beware. It is a positive danger to have emotional persons going about saying Dr. So-and-so is wonderful. As soon as many people say the same it becomes the dernier cri, and this lives only a little longer than a May-fly. De la Fourchardière, in an amusing cynical book entitled "Les Médecins malgré nous," points out that once the relation is made the patient wants the doctor if there is nothing the matter to find something; if there is something the matter, he wants him to find nothing.

A *pathology* may arise in the relationship between patient and doctor on the part of either. As regards the patient, nearly every one will be a single-minded person seeking relief, ready to give you all possible help in your work, bearing illness bravely, and commanding your admiration and regard. But you will learn to recognise a few folk who are less anxious to keep to the truth than to produce a certain impression; you will also become familiar with the sublime unconscious selfishness of the neurotic; and with the imitation great who show their importance by giving trouble. The relationship is also out of order if the patient expects a sound opinion without adequate information, examination, and reflection; or to be treated without interference with harmful habits. In these days the prevalence of new ways of observing has led some patients, and some doctors, alas! to a new error—namely, that of undervaluing careful clinical method, upon which our work must always be founded, and of thinking that some test will of itself make the diagnosis. You will bend to none of these errors, but will advise what you know to be right. The difference between you and the charlatan is that you are there to do the patient good by any method, whereas the charlatan is out to sell his wares, whatever they may be. The charlatan is judged by his successes, and we by our failures. And, of course, he has plenty of successes. He benefits, like all who follow the healing art, whether qualified or not, by the simple arithmetic of illness. If everyone needs a doctor on the average ten times in his life he only dies once—that is, in nine out of ten illnesses the patients are likely to get better, provided that they are fair samples of the population. Should you become a consultant and draw your patients from your fellow-doctors, the proportion of your successes, on an arithmetical basis, will be still less, because all the easy ones will have got well, and only those who need further help will be sent.

The *method of work* is of lasting importance, and that you will be taught here. You will soon recognise that in illness there are commonly two elements—namely, the disease, and the patient's natural anxiety about it. The second element can often be put aside by a quiet assured manner on your part.

When *taking a history* you will find that patients will speak with conviction about what cannot be established—e.g., "I make such a lot of bile," or "I do not assimilate my food," "I suffer from the liver," confusing an unstated fact with an overstated interpretation. You will form the habit of keeping the symptoms and signs well separate in your mind from any interpretation or diagnosis; and will try to avoid statements about what we do not know, remembering all the time how much there is, present and active, in any case, which is hidden.

If the case is a new one, you will find it a great help to get into touch with *other doctors* who have seen and treated the patient. Doctors are colleagues, not merely rivals, and the solidarity of our profession is not only right for us, but especially good for our patients. The public does not always realise this, putting much faith in a series of so-called independent opinions, which are sometimes just unconnected guesses. From some experience of obscure and difficult problems I say that special opinions are of much more value when those giving them communicate with each other, and have knowledge which, in many cases, only the family doctor can supply.

The family doctor is the unit of all medical work. His standard has risen enormously during the last generation, and will continue to rise. He should control the case, using specialists and institutions as need arises. His is the responsibility, and this is right, for he has to live with or near his patient for their common lives. Patients who do not keep to their doctor run a considerable risk, because no one else can hold all the threads.

I believe we fail more often in simple apprehension than in the two further parts of logic. The faculty of judgment—i.e., "of arranging the individual things we meet in general notions or classes . . ." and the faculty of reasoning founded upon it are, I suggest, less often at fault; in any case neither judgment nor reasoning will avail unless founded upon a right apprehension of the available facts. If you learn how to examine properly the avoidance of certain mistakes becomes unconscious. It is like style in cricket, tennis, or golf, which requires attention to little points, details which seem irrelevant when the main object is to hit the ball hard and straight. But attention to them ends by making your play, not perfect ever, but a more skilful and better game, and a game which you enjoy more yourself. Affectations correspond to useless waggles of the bat or club. And you will avoid like poison the mental attitude of the man who holds his club up in the air after a successful shot, as if to say, "See what I have done."

Diagnosis, Prognosis, and Treatment.

The public at large has only lately begun to grasp the importance of giving time and thought to diagnosis. The attitude hitherto has been that the doctor should at the least name the disease, after a short interview, and if he does not know what the matter is, the right course is to try another doctor and get the treatment decided upon and started as soon as possible. The fruits of this attitude are sometimes astounding. For instance, if it is recommended that a young person should go abroad for six months or take a voyage round the world for health, the whole family will foregather, and if necessary subscribe to carry out what is advised. But to spend a month, or some money, in finding out what the matter is, how bad it is, and what measures do most good, strikes many people as savouring of incompetence on our part. I could recount instance after instance of people who have spent years in trying different treatments, particularly abroad, whose cases could have been cleared up by simple investigations. But this phase is abating and you will perhaps before long be faced with a converse one which I begin to meet—namely, that presented by the people who are all for diagnosis but have no time or patience to try to get well.

I have mentioned that doctors may walk into the pitfall of making a diagnosis on a particular finding either at the bedside or in the laboratory. It is necessary, particularly with unexpected findings—a lump, a large heart, fluid in the chest, a gall-stone—which puts the idea of one particular disorder in your mind, to stop and ask yourself: Is this the cause of the ill-health? Can it be anything else?—going over each symptom. When you have given time to a knotty case, and have made a diagnosis, do not be too quick to alter it. I have several times been wrong in taking a diagnosis back.

The *complications* that may arise in the relation between doctor and patient are infinite. Among the most common on the part of the doctor is anxiety; it is essential not to allow anxiety to bias judgment. If there is one place more than another where a fidgety mind is not wanted it is in the sick-room. The doctor who worries too much takes away from his own usefulness; though I suspect that he that does not worry at all is no doctor.

Doubt and anxiety will be lessened if you are able so to arrange your work that you can deal with a problem at the time. Having your facts, go into the matter fully. Keep good reference books, and read up the case without delay. To-morrow fresh puzzles will come and drive the finer points of this one out of your mind. In some cases books do not help much, for diseases are not so obliging as to confine themselves to type; and each of you will meet one day a new disease, and many times new combinations of diseases. You must then settle down and think. And such thinking will be the more fruitful the more you have heeded your anatomy and physiology, and your training in the post-mortem room and at the bedside.

On the part of the patient the worst complication is mistrust. This is only natural in the first instance, and must not be resented. By the time that you have done all in your power to help your patient it will nearly always have vanished. If not, you are justified in suggesting to him in the most friendly way that what he really wants is a doctor he can believe in. Faith is, of course, a help. De la Fourchardière, our cynic, says that is why the clergy go to Vichy and the doctors to Lourdes. Some patients fear that the doctor is trying to keep them under treatment for longer than they think necessary. There are many more whose faith wavers; not unnaturally, when they are advised to follow a prolonged tedious course involving self-denial. It is expedient to keep in mind that outside causes influence progress, for good as well as for evil. It is common to find a patient not so well and full of complaints, and learn afterwards of some personal disturbance unconnected with the disease or its treatment, such as worrying letters or the non-arrival of expected news. You will often be asked to give counsel on matters which are not strictly medical at all. If your advice may concern others, when possible see the others. Your patient's interests come first, but it is in those interests that you should not be merely an advocate of his or her views, but should guide rightly.

The *prognosis* of the relations between doctor and patient is almost uniformly good, but if an exact relation between success and gratitude is expected there will be disappointment. I remember one patient in whose case we were doubly fortunate in that a serious disease was found and means of complete relief applied successfully. He bade me farewell as follows: "Doctor, I can never thank you enough. When I came here I was done and I knew it. Now I am well again." His eyes filled with tears, he shook me by the hand, and, looking to the open windows, added, "I believe its the air." If you have learned to laugh at yourself, you will have a good deal of fun. On balance, the rewards are more than the deserts.

The *treatment* of the relation between ourselves and the sick person is clear enough if we ask ourselves two questions: (1) How should I like to be dealt with if I had this patient's disease and his mental make-up? (2) How would it do me most good to be dealt with? The ideal blend of sympathy and firmness, we can envisage, but alas! seldom attain.

It is, on paper, hard to define how much a sufferer should know about his illness. It is generally better to tell an intelligent person the truth, in as simple language as possible, avoiding technical terms and all detail which may be brooded upon later and misinterpreted. It is more skilful to put the facts so that they are not alarming than to withhold them. If a man is the subject of a serious chronic disease he often knows, at the least, that he cannot be the same again, and will be satisfied if you dwell upon how to relieve rather than upon the unlikelihood of cure. The case of cancer is sui generis, but in effect difficulty seldom arises. Above all, in your desire to answer questions frankly never go beyond what is certain. To destroy hope in the mind of any patient is inexcusable. It is also unwise, because you do not always know. We are not there to pass sentence. Remember "Guérir quelquefois, soulager souvent, consoler toujours."

Conclusion.

In all these matters you will have the advantage of learning your profession in a country in which the standard and the conduct of practice is higher than in any other; in a city the streets of which were trodden by Harvey and Sydenham, Hunter, Jenner and Young, and Lister; and at a hospital which has had more than its share of these pioneers of medicine. The physicians and surgeons at St. George's have had the reputation of being not only technicians; they have played a part in other spheres—science, literature, art, and sport. And that is one reason why they have trained so many good doctors. A doctor may suffer a little in his personality if he does nothing but work. And to keep on a level keel, you will, if you are wise, carry on our hospital tradition. Do not have all your friends doctors. Be a man among men away from the sick-room. In looking back to the devoted clinical teachers of my youth I sometimes wish that in their desire to pass on to us what was known they had left less of an impress of finality; but had rather opened our eyes to the great fields of the unknown that lay before us, and had stirred us to believe how easy it might prove to the patient observer to reveal new facts. I had the idea as a student that all the main discoveries in medicine had been made, and that new ones would come only from the exceptionally able, and that after laborious and abstruse research. It was not so, and it is not so now. A great Frenchman said nearly 300 years ago, " the sphere of our knowledge expands without ceasing, but as it increases so does the number of its points of contact with the unknown." I have only to look back upon the changes and the simplifyings that have come over medicine in my short span to know that there are those listening to these words to-day who will add to our knowledge and to the means by which we may modify and arrest disease.

MIDDLESEX HOSPITAL.

E. A. COCKAYNE, M.D., F.R.C.P.,
PHYSICIAN TO THE HOSPITAL.

LIFE'S ENDLESS CHAIN.

[Dr. Cockayne said that the subject of heredity was a branch of medicine almost completely ignored by many authors of text-books and by teachers in the medical schools. Its study afforded evidence of the close relationship of the sciences taught in the preliminary course to one another and to the theory and practice of medicine. He summarised the simple experiments made by the Abbé Gregor Mendel in 1865 which had completely altered our views on the subject of heredity, and explained the laws of inheritance of dominant and recessive characters in plants. Experimental methods of breeding had shown that the characters of animals behaved like those of plants. Dominants were transmitted direct from parent to offspring, and recessives in the presence of the corresponding dominant were handed down from generation to generation, causing no outward and visible sign of their existence in the transmitters, but appearing again unaltered whenever a mating between two impure dominants took place. Dr. Cockayne then discussed the applicability of the Mendelian law to man. He said :]

Heredity in Man.

In man no direct experiments are possible, and the small families and the slow sequence with which one generation follows another make it far more difficult to prove that in him, too, inheritance obeys the Mendelian law, but the greater the number of long and accurate pedigrees that are accumulated the more does its applicability to man become apparent. Most of these pedigrees, it is true, illustrate the inheritance of conditions more or less abnormal, those illustrating normal ones are seldom simple. For instance, the inheritance of the colour of the hair and eyes, and of pigmentation of the skin, in which segregation undoubtedly takes place, are complex cases in which more than one pair of factors are involved. One form of curly hair, however, is a good example of the complete dominance of one normal character, hair spirally coiled and oval in cross-section, over another character, hair straight and circular in cross-section, and the pedigree shows that in the marriages between a curly-haired and a straight-haired individual half the children had curly and half straight hair.

If we turn from the physiological to the border-line between the physiological and the pathological we find that the same law of inheritance prevails. In man two types of piebald are met with, and in both of them the distribution of pigmented and unpigmented areas has its exact counterpart in a breed of domesticated animal, and in both man and animals the two types of kinds of piebald pattern are dominant to the normal pigmentation. Albinism, due to partial or complete inability to form the pigment melanin in the skin, hair, eyes, and internal organs, is definitely pathological. Owing to its conspicuous appearance and its widespread though rare occurrence in many species of animals, mammals, birds, and even reptiles, it has always excited public interest. There is more than one kind of albinism, but whatever its kind and in whatever animal or race of man its mode of inheritance has been studied, it has proved to be recessive to normal pigmentation. Though rare in most races of man, amongst an isolated tribe of Indians in the Daren Peninsula of South America albinoes are numerous. The tribe does not permit the marriage of two albinoes, and its common occurrence is due to the isolation of the community and the consequent frequency of intermarriage between blood relations, who are impure dominants. In these Indians albinism is always associated with small stature and increased hairiness of the skin, and in Europeans with visual defects. I mention this because what we call a unit character is often merely the most easily recognised, but not necessarily the most important of many departures from the normal, all of which are dependent on a single factor.

Another chemical error inherited as a recessive is porphyrinuria, in which porphyrin, a red pigment easily identified by chemical tests and by spectroscopy, is excreted in the urine. Here we trespass on the domain of physics, for the chief disability of those unfortunate people, who cannot break down hæmoglobin, the red colouring matter of the blood, beyond this stage is that the porphyrin accumulates in the skin and renders it sensitive to sunlight, which blisters and destroys it. Xeroderma pigmentosum is another recessive defect, in which the skin is so affected by sunlight that cancer of the exposed skin develops at an early age, and though the nature of the defect is still unknown, its resemblance to porphyrinuria makes one suspect that it too is an inborn chemical error. If so it may prove to be the best clue to the cause of cancer. As an example of defective structure I will cite polydactylism, which is dominant in most families, and it is interesting to note that in some of the domestic animals polydactylism occurs and is inherited in the same way.

Anomalies of the ductless glands, so fascinating because of their far-reaching effects on growth and metabolism, are in some cases hereditary. Diabetes mellitus, due to a deficient secretion of insulin by the pancreas, has many different causes, but in some families a weakness of the gland is inherited and transmitted as a recessive character. Man is not the only sufferer, for in mice a strain has been met with in which the same disease is transmitted and, as in man, it is a recessive. Gigantism and acromegaly, with its strange overgrowth of the extremities, are due to over-secretion of the anterior lobe of the pituitary gland and are inherited as recessives, while the excessive and perhaps abnormal secretion of the thyroid gland, that causes exophthalmic goitre, is inherited as a dominant in some families.

One might multiply examples of inherited physiological attributes or chemical and physical defects indefinitely, but enough has been said to show in what diverse conditions Mendelian segregation of unit characters can occur.

The Chromosomes as Carriers of Mendelian Factors.

The microscope has enabled us to supplement the work of the experimental breeder by revealing to us the physical explanation of the manner in which this segregation is brought about. The student of histology sees in every artificially stained cell a deeply coloured central part, the nucleus, and in a series of sections showing the various stages of cell division he sees the nuclear material form a ribbon and then split up into a number of small pieces, the chromosomes, a number varying in different species of animals and plants, but with certain remarkable exceptions constant in any given species. In the process of formation of the germ cells, both male and female, a reduction in the number of the chromosomes takes place. Half are lost, so that a germ cell only contains half as many as any of the cells of the rest of the body. It is only by the union of a male with a female germ cell that the full complement can be reached once more. Nor is the union haphazard; each chromosome unites with its corresponding chromosome and each part of a chromosome with the corresponding part of its fellow. Long before the discovery of Mendel's paper it was believed that the nuclear material of the cell was the part which carried the qualities of one generation to the next, and recent work has consistently added strength to this conviction. If we regard the chromosomes as the carriers of the Mendelian factors that determine *inherited characters, we can understand how the* halving of the number of chromosomes in the germ cells is adapted to ensure that each germ cell shall contain one of every pair of corresponding factors, and we can also understand how the manner in which the full number is restored in the fertilised ovum ensures that one of every pair of such factors is derived from each parent.

If the cells of the body contain in a pair of corresponding chromosomes both members of a pair of factors, say A and B, the germ cells of that individual will be of two kinds, one kind having one member of the pair, A, and the other kind the other member, B. If this individual marries another of like constitution the expected combinations of their germ cells are A with A, B with A, A with B, and B with B, and each combination should occur with equal frequency, so that if A is the factor for a character dominant to B the proportions among the offspring will be one pure dominant, A A, two impure dominants, A B, and one pure recessive, B B. Thus the behaviour *of the chromosomes* is adapted to bring about the results that are actually found in experimental breeding.

So far we have dealt only with characters that are met with equally in both sexes, and the explanation given will not cover the inheritance of those met with in one sex alone. In some beetles there is a chromosome fewer in one sex than in the other. In other animals, though the number of chromosomes in the two sexes is the same, one of a corresponding pair is smaller or, as in flies, differently shaped in the cells of the one sex. Conventionally we speak of this pair of dissimilar chromosomes, which appear to be the determiners of sex, as the X and Y chromosomes, and it is found that in man the male has an X and a Y, and the female two X chromosomes in the cells of the body. Thus when the germ cells are formed all those of the female will be alike, each having an X chromosome, but those of the male will be of two kinds, one having an X chromosome like those of the female, and the other a Y chromosome. Union between a germ cell of the female and a male germ cell of the former kind containing an X chromosome will give rise to a female child, whereas union with one of the latter kind containing a Y chromosome will give rise to a male child. The X chromosome may carry factors for normal or pathological characters just like any of the ordinary chromosomes, but the Y chromosome, which as I have said may be absent altogether, seldom if ever carries any factors at all.

Female Transmitters of Abnormalities Affecting Males.

This fact gives the key to those *strange cases of* inheritance in which the male alone shows the abnormality, but has apparently healthy children, while the females, though not themselves affected, transmit it to half their male offspring. This mode of inheritance, spoken of as sex-linked, can be explained by the factor concerned lying in the X chromosome and being recessive. If an affected man marries a normal wife all his sons will be normal, because they only receive the unimportant Y chromosome from their father, but all his daughters will be capable of transmitting the condition, because the X chromosome received from the father carries the recessive factor, though the second X chromosome received from the mother carries the corresponding dominant and so makes them appear outwardly normal. Half the germ cells of one of these transmitting females must have an X chromosome carrying the dominant factor for the normal and the other half an X chromosome carrying the recessive factor for the abnormality, so that, if she marries a normal male, there will be an equal chance of either kind of germ cell uniting with a male germ cell having a Y chromosome. Thus half the male children will be normal and half will inherit the abnormality. Half the female children will be normal, and the other half will appear so, but will be transmitters of the abnormality.

In addition to normal characters, of which we know little, a number of interesting and important human *abnormalities may be inherited in this way, such as* colour blindness, hæmophilia, optic atrophy, muscular dystrophy, and deficiency of hair and teeth with absence of sweat glands, though in other families the same or similar abnormalities may be dominants carried by one of the ordinary chromosomes and so affect both sexes alike. This dissimilarity of the sex chromosomes also provides us with a scientific explanation of the popular belief that sons take after their mothers. A son receives from his mother an X chromosome bearing the factors for many characters, and all of these will affect his mental and physical traits, whether dominant or recessive, because the Y chromosome received from his father bears no corresponding member of the pairs.

I have only mentioned the simple case of a pair of corresponding characters, but there are many more complex examples. Even now we can foretell of many human characters whether they are likely to be transmitted to the offspring, and, if so, in what proportion they may be expected. If dominant they are likely to appear in the next generation and in half the children, since pure dominants are almost unknown in man, but if recessive it is most improbable that they will appear in the next generation, though they will reappear in a subsequent generation near or remote. We can give a warning that, when a recessive character has appeared in a family, marriages between blood relations and especially between first cousins are likely to result in its immediate reappearance, because many impure dominants are present in such a family and marriage between two of these will lead *to its appearance in a quarter of the children.* The adolescent insanity, dementia præcox, is an example, and the frequent intermarriages of Parsis in Bombay is the cause of its high incidence among the members of this gifted community. Amaurotic family idiocy is another example, and in this fatal disease, which is almost confined to Jews, blood relationship between the parents can be traced in the majority of cases. Two similarly afflicted people seldom marry. Deaf-mutes are the commonest exception, and since one form of deaf-mutism is inherited as a recessive some of these marriages give rise to the expected result, a family of children all of whom are deaf-mutes.

Great as the advances have been in our knowledge of the inheritance in man of characters, desirable and undesirable, during the last two decades, an almost unlimited field awaits our further progress. There may be a number of diseases which originate from an obscure but innate defect, as pernicious anæmia appears to originate from an inherited achylia gastrica. Unsuspected metabolic disorders must exist, which when discovered will shed new light on the normal chemistry of the body.

Conclusion.

The science of eugenics is in its infancy. The application of Mendelian principles to agriculture and stock raising has had far-reaching results. For instance, the output of sugar per acre in Java and of wheat in the temperate zone has been greatly increased, and the use of a sex-linked character has become the basis of a large trade in "one-day chicks" in America. But its application to the improvement of the human race has been and must for many years to come remain very limited, nor do I see how it can ever be of equal value, because the methods employed in improving a breed of domesticated animals cannot be used for man. The stamping out of undesirable characters would be easy if they were dominants, but, if they were recessives, it would be a long and perhaps impossible process, and even if the worst of all the inherited afflictions of the human race were eliminated, they would still arise again from time to time as fresh mutations.

Looking at heredity alone, can anyone say with justice that a thorough grounding in the basic sciences of chemistry, physics, botany, and zoology is a waste of time for the doctor? The same laws govern heredity in plants and in animals, vertebrate and invertebrate, even in man himself, and there can be no doubt that the parallel cases of inheritance in man and animals have a deep significance. Our understanding of this we owe to these sciences, that have revealed in part the secret of life's endless chain and shown us how, in spite of apparent gaps, it extends unbroken from one generation to generation. Surely the wider the knowledge of them a man brings to his study of medicine the more clearly he will appreciate the essential unity of nature.

ROYAL FREE HOSPITAL.

DR. JANE WALKER, J.P.

THE RETURN OF WOMEN TO MEDICINE.

Women Doctors in History.

THERE are many proofs that from the beginning of time women were quietly and efficiently tending the sick and binding up wounds. Many women doctors were in practice in ancient Greece and Rome. Œnone, the wife of Paris, had the gift of healing, and the Cornish Princess Isolde was a doctor. It has always seemed to me that there is a good deal of evidence for the book of Ecclesiastics having been written by a woman doctor. The authorship is attributed to Kohelith, a feminine word in Hebrew for a teacher. It certainly shows signs of having been written by a somewhat disillusioned person—a state of affairs not altogether inconsistent with the experience of a practitioner of the healing art of some years' standing.

In the Middle Ages learning was not widely diffused, and was not regarded as a gentleman's accomplishment, and was therefore in a certain degree left to women. Ladies of the mediæval households were both nurses and doctors. Miss Kemp Welch in "Six Mediæval Women" gives a most graphic account of the day of one of them. Many heads of nunneries studied medicine, notably St. Hildegarde, who wrote the most famous book on medicine of her time. Then there was the famous school of Salerno, where in the tenth and eleventh centuries was a fine medical school, in which women as well as men taught, wrote, and practised medicine and surgery. In the twelfth century romance, "Le Lai Des Deux Amants," there is mentioned a woman who had studied for 30 years at Salerno, and in that celebrated school had completely acquired the art of medicine. In the romance of Gwaine and Gawin, when he is wounded in his fight with a giant, he is "healed at a fair castle by two maidens who were learned in leechcraft, and they also restored to health his lion." In the Via Sacra round Athens we constantly see Greek inscriptions, such as "To Basile, the Woman Doctor," "Thecle, the Woman Doctor, lies here." In Ostia, the Rhone Valley, in Spain and Africa, many a marble slab has been found erected to women doctors by some grateful patient. Galen mentions Aspasia, from whom he copied many prescriptions, and Cleopatra, a famous gynæcologist, another of his colleagues. There must have been women doctors in Egypt for thousands of years.

There is a story told by a Latin author of the time of the Emperor Augustus, that at one time it was forbidden in Athens for a woman *or a slave* to study medicine. Whereupon a certain woman cut her hair short and dressed as a man, studied and practised medicine with such success that the women pleaded for her. Whereupon the law was repealed, and women were free to study and practise medicine. Bologna had in the eighteenth century at least seven women professors—one, the professor of mathematics, was appointed by the Pope, and another, Anna Maria delle Donne, was appointed professor of obstetrics by Napoleon Bonaparte. There were many medical women in Italy, Germany, France, England, Spain, and Poland, who practised or wrote medical works before the revival of the nineteenth century, but after the fifteenth century the number of women practising medicine became fewer, and finally almost disappeared. In Elizabeth's time, Anne Cooke, who became Lady Bacon, and her sister Mildred, Lord Burghley's second wife, were both described as skilful in surgery and distillation of waters.

In the seventeenth century Margaret, the celebrated Duchess of Newcastle, was taught physic and chemistry. During the Stuart period the sense of public duty, so noticeable in the learned ladies of Tudor times, found its chief expression in the study of medicine.

There is scarcely a description of the upbringing of girls at this time which omits all reference to the study of physics. At home the mother instructed the daughter, but this was not the only means of obtaining information. Women doctors took apprentices. We read in Mrs. Elizabeth Walker's biography that she was very competent both in "physic and chyrurgery." Her medicine store contained at her death a good store of vomits, purges, sudorificks, cordials, pectorals, almost all kinds of syrups, and strong and simple distilled waters. Some women doctors had a fashionable reputation. John Evelyn supped in the City with a gentlewoman called Everard that was a very great Chymist, and obscure country villages had their female practitioners.

When medicine became more of a science, and less of a mystic empirical art, the men of science declared that women were incapable of learning it, and gave them no chance of proving whether they were capable or not. At the same time the old prejudice as to the mental inferiority of women was helped by the new prejudice that every woman possessed of unusual skill was a witch, and deserved to be cruelly done to death. Naturally they ceased to practise medicine. In France it took 300 years of struggle to exclude women from the profession. In Henry VIII.'s reign a law was passed which prevented women from practising medicine unless they were approved by a bishop, who should call unto him four physicians and four surgeons. Apparently no women were examined and approved, but still some of them continued to heal people without payment. The passing of the Medical Act of 1858, though a great advance in many ways, made it impossible for women to practise medicine unless and until a university or corporate body with power to examine them would do so and grant them degrees.

Famous Women and Famous Men.

In our own times the onslaught on the closed and barred gates of the citadel of medicine began with a thirst for knowledge, when women demanded higher education for themselves.

Among the pioneers in the women's medical profession Dr. Elizabeth Blackwell, Dr. Elizabeth Garrett Anderson, and Dr. Sophia Jex-Blake are outstanding. Elizabeth Blackwell's name was entered on the British Register in 1859. The other two first met at a lecture given by Dr. Blackwell in London, and from this meeting was born in them the determination not only to study and practise medicine, but to make this career available to others. After many difficulties they achieved their own medical education and then, with the help of Mrs. Thorne, managed to infuse others with their spirit and to secure the foundation of the London School of Medicine for Women. Some men were sufficiently enlightened and in advance of their times to see the justice of allowing women to carry on whatever work they felt they could do. In the very early days nearly 200 men doctors had signed a petition in favour of women in medicine. Sir James Paget was one of them, although he did not quite approve of women entering the medical profession.

Sir James Stansfeld's claim to enter the army of famous men as far as we are concerned is that he was the most active agent in getting the Royal Free open to us for practical training through his influence with Mr. Hopgood, chairman of the board of management of the hospital. Later on in the same year the London University agreed to admit women to medical examination and degree. Another great man was Dr. King Chambers, who after urging women to get teaching somehow and then boldly to practise as unregistered practitioners, being ready to submit to examination when called upon, joined in helping to found our school.

It was Dr. F. A. Anstie who definitely promised to become a lecturer if the women would get a school of their own fit for first-class theoretical courses. He believed the school would get teachers from other schools if that were done, and that then, with that evidence of sincerity and energy in work, some hospital or hospitals would give way and grant facilities for clinical teaching and experience. In every move he made or suggested he was right and far-seeing. He held the office of dean for only three months, during which all the arrangements were made for starting the classes in October, 1874, but he died of blood poisoning on Sept. 12th of that year. He was succeeded by Mr. Norton from St. Mary's Hospital, who occupied this post until 1883 and he was also lecturer on anatomy. It will be interesting to students who are entering for the first time to know that it was long before he made a real success of his profession. His total earnings for the first seven years of practice are said to have amounted to two guineas, and yet he lived to ride every morning on a favourite white horse and to own a villa on the Thames as well as his house in London.

A man great in many directions was Dr. William Allen Sturge, who was appointed physician and pathologist to the Royal Free Hospital, when the hospital decided to accept women as students in 1877. He was a brilliant lecturer and a warm supporter of women's medical education. He married Dr. Emily Bovell and they started practice together in Wimpole-street; but Dr. Sturge, however, was too delicate for the severe work of a London practice and they moved to Nice. She had to contend there also against the prejudices which prevailed at that time against medical women, and indeed, even now has not entirely disappeared. Disappointed and ill and saddened, she broke down again, and died in 1885.

Dr. Buchanan Baxter was a very remarkable person. He did not begin to study medicine until he was 30, did not practise till he was 40, and he died at 50. He was physician to the Royal Free Hospital only from 1881 to 1884, but he left an ever-abiding memory and devotion behind him. Mr. Stanley Boyd became lecturer on anatomy with Mr. Norton in 1882, and succeeded him in 1883. His close connexion with the school and all its doings kept up till the time of his death in 1910. There are innumerable famous men and women, both living and who are now gone, who have really gone through a very great deal to enable the present-day young woman and student to find herself where she is. They have indeed laboured that she may enter into her labours with peace and quietness.

The Entering Students.

A few words to the entering students I think is always regarded as an essential part of this address, and a good deal of space has been given in many previous addresses to things like your food, and your clothes, your recreation, and games. I am sure the food you require is that which you like to have, and as for your dress, I regard the modern girl as well and sensibly dressed as it is possible for her to be. The only thing I feel inclined to say to you on this point is, do not let anyone persuade you to wear your skirts longer than you do at present. They are both beautiful, graceful, and really useful, as well as being economical. It is now quite an ordinary thing to study medicine, and very rarely do women doctors not find plenty of work to do. But in spite of the ordinary young woman, as the ordinary young man, taking up the profession of medicine women doctors have still to be a bit better than men of the same standing. They must be equipped, not only with the best theoretical knowledge, but with infinite patience, forbearance, business ability, tact, good health, energy, and courage. They must familiarise themselves with political, economic, and social conditions. At the same time, do not be discouraged if you make mistakes—everyone makes bad mistakes—and they learn far more from them than from all their successes. At the same time, if you start in general practice, as I hope a very large proportion of you will do, that you will probably lead a rather solitary life in a town where there are 20 men doctors to one woman, and that any mistake you make will be handed round the town and be magnified 20 times more than any one of their blunders.

Women must be loyal to each other. It is a great thing for you at this school that so many of your professors and teachers are at the top. It is one of the disadvantages of the co-education schools that most of the people at the top are men. This brings on an undue state of humility with women students, and makes them unable to visualise themselves at the top, at which we ought all to aim. Disloyalty to women takes place where women compete with women for the favours of men, as in love, and where women compete with men for the favours of men, as in our profession. The French say it is men who make women dislike one another, and there is a Latin author who says, "Nothing is more unbearable than a woman with a full purse," and especially is this so when she has made it full by her own exertions. Do not let your loyalty to anyone be mere servility. It is no good truckling to anybody. Never be afraid of what people think of you. Do what you honestly think is right and leave it. Realise that you are human beings first, and women afterwards. Only as you do this will you attain that perfect freedom which we should all have as our aim, both for ourselves and for others.

WESTMINSTER HOSPITAL.

F. N. KAY MENZIES, M.D., F.R.C.P.,
MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER FOR THE COUNTY OF LONDON.

THE LOCAL GOVERNMENT ACT, 1929.

SIX months from to-day (Oct. 1st) an Act of Parliament will come into full operation known as the Local Government Act, 1929. This Act may truly be described as one of the greatest and most revolutionary advances in public health and social administration which has occurred in this country for over 100 years.

The portion of the Act to which I refer may be quite briefly summarised as follows: The Act transfers to the London County Council, on and after April 1st, 1930, the whole of the medical services, indoor and outdoor, of the poor-law guardians of London, and the whole of the powers and duties of the Metropolitan Asylums Board.

That means in effect transferring to one public authority—viz., the L.C.C.—over 100 public hospitals and institutions for the treatment of the sick, containing about 50,000 beds. Now, inasmuch as the L.C.C.

already provides over 20,000 beds for mental cases in their mental hospitals, and a large number of other beds in a variety of hospitals for various diseases, it will mean that the L.C.C. will have under its own direction and control no less than 75,000 beds, dealing with every variety of disease. That is, about five times as many hospital beds under one public authority as there are to-day in all the voluntary hospitals in the whole of London.

[Dr. Menzies traced the evolution of public health administration in this country during the last hundred years and pointed out that it had proceeded along certain lines of definite logical sequence. There was first communal health, or environmental hygiene, as exemplified by housing, water-supply, sewage and refuse disposal, infectious diseases, and so forth, and then came personal or individual health, as exemplified by the tuberculous patient, the V.D. patient, the orthopædic patient, maternity and child welfare, and the midwife. Moreover, the poor-law authorities of this country had, from the time of Elizabeth, been concerned with the relief of destitution, either in the form of cash or kind, or by means of institutions—viz., workhouses. Poor-law guardians relieve destitution—they have no choice. If a sick poor person could not obtain the medical attention he or she required elsewhere, the poor-law guardians had to provide it—even if the poor-law hospital or infirmary was overcrowded. Voluntary hospitals, on the other hand, made their own selection of cases, and were under no legal obligation to take in any particular patients. He continued :]

The great bulk of hospital treatment of the sick in this country is provided by poor-law guardians out of rates, and by the public health authorities out of rates and taxes, and not by voluntary hospitals—e.g., 350,000 beds in England and Wales, compared to 50,000 in voluntary hospitals—and in London 75,000, compared to 14,000. Not only all these hospital beds are provided and paid for out of rates and taxes, but they are in existence now, and have been for many years past. The London County Council, therefore, is not going, as some people seem to think, to create an entirely new public hospital service in connexion with its duties under the Local Government Act, 1929, but is simply taking over and centralising under one authority what is actually a going concern to-day, and humbly hoping to improve it.

Public opinion has long rebelled against the principle that a person who is technically "destitute," owing to sickness, must, if he is treated by the poor-law guardians, be regarded as a "pauper," and public opinion has prevailed at last. The agitation in favour of transferring the duties of the poor-law guardians with regard to the treatment of the sick to the public health authorities has been going on for over 25 years, and has only now, in the Local Government Act, 1929, been satisfied. The great change which will shortly come about in London and elsewhere is based, not on any mere sentimental whim or political prejudice, but upon the recognition of a principle that if a person is sick and is in need of treatment, and for any reasons he or she is unable to obtain it, then it is the business of the health authority to provide it.

The Effect on the Voluntary Hospitals.

There is a great fear, and a very natural one, that in some way or another the voluntary hospitals of this country will be adversely affected. Those who say that their days are numbered base this fear mainly on the belief that voluntary sources of income will gradually disappear, with the result that in time they will either be bound to receive large financial grants from the public health authority or close their doors. There are others who believe wholeheartedly in the continued generosity and financial support from the charitable public, with possibly some modification or adaptation to meet new conditions—such as massed weekly contributions from working men and women, or some organised form of voluntary sickness insurance, or the conversion of a larger proportion of beds into pay-beds on a higher scale of fees, or a combination of all these and others I have not mentioned.

There is very little, if any, practical experience to help us in making any forecast or coming to any decision on this extremely difficult and perplexing problem. I know of no reason, at all events in London, why there should be anything else but cordial and harmonious coöperation for the common purpose of promoting the welfare of the sick of this great metropolis, and, moreover, if such coöperation were properly established in London, it would be a great example to the rest of the country, and would have far-reaching beneficial reactions throughout England and Wales. For over 20 years past the policy of the London County Council has been cordial coöperation with the voluntary hospitals of London ; the Council has continuously and consistently sought the assistance of voluntary hospitals; at the present moment about £150,000 per annum is spent by the Council in financial grants to voluntary hospitals and voluntary committees in payment for work done on behalf of the Council.

Conclusion.

The London County Council and the members of their medical staff will be called upon very shortly to undertake the greatest responsibility which any single public authority in this world has ever been asked to shoulder. *The administration, efficiently* and economically, of a hospital organisation containing over 75,000 beds is a stupendous task.

If this task is going to be carried out successfully we shall need the cordial sympathy and whole-hearted support of all those who are genuinely interested in the care of the sick. The prestige and good name, not only of the Council, but of London is at stake. All right-thinking persons in every section of the community desire to make our hospital service, both public and voluntary, even more efficient than it is. Therefore, this is emphatically not a time for dissension between the public and voluntary hospital services. It is emphatically a time for coöperation to the best of our ability for a common purpose.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified : Surg. Comdrs. R. A. Brown and J. F. Ainley to *Egmont*, for R.N. Hospital, Malta ; Surg. Lt. J. G. Currie to *Tamar*, for R.N. Base, Singapore.

ROYAL ARMY MEDICAL CORPS.

Maj. M. B. H. Ritchie to be Lt.-Col., vice Lt.-Col. and Bt. Col. W. R. P. Goodwin.

Maj. T. H. Twigg is secd. for serv. under the Colonial Office.

J. M. Gibson to be Lt. (on prob.).

ARMY DENTAL CORPS.

Capt. A. R. Inglis to be Maj.

G. A. Ballantyne, late Capt., A.D. Corps, to be Capt.

INDIAN MEDICAL SERVICE.

Majs. to be Lt.-Cols. : R. F. D. MacGregor, A. L. Sheppard, P. K. Gilroy, J. A. A. Kernahan, M. L. C. Irvine, E. W. O'G. Kirwan, and G. L. Duncan.

Capts. to be Majs. : Shankar Lal Patney, Dwijendra Nath Bhaduri, Raghunath Ganesh Dani, P. F. A. Grant, and Coimbatore Subramania Venkataramanan.

The undermentioned appointments are made : To be Capts. (on prob.) : Capts. R. L. Frost and K. S. Fitch. To be Lts. (on prob.) : W. McAdam, W. McCoach, G. G. M. Davis, D. H. Waldron, E. P. N. M. Early, and E. B. Eedle. To be Temp. Lts. : Khurshed Jilani.

Lt.-Col. M. L. C. Irvine retires.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Reorganisation of Health Services.

THE Department of Health for Scotland has lost no time in issuing directions to the local authorities for preparing their schemes of reorganisation. In a circular dated Sept. 10th the Department analyses the leading powers of the new Act, and promises special circulars later on infectious diseases (including tuberculosis) and venereal disease, milk-supply, unsound food, food and drugs, maternity service, and child welfare and school health administration Meanwhile, in concert with the Scottish Office, it gives general directions for applying the Act in the localities.

The new Act will not come into operation until May 16th of next year, but the circulars are intended to enable local authorities to master the difficulties of detail that are certain to develop between the town councils and the other authorities within the cities, and between the county councils and the burghs within the counties. Only a special study of the duties of these bodies could make intelligible the amount of detail to be adjusted and readjusted. It is enough to say that the health circular emphasises the elements involved in a unifying of the health service under the single authority. One of the chief difficulties will be the incorporating of the school health services with the others. The circular says:—

> "The relationship between the public health committee and the education committee, and the division of functions between those committees, will have to be worked out in detail in the light of experience. Meantime, it should be kept in view that the school medical service as a health service should be definitely linked up with the other health services. Such an arrangement will facilitate the development of the service for the pre-school child. On the other hand, the full benefit of a scheme of medical inspection will not be secured unless the school health service is closely associated with education in order that the general principles of hygiene may be applied to the scheme of education, and that in particular all questions affecting individual children may be clearly considered from the educational point of view. The medical officer of health or a special medical officer on his staff must keep in close touch with the development of all schemes of education, and exercise his influence in moving policies in such a way as to secure for the child the best possible conditions for his proper physical and mental development."

Probably the major problem will be the reorganisation of the hospital facilities. The policy of the Department has been expressed in the Mackenzie Committee's Report—namely, complete coöperation between all the hospitals within the district as well as with the teaching medical schools.

> "The ultimate object of any hospital policy," says the circular, "must be to bring a complete and efficient hospital service within the reach of all. The Mackenzie Committee considered that this could best be obtained by the full development of both voluntary and public authority services working in co-operation. With this view the Department are in full agreement, and they have noted with pleasure that since the publication of the Mackenzie Committee Report there has been increasing readiness on the part of public authorities and voluntary hospitals to enter into co-operative arrangements. Hitherto the duties of local authorities in the provision of hospital beds under maternity service and child welfare schemes, and schemes for the treatment of venereal diseases, have in many cases been discharged through the agency of voluntary hospitals. Similarly, voluntary institutions provide a good deal of accommodation for tuberculous patients, more especially for non-pulmonary cases. It is probable that in the less populous areas this method may continue to be the most effective way of meeting the need for the provision of additional accommodation, and its desirability is indicated where such an arrangement facilitates the provision of one effective hospital unit, and obviates the building of a number of small units.
>
> "In other areas it may be found expedient that the local authority should itself provide the accommodation, but whichever course is followed, the essential point is that there should be an agreed policy between the local authorities and the managers of the voluntary hospitals.
>
> "Section 27 provides safeguards to ensure that local authorities take reasonable steps to secure co-operation with the voluntary hospitals and the medical schools serving the area of the authority. It is of the first importance that the development of hospital services in every area should be a matter of agreement between the public authorities and the voluntary hospitals. The machinery for securing contact between the public authorities and the managers of voluntary hospitals has been provided by the setting up of regional committees by the voluntary hospitals. A regional committee has been established for each of the four areas centring round the medical schools of the four universities, and a fifth regional committee has been established for the northern area. The machinery for co-ordination has been completed by the appointment of a Central Liaison Committee representing the voluntary hospitals, which will act in liaison between the five regional committees and the Department. The Department consider that the councils will be well advised to make touch with the appropriate regional committee at the earliest possible moment."

The principle of unification extends to diagnostic and treatment clinics as well as to hospitals. For diseases other than infectious, powers of recovery of the costs of treatment are conferred by the Act, but the Act does not require a local authority to make recovery. The view of the Department is, as in the case of maternity service and child welfare, that recovery should not be enforced to an extent that will discourage persons in need of treatment from obtaining it.

Transfer of Poor-law Functions.

Two circulars, dated Sept. 23rd, have also been issued detailing the necessary duties to be transferred from the poor-law to the local authority.

The transfer of the duties performed under the poor-law is even more difficult than the consolidation of health services, and there the question of settlement emerges. The local authorities may provide that any assistance that may be granted either under the Poor-law Acts or under any other Act, shall in future be wholly provided under such other Act, and thus be taken out of the category of poor relief. The town clerk of Edinburgh, however, in an elaborate report submitted to the town council, points out that if the assistance is given under the poor-law, the amount of the assistance given can be recovered from the authorities of other areas, where under the law of settlement liability attaches to these other authorities. But no such recovery can be made where the assistance is not given under the poor-law. Accordingly, if the conditions under which assistance is given in Edinburgh are regarded as more favourable to the recipients than in other areas in Scotland, the tendency may be to attract people to Edinburgh who would not otherwise come, and thus impose upon the Edinburgh ratepayers the burden of assisting persons who do not belong to the city.

In his report the town clerk makes suggestions for a highly specialised system of committees. He says:—

> "Many members of local authorities and other persons interested in public administration have recognised that, through the force of circumstances and the pressure of business the Town Council of the future must become more and more a deliberative and less and less an administrative body. The Town Council on this view will, in short, become something of the nature of a Parliament—the local parliament for the City of Edinburgh. It will then concern itself mainly with policy and the general direction of affairs, and it will be left, as far as possible, to Committees to carry that policy into effect and to attend to all the details of administration. Where the duties are so many and so varied it is apparent that each councillor cannot be expected to keep in close touch with every subject which comes before the Council. Individual members of Council, while having a general cognisance of the direction of the policy of each department, will require to specialise in particular branches of municipal administration. It would seem that a system of devolution of duties would greatly assist this process of specialising."

From all these documents it begins to be clear that a genuine revolution in administration has now begun. One main result will be a reduction in the personnel of the administrative bodies and an increase in the responsibility of the chief officials.

The New Chancellor of Glasgow University.

Sir Donald Macalister, retiring Principal of the University of Glasgow and President of the General Medical Council, is to be nominated as Chancellor of the University. By Sir Donald's friends all over the world this nomination will be received with the warmest good feeling. Only those who are familiar with the administration and growth of the Scottish universities can even approximately estimate the value of his services to Glasgow. It is not only that he has succeeded in establishing a large number of chairs and lectureships but that he has done so, all along, in the light of universal culture. It would be difficult to name from any country a man of greater accomplishment, and after a long and strenuous life he comes into this honour because of his sheer fitness for the post.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Abdominal Tenderness and Unnecessary Operations.

FOR some time Dr. J. B. Carnett, professor of surgery in the University of Pennsylvania, has denied [1] the validity of the doctrine, enunciated by Head and Mackenzie, that cutaneous areas of hyperæsthesia are related to visceral disease. The disease known as chronic appendicitis he declares to be non-existent, saying that nobody has ever described a syndrome characteristic of chronic appendicitis which he is not able to demonstrate in dozens of cases that have had the appendix removed. Parietal tenderness is, he says, due to parietal neuralgia, and is the cause of hundreds of unnecessary operations. Where it is found in the right upper quadrant the gall-bladder is attacked, when in the right lower quadrant the appendix or the tubes or the ovary. Patients are seen showing as many as five abdominal scars who still complain of the original tenderness and pain. It is true that very many of these patients are of a neurotic type, but their suffering is none the less real.

To distinguish parietal tenderness from that due to genuine deep-seated disease Dr. Carnett has developed a technique of his own. The patient's abdomen is first palpated in the ordinary way and the tender area or areas are observed, together with the degree of pressure required to cause pain. The patient is then asked to blow up the abdomen. When the muscles are thus made voluntarily rigid, tenderness will not be elicited in deep-seated disease, because the damaged area will be protected; parietal tenderness, on the other hand, will be as readily elicited as before. Another test is to seize a portion of the skin and fat between the thumb and forefinger and apply increasing pressure. The full force of this squeeze may cause discomfort but will not evoke pain in the absence of a neuralgia. In the neuralgic subjects, however, a very gentle squeeze will often suffice to make them wince. The areas of tenderness will be found to correspond to the peripheral distribution of nerves. If the lower quadrant is affected tenderness will also be found for the breadth of two fingers below Poupart's ligament (ilio-inguinal nerve) and also over an area of the buttock above a line joining the trochanters (ilio-hypogastric nerve). This anatomical distribution of tenderness assists the differential diagnosis and also excludes malingering. The neuralgia may result from toxæmias. from herpes zoster, and from injuries or deformiti[illegible] lf the spine. Lordosis is a common cause b[illegible]here are while arthritis is common in later life. [illegible]ontinued

B~the charitable[illegible]rivileged to attend one of Dr. [illegible]odification or adapta[illegible]st of the patients had already such as massed weekly lost the appendix without any lasting relief from the symptoms for which they had suffered operation. Although Dr. Carnett had not seen them previously he was able to demonstrate his signs with complete success, the delimitation of "pinch tenderness" by areas of nerve distribution being quite striking. One could not help remarking that under the conditions of the clinic there was a possibility that suggestion might affect the patient's response, but this can, of course, be ruled out in private practice. Dr. Carnett's teaching is certainly heretical, but there are a few surgeons and a number of internists who believe that it contains an important measure of truth and that a considerable number of appendices are removed without justification. Whether peripheral or intercostal neuralgia is as common as Dr. Carnett believes, only the application of his tests by independent observers can show.

Tick Paralysis.

The common tick of the Rocky Mountains, *Dermacentor andersoni*, may be the carrier of several kinds of illness. There is the true Rocky Mountain spotted fever which closely resembles exanthematic typhus. There is a tick fever without exanthem, with apparently a shorter incubation period and a much lower fatality, which may or may not be a variety of the same disease. There is the quite distinct infection with *B. tularense*, and finally there is tick paralysis. A case of this rather uncommon affliction has lately been reported.[2] When first seen the patient, a boy of 10 years, had a temperature of 100° F. with rapid pulse and weakness. He was unable to walk, and when he tried to stand he had to be supported stiff-legged against the bed. Abdominal and patellar reflexes were absent. On the next day he was drowsy, unable to lift either leg from the bed or to raise his head. There was a partial ptosis of the left upper eyelid and diplopia. The temperature was subnormal. The boy was then bathed and a tick found on his back was removed. Within three hours he desired to get out of bed and did in fact get out of bed. The next day he appeared to be completely recovered. The rapidity of recovery from these severe symptoms, when once the tick is removed, appears to be typical of this particular tick disease.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Prof. Noorden's New Clinic.

DURING the past ten years or so the Municipal Board of Health has been systematically working to secure better health for Vienna and better treatment of the sick. Tuberculosis has been attacked at its very roots; slums have been destroyed, and over 40,000 light and airy dwellings have been handed over to the working-class population; a hospital for rheumatic diseases, with 350 beds, is in course of construction; three children's hospitals have been added to the city's institutions, and now Prof. Karl Noorden, who from 1906 to 1913 conducted the first medical clinic of Vienna University, has consented to take over a model department in the municipal hospital devoted solely to the study and treatment of metabolic disorders. He will have 50 beds and a staff of selected specialists at his disposal, and will advise the authorities on dietetic problems. His clinic will have a special kitchen where physicians, nurses, and cooks will get suitable instruction. It should be distinctly understood that Noorden's return to Vienna, which he left some years ago for personal reasons, is not due to his appointment to a university chair; his age, which is 70, would prevent such a call. The Municipal Board of Health, however, has thought it a considerable gain to have the coöperation of so important an authority, whilst Noorden, on his side, gets an unlimited opportunity for further research, his position being quite exceptional. He will take up his work here early next year, and it is expected that his "school" for specialists will be a centre of attraction to medical men—and patients—from all parts of the world.

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[1] men an[illegible], or SOMEVCET, 1920, i., 32.

[2] Colorado Medicine, September, 1929, p. 326.

Infectious Disease in Austria.

A report by the Federal Board of Health shows that not a single case of typhus, small-pox, or cholera occurred in June–July. In the same period ten cases of encephalitis lethargica were noted and three cases of acute anterior poliomyelitis; other notifications of fresh cases being scarlet fever, 073 (3 deaths); diphtheria, 587 (12 deaths); typhoid fever, 155 (13 deaths); paratyphoid, 112 (7 deaths); epidemic encephalitis, 5 (1 death); puerperal fever, 20 (6 deaths); trachoma, 49; varicella, 351 (no deaths); and bites by suspected animals, 24 (no deaths). On the whole the health of the population was conspicuously good up till end of July, but since then there has been an epidemic of sore-throat both in Vienna and in many of the health resorts, in spite of the glorious weather we have enjoyed until quite lately. Ordinary colds, followed by otitis media and nasal sinusitis, are somewhat common at present in Vienna, perhaps because of the sudden exchange of an abnormally long heat-wave for cold autumn weather. Some observers think that the large incidence of respiratory infections is traceable to contamination of the water of swimming baths and ponds, which are frequented by enormous crowds of bathers. They hold that chlorine disinfection is not done as thoroughly as is desirable in hot weather.

Immunity to Syphilis.

At a recent meeting of the Vienna Society for Microbiology Dr. Prigge, of Frankfort, said that natural immunity to syphilis consists only in protection against the development of a primary lesion, and does not prevent invasion of the body by spirochætes. In animals apparently resistant to syphilis we see a general infection without symptoms, secondary and tertiary symptoms being sometimes visible much later. Kolle and his collaborators have shown in extensive investigations, lasting many years, that the immunity acquired by the rabbit through infection is not a true immunity. It is not transmissible passively, and the hope of obtaining a serum against syphilis is unjustified. Immunity takes 90 days to develop in the rabbit. The animals are then protected against the manifest effect of a reinfection with a homologous spirochæte; human beings, on the other hand, acquire immunity to heterologous organisms. In case of reinfection the resistance of the "immune" individual prevents the formation of a primary lesion (the chancre-immunity of Kolle), but allows the propagation and multiplication of spirochætes in the body, so that under certain favourable conditions aortitis, tabes, and general paralysis may be induced. Further research, said Dr. Prigge, is still badly wanted to clear up the problem of immunity against syphilitic infection.

The Symptoms of Rabies in Man.

Prof. Schweinburg, the director of the Lyssa Institute of Vienna, not long ago, at the invitation of the Vienna Medical College, gave an account of the chief symptoms of lyssa (rabies) encountered in persons bitten by infected animals. Apart from prodromal local pains at the site of the lesion, mental and nervous supersensitiveness, he said, appear early. The histological picture is that of a diffuse non-purulent encephalomyelitis, with infiltration round vessels and ganglia, the medulla oblongata being chiefly affected. Stimulation of any of the sense organs produces excessive responses. Breathing is difficult and oppressed, the muscles of the pharynx and œsophagus are over-irritable, and go into spasm with every effort of swallowing (hydrophobia). Later on the slightest tactile or sensory irritation (noise, light) produce twitching and spasms of the muscles of deglutition. These symptoms are never absent, and another constant symptom is ærophobia—i.e., spasms are elicited by a light blowing on the patient's face or by a draught of warm or cold air. On the second or third day very marked salivation appears; the quantities of saliva produced are so large that they are spread abroad by breathing or speaking. The temperature, at first normal, runs up toward the end to a very high level; in the blood count mononucleosis often develops, whilst the eosinophils and basophils disappear. After three days the excessive irritability of the central nervous system is exhausted, and the paralytic stage sets in. This is often rapidly followed by death, but sometimes the condition appears to improve, because the spasms disappear and the patients may take food, whilst supersensitiveness is absent. Paralysis of the heart, however, soon ends the patient's life. The paralytic type of lyssa, with absence of the spasmodic stage, is very rare in man—being perhaps relatively common in children—and a recurrent type is still rarer. No treatment is of any avail for manifest hydrophobia, for hitherto all inoculations or vaccinations have proved useless, and the same applies to various forms of chemical, biological, and internal medication. The only effective measure is preventive vaccination, lasting 13 days, and the mortality of such vaccination is now nil.

Obituary.

ERNEST EDWARD GLYNN, M.D. CAMB., F.R.C.P. LOND.,

LATE PROFESSOR OF PATHOLOGY, UNIVERSITY OF LIVERPOOL.

Ernest Edward Glynn died of diabetic coma on Sept. 22nd at Nerquis, near Mold, where he had been living in retirement since his health broke down in the autumn of 1927. He was born in 1878, the eldest son of Emeritus Professor T. R. Glynn, of Tremeirchion, who was for so many years professor of medicine in the University of Liverpool. Educated at Liverpool and at Clare College, Cambridge, Glynn qualified in 1898 and took his M.B. in 1901 and M.D. in 1908. In 1904 he became a Member of the Royal College of Physicians of London and was elected to the Fellowship in 1918. He intended originally to be a clinician and became an assistant physician to the Liverpool Royal Infirmary, acting at the same time as an assistant in the pathological department under Rupert Boyce. He proved such an efficient substitute during his chief's absences abroad, and when he was laid aside by illness, that in 1912 he succeeded him as Holt professor of pathology, and nominally gave up his clinical associations, though he was to the end at heart as much a medical man as an academic pathologist. Glynn was brought up in the broad outlook which includes morbid anatomy, bacteriology, and experimental pathology, and seeks to weave out of them a harmonious knowledge of disease. His students reaped the benefit to a singular degree and, as anyone knows who has acted as external examiner in Liverpool in recent years, they reached a standard of

PROF. GLYNN.

[Photo by Medrington, Liverpool

interest and knowledge which is quite exceptional. His methods may have been dogmatic; they gave at any rate a clear picture, and after all it is better for a student to have a crystallised scheme which is only partly right than an amorphous mass of muddy uncertainty. His influence and inspiration extended too beyond the undergraduate days of his men and, especially in the last few years, he had been remarkably successful in activating the younger graduates of his school.

Ernest Glynn took a keen interest in the growth of the Pathological Society of Great Britain and Ireland and was its honorary treasurer for many years. He attended its meetings regularly, and many of his contributions to pathological research took the form of communications to this society. He often joined in discussions at the Liverpool Medical Institution and showed there how closely he followed clinical medical progress. His catholic interests are shown also in the variety of topics which he advanced by his original work. To him is chiefly due the recognition of the association between adrenal tumours and sex change in women which has led to the diagnosis and cure of a number of cases, and one of the last things which interested him before he had to give up work was a remarkable example of precocious adrenal virilism in a male infant. Another matter of considerable importance which he, Dr. Howel Evans and their associates have recently developed is the increase in the number of platelets in the blood following operations, childbirth, and probably tissue injury in general which must have a good deal to do with post-operative thrombosis. In earlier years Glynn investigated the opsonic technique and brought forward the simple plan of counting bacteria in a hæmocytometer chamber which has been widely used. Dysentery bacilli, the pneumococcus and pneumonia, the meningococcus, and cerebro-spinal meningitis at one time or another had his effective attention; with lamb dysentery he was as energetic but less successful. An elaborate inquiry into the results obtained in the venereal clinic showed that the addition of mercurial treatment to a course of arsenicals was undesirable. It is no formality to say that scientific medicine will deeply feel the loss of Glynn just when he had reached the height of his productive powers.

Glynn was not married. He lived in the famous house, 62, Rodney-street, where Gladstone was born, with few interests beyond pathology and the motor-car which he drove so furiously. For the last few years of his life he was coping courageously with the disease which ultimately killed him.

LODGE MOOR HOSPITAL, SHEFFIELD.—Extensions to this institution were opened on Friday in last week by Sir George Newman, Chief Medical Officer of the Ministry of Health. The additions include two ward units and an isolation block. Each unit has two wards of 12 beds and two single wards, making a total of 26 beds. With the six wards in the isolation block the accommodation will thus be increased by a total of 58 beds. The one-storey buildings are arranged in V-shape to obtain the maximum of sunshine, and the central duty room is so placed that there is a clear view of every bed in the unit. The extension is part of a larger scheme, upon which work has already been begun.

CHARING CROSS HOSPITAL.—The annual report repeats the claim that this is the lowest in cost per bed of any London hospital. Its 4030 in-patients cost £12 2*s.* 7*d.* each for an average stay of 21 days, and there were 27,689 new out-patients who cost an average of 7*s.* 4*d.* each. There was a surplus of £3000 of income over expenditure, and there is no debt. The site and buildings of the Westminster Ophthalmic Hospital, which were bought for £70,000, will shortly be available, and of the £100,000 which will be the total cost of purchase and equipment, all but £11,000 had been obtained at the end of December last. Owing to the increase in the number of accident cases it will shortly be necessary to enlarge the casualty department. When this has been accomplished attention will be turned to the provision of a new nurses' home elsewhere, thus releasing the Chandos-street block for private paying patients.

Correspondence.

"Audi alteram partem."

RELATION OF THE TONSILS TO RHEUMATIC CONDITIONS.

To the Editor of THE LANCET.

SIR,—The remarks of Mr. Macleod Yearsley in your last issue appear to sum up the general consensus of opinion upon the rôle of the tonsils in acute rheumatism and allied conditions. I have had the opportunity of removing by enucleation large numbers of tonsils for these conditions, having excised all septic tonsils at three large hospitals wherever acute rheumatism, chronic rheumatism, cardiac disease, or chorea were discovered; also for septic eye conditions and tuberculosis more recently. I have, of course, strictly confined myself to unhealthy tonsils, the combination of secretion from the follicles and the circumfaucial infection-ring being my test of a septic tonsil. Septic teeth have been cleared in all cases. I can state very definitely that the perfect "T and A enucleation" does not prevent acute or chronic rheumatism or chorea, though the patient is all the better for the operation (overlooking one unfortunate stirring up of a septic endocarditis). This is especially so in the case of chorea, where many patients have lost their tonsils previously and elsewhere, or may be admitted with a recurrence.

My object in writing is to ask, Can we expect to affect acute rheumatism or chorea by removing the faucial and nasopharyngeal tonsils, whilst leaving behind the lingual tonsil—often visibly septic, and certainly a source of trouble in the upper respiratory tract? Have any of your readers experience of the inclusion of the lingual tonsil in the enucleation operation as a routine? Its complete enucleation is difficult and may give rise to secondary hæmorrhage in a situation difficult to deal with; but to leave it is to leave what in my opinion has been the cause of much infection.

I am, Sir, yours faithfully,
Manchester, Sept. 27th, 1929. WILLIAM WILSON.

To the Editor of THE LANCET.

SIR,—I am in complete agreement with Mr. Macleod Yearsley in his belief that the most frequent source of rheumatism, septic tonsils and septic teeth, lies in the toxæmia which results from chronic intestinal intoxication—so far, that is, as the chronic form of rheumatism is concerned. I do not know enough about the acute to discuss it. I also agree with Mr. Yearsley's opinion that apart from a certain general improvement that must necessarily accrue from the removal of a definitely septic focus, tonsillectomy has no influence upon the incidence or cause of any rheumatic condition, either acute or chronic. My belief that chronic rheumatism is merely a symptom of intestinal stasis or chronic autotoxæmia from the bowel is based on personal observations extending over a period of nearly 20 years. In chronic rheumatic states I have seen cases innumerable where tonsils have been expertly enucleated, and yet the rheumatism has persisted. I have also seen many mouths swept clean of all teeth with no real benefit to the rheumatism. I was therefore driven to the conclusion that there was another factor behind both septic teeth and unhealthy tonsils, and, as the result of treatment of the alimentary canal, I was further driven to the conclusion that here lay the source most likely producing the state existing in the teeth and in the tonsils, and certainly the source of the rheumatism.

I also found that practically every case of intestinal stasis (as proved clinically, by bacteriological examination of the fæces, and by a bismuth transit and a barium enema) was the possessor of unhealthy tonsils and in many cases of septic teeth. But as on having the teeth and the tonsils removed the rheumatism still remained in statu quo, an active onslaught on the bowel was made. The result of this was that the teeth (I do not refer to chronic *apical* dental sepsis) with ordinary hygienic care cleared up and the signs of tonsillar infection greatly receded. What was more surprising was that the rheumatism vanished, even in cases regarded as almost hopelessly chronic. Treated *from the source of infection* I know of no condition that will yield more satisfactorily to correct treatment; the results are often dramatic in the, apparently, most intractable of cases. But the treatment must be complete and thorough.

I am, Sir, yours faithfully,

A. GRAHAM-STEWART.

Ulster-place, N.W., Sept. 28th, 1929.

VITAL STAINING OF NEOPLASTIC TISSUES.

To the Editor of THE LANCET.

SIR,—In his most interesting paper in your issue of Sept. 21st (p. 603) Mr. Burrows suggests one therapeutic application of the phenomena he describes. I venture to suggest another, capable of experimental proof or disproof. With present operative procedures for neoplastic diseases the excisions have, for well-known reasons, to be very extensive and encroaching widely into normal tissues. If such neoplastic tissues are capable of differentiation by the various dyes, the dye could be injected prior to operation and the actual infiltration into normal tissues could be determined on operation and, in many cases, the field of removal be considerably reduced. Other applications would be in cases of severe burns and senile gangrene to determine definitely the line of demarcation.

In a paper by Mogilnitsky and Podljaschux, shortly to be published in *Die Fortschritte auf dem Gebiete der Röntgenstrahlen*, these investigators have found that trypan-blue is retained in the brains of dogs and rabbits which have been submitted to X rays. X rays (and doubtless γ rays) are, therefore, to be added to the list of irritants cited by Mr. Burrows, and any experiments he has made in this relationship would be of interest. The retention of dye after X ray treatment might confirm the view, held by many radiologists, that the beneficial results of such treatment is perhaps only due to reaction of tissues to irritation by the rays.

I am, Sir, yours faithfully,

BERNARD LEGGETT.

Romford-road, Forest Gate, Sept. 28th, 1929.

THE IMPORTANCE OF THE LIVER IN CHEMOTHERAPY.

To the Editor of THE LANCET.

SIR,—The article by Dr. L. Cunningham and Dr. M. M. Datnow in your last issue (p. 652) confirms, in the main, the work of our cancer research team on the effect of colloidal metals on the liver. There are some points, however, on which we are not in agreement. It is stated that lead selenide, amongst some other preparations, has little action on the liver of animals, but we observe in Table I. that the incidence of jaundice after lead selenide is about the same as after "S7." In our monograph on "Chemotherapeutic Researches on Cancer" published in July, 1928 (of which copies were sent to the Liverpool Medical Research Organisation at their request), the changes in the liver and other viscera are briefly noted; focal necrosis in the liver after lead selenide is recorded there. We have repeatedly found the same changes after the administration of active colloidal preparations of lead, thallium and thorium, differences are of degree only.

There is a risk that readers of this article might conclude that the hepatic factor could be ignored during treatment with colloidal lead selenide, "D4S." We find that we cannot afford to ignore the liver. For some hours before and after administration of "D4S" we give a very light carbohydrate diet. We find that fat digestion progressively deteriorates and that jaundice is readily provoked by a diet rich in fats; this jaundice readily yields to a fat-free diet. The evidence offered for the taking up of the colloid by the cells of the reticulo-endothelial system in the liver is inconclusive. We find that much lead is to be found in the liver in man and animals, much more than is to be found in the neoplasm, but we are not convinced that it is stored in the cells of the reticulo-endothelial system. Very similar granules to those figured are found after administration of many of the electro-negative colloids, even after non-metallic ones, such as the trypan blues. It is thought that these particles are often hæmosiderin derived from hæmolysis and the hæmorrhages which so frequently follow administration of these colloids. We and others have tried to prove that these particles are lead, but cannot obtain certainty.

I am, Sir, yours, faithfully,

A. T. TODD.

Bristol Royal Infirmary Cancer Research
Laboratories, Sept. 28th, 1929.

CONGENITAL ECTODERMAL DEFECT.

To the Editor of THE LANCET.

SIR,—In his article last week (p. 656) on congenital ectodermal defect, Prof. A. W. Falconer discusses the points of resemblance to "progeria." He refers to a case shown by Dr. Jean Smith (January, 1929) at the Royal Society of Medicine in which the diagnosis of progeria had been at first suggested. I venture to draw his attention to a case shown at the same Society in October, 1927, by Dr. C. F. Harris as one of progeria, which, however, was almost certainly not one of progeria but one of congenital ectodermal defect.[1] I am, Sir, yours faithfully,

London, W., Sept. 28th, 1929. F. PARKES WEBER.

VACCINATION AND ENCEPHALITIS.

To the Editor of THE LANCET.

SIR,—I was much interested to read in your issue of July 27th (p. 185) the report of two cases of encephalitis supposed to be the result of vaccination against small-pox. In my vast experience in India this complication is unheard of. We do get, not seldom, a general or localised eruption similar to vaccinia, but this the vaccinated child, if kept clean, gets over in a couple of weeks' time. May the encephalitis be not due to some condition present in the vaccinated person particularly if vaccinated at an age beyond that of infancy or childhood as happened in these two cases? Is it because we practise vaccination in infancy that such complications as encephalitis are totally absent in this country?

I am, Sir, yours faithfully,

A. F. WINNINGTON DA COSTA.

Sept. 9th, 1929. Civil Surgeon, Bilaspur, C.P. (India).

THE BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.

To the Editor of THE LANCET.

SIR,—In the issue of the *Times* of Sept. 27th, in which the composition of the Council of the British College of Obstetricians and Gynæcologists was set forth, my name was included in the list of Councillors. This was a mistake, and I should be obliged if you would publish this letter of correction.

I am, Sir, yours faithfully,

VICTOR BONNEY.

Devonshire-place, W., Sept. 28th, 1929.

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[1] Vide the discussion on the case, Proc. Roy. Soc. Med., Section for the Study of Disease in Children, 1927–28, xxi., 15.

MEDICAL SICKNESS, ACCIDENT AND LIFE ASSURANCE SOCIETY, LIMITED.

To the Editor of THE LANCET.

SIR,—The annual general meeting of this Society will be held on Monday afternoon next, Oct. 7th. Three important resolutions, of which due notice has been given, are to be moved at this meeting, but have been withheld from the agenda on the notice calling the meeting. The members of the Society have thus not been made fully aware of all the resolutions on which a vote will be taken. Nevertheless the Board, on finding that the proposer of a resolution, making an age-limit for directors, had received proxies supporting his resolution, have now issued official proxies in their own favour. Official proxies have to my knowledge never been sent out before. Last year when the re-election of a director was contested, the Board decided that it would not be justified in incurring the expense of sending out proxies. How can they justify themselves in doing so this year? I submit that it is not fair dealing for the Board to attempt to get votes from members without giving them full information.

I am, Sir, yours faithfully,
HARVEY HILLIARD.

Hyde Park Gardens, W., Oct. 1st, 1929.

A CASE OF SEVERE SNAKE-BITE IN THE WEST OF ENGLAND.

To the Editor of THE LANCET.

SIR,—A woman was lately walking down some cliffs near Plymouth when she was bitten by a snake on the dorsal aspect of her foot. She immediately had it sucked and a tight handkerchief was put round her ankle. In five minutes, however, a large swelling had developed and she could barely struggle down to a boat to be conveyed back to Plymouth. In a quarter of an hour from being bitten the foot and ankle were very much swollen and she experienced a "tight" feeling across the chest and difficulty in respiration. Her lips swelled up, she began to vomit, and in half an hour she was completely collapsed with a choking feeling in the throat, due to some œdema of the glottis. She was practically pulseless, cold, and sweating; she had incessant vomiting and diarrhœa; her face and lips were swollen enormously and the whole leg was enlarged with a slight vesicular eruption becoming visible. She was given injections of adrenalin (which relieved the throat condition), strychnine, and pituitrin and large quantities of brandy to drink, and was moved to a nursing-home, where the wound was incised and a clot turned out. It was then evident that the wound had directly involved a small vein. Potassium permanganate was rubbed in locally and stimulant injections were continued until her pulse gradually returned six hours later. Within the next two days she rapidly improved; her pulse became normal and no rise in temperature was charted. The leg, however, continued to swell with pitting œdema, and femoral thrombosis was suspected. After four days the swelling suddenly gave way to blotchy discoloration, obviously due to extravasation of blood into the tissues. After this recovery was uneventful.

Does the English adder venom commonly cause any thrombosis directly, or does it produce endothelial damage leading to extravasation into the tissues?

I am, Sir, yours faithfully,
Sept. 29th, 1929. D. W. B.

HOSPITAL FOR TROPICAL DISEASES.—The space liberated in the premises in Endsleigh-gardens by the removal of the London School of Hygiene and Tropical Medicine, which shared them with the Hospital for Tropical Diseases, is being utilised for the enlargement of the hospital. New wards, a pathological laboratory, and a clinical lecture theatre are being provided. In addition to treating tropical diseases, the hospital teaches medical men who intend to practise in the tropics and the students of the School of Tropical Medicine.

Medical News.

UNIVERSITY OF LEEDS.—At recent examinations the following candidates were successful:—

M.D.

R. Chester, M. S. Scott, and A. Sourasky.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—F. B. T. T. Drake, W. R. Everatt, G. Hirst, J. Rabinovitch, and M. I. Silverton.

Part II.—W. H. Craven, H. Denton, C. H. Foster, W. L. Hardman, J. N. Mill, L. Hoyle, C. Ponledel, S. Rosenberg, L. Seaton, W. E. Smart, E. J. Wayne, and J. W. Whitworth.

Part III.—*E. J. Wayne, †C. H. Foster, †W. L. Hardman, T. G. Clarke, H. Denton, S. K. Foster, W. Greaves, L. Hoyle, H. T. Knowles, C. Ponledel, Margaret F. Robertson, Mary G. Shawe, and J. W. Whitworth.

* First-class honours.
† Second-class honours.

D.P.H.

Kathleen M. Peacock and Edith A. Whitney.

D.P.M.

C. L. Copeland, W. Fraser, D. T. Gemmell, and J. J. O'Riordan.

FINAL EXAMINATION FOR L.D.S.

Part II.—J. Dobkin, J. W. B. Hargreaves, and Margaret E. M. Hey.

The William Hey Medal for the most distinguished medical graduate of the year has been awarded to Mr. Edward Johnson Wayne. Mr. Wayne has also been awarded the West Riding Panel Practitioners' Prize for proficiency in Medicine.

UNIVERSITY OF LONDON: *Forthcoming Lectures.*—Fixtures for the coming session include five lectures on Blood Plasma and Platelets, by Mr. J. W. Pickering, D.Sc., at King's College, at 5 P.M., on Tuesdays, from Oct. 8th to Nov. 5th; four lectures on the Physiology of the Fœtus, by Dr. A. St. G. Huggett, at St. Thomas's Hospital Medical School, at 5 P.M., on Tuesdays, from Oct. 8th to 29th; four on Secretion of the Digestive Juices, by Dr. R. J. Brocklehurst, at University College, at 5 P.M., on Mondays, from Oct. 14th to Nov. 4th; three on (1) Seasonal Variations of Epidemic Diseases, (2) Milk Epidemics, and (3) Diphtheria Toxin and Antitoxin, by Prof. Thorvald Madsen, of Copenhagen, at the London School of Hygiene and Tropical Medicine, at 6 P.M., on Oct. 14th, 16th, and 18th; four on the Metabolism of the Carbohydrates and Fats, by Mr. J. A. Hewitt, D.Sc., at King's College, at 5 P.M., on Thursdays, from Oct. 17th to Nov. 7th; and six on Human Nutrition, by Prof. V. H. Mottram, at King's College for Household and Social Science, at 5 P.M., on Fridays, from Oct. 18th to Nov. 22nd. Admission to these lectures is free, without ticket.

University of London: University College.—A farewell dinner to Sir Gregory Foster, who retires from the position of Provost of the College on Dec. 31st, will be given by past and present students on Friday, Dec. 20th, at a place in London to be determined later. Those who wish to attend are asked to inform Mr. B. N. Parker, hon. secretary, Old Students' Association, at the College, without delay, adding particulars of their Faculty and dates of student years at the College.

Mr. F. E. Smith, D.Sc., F.R.S., Director of Scientific Research at the Admiralty, has been appointed Secretary to the Committee of the Privy Council for Scientific and Industrial Research, on the resignation of Mr. H. T. Tizard, F.R.S.

CLINICAL LECTURES AT MAUDSLEY HOSPITAL.—A course of clinical lectures will be given at the Maudsley Hospital, Denmark Hill, London, S.E., from Oct. 28th, at 2.30 P.M. daily, except Saturdays. The lecturers will be on Mondays, Dr. A. J. Lewis, on Mental Symptoms and their Genesis; on Tuesdays, Dr. T. Tennent, on Nervous Disorders in Children; on Wednesdays, Dr. Edward Mapother, on Neurotic and Psychotic Syndromes; on Thursdays, Dr. J. S. Harris, on Relations of Mental Disorder to Physical Conditions; and on Fridays, Dr. F. L. Golla, Captain S. A. Mann, and Mr. C. Geary, on the Pathology of Mental Disorders, Laboratory Methods and their Place in Diagnosis, and the Pathology of the Nervous System, respectively. In addition, a discussion on cases in the hospital is held in the wards every Monday, Tuesday, and Thursday at noon, all these lectures and discussions being open to medical practitioners without fee. A course for the Diploma in Psychological Medicine will begin in January. Inquiries should be addressed to the Director of the Central Pathological Laboratory at the hospital.

Royal Dental Hospital of London: *School of Dental Surgery.*—Dr. Boyd S. Gardner, of the Mayo Clinic, Rochester, U.S.A., will give a lecture at this School in Leicester-square on Monday, Nov. 4th, at 6 P.M. His subject will be "the relationship between medicine and dentistry, emphasising the routine use of the X ray from both a pre- and post-operative standpoint; the necessity of an improved extracting technique, and the significance of laboratory investigation."

Mr. Arthur Greenwood, Minister of Health, has appointed Mr. S. F. S. Hearder to be his assistant private secretary. Miss Susan Lawrence, Parliamentary Secretary to the Ministry of Health, has appointed Mr. G. C. North to be her private secretary; and Mr. E. R. Forber, Deputy Secretary to the Ministry, has appointed Mr. E. C. H. Salmon to be his private secretary.

Royal Albert Institution Extension.—The foundation-stone of a new building to be called the Welch Memorial Home was laid on Sept. 27th by Lord Richard Cavendish, Chairman of the Central Committee. This new addition to the Royal Albert Institution at Preston will cost about £10,000, and will provide accommodation for about 50 senior boys, together with the staff. It will commemorate the late Mr. William Gibbins Welch, of Hampson, Lancaster, who was associated for half a century with the management of the institution.

London Medical Exhibition.—The exhibition will be held this year at the new hall of the Royal Horticultural Society, Greycoat-street, Westminster, London, S.W., during the week beginning on Oct. 14th. It will be open daily from Monday to Friday inclusive from 12 noon till 6.30 P.M. The exhibition has now been an annual fixture for a quarter of a century, but the organisers, who managed the exhibitions of the Seventeenth International Congress of Medicine, 1913, and the Fifth Clinical Congress of Surgeons, 1914, anticipate that this year's show of drugs and surgical appliances will be the largest yet held. One attraction will certainly be the size and convenience of the new hall in which it is to be held, for all exhibits will be on one level and well lighted. Admission will be confined to doctors, for whose recreation tea and orchestral music will be provided in a spacious reception room overlooking the hall. Practitioners who have not received invitation cards can obtain them on application to the Secretary, the London Medical Exhibition, 194–200, Bishopsgate, London, E.C. 2, or at the hall during the exhibition week.

Donations and Bequests.—Mr. Keith R. Maitland, W.S., of Edinburgh, left, subject to a life-rent, £2000 each to the Royal Infirmary, Edinburgh, and Royal Edinburgh Hospital for Sick Children; £1000 each to the Convalescent House, Murrayfield; Royal Edinburgh Hospital for Incurables; Royal Blind Asylum and School, Edinburgh; Governesses' Benevolent Society of Scotland; Society for Relief of Indigent Gentlewomen of Scotland; and Queen Victoria's Jubilee Institute for Nurses (Scottish branch).—Mr. John Thomas Chadwick, of Beech-road, Stockport, left, on the death of his sisters, £3000 to Stockport Infirmary and £1000 each to Stockport Working Lads' Association, Stockport Sick Poor and Private Nursing Association, Stockport Institute for the Blind, Deaf, and Dumb, and St. Dunstan's Hostel for the Blind. The ultimate residue in trust for British spa treatment of poor persons, natives, or residents of Stockport, suffering from arthritis, sciatica, rheumatism, neuritis, or gout.—Mr. Thomas Morgan, of the Woodlands, Treforest, Glamorgan, besides other bequests, left £1000 each to Pontypridd Cottage Hospital and to King Edward VII. Hospital, Cardiff.—Miss Margaret Cummings Innes, of St. Swithin's-street, Aberdeen, left £2000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers; £1000 each to the Aberdeen Royal Infirmary, the Aberdeen Royal Hospital for Sick Children, and the Morningfield Hospital, Aberdeen, with some further residual interest.—Mr. Henry Bacon Atkinson, of Adelaide Mansions, Hove, and Knyveton-road, Bournemouth, left £600 to the Sussex County Hospital, and £100 each to the Sheffield General Infirmary, the Sheffield Institute for the Blind, and the Sheffield Royal Hospital and Dispensary.—Mr. James Fleming Fyfe-Jamieson, of Ruthven, Perthshire, left a legacy of £1500 to endow a bed, called the Fyfe-Jamieson bed, in Viewpark Nursing Home, and £5000 to charity.—Mrs. Anna Nockold, of Goffs Oak Villa, Cheshunt, Herts, left over £13,000 to various institutions, including £2000 to Dr. Barnardo's Homes, and £2500 each to the London Temperance Hospital and the Blinded Sailors and Soldiers After-Care Organisation (St. Dunstan's, Regent's Park).—Bequests of over £31,000 were left to charities by the late Mr. Alexander Fowler Roberts, of Fairnilee, Galashiels, manufacturer, including £5000 to the Edinburgh Royal Infirmary and £2000 to the Longmore Hospital, Edinburgh.

The Minister of Health has appointed a Departmental Committee "to inquire into the administration of the laws relating to the relief of the casual poor and to make recommendations having special regard to the assistance of persons genuinely seeking work and to persons suffering from physical or mental disability." The members of the committee are: the Rev. L. R. Phelps (chairman), Mr. J. A. Dale, Mr. Douglas Hacking, M.P., Sir Arthur Lowry, Dr. A. C. Parsons, Mr. A. Paterson, Mr. A. Shepherd, Mrs. Wintringham, J.P., with Mr. L. N. Ure, of the Ministry of Health, as secretary.

Royal Medical Benevolent Fund.—A service in aid of this fund will be held at Liverpool Cathedral at 8 P.M. on Oct. 13th. The Rt. Rev. E. C. Pearce, Bishop of Derby, will preach the sermon, and the Lord and Lady Mayoress will attend. Doctors and their friends are invited to this service. Tickets may be obtained from the local hon. secretary, 28, Rodney-street, Liverpool.

At the two recent meetings of the committee £855 was voted in grants to 64 applicants, and £537 was voted in annuities to 20 beneficiaries over 60 years of age. The following were some of the cases helped with annuities:—

M.R.C.S., aged 79, who owing to deafness and age is unable to follow his profession. His wife's savings have been exhausted by the claims made upon him by his family, and his only income is £52 a year contributed by two nephews. Voted annuity of £70.

L.R.C.P. & S., aged 79, whose savings have all been exhausted. She is the inmate of a home where she has to pay rent of £19 10s. Her only income is the Old Age Pension £26. Voted annuity of £36.

Widow of F.F.P.S., aged 75, who lives with her married daughter whose husband is a Post-office sorter. The widow pays £32 10s. a year to her daughter for board and lodging and her income is Old Age Pension £26. Voted annuity of £36.

Widow of M.B., aged 68, whose daughter is earning 30s. a week and who contributes £52 a year to her mother being her only income. Voted annuity of £26.

Widow of M.R.C.S., aged 74, unable to work owing to her age and has only the Old Age Pension. Voted annuity of £26.

Daughter of M.R.C.S. aged 69. Has an income from investments of £34 a year. Voted an annuity of £35.

Subscriptions and donations should be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

Liverpool School of Tropical Medicine.—The Mary Kingsley Medal, which is conferred in recognition of distinguished scientific achievement, has been awarded to Dr. G. Carmichael Low, Senior Physician to the Hospital for Tropical Diseases, London; Dr. Guy A. K. Marshall, Director of the Imperial Bureau of Entomology; Emeritus Prof. Robert Newstead, F.R.S., formerly Dutton Memorial Professor of Entomology in the Liverpool School of Tropical Medicine; Dr. A. T. Stanton, Chief Medical Adviser to the Secretary of State for the Colonies; Emeritus Prof. J. W. W. Stephens, F.R.S., formerly Professor of Tropical Medicine in the Liverpool School of Tropical Medicine; and Dr. C. M. Wenyon, Director-in-Chief of the Wellcome Bureau of Scientific Research. The medals will be presented by the chairman of the School, Sir Frederick Bowring, at a banquet in Liverpool on Friday, Oct. 11th.

St. Bartholomew's Hospital Dinner.—The annual dinner of Old Students was held in the Great Hall of the Hospital on the evening of Oct. 1st, with Sir Frederick Andrewes in the chair, the size of the gathering being favourably influenced by the post-graduate course on radium which is in progress at the school. To many of those who attended the Hall itself was almost a novelty, for not only had electric light been installed, but the floor had been relaid and the ceiling redecorated as part of the work of general reconstruction which is going on throughout the hospital precincts. The dinner itself, which was largely attended, was of the usual domestic character, but the absence of a toast list did not prevent the treasurer, Lord Stanmore, from proposing "The Chairman," a toast which was drunk with musical honours. In reviewing the main events of the year Sir Frederick alluded with regret to the unusual number of deaths of seniors, including Church, Duckworth, Cumberbatch, Bowlby, and Harding. He then turned to the attraction of the moment, the new surgical block nearing completion and to be opened early next year. It was, he said, the last word in surgical luxury, alike for surgeon, dresser, nurse, and patient. Every surgeon had a self-contained floor, his own theatre, and his own private room, and last but not least, gas and oxygen was laid on from the basement to every operating table. Only about one-half of the sum of £200,000 spent on this block was yet in sight, but the Hospital had done well so far during its period of reconstruction which began nearly 30 years ago with the new buildings for out-patients, pathology, and nurses; for of the total £350,000 all but about £58,000 had been paid off in spite of the unfortunate reputation of being wealthy. An appeal would shortly be made jointly for the Hospital and College, the latter being now a corporate body capable of holding funds, although as yet wholly unendowed. He would like to see it able to pay adequate salaries and to subsidise research. As he sat down Sir Frederick's eye chanced on the panel which records the first gift made towards the building of the first wing of the present hospital in 1720, the donor being Sir Richard Brocas, Knight and Alderman, just two centuries ago. Besides the treasurer and the administrative staff of the hospital there were present as guests Sir Humphry Rolleston, Air Vice Marshal D. Munro, the Masters of six City companies, and Mr. T. A. Lodge, the architect of the new surgical block.

WESTMINSTER HOSPITAL DINNER.—On Oct. 1st about 130 past and present students dined together at Grosvenor House, Park-lane, under the genial chairmanship of Mr. Stanley Dodd, who was supported by Sir James Purves-Stewart, Dr. F. N. Kay Menzies, Dr. A. S. Woodwark, Dr. F. F. Bond, Dr. Florence Barrie Lambert, Mr. de Salis (chairman of Springfield Mental Hospital), and Mr. A. E. W. Marshall. Mr. Marshall proposed the toast of the Medical School, of which he is chairman. He praised the energy of their dean, Dr. Woodwark, in organising post-graduate courses which were widely appreciated, especially those on radium. Dr. Woodwark, in response, said the hospital was now starting on its 210th year and the school on its 96th, and that last year it had its record number of students. A great event during the year was the acquisition, mainly through the kindness of Mr. Woolf Barry, Colonel Bulkeley, and Dr. Reginald Worth (medical superintendent of Springfield Mental Hospital) of a fine sports pavilion which could be reached from the hospital in half an hour. The school was looking to the future with every confidence in its capacity to provide an excellent medical training combined with every facility for athletics. The chairman submitted the toast of Past and Present Students, recalling the days when students had not the amenities enjoyed by the present generation. He ended with wise and breezy advice to those who were now beginning their careers. Dr. F. F. Bond and Mr. A. S. Daniel, the hon. secretary of the Students' Club, replied to this toast. The latter voiced the gratitude of the students to those who had combined to provide them with a sports ground and pavilion. Mr. de Salis expressed the pleasure felt by the Springfield Mental Hospital Committee in helping to supply proper facilities for the students' recreation. Sir James Purves-Stewart proposed the Guests, making mention of the work of Dr. Barrie Lambert as chairman of that committee of the L.C.C. of which Dr. Menzies was executive officer, and of the activities of Mr. K. W. Barry, as chairman of the House Committee, and of Mr. de Salis in connexion with the mental hospital with which the school was associated. Dr. Menzies replied. Mr. Rock Carling proposed the Chairman, whose response ended the formal part of a happy evening.

MIDDLESEX HOSPITAL DINNER.—At the annual dinner held at the Savoy Hotel on Oct. 1st the chairman, Mr. A. E. Webb-Johnson, said that within a few weeks patients would be transferred to the new west wing. The two wards in the new surgical wing were to bear the names of Sir Charles Bell, founder of the Medical School, and Sir John Bland-Sutton. When the present work was complete the hospital would have, among other things, a new nurses' home, residents' house, power-house, pay-block, and institute of biochemistry, whilst the chapel would be enlarged. Nothing now remained but to pull down the right wing and start again; £300,000 would see the job through, and anyone who was at present feeling scared about financial speculation could not do better than choose a good safe investment such as the Middlesex Hospital. The sum of £300,000 given anonymously for the nurses' home was, he thought, one of the greatest if not the greatest gift ever received by a hospital from an individual during his lifetime. Retired nurses were getting the benefit of Dr. Essex Wynter's cottages, 11 of which were now occupied. After offering a cordial welcome to the new matron, Mr. Webb-Johnson referred to the death of Dr. F. J. Wethered, and spoke of the help which the hospital had had from the late Mr. Bernhard Baron. The retirement of Mr. Walter Kewley, the tried and trusted secretary of the hospital, had been a source of great regret, but it was to be hoped that his successor, Mr. S. R. C. Plimsoll, as the son of his father, would keep the hospital well above the safety line. Turning to the Medical School the chairman recalled that during the King's illness the scientific investigations had been done by Middlesex men, and congratulated Dr. L. E. H. Whitby and Prof. E. C. Dodds on their honours. Perhaps, however, the man most entitled to pride in these successes of his students was Prof. McIntosh. During the year the hospital had won two inter-hospital cups, for soccer and sailing. Mr. Eric Pearce Gould had retired from the post of Dean, which he had held with so much distinction to himself and so much benefit to others. His achievements had been many, but fate was ironical and he would probably go down to history as the man who got a drink licence for the School. Mr. Webb-Johnson concluded by wishing every success to the new dean, Dr. T. Izod Bennett. In proposing the toast of the hospital he expressed his admiration for Prince Arthur of Connaught for accepting the chairmanship when he knew what difficult problems had to be faced. In reply to the toast Prince Arthur said there was every reason for optimism. The general public, however, was apt to look on hospitals as rather frightening and repellent, and he wished they could be taught to change this view, and regard them not only as part of the national life, but as something friendly and welcoming. Responding for the Medical School, Dr. Izod Bennett made some amusing observations on the repressed romanticism of neurological surgeons, and Mr. J. N. O'Reilly produced witticisms which in themselves justified his selection as one-third of the Broderip scholar. Mr. Pearce Gould, proposing the toast of the Guests, pointed out that the guests of hospitals usually came in for rather peculiar hospitality. If he had taken a complete history of all the guests at this dinner what a tale he could unfold! Viscount Lee of Fareham, in his reply, said that the profusion of doctors present reminded him of the remark of a poor old woman from London who saw the sea for the first time and said: "My, but it's good to see enough of anything for once." He complained of the dog Latin affected only (he thought) by doctors and gardeners, and mentioned that his popularity seemed to have increased in hospital circles since it became known that, as chairman of the Radium Commission, he possessed a four-gramme bomb of radium. Lieut.-General H. B. Fawcus, Director-General of the Army Medical Services, spoke of the need for coöperation between civilian and military medicine in time of peace. Sir Arnold Lawson proposed the health of the chairman, whom he compared to Moses in his capacity for striking things out of rocks—not, however, by force, but by kind words and winning smiles. This toast was drunk with musical honours, and when Mr. Webb-Johnson replied he did not hesitate to tell Lord Lee that the four-gramme bomb could be safely entrusted to the Middlesex Hospital.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 8th.—5 P.M., THERAPEUTICS. Dr. Philip Hamill: Some Principles of Therapeutics (Presidential address).

THURSDAY.—8.30 P.M., NEUROLOGY. Dr. Gordon Holmes: Dissociation of the Ocular Movements (Presidential address).

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 5 P.M.) Dr. H. V. Morlock: Case of Pseudo-leukæmia. Mr. Cecil P. G. Wakeley: (1) Case of Congenital Shortening of the Femur. (2) Two Cases of Kohler's Disease. (3) Tuberculous Knee in a Boy of Ten. Dr. Gerald Slot: (1) Case of Actinomycosis. (2) Spinal Tumour. Mr. H. C. Edwards: Nævus of the Tongue. Dr. Dorothy Hare: Subacute Multiple Arthritis with Fibrous Nodules. Other cases will be shown. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Papers: Mr. E. E. Maddox: Demonstration of the Cheiroscope. Miss Rosa Ford: Some Ocular Complication of Nasal Sepsis. Cases and Specimens: Mr. Foster Moore: Case of Blue Sclerotics. Mr. J. Cole Marshall: Cystic Adenoma of the Conjunctiva. Mr. Humphrey Neame: Case of Gunshot Wound of Eyeball with Pellet Remaining in the Vitreous. Other cases will be shown.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, Oct. 8th.—4 P.M. (In the Great Hall of the British Medical Association House, Tavistock-square, London, W.C.). Sir Josiah Stamp: Alcohol as an Economic Factor. (Norman Kerr Memorial Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 7th, to SATURDAY, Oct. 12th.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Tues., 2.30 P.M., Dr. Browning Alexander (Ward Round). Thurs., 2 P.M., Mr. H. W. Carson (O.P. Demonstration. No fee).—NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W. Intensive Course for two weeks. Limited to an entry of 20.—LONDON SCHOOL OF

HYGIENE AND TROPICAL MEDICINE, Endsleigh-gardens, W.C. Tues. and Thurs., at 2 P.M., lecture-demonstrations by Dr. Carmichael Low and Dr. Manson-Bahr. Further particulars from the Fellowship of Medicine.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS: Annual Conference at Newcastle-on-Tyne.

THURSDAY, Oct. 10th.—10.30 A.M. to 12.30 P.M., Mr. H. A. Mess, Ph.D.: Tuberculosis on Tyneside—A Sociological Survey. 2.30 P.M., Dr. Edouard Rist (Paris), Dr. A. F. Bernard Shaw, Dr. C. G. R. Goodwin, and Sir Thomas Oliver: The Factors that Produce Adult Pulmonary Tuberculosis.

FRIDAY.—10.30 A.M., Scheme of National Propaganda regarding Tuberculosis; Combined Treatment and Technical Education of Tuberculous Youths. 2.30 P.M., Sec. I.: *Teaching of Tuberculosis to Under-graduates*; Training of Tuberculosis Medical Officers. Sec. II.: Methods of Local Propaganda regarding Tuberculosis; Dentistry in relation to Tuberculosis.

SATURDAY.—9.30 A.M., Visits to Hospitals.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Oct. 7th.—2.30 to 5 P.M.: Medical, Surgical and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Oct. 7th.—12 noon., Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Adie: Disseminated Sclerosis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Occupational Neuroses.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Some Heredo-familial Diseases.

FRIDAY.—12 noon., Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods (in Exercise Room).

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Oct. 7th.—1.30 P.M.: Examination of the Mouth and Pharynx.

WEDNESDAY.—1.30 P.M.: Examination of the Larynx.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Oct. 9th.—4.30 P.M., Dr. D. Thomson: Common *Infections of the Genito-urinary Tract.*

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Oct. 8th.—5 P.M., Dr. W. N. Goldsmith: Anatomy and Physiology of the Skin.

THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Morphology and Histopathology of Elementary Lesions.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Oct. 9th.—3.30 P.M., Dr. J. F. Halls Dally: High Blood Pressure—What it is and How to Avoid it.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Oct. 8th.—4.15 P.M., Mr. H. H. Rayner: The Position of Surgery in the Treatment of Gastro-duodenal Ulceration.

FRIDAY.—4.15 P.M., Mr. C. W. W. Surridge: The Relation of the Medical Profession with Coroners.

Appointments.

KEELE, C. A., M.B., B.S., has been appointed Resident Medical Officer, Freemasons Hospital and Nursing Home, Fulham-road, S.W.

SHARPE, J., M.B., Ch.B. Glasg., D.P.H., Medical Officer to Lanarkshire Joint V.D. Committee.

Certifying Surgeons under the Factory and Workshop Acts: PLATT, A. H., L.R.C.P. Lond., M.R.C.S. (Acton and Ealing); and MARREN, J. P., M.B., Ch.B. R.U.I. (Clwt-y-bont Carnarvon).

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Mental Hospital.—Jun. Asst. P. £250.

Bangor, Carnarvonshire and Anglesey Infirmary.—H.S. £200.

Bath, Royal United Hospital.—H.P. At rate of £120.

Bermondsey Parish Hospital, Lower-road, Rotherhithe, S.E.—Res. Asst. M.O. At rate of £100.

Birkenhead General Hospital.—Cas. S. £100.

Birmingham, Dudley Road Hospital.—Jun. Asst. M.O. At rate £200.

Birmingham, Selly Oak Hospital.—Res. Physician. £400–£600. Also Cas. O. at rate of £200.

Birmingham and Midland Ear and Throat Hospital.—Asst. Surg. O. £300.

Birmingham, Queen's Hospital.—Med. Registrar. £200.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.

Bootle Borough Hospital, Derby-road.—Jun. M.O. £125.

Bootle County Borough of—Asst. School M.O. and Asst. M.O.H. £600.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £120.

Bury Infirmary, Lancs.—Sen. H.S. £250.

Carlisle, Cumberland Infirmary.—H.P. At rate of £155.

Carlisle, Cumberland, and Westmorland Mental Hospital, Garlands.—Jun. Asst. M.O. £350.

Carmarthen Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.

Cardiff City Mental Hospital, Whitchurch. — Post-Graduate Research Studentship. £100

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. Chief Clin. Assts.

Darlington County Borough —Deputy M.O.H. £750.

Doncaster Royal Infirmary.—Third H.S. At rate of £150.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—Aural H.S. and Cas. O. At rate of £120. Also Hon. Physician.

Folkestone, Royal Victoria Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £100 respectively.

Gloucester, Gloucestershire Royal Infirmary, &c.—Hon. S. to Ear, Nose and Throat Dept.

Great Yarmouth General Hospital.—Sen. H.S. £150. Also Jun. H.S. £100.

Halifax Royal Infirmary.—Third H.S. At rate of £100.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Highgate Hospital, Dartmouth-park Hill, N.—Third Asst. M.O. £350.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. At rate of £50.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Hull Royal Infirmary.—Third H.S. Also Asst. H.P. At rate of £150 and £130 respectively.

Inverness Northern Infirmary.—Hon. Radiologist.

Islington Dispensary, 303, Upper-street, N.—Res. M.O. £400.

Larbert, Stirling District Mental Hospital.—Third Asst. M.O. £250.

Leicester Royal Infirmary.—Hon. Asst. Ophthal. S.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Maidstone, West Kent General Hospital.—H.S. At rate of £220.

Manchester Royal Infirmary.—H.S. for Special Depts. At rate of £50.

Manchester, St. Mary's Hospital—Four H.S.'s. Each at rate of £50.

Manchester, Salford Royal Hospital.—Cas. H.S. At rate of £125.

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £200.

Margaret-street Hospital for Consumption, 26, Margaret-street, W.—Hon. Asst. Physician.

Metropolitan Ear, Nose, and Throat Hospital.—H.S. £150.

Metropolitan Hospital, Kingsland-road, E.—H.P.'s, H.S's, &c. Each at rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Out-patient Officer. At rate of £150.

Newcastle-upon-Tyne Eye Hospital.—Hon. Res. H.S. £200.

North Middlesex Hospital, Edmonton, N.—Second Asst. S. £500.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham City Mental Hospital.—Jun. Asst. M.O. £350 to £400.

Nottingham General Dispensary.—Res. Surg. £250.

Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150. Also Anæsthetist, £75.

Rotherham Hospital.—H.P. £150.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. Asst. Surg. Also Surg. Registrars. Each £105.

Royal Naval Dental Service.—Dental Officers.

Salford Royal Hospital.—H.S. £125. Cas. H.S. £125.

St. Andrew's Hospital, Dollis Hill, N.W.—Sen. and Jun. Res. M.O.'s.

St. John's Hospital, Lewisham, S.E.—Res. Cas. O. and Res. H.P. Each at rate of £100.

St. Peter's Hospital for Stone, Henrietta-street, W.C.—Radiologist. £25.

Saint Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. At rate of £75.

Salisbury General Infirmary.—Res. M.O. £150.

Sheffield, South Yorkshire Mental Hospital.—M.O. £400.

Southampton, Royal South Hants and Southampton Hospital.—Cas O. At rate of £120.

Stafford County Mental Hospital.—Second Asst. M.O. £600.
Sudan Medical Service.—M.O. £E720.
Sydney University, N.S.W.—Bosch Chair of Bacteriology. £1500.
Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.
West London Hospital, Hammersmith, W.—Hon. Registrar for Throat, Nose, and Ear Dept. House Officer for Children's Dept. At rate of £150. Asst. M.O. At rate of £450. Also three Jun. Asst. M.O's. Each at rate of £350.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non-Res. H.S's. At rate of £150 and £100 respectively.
Weston-super-Mare General Hospital.—Res. H.S. £130.
Westminster Hospital, Broad Sanctuary.—Wander Scholarship, &c. £250.
Willesden General Hospital, N.W.—Res. H.S. At rate of £100. Also Physician.
Winchester, Royal Hampshire County Hospital.—Res. H.S. At rate of £150.
Woolwich and District War Memorial Hospital, Shooter's Hill, S.E. Res. M.O. £175. Also H.S. At rate of £125.
Worcester General Infirmary.—Jun. Res. M.O. At rate of £120.

Births, Marriages, and Deaths.

BIRTHS.

LANSDOWN.—On Sept. 30th, at Woodcote Grove-road, Coulsdon, the wife of R. B. P. Lansdown, M.B., B.Ch., of a daughter.

MACKENNA.—On Sept. 25th, the wife of Dr. R. M. B. MacKenna, Liverpool, of a daughter.

MCLAGGAN.—On Sept. 29th, to Elsa V. McLaggan, M.B., B.S. (née Adams), wife of J. D. McLaggan, F.R.C.S., of 15, Wimpole-street, W.1—a son.

MARRIAGES.

DOWELL—DOMMEN.—On Sept. 17th, at St. Werburgh's, Derby, Dr. W. H. Dowell, of Castle Donington, to Henriette (Babs) Dommen, of Swiss Cottage, Tutbury.

HUDDY—JUMP.—On Sept. 21st, at the Parish Church, Wimbledon. E. C. Huddy, M.B., B.S. Lond., of New Milton, Hants, to Mary, only daughter of Mr. and Mrs. E. Jump, of Cambridge-road, Wimbledon.

SMITH—HOOGEWERF.—On Sept. 28th, at St. Mary's Church, Egerton-gardens, N.W., Kenneth Shirley Smith, M.D., M.R.C.P., to Alice Wilhelmina, elder daughter of Mr. and Mrs. Edmund Hoogewerf, late of Industries Department, Bengal.

DEATHS.

BOND.—On Sept. 24th, at a nursing home, Eastbourne, Charles Knox Bond, M.D.

FRASER.—On Sept. 26th, Dr. Mathew William Fraser, Rimpton, Somerset, and late of the West African Medical Service.

GLYNN.—On Sept. 22nd, Ernest Edward Glynn, M.D., F.R.C.P., late Professor of Pathology, University of Liverpool, aged 56.

MITCHELL.—On Sept. 27th, at Aberdeen, Peter Mitchell, M.D., C.M., aged 65 years.

SMYTH.—On Sept. 23rd, at St. Ives, Cornwall, William Ardagh Smyth, L.R.C.P., L.R.C.S. Edin.

N.B.—A fee of 7s. 6d is charged for the insertion of Notices of Births, Marriages, and Deaths.

PRINCE OF WALES'S GENERAL HOSPITAL.—This institution at Tottenham is the only large London general hospital which serves a population of three-quarters of a million in the industrial district of north-east London. There are 200 beds, and the report for last year shows that 2796 patients were dealt with, and that their cost, for an average stay of 22 days, was £10 17*s.* 7*d.* New out-patients numbered 28,780 and cost 8*s.* 3*d.* each. The antiquated out-patient department urgently needs to be rebuilt, which would cost £35,000, of which only one-seventh is yet in hand.

BIRMINGHAM CRIPPLES HOSPITAL.—The annual report describes the additions that are being made to the Woodlands Hospital which are to be opened by the Duke and Duchess of York at the beginning of November. There is a new children's ward divided into two sections, one for boys and the other for girls, with 30 beds in each; adult male and female wards each have 20 beds. A nurses' home will accommodate 41 probationers and 8 sisters, and new theatre and massage departments have been provided. In 24 years the Workmen's Auxiliary Committee has given £28,000 to the hospital.

Notes, Comments, and Abstracts.

OBSERVATIONS IN ICELAND.

HISTORY AND HEALTH.

(FROM A SPECIAL CORRESPONDENT.)

IN the summer of 1929 I visited Iceland with a view to getting into touch with the members of the Icelandic Red Cross, studying its work, and ascertaining if there were any ways in which the League of Red Cross Societies, of which the Icelandic Red Cross Society became a member in 1924, could be of service to it. Before undertaking this study visit, I called on Dr. Gregg, of the Rockefeller Foundation in Paris, as he had recently visited Iceland on behalf of the Foundation. The information he most generously put at my disposal provided me with a very useful bird's-eye view of the whole situation, and I started on my journey not only infected with some of his enthusiasm for what he called "a beautiful little rock garden" in the Atlantic, but also grounded in some of the elements of the public health problems of Iceland.

To those who may feel tempted to visit Iceland (and I recommend it as a most curiously fascinating country, calculated to titillate the palate of the most jaded globe-trotter) I would mention the very comfortable route I followed—a special boat-train from King's Cross to Newcastle, a boat that takes only 24 hours to Bergen, and the *Lyra*, which leaves Bergen every other Thursday, and reaches Reykjavik early the following Tuesday, after having touched at the Faroe Islands. The Bergenske Dampskibsselskab, on whose boats I travelled, charge 210 kroner for this journey from Newcastle to Reykjavik, board being included in this first-class ticket. The exchange value of the Norwegian krone is about 18 to the pound sterling.

The visitor to Iceland who intends to do something more than play bridge on board ship and take snapshots of his fellow travellers and other bizarre objects, would do well to study the outlines of its history. It was the last of all the European countries to be colonised, the first colonists settling in A.D. 874. The settlers were chiefly Norwegians, many of them being of noble birth and of too independent a spirit to submit to the rule of Harald Haarfagre, King of Norway. In his interesting anthropological study of Iceland, Prof. Gudmund Hannesson has drawn attention to the influence this process of selection has had on the physique of the Icelander of to-day. He has found that the modern Icelander is taller than his contemporaries in the parent Scandinavian countries, and he assumes that the first settlers were as a class tall men, as well as being chieftains of noble blood. Most of the present-day Icelanders can trace their descent uninterruptedly from one or other of these chieftains, and it is this fact which largely explains the spirit of chivalry and old-world courtesy which permeates all classes. The modern Icelander is something of the *grand seigneur* whose instinctive, but unwritten motto is: *noblesse oblige.* The visitor would do well to remember that the hospitality he receives on some lone farm is not that of some humble crofter, but of a nobleman whose ancestors would have regarded most of the folk who "came over with the Conqueror" as parvenu adventurers.

The first 60 years of the history of Iceland were politically nondescript. In 930 the country became a republic, with an Althing, or Parliament, and a code of laws for the whole country. It was a free and sovereign State which lost its independence in 1262, when it came under the rule of Norway. In 1380 its allegiance was transferred to Denmark, and under Denmark it remained till only a few years ago. In 1918, after many years of difficult negotiations with Denmark, Iceland achieved independence, and it is now a sovereign State again. As an independent monarchy, it is reigned over by the King of Denmark. Next year, on June 26th, 27th, and 28th, Iceland will celebrate at Tingvalla, the volcanically-formed, open-air forum a few miles outside Reykjavik, the thousand-year jubilee of parliamentary government.

The total area of Iceland is 103,000 square kilometres, but the habitable area is small and is chiefly limited to the coast and certain valleys. At Reykjavik the annual mean temperature is 4·1° C., the mean temperature in January, which is the coldest month of the year, being 1·2° C. The mean temperature in July, which is the warmest month of the year, is 10·0° C. Iceland is generally reputed to be very bleak and fog-bound, but in the summer, at any rate, there is plenty of sun, and a solarium in the new hospital at Reykjavik is a tacit protest in concrete against this reputation. A few miles outside Reykjavik there are conservatories, heated by natural hot springs, in which tomatoes and melons ripen.

The population of Iceland on Dec. 31st, 1927, was 103,317, that of Reykjavik alone being 21,301. This nation is rapidly growing, the population on Dec. 31st, 1925, being only 100,117. The birth-rate in 1927 was 25·0 per 1000, and the death-rate 12·4. In the past, much of Iceland's surplus population has emigrated, and there are approximately 25,000 in Canada and the United States alone. At the present time Iceland can absorb her own surplus population, chiefly because the modern development of her fisheries is bringing her unprecedented prosperity. It is for this reason that the increase in the population concerns only the coastal areas. But though the rural population has stood still, or even dwindled, it is only a matter of time, probably quite a short time, before the rapidly growing network of roads and the exploitation of Iceland's superabundance of water-power, will people the interior with many times its present population. At present, with almost four-fifths of the country uninhabited, and for the most part uninhabitable on account of glaciers, volcanic deserts, &c., there is something less than one person per square kilometre. The excess of females above males reflects to a certain extent the increased hazards of drowning to which males are disproportionately subjected. In the five-year period 1916–20 almost two-thirds of the deaths from accidents were due to drowning. Many doctors lose their lives in this way; crossing a swollen torrent, the doctor is carried away, while his pony swims ashore.

There are about 100 doctors in Iceland (in 1927 there were 98), 48 of whom act as medical officers of health in as many administrative medical districts. They are, of course, general practitioners as well. In almost every parish there is a trained midwife, and the total number of trained midwives is about 200. Their duties include vaccination, which has been compulsory since 1810. But there are only about half a score of dentists and as many chemists in the whole of Iceland. A medical director is responsible for the administration of all matters concerning public health.

Housing and Town-planning.

Some thousand years ago the dwelling-houses were comparatively large, and the birch wood which then covered the island provided plenty of fuel for the fires burnt in the middle of the room in the old Norwegian fashion. Later, lack of timber for building purposes and of wood for firing compelled the inhabitants to live in small huts of turf and rough stones, providing only some 5 cubic metres for each person. As Prof. Hannesson puts it: "The birch wood forests disappeared. . . . There was no coal, and good peat was scarce. The fire of the hearth was no longer lit. For centuries the Icelanders have lived in almost unheated houses. . . ." This state of affairs is changing, as a rule for the better. But in the rapidly growing villages and towns on the coast there is a serious housing shortage, and the dwellings are apt to be poor as well as overcrowded. The new buildings are usually made of concrete. The double outer walls are provided with an intermediate space which is packed with dry peat dust or chips of cork. These houses are both warm and fire-proof. Central heating is sometimes provided by natural hot springs, and electric light from some neighbouring waterfall. Recent town-planning legislation obliges all communities numbering 500 and upwards to make a survey of the harbour and of as much of the surrounding land as will be required for the growth of the community in the next 50 years. The cost of this survey is borne equally by the Government and the town. All communities having a Government-ratified town plan are subject to Government inspection every fifth year, and all new buildings which do not conform to the town plan are to be immediately pulled down at the cost of the town. This legislation is said to have worked satisfactorily on the whole.

Infant Welfare.

Few figures are so eloquently demonstrative of the progress made during the last decades as those dealing with vital statistics. During the period 1886–95 there were 86 still-births for every 1000 births. During the five-year period 1916–20 this figure was reduced to 29, and during the five-year period 1921–25 there was a further reduction to 25. According to the reports of midwives, 95·4 per cent. of the infants in Reykjavik, and 75·8 per cent. in the country districts, were breast-fed. The average infant mortality of 52·8 per 1000 in the five-year period 1921–25 is among the lowest, if not the lowest, in Europe.

Tuberculosis.

Until the last quarter of the nineteenth century, when housing and sanitation were at a low level and semi-starvation not rare in Iceland, tuberculosis was hardly known. During the last decades, housing, general sanitation, and the nation's diet and standards of cleanliness have vastly improved. Preventive and therapeutic measures in relation to tuberculosis have absorbed increasingly large sums of money. Yet the disease has apparently increased by leaps and bounds. In 1921 the number of notified cases was 746, whereas in 1927 this number had risen to 1100. The rise in the death-rate from tuberculosis was much less abrupt. In the five-year period 1911–15, with an annual average of 147 deaths, it was 1·7 per 1000, whereas in the five-year period 1921–25, with an annual average of 186 deaths, it was 1·9 per 1000. The apparent rarity of tuberculosis in former years may partly be traced to defective diagnosis and notification, but it would also seem that the improvement of communications, and all that this improvement entails, have favoured an actual increase of the disease. This increase has been spread over several decades, and may not yet have reached its maximum. The first sanatorium (Vifilsstadir Sanatorium, 140 beds) was not built till 1910.

Drastic and costly measures have been taken to combat tuberculosis. In 1921 a special law was passed, and strict regulations were adopted with regard to notification and the prevention of infection. Disinfection is compulsory when a patient moves or dies, his home cannot be used as a school, and children with open tuberculosis may not attend ordinary schools. The subjects of open tuberculosis may not be employed as school teachers or midwives, nor work in milk shops, restaurants, or provision stores. Children and young persons may not live in the homes of patients suffering from open tuberculosis. The State not only provides sanatoriums and similar institutions, but also defrays three-fifths of the running expenses, except when the patients are in easy circumstances. In practice nearly all open cases are given free treatment for a long period in sanatoriums and hospitals, and the annual cost to the State now exceeds 500,000 kr. Of all the cases notified in 1920, 27·7 per cent. were under the age of 15. Of the patients over this age and suffering from pulmonary tuberculosis 64·5 per cent. were women—a curious sex disproportion which is the more remarkable as only 51·2 per cent. of the patients suffering from tuberculosis of organs other than the lungs were women. About 20 per cent. of the deaths from tuberculosis in 1926 were due to meningitis.

Tuberculosis is rare in cattle; measures have recently been taken against it. In 1923 it was made notifiable. Diseased animals must be inspected by a veterinary surgeon and slaughtered if necessary, the cost of these measures being borne partly by the State, partly by the local authorities.

Leprosy.

Leprosy was formerly very rife in the country, and as late as 1896 there were as many as 280 lepers. In 18[illegible] a 60-bed hospital for lepers was built near Reykjavik. By 1921 the total number of lepers had fallen to 63, and in 1927 this number had been further reduced to 44, 31 of these patients being resident in the hospital. Four new cases were notified in the five-year period 1921–25.

Venereal Disease.

Gonorrhœa became endemic in Iceland about 1800, and syphilis after 1900. As was to be expected, these diseases are practically limited to the seaports, and a considerable proportion of the patients are foreigners. Gonorrhœa and syphilis are increasing. Legislation in 1923 provided for the compulsory notification and treatment of cases of venereal disease, the cost of residence and treatment in hospital being free for persons in necessitous circumstances. The medical officers of health are instructed to conduct educational campaigns against this disease in those areas where it is rife. Persons suffering from venereal disease in an infectious stage are forbidden by law to marry. In 1927 there were 318 cases of gonorrhœa notified, the annual average for the five-year period 1921–25 being 230. As many as 12 of the 31 patients notified as suffering from syphilis in 1927 were foreigners. The annual average of notifications of syphilis in 1921–25 was 25.

Influenza.

There is a deep-rooted conviction in Iceland, both with regard to man and to cattle, that the plagues from which the country has suffered from time to time have been imported from abroad. Doubtless this conviction is well founded. But in the case of cattle, at any rate, it has done much to prevent the improvement of the stock by new and better imported strains. Influenza is no exception to the rule that most infectious diseases are imported, all the serious outbreaks being traced to infection from abroad. The "Spanish influenza" of 1918 caused many deaths, but also conferred an immunity in the survivors which was little impaired when another epidemic wave invaded the country in 1921. This epidemic lasted for five months, reaching its maximum in the third month. Three districts escaped completely by voluntary isolation, and there were many instances of whole parishes and single farms escaping the epidemic by this means. The epidemic of 1924 lasted for some months, reaching its maximum in the second month. In some districts it spread to almost every home, while in other districts it was much more sporadic as a result of preventive measures or of the immunity left by the waves of 1918 and 1921. The comparatively slow spread of the disease in most districts may have been due in great part to this immunity. The death-rate from the epidemic in 1924 was about 1 per cent. The growing immunity to influenza seems to have created a crop of abortive cases and to have rendered the differential diagnosis of influenza and acute bronchial catarrh very difficult. The latter disease did not spread so rapidly, and the one disease did not confer immunity to the other. Cases of influenza were most infectious in the latter half of the incubation period, and shortly after the outbreak of symptoms, but usually for not more than four days after this outbreak. The age-incidence varied in different epidemics, in some of which few persons under the age of 15 suffered, whereas in others there were many patients under this age. While only 941 cases were notified in 1925 the number of notifications rose to 3115 in 1926, in the latter half of which there was a typical epidemic which spread rather slowly. Most of the persons who had had influenza in 1925 were immune, but in isolated areas, which had not been visited by influenza for some years, the epidemic spread to almost every home and caused considerable havoc.

Epidemic Pleurisy.

In 1911 and again in 1917 there were small outbreaks of this obscure disease. An epidemic in 1923 was investigated by the bacteriologists Dr. Thjötta and Dr. Salvesen, but no specific germs could be found. A serious outbreak occurred in 1926. It began in Reykjavik in June, and it was not clear whether it was imported from abroad or not. The 87 notifications in Reykjavik in June rose to 148 in July and sank to 42 in August, petering out soon afterwards. In the latter half of the year it spread to about 20 districts. The main epidemic ran through the country in four months, reaching its maximum in the second month. The incubation period was short, and the disease began with high fever, sometimes of a remittent character, associated with more or less violent pain in the chest. Sometimes this pain was like that of pleurisy or lobar pneumonia, sometimes it was more diffuse, involving the upper abdomen as well as the lower part of the thorax. The pain was often so severe and the abdominal muscles were so tender that the patients preferred to lie motionless. The stethoscopic examination was sometimes negative but sometimes revealed definite pleuritic rubs over the lower parts of the lungs after the patient had been ill for some days. The illness lasted a week or a week and a half, usually without any signs of bronchial catarrh or influenza. Relapses occurred, notably after exertion or exposure, but no case ended fatally. While the rapid spread of this epidemic over a great part of the country has caused it to be regarded as a modified form of influenza, the facts that it has formerly occurred in small local epidemics, and that its manifestations are in many respects different from those of influenza, are opposed to this conception. Outbreaks of this disease in the middle of the winter weaken the case for regarding it as insect-borne.

Rheumatism.

The number of cases of acute rheumatism observed every year does not vary greatly, nor is there any marked seasonal difference. The disease seldom runs parallel with acute tonsillitis, scarlet fever, or diphtheria. It is usually of a mild type, and not only is it less frequent than in neighbouring countries but it is also comparatively seldom followed by endocarditis. Salicylates have but a slight effect on it, and it is possible that it is often of tuberculous origin (Poncet's rheumatism). The proportion of male to female patients is as 1 to 3. Among the 146 cases of acute rheumatism notified in 1926 there was not one in which heart complications were mentioned.

Lobar Pneumonia.

This disease is frequent in Iceland and its incidence varies greatly from year to year. Thus, in the five-year period 1916–20, the annual notifications averaged 812, whereas in the five-year period 1920–25 this figure rose to 913 cases. In 1926 only 185 cases were notified, whereas in 1925 there were 278 cases. The disease was most frequent in the North and West, and in the months of May and June. The age- and sex-distribution showed some curious features. In over 10 per cent. the patients were under the age of 15. Between the ages of 15 and 65 the percentage-incidence was 52·4 for males and 22 for females. Over the age of 65 this preponderance among males was continued, the respective percentages being 4 and 2·4. In some cases the disease was very contagious, and on one farm all the five inmates were ill at the same time.

Measles.

An epidemic of measles, imported from Norway in 1924, ran through the country and lasted till 1926. Public measures taken in the beginning of the epidemic failed to arrest it, but voluntary isolation was temporarily effective in many districts. It ran on the whole a mild course, with a mortality of about 0·5 per cent. In earlier years, and before the inhabitants had become immunised, the epidemics which swept over the country at long intervals were associated with a high mortality. This epidemic seemed to have come to an end in October, 1925, but in November there was a recrudescence of it, the peak being reached in January, 1926. It died out in August of this year. While the usual duration of epidemics of measles is 14 to 16 months, this epidemic lasted about 26 months—a spell the length of which may be traced to the preventive measures which were adopted in certain districts, and which evidently deferred without permanently aborting the evil. The districts which entirely escaped this epidemic may find measles a very unpleasant rod in pickle when the next epidemic invades the country. Prevention of the disease by the injection of the serum of convalescents was found effective in some districts.

Hydatid Disease.

Some 60 or 70 years ago hydatid disease of the liver caused by *Tænia echinococcus* was so common that about 2 per cent. of the inhabitants were supposed to suffer from it. Now this disease is becoming rare, thanks to the drastic measures taken against it. About 25 years ago Dr. Steingrimur Matthiasson, now in charge of the hospital in Akuryri, the second largest town in Iceland, found that operations for hydatids were the most frequent of all major operations at his hospital, whereas at the present time he can count such operations on the fingers of one hand in the course of the year. In 1863 there was one dog to every three to five inhabitants, whereas at the present time this dog-to-man ratio has been reduced to 1 to 16. Thanks to the energetic efforts of Dr. Gunnlaugur Claessen and his colleagues, no one may keep dogs in Reykjavik, and in certain other communities they are excluded or kept under very close control. The law of 1890 imposed a tax of 2*s.* to 10*s.* on every dog, and enjoined the deep burial or burning of hydatid-infected material found in slaughtered animals. The same law imposed on all town and parish councils the task of purging dogs with areca powder after the slaughtering time in the autumn. Dr. Claessen's recently published work on X ray aspects of hydatid disease, qualifying him for the degree of M.D. in Sweden, promises not only to be a standard work in this field, but is also a good example of the scientific activities of the medical profession of Iceland to-day.

(To be concluded.)

ASPIRIN AS A HIRUDICIDE.

To the Editor of THE LANCET.

SIR,—During the Great War in a district in Palestine where no doctors were easily available, a woman with a sick child who suffered from fever and spitting of blood consulted a pharmacist. The puzzled man invoked his old friend aspirin to combat the fever. An hour after having administered aspirin to the boy the mother returned with two big leeches in her hand, thanking the pharmacist and reporting the cure of the child. Henceforth we made experiments on dogs afflicted with leeches by simply throwing aspirin into their mouths, and in all cases this treatment has proved effective. I believe aspirin is a much better treatment for leeches than the extraction method.

I am, Sir, yours faithfully,
BUTRUS SALAH, M.D.

Jaffa, Palestine, Sept. 18th, 1929.

THE DESTRUCTION OF HOME PESTS.

ALL households, especially those situated in the country, are at some time visited by one if not more of the ordinary home pests such as ants, flies, or mosquitoes. Since these are a menace to public health it is important that everyone should be familiarised with the best methods of exterminating them. A brief knowledge of their habits and life histories is essential if these pests are to be intelligently combated. Since it is easier to cope with them in the egg or larval stages than after they have become adults, Mr. J. S. Bainbridge[1] recounts the habits, life-histories, and tested methods of control of all the common household pests, gives simple practical advice, and includes a number of clear illustrations.

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[1] Home Pests and their Destruction. By J. S. Bainbridge, M.Sc. London: William Heinemann (Medical Books), Ltd. 1929. Pp. 94. 3*s.* 6*d.*

An Address

ON

RECENT AIDS IN THE DIAGNOSIS OF SOME COMMON DISORDERS.

Delivered at the St. Mary's Hospital Post-graduate Course on Oct. 4th

BY T. C. HUNT, B.M. OXF., M.R.C.P. LOND.,
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HIGH BLOOD PRESSURE.

THE diagnosis of high blood pressure is, of course, easy, and difficulty only arises when its significance has to be estimated.

The upper limit for the normal constant systolic pressure should never, whatever the age of the patient, be above 155 mm. of mercury. This figure is rather lower than used to be accepted, but is probably too high rather than too low. For the diastolic pressure a figure over 95 mm. is always to be considered as abnormal. There is no doubt, however, that remarkable temporary variations in systolic blood pressure may occur, especially under the stress of emotion, fear during examination, and the like, and it is common to find the first reading taken with the sphygmomanometer to be 10, 20, or even 30 mm. higher than subsequent readings.

In this connexion there is one important variation which can often be detected by the sphygmomanometer although the finger may do no more than suspect it. This is the pulsus alternans, which is particularly apt to be found in cases of high blood pressure and is shown by a doubling of the number of beats heard or felt below the arm-band, as the pressure is gradually lowered from the point at which the first sounds appear. The difference between the systolic pressures of alternate beats may be as much as 10 or even 15 mm. of mercury, and such a finding is always of the gravest importance.

The diastolic pressure, which is at least as important as the systolic, shows less variation and should always be recorded with the systolic.

When a persistently raised blood pressure is found it may be hard to determine to what extent (if any) it is associated with definite involvement of the kidney. The exact height of the pressure is no indication of the presence or degree of renal damage. Nor is peripheral arterio-sclerosis by any means constantly present; indeed the hard tortuous arteries so commonly found, for example, in manual labourers are often to be seen in cases where the blood pressure is not raised at all.

Hypertension occurs in practice essentially in three forms: (*a*) as a condition sui generis without changes in the kidney; (*b*) associated with renal arterio-sclerosis (nephrosclerosis arterio-sclerotica); and (*c*) associated with, and probably secondary to, granular contracted kidney of the true inflammatory type. The first of these is called essential hypertension or hyperpiesia; the two latter forms we group together clinically as chronic interstitial nephritis. There are, however, important distinctions between the two members of this group, and since the prognosis is largely dependent upon their separation I propose to say something firstly about a few points in this differentiation, and secondly and more particularly about the early recognition of renal damage of whichever type it may be.

Arterio-sclerotic Kidney.

Briefly stated, high blood pressure associated with arterio-sclerotic kidneys presents the following features. The systolic blood pressure is subject to fairly wide variations under different circumstances, and may fall considerably with rest in bed. The diastolic pressure is apt to be relatively low, and thus the range between systolic and diastolic is high—i.e., the pulse pressure may be 120 mm. or even more. The patients are most usually elderly, often 60 or over, and frequently nervous and excitable about themselves; their colour is good—that is to say, there is no anæmia. The retinæ show arterio-sclerotic changes, pinching of the veins, and silver-wire arteries, and sometimes hæmorrhages. The prognosis, with suitable treatment, is comparatively good and the cause of death is apt to be apoplexy or heart failure.

Secondarily Contracted Kidney.

The second type, in which the high blood pressure is apparently the result of primary nephritis, corresponds to the true "small white kidney" which follows a recognised or unrecognised acute nephritis. Here the systolic blood-pressure is usually far more fixed and seldom varies more than 10 or 15 mm. though it tends to rise somewhat during the course of the day; it is not necessarily very high, but the diastolic pressure is, in comparison, often much raised. The patient is generally younger, perhaps 30 or 40 years of age, and is markedly anæmic. The anæmia is, indeed, such a striking feature that these cases are often described as white hypertension, in contrast to the former type which is called red hypertension. The anæmia is probably the result of a chronic toxæmia, and is so important in prognosis that it is probably correct to say that when the red cell count is 3 million or under the patient will not live longer than two years. In these cases death is commonly from uræmia and the prognosis is bad.

A Differential Test.

In the early stages both these types of patient present themselves, as a rule, as simple cases of high blood pressure, with or without symptoms attributable to this. Of the various symptoms I would mention especially "rheumatic" pains in the limbs, headache (especially occipital), vertigo (sometimes), and dyspepsia (often). Dyspnœa on exertion is particularly common in the arterio-sclerotic type, as also are "rheumatic" pains, whilst headache is especially frequent in the inflammatory type. The early symptoms, however, rarely indicate the extent or nature of the renal damage; polyuria may not be complained of and in both types the urine may not be characteristic in its content of albumin, blood, or casts—all of which may indeed be absent.

It is in the diagnosis of the presence, degree, and to some extent of the type of nephritis in cases of this kind that I would like to call attention to one simple test which, though in no sense new, is yet recent in its application. I refer to the water test of kidney function of F. Volhard and Koranyi. This test is in routine use in almost all continental clinics, and widely in America, and I think it deserves more general recognition in this country. Thanks to the kindness of Prof. F. Langmead I have had the opportunity of applying it on many patients in the wards, and I feel that in such cases as I am discussing its simplicity and usefulness make it of very great value. The test, as I apply it, is as follows.

The patient is instructed to take as little fluid as possible from lunch-time onward, but to eat his ordinary diet; no fluids at all are drunk after 6 P.M. when the bladder is emptied (and the urine discarded). All the urine passed from this hour until 9 A.M. is then collected and measured, and a specimen is saved. At 9 A.M. a pint and a half of weak tea or water is drunk, and the urine is passed hourly for at least four, and if possible six, hours; each hourly specimen is measured and a sample is saved. The test can easily be carried out at home, preferably perhaps over a Saturday and Sunday, and if the hourly collection of specimens is difficult almost as much information may be obtained by examination of two-hourly samples. The specimens are all investigated as regards their volume and specific gravity.

The patient should be in bed during the test, for otherwise extrarenal factors—especially cardiac—are involved which lessen the value of the results. Such conditions as obvious heart failure, gross œdema, or severe diarrhœa, must naturally also vitiate the test, though they will not often be encountered in the type of patient that I am discussing. It is advisable, further, to carry out the test on one or two separate occasions if possible rather than to rely entirely upon one examination.

Night Urine.—The normal patient should not excrete more than about 20 oz. of urine during the night period, and the specific gravity should not be less than 1025. *The restriction of fluids before going* to bed ensures a maximum concentration in this specimen which *normally* bears *a ratio to the day* urine of about 1 to 3. The average volume in health *is less than 15 oz., and the average specific gravity* 1032 (T. Addis and M. C. Shevsky).

Water Test or Dilution Urine.—All the 30 oz. of fluid drunk in the morning should be excreted within 4½ to 5 hours; *it is usually put out in not more than* four. More than half—i.e., 15 oz.—should be excreted *in the first two hours,* and the rate of removal of the test dose is of great importance. The maximum flow should be during the second hour of the test, when the volume should not be less than 10 to 15 oz.; the flow at its maximum point reaches a rate of nearly half an ounce a minute (E. B. Verney); the specific gravity should fall to 1003 or lower. These figures have been obtained over a large series of normal subjects, and may be taken as substantially correct.

Results of the Water Test in Cases of High Blood Pressure.—All are agreed that the earliest evidence of renal impairment is shown by a poor concentration of the night urine. This is especially true of the inflammatory group of cases, in the early stages of which the volume is high (greater than a pint and often two or three pints), and the specific gravity is low. In the arterio-sclerotic kidney these changes are less marked; here the volume at night is slightly increased but the specific gravity is less reduced. Thus, for example, the volume may be 25 oz. and the specific gravity 1018, whilst in the inflammatory kidney the volume may be 40 oz. and the specific gravity 1006. In the *late* stages of both conditions the nocturnal polyuria ceases—a sign, as it were, of "decompensation" of the kidney—but the specific gravity remains fixed at 1010. Thus a small night volume with a specific gravity not greater than 1012 suggests a very serious prognosis.

The output of the test dose is also an excellent guide to the extent of renal damage. In the very lightest degrees there may be an excessive output, so that an abnormally high volume may be passed in four hours—well above the 30 oz. originally given. But the significance of this is somewhat doubtful, and in general it may be said that the less the amount put out of the 30 oz. given the worse the prognosis; the more the specific gravity remains fixed at 1010, the smaller each hourly volume becomes, and the more each equals another in volume the more grave is the impairment. Equality in volume of the consecutive specimens is a sign of serious import but indicates less severe impairment than does great diminution in the hourly amounts.

To some extent the response to the test may, I think, differentiate the nature of the lesion. Thus the inflammatory kidney which acts normally at its maximal excreting power shows a constant polyuria (by day and especially by night) but fails to excrete the added dose of fluid. A typical result is the following, the patient being a man of 55 who was sent home from abroad as a case of peripheral neuritis, with a blood pressure 220 systolic and 135 diastolic.

Hour.	Volume.	Sp. gr.
1st	1¼ oz.	1011
2nd	1 ,, ...	1010
3rd	2 ,, ...	1010
4th	1¼ oz.	1011
5th	2 ,, ...	1010

Total excretion in 5 hours—of 30 oz. given—8 oz.

This patient showed a maximum urea concentration of 2·1 per cent. and a blood-urea of 60 mg. per cent., and died six weeks later from uræmia—an outcome which might not have been expected from the results of the urea-concentration test or blood examination alone.

The arterio-sclerotic kidney retains more of its power of excreting water, and most of the fluid given is excreted within six hours; the specific gravity is also lower and may fall in the largest specimen to 1005 or under. The following are two further examples of actual results which I think will demonstrate the value of the test.

A patient, aged 68, of high colour, had some arterio-sclerosis of the peripheral vessels. The blood pressure was 180/125, and there was a history of transitory left-sided hemiplegia. The maximum concentration of urea in the urine *after 15 g. of urea* was 3 per cent., but the minimum was down to 1·2, so that a range of 1·8 was found, which did not suggest any nitrogen retention in the blood; the blood-urea was in fact 20 mg. per 100 c.cm. There was slight albuminuria but no casts were found. The water test gave the following figures:—

Night urine.—Specific gravity 1015. Volume 23 oz.

Hourly specimens after 30 oz. of fluid—

Hour.	Volume.	Sp. gr.
1st	No urine ..	—
2nd	8 oz.	1014
3rd	4 ,, ...	1008
4th	4 ,, ...	1007
5th	1 oz.	1006
6th	2 ,, ...	1012
7th	2 ,, ...	1014

In this case there is a delay with a moderate retention (11 oz.) at six hours; the specific gravity falls to 1006, giving a total range of 9. There is thus a definite picture of moderate arterio-sclerotic nephritis.

The second case, in contrast to the above, is that of a woman, aged 55, with some traces of albumin in the urine and a blood pressure of 175/110. The urea concentration was 4·2 per cent. after 15 g. of urea and in the dilute specimen 0·25 per cent.—i.e., there was a range of 3·95. The night urine showed a specific gravity of 1019 and volume 14 oz. The blood-urea was 26 mg. per 100 c.cm. The water test showed:—

Hour.	Volume.	Sp. gr.
1st	5 oz.	1010
2nd	23 ,, ...	1003
3rd	5 oz.	1008
4th	2 ,, ...	1012

Here the total volume of fluid is fully excreted in four hours and the range of specific gravity is high from 1019 to 1003—i.e., 16. This was therefore clearly a case in which a serious renal involvement could be confidently excluded, the only suspicious features being a slight failure of specific gravity in the night specimen and a somewhat excessive output of fluid in the second hour, with a total excretion just above the test quantity given. It will be seen that the volume and specific gravity tests alone were able to eliminate with some certainty any marked degree of arterio-sclerotic nephritis.

The main value of the test lies in estimating the extent of renal damage and is of the greatest value in prognosis. Thus if the specific gravity does not vary appreciably from 1010, and not more than half the test dose is excreted in six hours, the patient is unlikely to live more than a few months. To sum up, I will repeat the main points in estimating the degree of renal impairment.

Early Stages.—(1) A night urine of volume greater than 20 oz. and specific gravity below 1020. (2) Delayed and incomplete excretion of the test dose of water.

Later Stages.—(3) An increasingly smaller difference between maximum and minimum specific gravities, with a night urine of less volume but specific gravity approximately 1010; an equality in volume of the specimens following the fluid, the quantity of each being not more than 2 or 3 oz. (4) Fixation of specific gravity in all specimens at between 1009 and 1012.

In the attempt to differentiate early arterio-sclerotic from early inflammatory cases, we may say that, broadly speaking, the inflammatory kidney shows a greater polyuria, especially nocturnal, a greater fixation of specific gravity, and a greater inability to excrete a test dose of fluid. The arterio-sclerotic kidney shows a more normal daily urine volume, less nocturnal secretion, a higher range of specific gravity between concentrated and dilute specimens, and better power of excreting an excess of fluids.

Nitrogen Retention.

It may be that these distinctions are largely those of the severity of the renal impairment, but in accurate diagnosis and prognosis they are of real importance. They are of especial value in cases of high blood pressure with early kidney damage such as I am discussing, since albuminuria may be slight or absent and a raised blood-urea is a late occurrence.

Further in this stage the urea-concentration test—as usually carried out—may not show any renal defect. Thus in both arterio-sclerotic and inflammatory nephritis the maximum urea concentration in the urine after a dose of 15 g. of urea may be 2 per cent. or over—i.e., within normal limits. If, however, the dilute specimens after the dose of fluid are examined the contracted kidney may show a concentration of 1·9 per cent., or even an unaltered percentage, whilst the arterio-sclerotic kidney shows a figure of, say, 1 per cent. or even less. In this way, as was suggested by Dr. E. G. B. Calvert, estimation of the urea in the night specimen and in the dilute specimen after the fluid will provide a range of urea-concentration test, which gives similar information to the range of specific gravity but is less simple of application.

There is one further point in this connexion—namely, the detection of the presence of nitrogen retention in the blood. Even in uræmia there is not *always* a raised blood-urea, but it is a laboratory finding of great importance. A high blood-urea may be generally inferred when the specific gravity range is less than 3, and the maximum figure about 1010, whilst if the specific gravity in any specimen falls below 1006 it is unlikely to be present. In terms of urea concentration, if the maximum concentration is 2 per cent. or less, and the minimum is not lower than 0·2 to 0·3 per cent. less, the blood-urea is almost sure to be raised. A rough check upon the blood itself is easily available, without recourse to exact laboratory methods, in a simple test devised by Weltmann. This requires the use of two reagents only and is performed as follows:—

Five c.cm. of blood are taken from a vein and an approximately equal volume of trichloracetic acid is added to it at once. The mixture is then shaken and filtered. To the clear filtrate 5 drops of Ehrlich's aldehyde are added—a reagent to which I shall refer later. If the blood-urea is raised above about 40 mg. per cent., which is the upper normal figure, a greeny-yellow colour develops, which is darker and more intense the higher the blood-urea. If no colour develops any appreciable degree of nitrogen retention can be confidently excluded.

This test is simple, sufficiently accurate, and of real value—for example, in cases of coma when uræmia is suspected as the cause.

Types of High Blood Pressure with Early Renal Involvement.

Arterio-sclerotic.	*Inflammatory.*
Age.—Over 40.	Often under 40.
History.—Previous good health.	Previous acute nephritis; often chronic focal sepsis.
Appearance.—Red; excitable.	Pale; lethargic.
Main symptoms.—Dyspnœa; rheumatic pains; angina pectoris.	Headache; dyspepsia; often polyuria.
Blood pressure.—Variable.	Fixed.
Blood.—Sometimes plethora or polycythæmia.	Anæmia.
Ocular changes.—Silver-wire arteries; pinching of veins; hæmorrhages. Later sometimes "fluffy" patches of exudate.	Similar, but with fan-shaped exudate round macula.
Urine.—Albumin, blood, and casts may be present or absent in either type.	
Night urine.—Volume about 20 oz. (max. concentration). Specific gravity about 1018.	Volume more than 20 oz. Specific gravity 1015 or less.
Max. urea concentration.—Approx. 2% or more.	Approx. 2% or less.
Min. urea concentration.—Approx. 1% or less.	Approx. 2%.
Urea range.—Approx. 1% or more.	Approx. 0·2% or less.
Water test.—Good dilution; delay in output, but little retention over 6 hours.	Bad dilution; volumes of specimens small; equal half or less of the fluid excreted in 6 hours.
Specific gravity range.—Fairly good—e.g., 1018 to 1005.	Relatively fixed—e.g., 1015 to 1008.
Blood-urea.—Not raised till late.	Often raised early.
Duration.—Often many years.	Short—1 to 4 years.
Outcome.—Apoplexy; cardiac failure; angina pectoris.	Uræmia: intercurrent disease; heart failure.

Further Guides to the Condition of the Kidney.

The above table shows very schematically the main features which may help in differentiating the early stages of arterio-sclerotic from those of inflammatory kidney; it must not be taken as in any sense a hard-and-fast classification, and is merely meant as a rough guide to which there must be many exceptions. It must be remembered, moreover, that it is possible that these types may be but different stages of one and the same disease, which is probably primarily a vascular one. Nevertheless definite pathological differences can be found post mortem, and in practice the distinction is not an unimportant one. For a full discussion of this point I would refer the reader to Dr. T. Izod Bennett's Goulstonian lectures of 1928.[1]

DIAGNOSTIC SIGNIFICANCE OF THE PRESENCE OF UROBILIN IN THE URINE.

Urobilin is a biliary derivative which may sometimes appear in the urine and is quite distinct from the true bile-pigments, bilirubin and biliverdin, which are present in the blood and urine in such conditions as obstructive jaundice, and are detected in the urine by the formation of a green ring with either strong nitric acid or (better) a dilute solution of iodine in potassium iodide. Under the term urobilin I include both this substance itself and its probable precursor, urobilinogen, since their occurrence and importance are clinically the same.

The mode of formation of urobilin is as follows. The bile-pigments, bilirubin and biliverdin, are formed from the hæmoglobin of the blood, secreted in the bile by the liver, and reach the intestine through the common bile-duct. In the intestine they undergo a change into urobilin (probably through bacterial action), some of which appears in the stools under the name of stercobilin. Most of it, however, is absorbed back into the blood, reaches the liver again, and is then reconverted into bilirubin. So a circulation of the bile-pigments takes place.

Clearly an excess of urobilin may be present in the blood for two main reasons: (1) an excess of pigments may be formed originally from the blood so that an excess will reach the intestine and thus an excess of urobilin will be absorbed from the gut. (2) The liver may fail to reconvert the normal amount of urobilin which reaches it after absorption from the intestine. This liver function of converting urobilin to bilirubin is one that is easily impaired and appears to suffer in disorders of the liver before its other functions are appreciably affected. Further, with a normal kidney a slight excess of urobilin in the blood leads to its excretion in the urine, where it may be readily detected. The test for its presence is by means of Ehrlich's aldehyde reagent.

This solution—whose full name is para-dimethyl-amino-benzaldehyde—is readily obtainable and keeps fairly well in a dark coloured bottle. About 20 drops are added to an inch or so of urine in a test-tube and the presence of urobilin is shown by the appearance of a bright red colour which is apparent immediately in the cold if large amounts are present, more slowly reaching its maximum in one to three minutes if the amounts are only moderate, and producing only a faint tint on warming if there are only traces.

A strongly positive result with this test is always pathological, but slight traces of urobilin may sometimes appear in the afternoon urine of healthy people. The significance of a positive result is twofold. Firstly, it occurs in conditions where an excess of blood is being broken down; and, secondly, in conditions where liver function is defective. It is thus a simple and valuable test for disorders of the liver and for those of blood destruction. As a rule it is readily possible to distinguish which factor is at work, though both may sometimes be combined. The commonest of the two is that of liver impairment, and the value of this test in two or three common types of liver disorder is undoubted.

Urobilinuria and Defective Function of the Liver.

In *cirrhosis of the liver* the test is usually strongly positive and with other evidence is of very real diagnostic assistance; it may be positive before other tests of hepatic function—such as the lævulose and galactose tolerance tests—show signs of insufficiency. Urobilin has also been shown by many workers to be constantly present in the urine after acute alcoholic excess, and this has even been urged as a legal point in those difficult cases of "drunk-in-charge-of-a-car." Its presence is at least evidence of the temporary damage to the liver which may be produced by alcoholic intoxication.

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[1] THE LANCET, 1928, i., 741.

Secondly, in *catarrhal jaundice*, which we now know to be mainly toxic and not obstructive in nature, the test is positive at a very early stage, considerably before the appearance of the true bile-pigments which give the tests with iodine or nitric acid.

Thirdly, in *heart failure*, the test may be helpful, for an early sign of decompensation is the appearance of urobilin in the urine due to slight congestion of the liver; this, as is well known, may often occur before obvious signs such as dyspnœa, cyanosis, and gross œdema supervene. The dyspepsia and mild abdominal discomfort of apparently compensated mitral cases are often due to slight hepatic engorgement, and in such patients considerable amounts of urobilin may be present in the urine.

There is, moreover, a further point in this connexion to which I should like to call attention. As I stated, a normal kidney will excrete urobilin when it is present in the blood in only very slight excess. In nephritis this power is lost. Urobilinuria is thus an important consideration in cases of frank heart failure due to renal disease; in, for example, the common type of patient of, say, 50 to 60, who is brought to hospital with sudden acute heart failure, severe dyspnœa, œdema, cyanosis, and often auricular fibrillation. The vessels may be thickened, but the blood pressure may have fallen very low; there is often advanced emphysema and bronchitis, and it is sometimes difficult to know if the condition is primarily one of high blood pressure with "renal heart failure," or is the result of chronic pulmonary disease, myocardial degeneration, or pre-existing valvular lesions. The condition of the urine may be almost diagnostic. The usual features of heart failure urine are, briefly, small volume, high specific gravity, great acidity, with generally the presence of a large excess of uric acid. In renal heart failure the specific gravity is not so high—always an extremely bad sign in decompensated hearts—and Ehrlich's aldehyde test is negative; in heart failure with congestion of the kidneys but no previous renal disease there is abundant urobilin in the urine and a red colour appears immediately with Ehrlich's reagent. Thus in heart failure a urine of low specific gravity which gives a negative reaction for urobilin is of very grave significance, and suggests great care in the administration of diuretics, particularly of the new mercurial types, such as novarsurol or salyrgan, or even the simpler drugs such as calomel itself.

Whilst speaking of the subject of the urine in heart failure, I may perhaps mention a test which has recently been introduced from America and has been highly spoken of in Vienna and elsewhere, though I cannot myself vouch for its accuracy. It may be put in the form of an aphorism and is simply this: "*If the urine in heart failure remains acid to methyl-red in spite of treatment, the patient will not recover.*" A few drops of this indicator, which is readily to be had, are added to about 5 c.cm. of urine, and high acidity is shown by a permanent red colour, using a control of the untreated urine; when the acidity lessens the indicator gives only a yellow colour. Thus if the urine remains red to methyl-red in spite of treatment, the prognosis must be considered hopeless. I would commend this test as possibly useful, but it requires confirmation in a larger number of cases.

Urobilinuria in Hæmolytic Conditions.

Returning to the second uses of the test for urobilin in the urine, its value is more limited. It is positive in conditions of excessive hæmolysis or blood destruction, such as occurs in malaria, the most important of which is pernicious anæmia. Here, owing to the abnormal hæmolysis, a positive aldehyde reaction is almost constant, and this fact may be useful in the differential diagnosis of pernicious anæmia from, for instance, carcinoma of the stomach. There is often a lemon-yellow tint of the skin in both diseases; in both there are abdominal symptoms, and radiography and blood examinations are not always easily obtainable. In a case with these symptoms a positive urobilin test is highly suggestive of a hæmolytic anæmia, and demands a full blood count without delay.

In all forms of hæmolytic jaundice—of which pernicious anæmia is an example—large amounts of urobilin are present in the urine unless there is associated severe nephritis. In obstructive jaundice it is necessarily absent, since no bile can reach the intestine to be converted into urobilin. The test may thus distinguish between hæmolytic jaundice, in which it is positive but the iodine test is negative, and obstructive jaundice, in which it is negative but iodine shows the presence of unaltered bilirubin. In such conditions the van den Bergh reaction in the plasma may not always be decisive, and, moreover, possesses the great disadvantage that if the blood is not tested within at the most two to three hours after its withdrawal from the vein, the results are fallacious. It is thus futile to carry out this test on blood specimens delivered through the post.

Urobilin in Hæmorrhage.

In extensive internal hæmorrhage an excess of blood-pigment is absorbed into the blood, and large amounts of urobilin may be passed in the urine. The test is, therefore, used widely abroad in the differential diagnosis of such conditions as ruptured ectopic pregnancy, and has a particular value in the diagnosis of hæmorrhagic infarction. For example, in pulmonary infarction, which may often cause difficulty in diagnosis, the test becomes positive some six to eight hours after the infarction, and remains strongly positive during the first two or three days, while the bulk of the broken-down blood is being absorbed. The value of the test in this connexion is stressed by continental authorities, and I have myself watched the appearance and disappearance of urobilin in the urine in two such cases.

To sum up, Ehrlich's aldehyde reagent is a useful addition to the small list of urinary test substances which are required in practice, and with due appreciation of the causes that may lead to its appearance, the presence of urobilin in the urine is a valuable diagnostic sign. The reagent is also helpful, as I have mentioned, as giving a rough test for the detection of a raised urea-concentration in the blood, with which it gives a greeny-yellow colour to the otherwise colourless blood filtrate.

Biliary Drainage.

The next diagnostic aid of recent introduction that I want to describe is one which may perhaps be considered somewhat impracticable. It is the examination of the bile obtained by duodenal catheterisation. Although this procedure has not been widely taken up in this country, I feel that it has a considerable value. I have had the opportunity of carrying out such an examination in 51 cases so far, and would like briefly to mention a few points about its usage which I have mainly learnt from my own experience. The test demands a lot of patience—both from the physician and from the patient—but very little apparatus. For those who can afford the time necessary it is simple to carry out.

Technique of Duodenal Catheterisation.—An ordinary Einhorn fractional test-meal tube is used, which is about the diameter of No. 6 rubber catheter. This is swallowed by the patient (who should have fasted for at least eight hours) up to the first ring on the tube. There is rarely much difficulty in this and cocainisation of the throat is not advisable since sensation returns during the course of the test and may lead to serious retching at an inopportune moment.

The gastric contents are withdrawn and the stomach is washed out with a few syringefuls of distilled water. The tube is then pushed down to the second ring, a distance of 28 inches, and the patient is turned on to the right side with the buttocks raised by a pillow; this position aids the passage of the tube through the pyloric sphincter. This may take place almost at once, and is shown by the aspiration of a small quantity of alkaline bile-stained fluid—the duodenal content. It may, on the other hand, take a long time—often up to two or three hours—and one American investigator has recorded waiting 14 days for the tube to pass the pylorus! If there is delay I have found the sipping of a few ounces of very hot water useful, and slight withdrawal and reinsertion of the tube may sometimes be necessary; twice I have used atropine gr. 1/150 subcutaneously with success to aid relaxation of the sphincter. In general, however, the tube will pass in about one-half to two hours—the average time taken in my cases being one and three-quarter hours.

When the end of the tube is thought to be in the duodenum, a syringeful of water is blown in and if the tube is correctly placed this is not usually withdrawable; if it is still in the stomach the fluid can be at once sucked back, generally with a quantity of mucus. Fifty c.cm. of a 30 per cent. solution of magnesium sulphate are then slowly injected down the tube and some air is forced down after it. I inject the solution at ordinary room temperature, since I have found that warming it is apt to lead to nausea and regurgitation of the tube out of the duodenum; the magnesium sulphate is not as a rule withdrawable. After this, aspiration is carried out at short intervals, and normally the first bile-flow occurs within one to ten minutes. This flow is due to a reflex action from the duodenal mucous membrane and with healthy liver and biliary passages presents the following features. It is almost immediate in onset, rapid, painless, and of about 80 to 120 c.cm. volume. It shows, moreover, a typical gradation. First is a light yellow fluid, then a thick, dark green or brown viscid fluid, and finally it is of a clear golden limpid honey colour. The variations in these three types of bile—which are sometimes called A, B, and C bile—are important. The total flow usually lasts some 15 to 30 minutes.

Deductions from the Test.

I will not enter into the controversial subject of the exact origin of the three types of bile, and will merely refer briefly to some of the points in their examination by which this test may be of assistance. As with the urine and renal function, so may the rate and mode of secretion of the bile give almost as much information as a detailed chemical analysis of its constituents.

Complete failure to obtain bile on two repeated occasions is strong evidence of a stone in the bile passages. In association with jaundice it is almost conclusive of mechanical obstruction. It may thus be helpful in the diagnosis, for example, of carcinoma of the head of the pancreas from severe catarrhal jaundice, which is not always accurately possible by clinical means, and blood, urine, and stool examinations alone. Failure to obtain concentrated bile (bile B) can, though I think rarely, occur with healthy liver and biliary passages, but it is very unusual in the absence of disease to fail to obtain any bile at all if the test is carefully carried out. At the same time in a certain number of cases the attempt may have to be abandoned without it being certain that no bile could be obtained, on account of technical failure generally due to a revolt on the part of patient! In eight of the cases I have examined I must admit to complete non-success on these grounds. Pain during the flow suggests stone and infection in the gall-bladder. A very slow secretion with delayed onset and scanty volume seems also to be found—and I have observed this myself—in cholecystitis with or without stone.

In laboratory examination of the bile, as of the urine, the microscopic findings are of great importance. The presence of pus cells in the concentrated bile, often with many epithelial cells, is typical of cholecystitis; cholesterol crystals are not commonly seen, and when present in fair number are very suggestive of stone. Calcium bilirubinate crystals, which are very fine needles often clumped together into irregular masses, do not have such definite significance, and are often present in apparently normal patients. A large amount of albumin is present with biliary infection, but may also occur with disorder of the liver apart from infection. The normal in my cases has been less than ½ part per 1000, and more than 1 part per 1000 is always pathological. The presence of urobilin is also abnormal, and is seen especially with impaired hepatic function. In my cases large amounts have been present in ten and traces in four.

Catheterisation and Cholecystography.

I have not attempted to go into any detail about this test because I do not feel that its results are at present definite enough to warrant its use as an absolutely general procedure. It requires some practice both in performance and in the interpretation of results. Undue claims have, I think, been made for biliary drainage, just as undue claims were made when the fractional test-meal was first introduced. It nevertheless offers a very real aid in the diagnosis of cholecystitis and cholelithiasis and should, I think, be always employed where the existence of these conditions is in doubt. Its results should be viewed in association with those of radiography of the gall-bladder—a means of diagnosis which is also open to certain fallacies. With the use of the dye methods introduced by Graham a great advance has been made, but the method is still far from perfect, and I should like to say a few words about why this is so.

The dye most commonly used is sodium tetra-iodo-phenolphthalein, and is generally given by mouth; at St. Mary's Hospital we are using a preparation named shadowcol, distributed by Messrs. Kodak, which causes very little nausea or diarrhœa. After absorption from the intestine the dye is excreted by the liver into the bile, and reaches the gall-bladder by way of the cystic duct. In the gall-bladder water is absorbed and the dye becomes concentrated so that it is sufficiently opaque to give a shadow on a radiographic film. The densest shadow is thus seen when the patient is a normal subject, and there may be no shadow for one or more of the following reasons: (1) The dye is not sufficiently absorbed from the alimentary tract. (2) The liver is unable to excrete it efficiently. (3) The cystic duct is blocked and bile cannot reach the gall-bladder; or (4) the gall-bladder is incapable of concentrating its contents satisfactorily.

With so many factors involved it is clear why cholecystographic results are not correct in probably more than 50 to 60 per cent. of cases examined. In association with results of biliary drainage, however, they gain in importance, and I feel that a direct examination of the bile is likely to increase in value in the near future. As to its application to bacteriological investigations there is as yet hardly sufficient evidence to speak at all definitely, but it seems to be of real help in the investigation of latent focal sepsis in the gall-bladder. To sum up, I would say that it should always be used when possible in doubtful cases of gall-bladder disease, and would stress especially the importance in diagnosis of pain during the flow, of the rapidity, volume, and appearance of the bile, and of the presence of pus, epithelial cells, and cholesterol crystals in the centrifuged deposit.

INDIGESTION.

In conclusion I should like to say a few words about the differential diagnosis of some of the causes of indigestion, with particular regard to the so-called functional dyspepsias. The common type of patient, most usually a woman, who has abdominal symptoms suggestive of perhaps a gastric ulcer, but in whom we feel confident that a "neurosis" is the true cause, may present great difficulty in diagnosis. Often enough the general behaviour of the patient is characteristic and the pain is usually one that gets worse on going to bed, but never wakes her up once she has got to sleep; it is probably fairly true that "a neurosis never woke a patient." At the same time we often wish for physical signs or laboratory tests that can confirm our suspicions and exclude organic disease.

Of the physical signs of neurosis there is no one alone that can be of genuine assistance, and even a combination of many together can only increase the probability of a functional condition. Of these signs I may mention the exaggerated deep reflexes, brisk abdominals, absent palate reflex, and the evidences of various stigmata of degeneration such as asymmetries and minor deformities. To these is often added a condition of excessive vasomotor irritability or dermographia, in which a wide red mark rapidly appears after quite gently stroking the skin with a blunt instrument. There is frequently a tachycardia and a low blood pressure which reacts abnormally to mild exertion. A further sign which is not commonly present in persons of "non-neurotic nature" is an absence of the corneal reflex, which is perhaps the most suggestive of all the multitudinous signs of "neurasthenia" that have been proposed.

All these signs, however, are notoriously unreliable and laboratory aids in investigating the case are of real importance. Of these I would especially mention the value of an examination of the stools for *occult blood*, the finding of which definitely excludes a functional condition. It is so readily detectable that it should be looked for in all cases in which the possibility of ulcer or growth arises. In peptic ulcer intermittent bleeding is very common, and in carcinoma of the stomach occult blood is seldom absent and often continuous.

The test is very easily carried out, and the patient need only exclude meat (and meat extractives such as soup), fish, and green vegetables for two days from his diet. The simplest and most reliable technique is that of Gregerson, with the aid of benzidin tablets (benzidin 0·025 g. and barium peroxide 0·2 g.) obtainable from any chemist. One tablet or powder is dissolved in 5 to 10 c.cm. of strong acetic acid (50 per cent.), and a small particle of stool is rubbed up on the end of a match with a few drops of this solution. A positive result is shown by a green to deep blue colour appearing at once or within one to two minutes.

The use of these powders not only simplifies the test considerably, but excludes some of the fallacies of other methods of detecting occult blood. Indeed, A. G. Ogilvie considers that a blue colour obtained within 30 seconds is proof of occult blood in the stools entirely irrespective of the patient's previous diet. I realise that the test is well known, but I think it deserves more frequent application in general practice.

Test-meal analyses are, I am afraid, seldom of great assistance except in carcinoma of the stomach, pernicious anæmia, and duodenal ulcer. In the reflex and toxic dyspepsias of pulmonary tuberculosis, gall-bladder disease, renal disease, or chronic appendicitis, for example, the variations in gastric secretions are so diversely reported that assessment of their true significance is extremely difficult. In functional dyspepsia all types of test-meal results may be obtained.

There is one further test, which is old in origin but recent in its general utilisation, which may be employed with advantage in such cases—namely, the *red cell sedimentation test*. In spite of all that has been written and claimed for this test, especially in relation to pulmonary tuberculosis, the evidence of recent years shows that its real and great practical value lies simply in the differentiation of organic disease from functional disorder. It is in no way specific for any one form of disease, although exaggerated claims have often been made in this respect. It is a test that determines merely the rate at which the red cells fall to the bottom in citrated blood, and even now, in spite of the immense amount of work that has been done upon it, we do not know the exact factors that control this rate of sedimentation. Four volumes of blood are mixed with one volume of 3·8 per cent. sodium citrate and the rate of sinking of the red cells in this dilution is normally slow. I will not describe the exact details of the test, the results of which are recorded either in terms of the time taken for the cells to reach a given height in a standard tube (Westergren-Fahraeus) or of the height reached at a given interval of time (Linzenmeier).

In organic disease, especially where any form of tissue destruction is occurring, the rate of sedimentation is considerably increased. It has now been completely demonstrated that in a given case rapid sinking of the red cells above the normal rate excludes the diagnosis of a purely functional disorder.* A normal rate is unfortunately by no means such certain evidence of the *absence* of organic disease. In suspected gastric neurosis or other functional disorders, therefore, a normal sedimentation rate is confirmatory only of the diagnosis, whilst on the other hand a rapid sedimentation must make us immediately turn to an organic cause for the symptoms concerned. In this somewhat limited field of usefulness this simple and inexpensive test has, I think, a definite value. The details may be found in any recent text-book.

SYPHILIS OF THE LUNG WITH PULMONARY ARTERITIS (AYERZA'S DISEASE).

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MORE than a hundred years ago Laënnec described dilatation of the pulmonary artery in chronic affections of the lungs.[1] Andral, in 1829,[2] stated that most of the lesions which occur in the aorta are also to be found in the pulmonary artery, but much more rarely. Huchard, in 1893,[3] drew up a table of arteries showing their liability to atheroma. He quoted similar tables by Rokitansky and Lobstein confirming his conclusion that the pulmonary artery is, of all the large arteries in the body, one of the least liable to atheroma. Romberg, in 1891,[4] recorded a case of a man aged 24, in which there was extensive sclerosis throughout the pulmonary artery and its branches and hypertrophy of the right ventricle without apparent cause. Dyspnœa and cyanosis of the skin and mucous membranes were prominent symptoms for many months before death.

Sansom, in 1896,[5] working at the London Hospital, summarised the subject. He concluded that acute and subacute pulmonic endarteritis are mostly due to the extension of septic endocarditis, but that the inflammation may be due to syphilis. In discussing chronic, endarteritis and atheroma of the pulmonary artery he mentioned congenital defects, mitral stenosis, and obstructive diseases of the lung as important ætiological factors.

In 1901, Abel Ayerza, professor of medicine in the National University of Buenos Aires, drew attention in an unpublished clinical lecture to the morbid entity of "cardiacos negros," a syndrome which Escudero[6] claims to have shown in 1905 to be associated with generalised sclerosis of the pulmonary artery and hypertrophy of the right ventricle. Though these two workers had so far only confirmed Romberg's observations we find the term Ayerza's disease, which was used for the first time by Marty in 1909,[7] creeping into general use. Leonard Rogers, in 1909,[8] writing on nine Bengalis suffering from primary atheroma of the pulmonary artery accompanied by extreme right heart hypertrophy but without valvular lesions, concluded that the extensive atheroma of the whole of the pulmonary arteries was syphilitic in origin. The symptoms from which his patients suffered were palpitations, dyspnœa, and dropsy; he did not stress cyanosis. Escudero, however, in 1911,[6] revised his opinion of the pathological basis of "cardiacos negros" in that he now associated the sclerosis of the pulmonary artery with bronchial syphilis.

Advances in the diagnosis of lesions of the pulmonary artery were made by Posselt in 1908[9] who emphasised the importance of radiological and electrocardiographic findings.

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* A rapid sedimentation is normal during the early months of pregnancy.

Arrillaga,[10] in 1913, in a monograph, the English translation of which was kindly lent to me by Dr. Geoffrey Evans, gave a detailed account of "cardiacos negros." His main conclusions were as follows:—

1. The ætiological factors of "cardiacos negros" are chronic pulmonary disease processes, asthma, chronic bronchitis, tuberculosis, and pleural adhesions—in short, all disturbances which have as their final result a state of pulmonary emphysema.

2. These processes evoke, in a pulmonary artery, rendered sensitive by slow infections such as syphilis, paludism, &c., or by intoxications, a sclerotic process which causes a physiological stenosis of the arterial tract which the blood *follows on its way to oxygenation.*

3. This sclerosis of the pulmonary artery can not only be demonstrated microscopically and histologically in the specimens obtained from these patients, but may also be recognised clinically in hæmoptysis, cyanosis, dyspnœa, and hypercyanotic angina, from which these patients suffer.

4. The right heart undergoes an enormous hypertrophy involving both the auricle and the ventricle which are forced to struggle against the obstacle in the peripheral circulation.

5. This hypertrophy, as well as the dilatation of the pulmonary artery in its early stages, can be clearly seen by radioscopy and radiophotography.

6. The principal symptoms of this entity are: cyanosis, polycythæmia, dyspnœa, cough with mucous or mucopurulent expectoration, cephalalgia, hypercyanotic angina, hæmoptysis, vertigo, an overpowering desire for sleep, &c.

7. *The pulmonary stage is a very long one; after about* 20 years as a pulmonary complaint it comes to the notice of the clinician in its cardiac phase.

8. The course of the "cardiacos negros" stage is also long and varies from two to five years.

9. Some of the patients may end as "cardiacos negros" and after showing the right gallop rhythm die in their sleep, without having suffered from a trace of œdema. Others, in whom degeneration of the cardiac fibre had taken place, early succumb to ordinary asystole caused by failure of the right heart and die in a state of advanced anasarca. Finally, some die of complications, of which the commonest is broncho-pneumonia.

In subsequent writings, Arrillaga [11] [12] insists more positively that syphilis is the essential ætiological factor in the evolution of the "cardiacos negros" and that chronic cardiopulmonary diseases play only a subsidiary part.

Of recent years there have been many contributions, American and European, to the literature of sclerosis of the pulmonary artery. Warthin, in 1917,[13] demonstrated for the first time the *Spironema pallidum* in the wall of the pulmonary artery in a case of syphilitic arteritis and aneurysm of this vessel. Four years later Elizaldo confirmed this finding in one of Arrillaga's patients[14] who had a history of syphilis and a positive Wassermann reaction. M. Giroux, in 1910,[15] and Marcel Thomas, in 1927,[16] contributed detailed theses on lesions of the pulmonary artery. Cheney,[17] in the same year, reported two cases of Ayerza's disease, and concluded that the term should be restricted to cases of sclerosis of the pulmonary artery and hypertrophy of the right heart due to syphilis. Clarke, Coombs, Hadfield, and Todd [21] recently published details of five cases of congenital and acquired lesions of the pulmonary artery which had come to autopsy.

"Primary" Sclerosis of the Pulmonary Artery.

Though many authors have published cases of so-called primary sclerosis (non-syphilitic) of the pulmonary artery the existence of such an entity is in doubt.

Prof. H. M. Turnbull in his early[18] and later work upon the arteries has found thickening of the pulmonary arteries to be almost entirely intimal. The intimal thickenings are composed either of layers of muscle and elastic fibres, which have usually undergone a greater or less degeneration, or of granulation tissue, the endarteritis fibrosa of Jores.

In the formation of the layers of muscle and elastic fibres the elastic stripe separates from the elastic lamella and proliferates. Layers of muscle and elastic fibres of similar structure are normally developed in a similar manner during early years in the aorta and its large elastic branches. An increase in magnitude of the intimal layers of muscle and elastic fibres in these arteries and their development in other arteries can only be regarded as a hypertrophy. Hypertrophied intima is prone to degeneration, particularly in older subjects. Slight intimal hypertrophy is found in the pulmonary arteries of the elderly, and is doubtless due to medial degeneration; one or two minute flecks of atheroma can usually be detected on careful examination with the naked eye, and more extensive focal degeneration of the intima is found under the microscope. Greater degrees of intimal hypertrophy, with greater degeneration, are found in mitral stenosis and all other *conditions causing an obstruction to the circulation* in the lungs.

Far the commonest form of intimal degeneration in the pulmonary arteries is a degeneration that is superimposed upon hypertrophy and is independent of inflammation. From his experience of the aorta, however, Prof. Turnbull has no doubt that intimal degeneration may complicate chronic inflammation of the pulmonary stem and large branches, although he has not personally had an example. When syphilitic aortitis is confined to the adventitia and media, the overlying intima may hypertrophy and then undergo atheromatous degeneration. Usually the aortitis implicates the intima and causes a granulo*matous thickening. When this inflammatory thickening* has become sclerotic it usually becomes impregnated with calcium or undergoes true fatty and calcareous atheroma, just as calcareous impregnation and atheroma tend to affect cardiac valves which have been sclerosed by chronic inflammation. Such degenerations secondary to inflammation may doubtless, therefore, occur on the rare occasions when the pulmonary stem and large branches are affected by syphilitic inflammation. In syphilitic and tuberculous arteritis of the smaller pulmonary arteries, and the small arteries in other organs, he has not seen secondary degeneration.

Such intimal degeneration of the larger pulmonary arteries, although a secondary complication of syphilitic inflammation of these larger arteries, might be called primary, in so far as it is not secondary to obstruction within the lungs. Prof. Turnbull has not had an example of such degeneration of the intima of the pulmonary arteries superimposed upon syphilitic or tuberculous inflammation of the subjacent coats. His cases belong to the group in which there is no underlying inflammation. When, in his experience, there has been degenerative thickening of the intima of the pulmonary arteries, there has always been histological evidence of intimal hypertrophy having preceded the degeneration; when the hypertrophy and degeneration have been great, there has always been an obvious cause of obstruction to the pulmonary circulation. He has therefore found no evidence of a primary, non-inflammatory sclerosis of the pulmonary arteries, except the slight atherosclerosis of elderly subjects.

Definition of Ayerza's Disease.

There can be little doubt that many of the cases referred to by Arrillaga in his thesis[10] on "cardiacos negros" belonged to the already well-known group of chronic cardiopulmonary diseases producing right heart hypertrophy and later failure. Parkinson and Clark-Kennedy's paper on Heart Failure with Normal Rhythm[19] includes a series of such cases. Intimal hypertrophy and degeneration of the pulmonary arteries in such cases were also well known as secondary effects.

The clinical manifestations of such a sequence of events are cyanosis, dyspnœa, hæmoptysis, clubbing of the fingers, and secondary erythrocythæmia. The signs and symptoms of congestive heart failure are usually superadded before death.

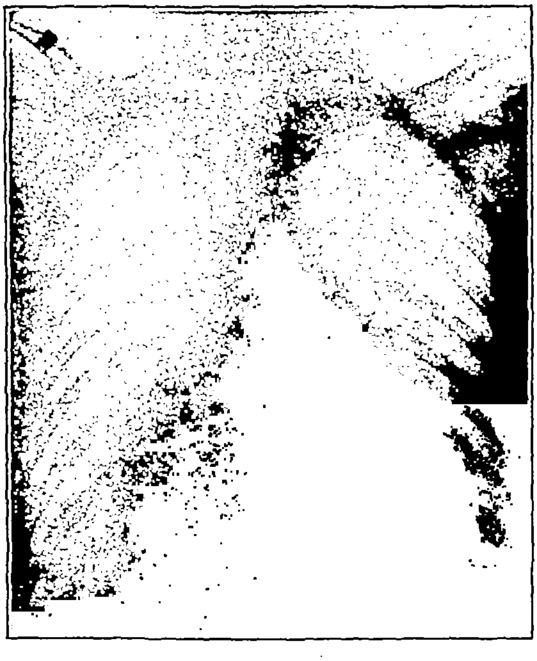
Ayerza has left no written account of his observations, but if we are to accept his pupil Arrillaga's writings as embodying the teaching of his master, Ayerza's claim to a place in medical nosology must be based on his discovery of the "black cardiac" syndrome due to *syphilis* of the lung and pulmonary arteries. The many accurate macroscopic and microscopic descriptions of undoubted syphilitic pulmonary arteritis, confirmed by Warthin and Elizaldo's demonstration of the *Spironema pallidum* in the wall of such arteries, have placed the existence of this entity on a sound footing. Now just as emphysema and non-specific fibrosis of the lungs may, by causing obstruction and hypertension in the lesser circulation, induce intimal hypertrophy and degeneration of the pulmonary artery so also can peribronchial and interstitial pulmonary syphilis induce these changes.

In the case here reported the smaller branches are the seat of obliterating syphilitic arteritis, whereas the pulmonary stem and main branches show the changes due to hypertension—namely, intimal hypertrophy with superimposed atheromatous degeneration.

Clinical Features.

Both sexes are affected about equally, there being 15 men out of 27 cases collected from the literature by Cheney. He says that cases have been recorded in Europe, South America, United States, and India. The patient usually *does not present himself with* typical symptoms until he has reached the age-period 20–50 years. Cough and expectoration may have been present for many years. Gradually dyspnœa, cyanosis, persistent headache, and drowsiness become added to the picture. Orthopnœa is the rule, and hæmoptysis is common. Oppression in the chest, particularly after exertion, may be a prominent symptom. The somnolence often considerably mitigates the patient's sufferings and may be partly responsible for prolonging the life of the patient after extreme cyanosis has developed. Congestive heart failure more frequently than not supervenes before death. The cardiaco negro may die, however, in his sleep without manifesting any of the signs or symptoms of heart failure.

FIG. 1.



Antero-posterior radiogram of chest. The enlarged globular shadow of the heart is seen. On its left border the prominence immediately below the small aortic knuckle is the pulmonary artery which is larger and denser than normal; the mottling in the lower lung-fields is due to fibrosis and congestion.

Though the average case runs a protracted course over many years, others such as ours die within two years of their first symptom.

On examination the temperature is often subnormal; the pulse and respiration-rate may be 100 and 30 respectively. Cyanosis of the head and neck, mucous membranes, conjunctivæ, and periphery of the limbs is a striking feature even *when the* patient is at rest; that of the buccal mucosa often extends to the soft palate and posterior pharyngeal wall. The pulse is regular, and the palpable arteries are not unusually thickened. Clubbing of the fingers is usually seen. The blood pressure is within normal limits. Cardiac and hepatic dullness may be encroached upon by lung resonance; the heart sounds will then be distant. Unless emphysema is too great systolic pulsation in the pulmonary artery can be seen and palpated, and the pulmonary *second* sound is accentuated.

Five to fifteen ounces of muco-purulent sputum may be expectorated daily. The accessory muscles of respiration, particularly the scalenes, hold the barrel-shaped chest in the position of full inspiration. Lung resonance is increased and on auscultation loss of vesicular murmur and prolonged expiration is heard. Rhonchi and crepitations are heard at the bases.

General anasarca and hepatic enlargement depend on whether congestive heart failure has occurred or not. Blood examination shows a red count of between five and ten million, the hæmoglobin being above normal and the colour-index below 1.

Radiological Examination.

1. The heart shadow is much enlarged both to the right and to the left, giving a globular appearance. 2. The enlarged pulmonary artery is seen vigorously pulsating below the aortic knuckle, which seems small by comparison. A half turn of the patient to the left (first oblique position) gives an even better idea of the size of the pulmonary artery, which may even reach aneurysmal proportions.[20] Each pulsation will be seen to follow immediately upon ventricular systole. 3. The shadows of both lung roots are abnormally large and dense and the component arteries may visibly pulsate; shadows radiating from them into the lung parenchyma may be due to vascular engorgement or to fibrosis. 4. Evidences of emphysema may be found, such as horizontal position of the clavicles and ribs, wide intercostal spaces, and low position of the diaphragm with diminished movement. An electrocardiogram will show striking right ventricular predominance.

Differential Diagnosis.

Any disease process leading to pulmonary hypertension may produce symptoms clinically indistinguishable from Ayerza's disease. Chronic disease of the lung and pleura, chronic valvular lesions of the heart, particularly mitral stenosis, congenital morbus cordis, malformations of the pulmonary artery, thoracic deformities should all be excluded before the diagnosis is suggested.

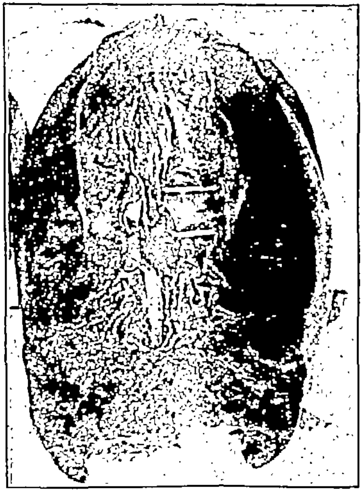
Difficulty may arise in differentiating other causes of cyanosis, especially erythræmia (Vaquez-Osler *disease*). Reliance must be placed on the clinical, radiographic, and electrocardiographic evidence of dilatation and hypertrophy of the right ventricle and pulmonary artery together with evidence of syphilis in those exhibiting Ayerza's syndrome. The spleen is not usually palpable and the blood pressure is normal. Blood counts may be identical in the two conditions.

Enlarged mediastinal glands, thoracic tumours, and aortic aneurysms may, by obstructing the superior vena cava, cause congestion and cyanosis of the head and neck. The limited distribution of the cyanosis, the enlargement of the superficial collateral circulation, and radiographic examination make the diagnosis easy. Mediastinal tumours and aneurysms, however, by pressing on the pulmonary artery may cause difficulty. Congenital morbus cordis, even when unassociated with marked abnormality of the pulmonary artery, may be the cause of extreme cyanosis. It should also be borne in mind that aneurysm of the pulmonary artery may occur as a congenital *abnormality*; Bedford [20] reports an example of this complicated by infective endocarditis.

Treatment.

Prophylaxis and treatment whilst the disease is in its pulmonary stage offer the best chances of success. Once cyanosis has become established little can be done apart from symptomatic treatment. Even if the Wassermann reaction is negative antisyphilitic remedies should be given if there is a positive history or if there are signs of old visceral or cutaneous lesions. In the presence of persistent headache or frequently recurring hæmoptyses venesection should be employed. Oxygen administered by the intranasal method and other measures usual in cardiac failure from other causes may help.

FIG. 2.



Section through the left lung. The larger pulmonary arteries are greatly dilated and have thickened walls. The lower lobe is seen to extend almost as far as the apex of the lung and largely replaces the shrunken fibrotic upper lobe, which has retracted inwards. Inferiorly many dilated and thick-walled bronchioles lie closely packed together; around these a reticular fibrosis is clearly shown.

Illustrative Case.

A.B., a male nurse, aged 45, was admitted to the London Hospital with a history of 18 months' increasing dyspnœa which was worse on exertion. Five months previously he had had two small hæmoptyses, the sputum being only tinged with blood. A month later he noticed that his lips were blue and that his feet became swollen after exercise. Cough was never a prominent symptom.

Past History.—31 years before he had had typhoid fever, and 25 years before he had had ulcers on the soft palate, which left two small perforations.

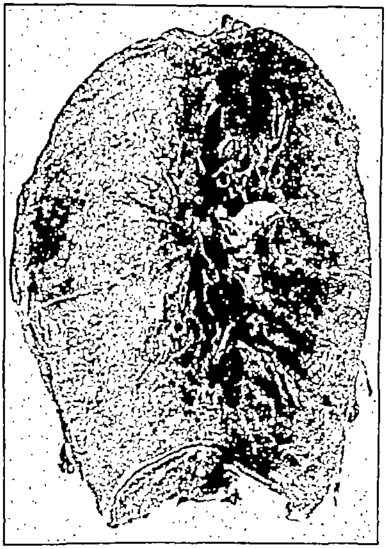
On Examination.—Cyanosis of lips, ears, cheeks, and feet. Orthopnœa present. Considerable œdema of the feet, legs, thighs, and lumbar region. Extensive tattoo marks over trunk and limbs. Moderate clubbing of the fingers, and cyanosis of the nail-beds. Two small perforations of the soft palate slightly to the left of the mid-line and close to the junction of the hard and soft palate. Small white scar on under surface of glans penis.

Circulatory System.—Pulse 100, regular, and of moderate volume. Blood pressure 120–180. Brachial and radial arteries not thickened. Apex-beat not defined, left border of cardiac dullness one inch external to the left nipple line. Heart sounds normal.

Respiratory System.—Sputum, three ounces of mucopurulent sputum daily. Chest held in position of full inspiration. Scalene muscles in action during inspiration. Inspiration everywhere harsh and expiration prolonged. Coarse crepitations at both bases, more numerous on the left side.

Abdomen slightly distended, lower border of liver palpable two fingers-breadth below the costal margin. No tenderness over the liver. Spleen and kidneys not palpable.

FIG. 3.



Section through the right lung. The dilated and thickened larger pulmonary arteries are seen in longitudinal and transverse section. A delicate reticular fibrosis is conspicuous in the greater part of both the upper and lower lobes. In the base larger fibrous trabeculæ and stellate patches of fibrosis are present in addition.

Nervous System.—Pupils equal, react to light and accommodation. Knee-jerks and ankle-jerks equal and active. Bilateral flexor plantar response.

Reports.—Urine free from albumin and sugar. Wassermann reaction *positive* in serum. *Blood-urea*, 0·034 *per cent.* White cell count, 7120. Polymorphonuclear leucocytes, 65 per cent., large hyaline cells 11·5 per cent., small lymphocytes, 20 per cent., large lymphocytes 3·5 per cent. By an oversight the total number of red blood corpuscles and the hæmoglobin value were not estimated.

Radiographic Examination (Dr. George Vilvandré).—Enlargement of the heart to the right and left, the cardiac shadow presenting a globular appearance. Left border of the heart ¾ in. external to the mid-clavicular line. Pulmonary artery unduly prominent, lying below the normal aortic knuckle (Fig. 1). Both lung roots obscured by the large cardiac shadow. General coarse mottling shown by the bases of lungs.

Electrocardiogram.—Right ventricular predominance. A negative "T" in leads II. and III. due possibly to digitalis.

Course.—Digitalis was given without benefit until coupling took place, a polygram showing alternate ventricular premature beats. Despite the administration also of diuretin, iodides, and mercury the œdema increased, and the amount of urine decreased from 60 to 8 ounces per diem. The pulse continued regular except for the above-mentioned digitalis coupling, and varied between 56 and 110 until just before death when it rose to 120. The patient died four weeks after admission, the temperature remaining between 96 and 97° F. during the whole period.

This patient, admitted with cyanosis, severe though by no means black, with congestive heart failure, with œdema, yet with normal heart sounds, was at first regarded as a case of heart failure with normal rhythm, probably due to syphilis affecting the orifices of the coronary arteries (Wassermann reaction positive; perforated palate). The X ray appearance showing no aortic enlargement but prominence of the pulmonary artery shed doubt on the preliminary diagnosis and it was not until the necropsy that the exact nature of the underlying lesion was determined.

I am indebted to Dr. John Parkinson for his advice and for permission to publish the notes of this case, and to Dr. D. Evan Bedford for help with the bibliography, and to Prof. Hubert Turnbull for his remarks upon degeneration of the pulmonary arteries, and for his report upon the necropsy.

REPORT UPON PATHOLOGICAL FINDINGS.

BY HUBERT M. TURNBULL.

Summary of necropsy (P.M. 446. 1928).—Failure of hypertrophied right heart. Syphilitic interstitial fibrosis of lungs and extensive endarteritis of pulmonary arteries.

Anthracosis and plasma-cell infiltration of bronchial glands. Conspicuous patchy atheroma of hypertrophied intima of pulmonary stem and of branches not affected by arteritis. Lumen of pulmonary stem, 8·5 cm. in circumference; wall, 0·1 cm. thick; lumen of ascending aorta, 7·5 cm. in circumference. Slight atheroma of arteries of greater circulation. Great hypertrophy and dilatation of right ventricle and auricle; slight atrophy of left ventricle. Foramen ovale closed. Milk spots on anterior surface of right ventricle and posterior surface of right auricle. Congestion and confluent central back-pressure atrophy of liver. Back-pressure spleen and kidneys. Great congestion of stomach; area (2·2 by 1·5 cm.) of purulent streptococcal inflammation and necrosis of centre of posterior wall of body of stomach. Area (2·5 by 1·1 by 1·3 cm.) of purulent hæmorrhagic inflammation and fat necrosis in subjacent portion of body of pancreas. Great submucous œdema of cæcum and ascending colon; œdema of bone marrow; general anasarca, greatest in feet, legs, and back; ascites (907·2 c.cm.). A few patches of fatty hæmatogenous marrow in upper half of shaft of femur. Perforation (0·4 by 0·15 cm.), with healed and scarred margins, through anterior extremity of soft palate. Great fibrosis of faucial tonsils. Considerable syphilitic fibrosis of bodies of testicles, especially of left. Faint, slightly sunken, white scar on under surface of glans penis. Colloid adenoma (0·6 cm. diam.) in lower pole of left lobe of thyroid. Thymus masked by fat. A few scars (of war wounds) on right buttock. Healed amputation of second toe of right foot. Superficial erosion of skin over buttocks. Wasted man.

Weights: Body, 64·27 kg. (length 1·72 metre); brain, 1318·3 g.; liver, 1234·0 g.; heart, 453·6 g.; kidneys, 368·7 g.; spleen, 212·6 g.; pancreas, 98·7 g.; thyroid, 20 g.; thymus, 14·2 g.; suprarenal bodies, 11·3 g.; pituitary body, 0·6 g.

Macroscopic Appearances.

The thickened parietal and visceral pleuræ were everywhere either completely fused or bound together by a net of fibrous sheets and trabeculæ. In places they could be torn apart so as to expose a visceral layer which was milky-white and either quite opaque or sufficiently translucent to show a background of dark slate. Cut surfaces of the lungs, except in the upper half of the posterior part of the left lower lobe and in the apex of the right lower lobe, had to the naked eye a conspicuously spongy appearance. A net of pearly fibrous tissue enclosed spaces, of which the larger were obviously dilated bronchioles and the smaller dilated vesicles. The fibrous septa of this sponge varied considerably in thickness in different places. Even the most delicate were clearly visible to the naked eye. Those bounding bronchioles were stouter than those bounding adjacent vesicles. Comparison of different areas showed that in general the stouter the septa were the larger were the pores. The sponge was traversed and interrupted by pearly branching trabeculæ about one millimetre broad and by pearly stellate patches about one centimetre in diameter. Some of these trabeculæ and patches could be seen to surround bronchi and large bronchioles; any bronchus or bronchiole which happened to be cut transversely in the centre of a patch was seen to be conspicuously dilated. Even in the areas mentioned above as not being spongy to the naked eye a delicate reticular fibrosis and a spongy structure were seen with a hand lens. The fibrosis was especially great throughout the left upper lobe, which was so shrunken that the lower lobe formed the apex of the left lung. It was also very great in the anterior part of both the upper and middle lobes of the right lung; here it enclosed many bronchi, which were considerably dilated and packed close to one another. In general it was greatest in the anterior and lower portions of the lobes, and there was no appearance of radiation from the hilum. The more fibrotic areas were distinctly more anthracotic than the less, and the shrunken left upper lobe was deeply anthracotic. The areas which were not spongy to the naked eye were of a rusty tinge. Very few small branches of the pulmonary artery could be recognised; most of these were unusually thick but otherwise of normal appearance, a few could be identified as solid cords of pearly-grey fibrous tissue. The larger pulmonary branches projected, and had conspicuously thick walls. When slit open their intima showed numerous opaque yellowish-white flecks and small buttons of atheroma. In the distal portion of the pulmonary stem were a few faint yellow flecks.

The necropsy was performed by Dr. W. W. Woods.

*Microscopic Examination.**

The visceral and parietal *pleuræ* are both greatly thickened by a dense collagenous fibrous tissue, and are intermittently fused. *The upper part of the lower lobe of the left lung* shows no abnormalities except emphysema, and engorgement of the larger capillaries and venules. All the other portions *of the lung show a great thickening by dense fibrous tissue* of the septa and of the adventitia common to the bronchi or bronchioles and their pulmonary artery. The dense fibrosis extends from the broncho-pulmonary adventitia along the adjacent walls of the alveolar passages and infundibula. Near the bronchi or bronchioles the air cavities have been completely replaced by fibrous tissue or are represented by a few small widely separated cavities. Further out the fibrotic thickening of the walls of the alveolar passages and infundibula diminishes progressively, but it is completely absent in only a very few areas. Such areas appear as islands in the fibrotic tissue. The alveoli with fibrotic walls are lined with a continuous row of oval or cubical cells. Where the fibrosis is greatest and has led to reduction in the size of the alveoli many of the alveoli contain round, desquamated epithelial cells.

The fibrotic tissue in the pleuræ and lung consists of stout collagen fibres and contains few fibrocytes; it shows patchy infiltration with lymphocytes, plasma cells, and a few eosinophil leucocytes.

The bronchioles are dilated. In the anterior part of the upper lobe of the right lung and the lower posterior part of the upper lobe of the left lung they are greatly dilated and are filled with mucus, which contains a variable number of desquamated epithelial cells and an occasional neutrophil leucocyte. Except where the air cavities have been almost completely obliterated by the interstitial fibrosis the respiratory bronchioles, alveolar passages and alveoli are conspicuously dilated; this dilatation is greater in the fibrotic areas than in the islands in which fibrosis is absent.

The number of capillaries is obviously reduced in the fibrotic alveolar walls, and is reduced in proportion to the amount of fibrosis. All capillaries throughout the fibrotic portions of the lung are greatly engorged but the engorgement is most striking in the included islands of lung tissue which are free from fibrosis. Here the walls of the alveoli are greatly widened and are moniliform in outline owing to the great distension of their engorged capillaries. There is much hæmorrhage into alveoli, and there are many small and a few large hæmorrhages into the interstitial tissue. The muscular tissue of the fibrotic portions of the lung is greatly hypertrophied. There is slight anthracosis in the site of lymphatics. Nowhere is there any infiltration with neutrophil leucocytes or any acute bronchitis or pneumonia.

In the *right main bronchus* many of the columnar epithelial cells are distended by mucus, there is a patchy infiltration of the mucosa with lymphocytes, plasma cells, and an occasional neutrophil or eosinophil leucocyte, and the mucous glands are infiltrated with plasma cells and lymphocytes.

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* Portions were taken from the posterior border of the lower lobe and from near the anterior border of the upper lobe of the right lung; from the lower part of the posterior border of the upper lobe, including the adjacent part of the lower lobe, and from near the anterior border of the upper lobe of the left lung; from the right main bronchus, including a lymphatic gland; from the pulmonary stem; the right pulmonary artery; the left testicle; the body of the stomach; and the pancreas. After fixation in 4 per cent. saline formaldehyde they were embedded in paraffin; sections were stained with Ehrlich's hæmatoxylin and eosine, Weigert's iron hæmatoxylin, and van Gieson's mixture, Weigert's fuchselin and neutral red and, in some cases, Gram's stain and neutral red. Other portions were put through the Levaditi process for the demonstration of spirochætes, with a piece of congenitally syphilitic liver as control.

Few parabronchial *intrapulmonary pulmonary arteries* happen to be included in the sections. One such artery is occluded by endarteritis fibrosa; the others show considerable musculo-elastic hypertrophy of their intima. Some of the primary branches of these arteries and numerous pulmonary arteries of medium and small size are occluded by endarteritis fibrosa. The occluded lumen in some cases is narrowed, the media being crenated. The occluding tissue is sometimes composed of a reticulum of delicate collagenous fibrils and a few large spindle fibrocytes. It is sometimes sparsely infiltrated with lymphocytes and plasma cells. Usually it consists of very stout collagenous fibres and very few fibrocytes. It usually then contains delicate elastic fibrils. It is almost always canalised, and the canalising vessels usually comprise veins and capillaries as well as an artery. Sometimes, as in the case of the artery accompanying a bronchus, a large artery occupies almost the whole of the lumen of the old artery, being separated from the old media by a narrow zone of fibrous tissue containing capillaries. The canalising veins and arteries have muscular walls. Elastic fibrils are usually present in their walls; the fibrils are delicate and vary in number, but in many arteries they are as abundant as in a typical pulmonary artery. Most of the pulmonary arteries that are free from endarteritis fibrosa, especially the larger, show musculo-elastic hypertrophy of the intima. Secondary degeneration can sometimes be recognised by replacement of some of the muscle fibres by foam cells.

The *bronchial and pleural arteries* are free from endarteritis but usually show intimal hypertrophy. The pleuræ contain many wide veins. If *pulmonary veins* in the septa and pleura have been destroyed by endophlebitis their destruction has been complete, because there is now no recognisable remnant of their walls.

The intima of the *right pulmonary artery* is hypertrophied over four-fifths of the circumference, and is in places twice as thick as the media. Secondary degeneration is indicated by replacement of muscle fibres by many groups of cells which appear to be distended with fat, but paraffin sections are alone available.

The intima of the *pulmonary stem* is hypertrophied throughout the section, and in thickness has a ratio to the media which varies from 1 : 6 to 1 : 1·34. The hypertrophy is formed almost exclusively by the longitudinal musculo-elastic layer of Thoma. Many muscle fibres are replaced by foam cells.

The right *hilar lymphatic gland* is extremely engorged and the sinuses are filled with blood. There are numerous plasma cells in the lymphadenoid tissue.

In the left *testicle* there are large confluent areas of fibrosis. In these areas the tubules are obliterated by a great hyaline thickening of the fibrous layer internal to the elastic membrane, and the obliterated tubules are widely separated by dense fibrous tissue. In the centres of some areas the elastic membrane has been partially or completely destroyed. There is a slight infiltration with lymphocytes, plasma cells, and eosinophil leucocytes, particularly in the periphery of the fibrous areas. The large arteries show intimal hypertrophy; the lumina of many of the smaller arteries and veins are partially occluded by endarteritis fibrosa.

The *body of the stomach* is greatly engorged. In one section there is no other abnormality except an infiltration of the mucosa with plasma cells, which is usually confined to a narrow zone at the surface. In the section including the hæmorrhagic area there is in the submucosa a large area of œdema, dense infiltration with neutrophil leucocytes, and hæmorrhage; the walls of many veins are infiltrated and necrosed. The hæmorrhage and infiltration extend into the circular layer of the muscularis. The mucosa over the area is necrosed and at one spot its deeper layers are packed with neutrophil leucocytes. In the necrosed mucosa there are masses of Gram-positive cocci and bacilli; in the submucosa there are numerous Gram-positive cocci, diplococci, and streptococci in short chains, but only a few bacilli; some of the cocci lie within veins.

The *pancreas* shows a purulent pancreatitis with lipolysis, proteolysis, and hæmorrhage. There is infiltration and necrosis of the walls of some veins. The adipose tissue beneath the peritoneum of the lesser sac is densely infiltrated with neutrophil leucocytes. The duct of Wirsung is surrounded by infiltration and contains concretions and a few neutrophil leucocytes. A few Gram-positive diplococci were found on careful search.

Levaditi preparations.—In the sections so far examined no spironemata have been found; spironemata pallida are abundant in the control sections of syphilitic liver.

Remarks.

The necropsy showed that the essential cause of death was failure of the hypertrophied right heart. That the heart failure had been present for some time was shown by the severe "back-pressure" atrophy of the liver. The purulent streptococcal inflammation of the stomach and pancreas was obviously a subsidiary terminal event. As regards the cause of this terminal infection, the condition of the spleen appears to exclude pyæmia; the most likely explanation is a focal infection of the mucosa of the greatly engorged stomach and an infection of the subjacent pancreas by direct spread; the juxtaposition of the inflammation in the stomach and pancreas brings strong evidence in favour of this view.

The hypertrophy of the right heart, the failure of the heart, and the cyanosis observed during life are adequately explained by the condition in the lungs. First, there was a great loss of alveolar surface. Many alveoli had been completely destroyed by the interstitial fibrosis. Where the fibrosis was less the alveoli were greatly distended. The distension of these alveoli and the bronchiectasis were doubtless due to retraction of the peribronchial and peribronchiolitic fibrotic tissue. Such alveoli as were not fibrotic were distended to a less degree, those which lay as small islands in the fibrotic portions of lung being more distended than those which were not in close relation to fibrosis (the section of the upper part of the lower lobe of the left lung); but the lung in the latter position showed typical vesicular emphysema. Secondly, there was a great loss of capillaries in the walls of the fibrotic alveoli. Finally, most of the pulmonary arteries of medium and small size, and some of the large, parabronchial, were occluded by canalised endarteritis obliterans. These changes could not fail to cause great obstruction to the lesser circulation. Direct evidence of the obstruction caused by the reduction of the capillary area was shown by the intense engorgement of the remaining capillaries and by the intra-alveolar and interstitial hæmorrhages.

The inflammation in the lung had been of long duration. This was shown by the stoutness of the collagen fibres and the paucity of fibrocytes in the fibrotic pleura and pulmonary interstitial tissue, by the presence of elastic fibrils in the inflammatory tissue occluding the arteries, and by the formation of vessels with muscular and elastic coats within this tissue. But the inflammation was still active: patches of infiltration with lymphocytes, plasma cells, and eosinophil leucocytes lie in the pleura and in the interstitial tissue of the lung; the lumen of some pulmonary arteries is occupied by young granulation tissue.

Although no *S. pallida* have yet been found there can be no doubt in view of the histology that the inflammation of the lung, pleura, and pulmonary arteries was, like the inflammation of the testicles, syphilitic. If confirmation were required it can be found in the positive Wassermann reaction, the perforation of the palate, the fibrosis of the tonsils, and the scar on the penis, which at least suggests venereal infection. The syphilitic inflammation of the lung is entirely interstitial; there is no trace in the sections of bronchiolitis obliterans or of intra-alveolar organisation. Further, there is no evidence of its having spread fan-wise from the hilum into the lung.

In most of the pulmonary arteries in the lung that were free from inflammatory endarteritis, in the right primary branch of the pulmonary stem, and in the pulmonary stem itself there was intimal hypertrophy; and the hypertrophied intima was the seat of considerable atheroma. Such intimal hypertrophy and secondary degeneration occur in all cases of obstruction to the flow of blood in the lesser circulation, for instance in mitral stenosis; and they have been in my experience proportional to the *estimated* degree of obstruction.

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THE RESISTANCE TO MALIGNANT GROWTH.

BY TREVOR HEATON, D.M. OXF.,
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IN the following paper a brief résumé is given of the results of seven years' work, of which a full account has been already published elsewhere.[1]

The experiments were prompted in the first instance by a doubt whether the cancer cell differs in any essential respect from cells of the normal body. The extreme diversity of cancer, it seemed, is difficult to reconcile with the idea of a specific nature or common causation; and the gradation of its different types from innocent tumours to malignant disease of the most virulent kind points to a perfectly regular descent from one to the other. The histological classification of tumours is notoriously artificial: their propensity when malignant to invade adjacent tissues, to form metastases, or to survive transplantation may be very pronounced and quite distinct as a general rule, but on the other hand is sometimes only feebly developed or even altogether absent; it is scarcely possible to look upon any of these properties singly as absolutely characteristic or fundamental, and the combination of them all is probably rather exceptional. The boundaries between tumour tissue and normal cells are almost as indefinite as those between one tumour and another: three well-known illustrations of this are the dermoid cyst, an evident anomaly of development; the chorion, passing occasionally into chorion-epithelioma; and embryomata, or the tumours which arise from the introduction of embryonic fragments into the tissues of an adult host. The course of evolution rarely leaves behind it so complete a chain of "missing links" between the various products of its operations. Finally, the application of a series of tar products of varying potency may induce hyperplasia, or papilloma, or cancer, or all of these in succession; and the cancer when it develops may or may not prove to be transplantable.

The growth of cancer was for these reasons regarded as of fundamentally the same nature as growth of any other kind, however magnified and distorted and nearly unrecognisable the growth-picture may become. In this connexion the word "growth" is itself ambiguous; for the growth of a tissue must be differentiated from the growth, or condition of multiplication, of its constituent cells. The growth of a cell-population is not merely a question of birth-rate; it is a preponderance of births over deaths. In the normal adult body there is, as a rule, no such preponderance, and therefore no growth; but this is not because there is no cell-multiplication, but because there is an equally high cell-mortality. Even in old age the cells of many tissues continue to multiply rapidly; and the characteristic feature of a tumour is not that its cells multiply, but that their multiplication leads to uncontrolled growth. In the genesis of cancer, therefore, it seemed to be idle to consider only the cancer cell; and necessary first to ascertain the normal method of growth control. For if the transitional stages in tumour malignancy reflect different degrees of failure in the control process, they indicate also that the method of control is seldom if ever completely ineffective. Moreover, if the process of physiological control were understood, it might also be reinforced; and the prevention or even the arrest of malignant disease might in fact be accomplished, not by pharmacological methods in the narrow sense, nor by the methods of bacteriological immunisation, but by the physiological method at work in the normal body for the prevention of excessive growth, of which cancer itself is only an extreme and perverted form.

The Control of Normal Growth.

Leaving aside for the moment, therefore, all question of tumours, the conditions first to be reviewed are those which prevail in the normal body.

Tissues which *fail to increase*, though their cells proliferate, must clearly be subject to some form of restraint, and the process has been described as "tissue tension." It is a description, not an explanation, and implies only that tissues in contact with one another maintain a certain equilibrium, in spite of tendencies to expand which any of them may display. But the manner of this resistance to expansion would not seem to be in doubt, though the blood-cells and blood-forming organs are obviously exceptional, and require control of an exceptional kind. Apart from these, any tissue whose cells are constantly multiplying will expand, like other living colonies, to the limit of the available food-supply, and tissue tension must involve the restriction of this supply. The needs of different tissues in this respect no doubt vary greatly, and include nutrition, oxygen, mechanical support, and the removal of waste products; but so long as these services, comprised under the name of "stroma," are stationary, all tissues dependent thereon must be stationary also. It is therefore striking that most of the tissues whose cells continue to multiply throughout life are epithelia, while the vascular connective tissues are normally static and passive. If growth never occurred the process of tissue tension might be thought to consist simply in this passivity, imposing a limit on epithelial proliferation and differing in various *localities* only in the pattern of the various supporting and proliferative tissues.

Actually growth is always taking place; almost every organ is capable of hypertrophy and of renewal of activity for the repair of injury. In the skin, for example, the multiplication of epidermal cells is normally limited to the replacement of wear and tear, any increase being prevented by the unyielding character of the underlying stroma; but sometimes true growth occurs, as when hairs are developed at puberty or, as in many animals, with the recurrence of the seasons. In such cases the hair follicles increase in size, in response to the stimulus of a hormone; and this involves growth not only in the specific epithelium, but also in the connective tissue which supports it. The hormone acts directly upon the epithelium, but this in turn induces a reactive increase of stroma. The passivity of stroma, therefore, is only relative; it is overcome whenever the growth tendency of the epithelium receives *additional* impetus. Similar reactivation of static connective tissue is seen on a large scale in the process of granulation, and in both cases passivity is resumed as soon as the special conditions cease to exist.

An accurate balance, therefore, preserves the passive status of connective tissue stroma, and on this equilibrium tissue tension would seem to depend. The stimulus of epithelial activity tends constantly to upset the equilibrium, but is only in special circum-

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stances sufficient to do so. There must be some agency to counteract it; it cannot be counteracted merely by the inherent inertia of connective tissue. For connective tissue has, in fact, no such inherent inertia at all; when cultured in vitro its cells continue to proliferate indefinitely, and indeed with greater robustness than any other type of cell. The influence which antagonises the stimulant action of epithelia is therefore external; and on the analogy of the numerous growth-promoting factors which are known, both hormones and vitamins, is likely to have a chemical character. It is likely, in fact, to be a hormone or a vitamin itself, the equilibrium of tissue tension being of the common physiological type, between this factor which tends to arrest growth and antagonistic factors tending to promote it; now one predominates, now the other. Furthermore, the growth-promoting influences are multiple, for the epithelia upon which they act are very diverse; but the inhibiting influence which acts upon a single tissue, the stroma, is not unlikely to be single.

A Growth-inhibiting Factor.

Various organs were therefore tested in the hope of obtaining an extract with the property of stabilising connective tissue. The method employed was that of tissue culture, the extracts being added to a nutrient medium in which connective tissue cells (fibroblasts) were implanted; implants of epithelia (from the intestine) were made at the same time as a control, to ensure the general fitness of the medium for cell growth. Nor was the search long or difficult. The extracts were made in 75 per cent. alcohol, evaporated down, taken up in water and sterilised, being freed thereby from proteins and growth-promoting factors which all tissues, of course, contain; and the action in question was shown by all the tissues examined in approximately the same degree, extracts of the liver being perhaps rather more active than those of other organs. In the plain medium, that is to say, fibroblasts and epithelial cells grew equally well; but the addition of extract of any tissue prevented the growth of the fibroblasts without interfering with that of epithelia.

The widespread distribution in tissues of a substance which inhibits growth was not unexpected; but it seemed to point to derivation from the diet rather than to a synthetic origin in the body, and yeast, among other foodstuffs, was tested for its presence. Brewers' yeast was found to contain it, but not bakers' yeast, and a likely source was thus indicated in malt, upon which brewers' yeast is grown. After long use of an extract obtained from yeast, malt was accordingly substituted, and seemed to be preferable, yielding very readily a crude but active extract of fairly constant composition.

Effect on Normal Growth.

An extract being now available with the desired action upon connective tissue cells in vitro, the next step was to apply it in vivo. The suggestion was that this substance inhibits the proliferation of fibroblasts in the body and determines, by its eventual predominance, the cessation of the growth period. If this were so, it seemed that by administration of the extract to young animals the growth-promoting factors might be prematurely counteracted and normal growth cut short. It was administered by addition to the water in the case of aquatic animals, and by intraperitoneal injection to mammals. The effect was noted on the metamorphosis of tadpoles, on the regeneration of amputated parts in newts, on the growth of young rats, guinea-pigs, and rabbits, and on the course of pregnancy in guinea-pigs. The result in every case was the same: with small doses growth was delayed, with larger doses it was completely and immediately arrested; and when the treatment was omitted growth was resumed.

Objection might be made that the effect of injecting a crude extract would be gross poisoning, and arrest of growth from mere interference with appetite and general well-being. Indeed the objection would not be unreasonable, for the doses given were but little less than lethal. It was noticed, however, that the younger the animals the less easily were they affected. The relative dose for a small rat or guinea-pig was three times as large as that required for a half-grown animal; and a curve was obtained in the case of guinea-pigs showing a definite inverse ratio between body-weight and the dose per kilo necessary to arrest growth. So marked a discrepancy, it seemed, would scarcely be consistent with a merely toxic effect; but was only to be expected if the action were specifically upon the growth process, for the energy of growth is at its greatest in young animals. Furthermore, the dose necessary to arrest growth was found to be considerably larger than was sufficient to prevent its resumption, and the dose necessary to arrest the course of pregnancy considerably larger than would be tolerated by non-pregnant animals.

Effect upon Tumours.

The normal function of this factor, it is suggested, consists in preserving the balance of physiological growth, and as such may have some general physiological interest in relation to problems of growth and diet. But its effect when given in excess would seem to be applicable also to the case of growing tumours. For as seasonal or other normal growth is induced by hormones, the growth of tumours is induced by epithelial stimulation in other ways, as by certain irritants; and the effect in either case is to overcome the resistance to expansion of the underlying stroma. If by giving the inhibiting extract in excess this resistance can be raised sufficiently to prevent physiological growth, there would seem to be no reason why the growth of tumours whose demand for stroma is precisely the same should not be resisted in the same way.

Whether the inhibiting extract will be found in fact to have any prophylactic or curative value as applied to human cancer has yet to be determined, and experiments to that end are in progress. Hitherto trial has been made only with transplantable tumours in rats—namely, the Jensen rat sarcoma, and, in a few cases, the rat carcinoma No. 9—and the extract has necessarily been given by intraperitoneal injection. The results were striking enough, tumour growth in several hundred animals being brought very rapidly to a standstill; but the necessary dose was large, since only young rats were used, and after the growth of their tumours had been arrested the animals usually died. The difficulty was thought to be only technical, for in a number of rats which could be induced to take the extract by the mouth complete retrogression of the tumours was obtained. The following facts, moreover, seemed to be of importance: (1) the appearance of the tumours after arrest of growth was one of intense venous congestion, as has been found also after their arrest by radium or the application of heat; (2) whatever the size of the animal the dose necessary to arrest tumour growth was the same as that necessary to arrest its body growth, and in full-grown animals would therefore be comparatively small; (3) an effect on tumours was only obtained with extracts which proved on tissue cultures to exhibit the specific property described, of preventing the growth of fibroblasts.

The Jensen rat sarcoma is no less malignant than the majority of spontaneous tumours; and the experiments therefore suggest that the differences between malignant and normal cells are less important than their fundamental resemblance. A tumour, like any other growing focus, needs a growing vascular environment; it is on this environment that the control of normal growth is exerted, and it is here that resistance may be offered also to the growth of cancer. The inhibiting factor seems to provide a possible agent for making this resistance effective.

Corrigendum.—In Dr. E. Fränkel's article on the Blastogenic Principle in Fowl Sarcoma, THE LANCET, Sept. 14th, p. 539, col. 2, line 50, for "six attempts out of ten" read "out of *twenty-one*."

THE USE OF INSULIN IN THE TREATMENT OF PERNICIOUS ANÆMIA.

By Dr. L. von Varga,

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The importance of liver in the process of blood-regeneration was first pointed out, independently, by Whipple and Robscheit-Robbins, and by Jeney. Whipple and his collaborator were the first to report good results from feeding dogs, made anæmic by repeated bleeding, with fresh liver, while the favourable results of protein-free liver-extract were first published in a Hungarian medical journal by Jeney in a communication from the Jobling Institute for Pathology, Columbia University, where he carried out his researches in 1923–24. The paper[1] by Whipple and Robscheit-Robbins was published in May, 1925, and Jeney's work appeared in the spring of the same year.[2] Minot and Murphy in 1926 introduced their successful liver diet, which has since become famous, for pernicious anæmia, but Whipple and his collaborator adopted liver extracts only in 1927. Jeney's researches, performed in 1923–24, partly in collaboration with Prof. Jobling, were therefore the first in connexion with a protein-free liver extract. Accounts of them were published in America in 1927.[3] [4] I have emphasised these facts because Jeney's right of priority is in question, and his name is not mentioned in the most important papers and works on the subject. Mouzon[5] alone mentions the experiments of Jeney and Jobling with alcoholic liver extract.

Liver and Insulin.

Of the very numerous proposals for treating pernicious anæmia that represented by Minot and Murphy seems to be the most noteworthy. According to these investigators, liver supplies the materials necessary for building up the cytoplasm of the blood corpuscles and at the same time has a stimulating influence on the bone-marrow, acting in so specific a manner that they consider that any anæmia in which a liver diet is ineffective may be excluded from the class of pernicious anæmia. That liver actually contains substances which promote the formation of red blood corpuscles—in the form of building substances or specific stimulants—is proved by the researches of Jeney and Jobling and by Robscheit-Robbins and Whipple's experiments on animals. Jeney's[6] work shows that the substances promoting blood formation are to be sought in the decomposition products of red blood corpuscles developed in the liver.

It is only natural that the treatment of pernicious anæmia should depend on a series of factors, such as the state at which the patient is received for treatment, his individuality, his reactivity, the regenerative power of the bone-marrow, the duration of the malady and the number of relapses, and this fact must not be disregarded. It explains the relative failures frequently obtained alongside favourable results.

During the past two years we have had a strikingly large number of cases of pernicious anæmia in comparison with former years. Since the essential of treatment must lie in assisting the blood-forming organs and in strengthening the whole body, we thought it advisable to employ a remedy intended to combat the [illegible] known loss of appetite in pernicious anæmi[illegible]s purpose tried insulin, which we had [illegible] using in all cases of anorexia. [illegible]hexia of our patients made it [illegible] liver diet at once, but we hoped [illegible] their appetite so that they [illegible] time we had eight patients [illegible]tment and its effects is

Case 1 was treated with insulin alone (60 units daily) and the number of the red blood corpuscles rose within a month from 770,000 to nearly four millions, the appetite being meanwhile excellent, while the hæmoglobin content also assumed more normal figures. Cases 2, 3, and 4, which were placed on insulin and arsenic treatment, showed results in no way better than Case 1. The rise in the blood count was somewhat gradual, the hæmoglobin values showing rather greater improvement. Case 5 is interesting. During the first 24 days of treatment the patient received 30 units of insulin daily and 1 c.cm. of strychnotonin (a preparation containing arsenic). During this period the red blood cells rose from 850,000 to 1,400,000, and the hæmoglobin percentage from 22 to 28. The patient was then put on a diet including 100 g. of cooked calf's liver daily, with the result shown in the table. Case 6 received 60 units of insulin daily from the first to the 37th day, and 2·5 g. of Richter's perhepar (a liver extract) from the 10th to the 50th day. During the first ten days, with insulin alone, there was no increase in the blood count and hæmoglobin values, though the general condition and appetite were excellent. When liver treatment was started they immediately began to rise, and after a month the patient was discharged in very good health. Case 7 at first responded well to insulin and arsenic treatment, but after a month's progress the red cells and hæmoglobin became stationary. From the 80th day onwards the insulin was stopped and the patient was given 100 g. of Schottmüller's hepatopson daily. It was very striking to note that the number of the red corpuscles increased by 1·5 million during the ensuing 20 days, while the hæmoglobin value declined. In Case 8, owing to the grave condition of the patient, both insulin and liver extract were given from the beginning (insulin 50 units and a spoonful of hepatopson). Both forms of treatment were discontinued within 42 days, but in two months the number of the red corpuscles rose to over five million, although the patient was in a dying state when admitted.

No.	Age in years.	Period of treatment.	Values at the beginning and at the end of treatment.			Daily increase.	
			Hb %.	Blood count in millions.	Colour-index.	Hb.	Blood count.
1	36	Feb. 10 to Mar. 17.	15–60	0·77–3·8	1·0 –0·78	1·2	84,400
2	30	Apl. 20 to May 26	28–78	1·14–2·9	1·11–1·21	1·4	45,000
3	55	Feb. 6 to Mar. 17.	35–70	1·4 –3·2	1·13–0·98	0·87	45,000
4	55	Mar. 27 to June 5.	48–70	1·36–2·56	1·55–1·23	0·3	16,901
5	41	July 27 to Oct. 1.	22–65	0·85–1·5	1·23–0·65	0·59	50,695
6	66	Apl. 16 to June 5.	36–82	1·8 –3·9	1·00–1·05	0·92	42,000
7	36	Dec. 1 to Mar. 13.	37–80	1·8 –4·9	0·70–0·80	0·6	41,346
8	36	Jan. 6 to Mar. 21.	21–75	0·73–4·4	1·02–0·70	0·71	45,655

Treatment.—(1) 2100 units insulin; (2) 540 units insulin and strychnotonin; (3) 3000 units insulin, and arsenic; (4) 2200 units insulin, and natrarsen; (5) 690 units insulin, 4600 g. liver; (6) 2220 units insulin, 100 g. perhepar; (7) 4050 units insulin, 2100 g. hepatopson; (8) 1950 units insulin and 3000 g. hepatopson.

The subjective condition improves in a very short time in response to insulin by itself, as well as to the insulin-liver and insulin-arsenic treatments. After taking insulin bulimia sets in, and the vertigo, buzzing in the ears, and general debility disappear; the condition of the patients visibly improves, and the number of red corpuscles and the hæmoglobin content increase (*by 30,000–40,000 and 5·10 per cent. respectively per day*). The headaches disappear last, but these, together with serious anæmia, are correlated

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with the gastro-intestinal disorders, which, as a rule, remain to the end and which are often strongly marked. The constant anorexia can be transformed into bulimia in three or four days by insulin, so that patients want to eat continuously. Return of healthier colour may be looked for on the tenth day; this and the redness of the lips is increasingly pronounced. As the blood count and hæmoglobin values rise there is a fall in the colour-index, and a disappearance of hyperchromatosis, together with a decrease of anisocytosis, megalocytosis, and poikilocytosis, and disappearance of polychromatophilia and normoblastosis. The only symptom which remains to the end, and which it is impossible to influence in any way, is achlorhydria.

I began the insulin treatment with 20–30 units (twice daily), increasing with the improvement in appetite to 40 units, always half an hour before meals. With the use of Richter's insulin there are practically no disagreeable symptoms, such as hyperæmia, œdema, and pains. Large doses, however, entirely destroy the appetite, while there is also the danger of hypoglycæmia. It should be noted that in general the insulin treatment has always an optimal limit. In Case 8 we discontinued the liver diet, mainly because the hepatopson was very trying to the patient, owing to its bulk and unpleasant smell. Later we had recourse to Richter's perhepar, a remedy containing a large quantity of liver substance in quite a small compass (1 g. equivalent to 100 g. of liver), so that the daily dose of 250–300 g. of liver can be administered in the form of a few grammes in wafers without any difficulty. *It is now obtainable also in tablet form.*

Results of Other Workers.

I thought the publication of these results with insulin would not be without interest, if only because Walinski[7] has hitherto been the sole investigator who has reported satisfactory results from a combined insulin and arsenic treatment with blood transfusion, though Weil[8] has also had a certain degree of success with the same combination. He, however, gave only 5–10 units of insulin. Rathery[9] has reported unfavourable results, and Neuburger,[10] who made unsuccessful experiments in 1924, rejects insulin treatment not merely because the patients are apprehensive of its unpleasant effects, but also because he found that in every case there was pronounced deterioration. According to Imchanitzky, the number of red corpuscles decreases with insulin. Lévai[11] also mentions experiments by Jaksch-Wartenhorst, according to which the use of insulin in pernicious anæmia causes a deterioration in the condition. Varga[12] alone reports the case of a man of 70 in which insulin and arsenic treatment gave good results.

When it is considered that many authorities regard the cause of pernicious anæmia as being a displacement of the blood reaction in the direction of acidosis, which facilitates hæmolysis, and that insulin, on the other hand, increases the alkalinity of the blood (Walinski), the soundness of the insulin treatment appears to be further confirmed.

In a case like No. 8 the use of insulin is of vital importance. On his admission the patient was unconscious, the number of red blood corpuscles being 700,000. Every attempt to feed him failed. After an insulin injection, however, he even took hepatopson, although he fell asleep while being fed. On the third day he began to have a keen appetite, his complexion soon became more healthy, and in a fortnight he was able to leave his bed for a few minutes.

Whilst a liver diet must be regarded as the standard remedy for pernicious anæmia, insulin may be looked on as an indispensable auxiliary.

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(*Continued at foot of next column.*)

Clinical and Laboratory Notes.

LOA LOA INFECTIONS.

A CASE WITH RAPID ONSET OF SYMPTOMS.

By N. A. Dyce Sharp, M.R.C.S. Eng.,
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Attention has often been drawn by Low, Manson-Bahr, and others to the longevity of *L. loa*, and to the lengthy period which may elapse before either symptoms or infection of the blood by filarial embryos becomes manifest. This period may amount to four or more years, and worms have been removed from beneath the conjunctiva of persons who have been outside an infective area for 12 and even 15 years.

On the other hand, little attention has been paid to the minimum period which must necessarily elapse between the bite of the infected chrysops and the moment when the first symptoms appear. The principal symptom, apart from pain and discomfort in the eye when a mature worm happens to pass across it beneath the conjunctiva, are certain rather odd enlargements known as Calabar swellings which most commonly affect the forearms and wrists but also occur in the legs, trunk, and face, and even under the scalp. In an endemic area their appearance is so characteristic as to make the diagnosis comparatively simple in almost every case. Often they arise in a night, giving a bloated, œdematous appearance to the affected part. While objectively they exhibit many of the signs of an acute inflammatory condition, the subjective sensations are relatively trivial, and in a large proportion of cases there is no actual pain or tenderness, but merely stiffness with a feeling of weakness. They never lead to suppuration, and as a rule they disappear as mysteriously as they arise in 50 to 70 hours.

We are at present very far from knowing their true pathology. Manson, who described the worm in 1891, believed that they might be caused by the emission of myriads of larvæ by the pregnant female lying in the connective tissue. Others have suggested as a cause the death of the mature worm and the setting free of unknown toxins. It is proposed to show that in the light of the case given below both these theories are untenable.

Filaria loa is manifestly long-lived and, according to Manson-Bahr, development of the larva in the human body is so slow that full maturity is not reached for several years. In support of this statement he points to the well-established fact that the offspring of the worm may not appear in the blood as microfilariæ for seven years, while the adult parasite itself may not appear for four or more years. Further, infected children rarely show embryos in the blood though immature worms may be found in the tissues. *These facts would lead one to expect a period of several years at least to elapse between the date of infection and the appearance of Calabar swellings if the latter are caused by mature or parturient filariæ.*

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THE USE OF INSULIN IN THE TREATMENT OF PERNICIOUS ANÆMIA.

BY DR. L. VON VARGA,
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THE importance of liver in the process of blood-regeneration was first pointed out, independently, by Whipple and Robscheit-Robbins, and by Jeney. Whipple and his collaborator were the first to report good results from feeding dogs, made anæmic by repeated bleeding, with fresh liver, while the favourable results of protein-free liver-extract were first published in a Hungarian medical journal by Jeney in a communication from the Jobling Institute for Pathology, Columbia University, where he carried out his researches in 1923–24. The paper[1] by Whipple and Robscheit-Robbins was published in May, 1925, and Jeney's work appeared in the spring of the same year.[2] Minot and Murphy in 1926 introduced their successful liver diet, which has since become famous, for pernicious anæmia, but Whipple and his collaborator adopted liver extracts only in 1927. Jeney's researches, performed in 1923–24, partly in collaboration with Prof. Jobling, were therefore the first in connexion with a protein-free liver extract. Accounts of them were published in America in 1927.[3] [4] I have emphasised these facts because Jeney's right of priority is in question, and his name is not mentioned in the most important papers and works on the subject. Mouzon[5] alone mentions the experiments of Jeney and Jobling with alcoholic liver extract.

Liver and Insulin.

Of the very numerous proposals for treating pernicious anæmia that represented by Minot and Murphy seems to be the most noteworthy. According to these investigators, liver supplies the materials necessary for building up the cytoplasm of the blood corpuscles and at the same time has a stimulating influence on the bone-marrow, acting in so specific a manner that they consider that any anæmia in which a liver diet is ineffective may be excluded from the class of pernicious anæmia. That liver actually contains substances which promote the formation of red blood corpuscles—in the form of building substances or specific stimulants—is proved by the researches of Jeney and Jobling and by Robscheit-Robbins and Whipple's experiments on animals. Jeney's[6] work shows that the substances promoting blood formation are to be sought in the decomposition products of red blood corpuscles developed in the liver.

It is only natural that the treatment of pernicious anæmia should depend on a series of factors, such as the state at which the patient is received for treatment, his individuality, his reactivity, the regenerative power of the bone-marrow, the duration of the malady and the number of relapses, and this fact must not be disregarded. It explains the relative failures frequently obtained alongside favourable results.

During the past two years we have had a strikingly large number of cases of pernicious anæmia in comparison with former years. Since the essential of treatment must lie in assisting the blood-forming organs and in strengthening the whole body, we thought it advisable to employ a remedy intended to combat the [illegible] own loss of appetite in pernicious [illegible] s purpose tried insulin, which we [illegible] using in all cases of anorexia. [illegible] hexia of our patients made it [illegible] ver diet at once, but we hoped [illegible] their appetite so that they [illegible] time we had eight patients [illegible] tment and its effects is

Case 1 was treated with insulin alone (60 units daily) and the number of the red blood corpuscles rose within a month from 770,000 to nearly four millions, the appetite being meanwhile excellent, while the hæmoglobin content also assumed more normal figures. Cases 2, 3, and 4, which were placed on insulin and arsenic treatment, showed results in no way better than Case 1. The rise in the blood count was somewhat gradual, the hæmoglobin values showing rather greater improvement. Case 5 is interesting. During the first 24 days of treatment the patient received 30 units of insulin daily and 1 c.cm. of strychnotonin (a preparation containing arsenic). During this period the red blood cells rose from 850,000 to 1,400,000, and the hæmoglobin percentage from 22 to 28. The patient was then put on a diet including 100 g. of cooked calf's liver daily, with the result shown in the table. Case 6 received 60 units of insulin daily from the first to the 37th day, and 2·5 g. of Richter's perhepar (a liver extract) from the 10th to the 50th day. During the first ten days, with insulin alone, there was no increase in the blood count and hæmoglobin values, though the general condition and appetite were excellent. When liver treatment was started they immediately began to rise, and after a month the patient was discharged in very good health. Case 7 at first responded well to insulin and arsenic treatment, but after a month's progress the red cells and hæmoglobin became stationary. From the 80th day onwards the insulin was stopped and the patient was given 100 g. of Schottmüller's hepatopson daily. It was very striking to note that the number of the red corpuscles increased by 1·5 million during the ensuing 20 days, while the hæmoglobin value declined. In Case 8, owing to the grave condition of the patient, both insulin and liver extract were given from the beginning (insulin 50 units and a spoonful of hepatopson). Both forms of treatment were discontinued within 42 days, but in two months the number of the red corpuscles rose to over five million, although the patient was in a dying state when admitted.

No.	Age in years.	Period of treatment.	Values at the beginning and at the end of treatment.			Daily increase.	
			Hb %.	Blood count in millions.	Colour-index.	Hb.	Blood count.
1	30	Feb. 10 to Mar. 17.	15–60	0·77–3·8	1·0 –0·78	1·2	84,400
2	30	Apl. 20 to May 26	28–78	1·14–2·9	1·11–1·21	1·4	48,0[illegible]
3	55	Feb. 6 to Mar. 17.	35–70	1·4 –3·2	1·13–0·98	0·87	45,9[illegible]
4	55	Mar. 27 to June 5.	48–70	1·36–2·50	1·55–1·23	0·3	16,511
5	41	July 27 to Oct. 1.	22–65	0·85–4·5	1·23–0·65	0·59	50,5[illegible]
6	66	Apl. 16 to June 5.	36–82	1·8 –3·9	1·00–1·05	0·92	42,0[illegible]
7	36	Dec. 1 to Mar. 13.	37–80	1·8 –4·9	0·70–0·80	0·6	41,318
8	30	Jan. 6 to Mar. 21.	21–75	0·73–4·4	1·02–0·76	0·71	45,555

Treatment.—(1) 2100 units insulin; (2) 540 units insulin and strychnotonin; (3) 3000 units insulin, and arsenic; (4) [illegible] units insulin, and natrarsen; (6) 690 units insulin, 4000 g. liver; (6) 2220 units insulin, 100 g. perhepar; (7) 4050 units insulin, 2100 g. hepatopson; (8) 1950 units insulin and 3000 g. hepatopson.

The subjective condition improves in a very short time in response to insulin by itself, as well as to the insulin-liver and insulin-arsenic treatments. After taking insulin bulimia sets in, and the vertigo, buzzing in the ears, and general debility disappear; the condition of the patients visibly improves, and the number of red corpuscles and the hæmoglobin content increase (by 30,000–40,000 and 5·10 per cent. respectively per day). The headaches disappear last, but these, together with serious anæmia, are correlated

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changes and no difficulty in swallowing were noted. On aspiration of the left chest 5 c.cm. of clear fluid were obtained. This contained a large amount of albumin, erythrocytes, and occasional polymorphonuclear and some mononuclear cells, but no tubercle bacilli. Cultures were sterile, as was also the blood culture. The sputum contained no tubercle bacilli or streptococci and little pus. A blood count showed 5,744,000 red cells and 6148 white cells made up of: polymorphonuclear cells 70 per cent., lymphocytes 22 per cent., and large mononuclears 8 per cent. The colour-index was 0·7 and the hæmoglobin 80 per cent.

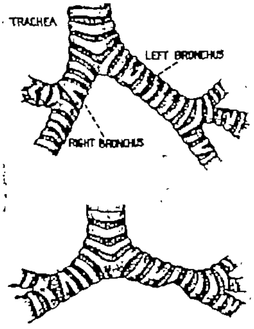
A diagnosis of collapse of the lower lobe of the left lung was made.

On June 18th the signs were as before and included a few coarse crepitations at the base of the left lung. Later signs of gross congestive failure appeared. Digitalis and leeches were ordered, but on July 9th the patient died.

Autopsy by DR. KEITH.

The general development was normal for the age. There were a few recent pleural adhesions on both sides, and some *small* patches of partly organised *lymph. The right* lung was intensely œdematous and congested, and showed a recent infarct at the apex of the right lower lobe, covered by a patch of pleurisy. The changes in the lung were recent and did not suggest a broncho-pneumonia. The lower lobe of the left lung was collapsed; not to that extreme degree seen in pneumothorax, but it was completely airless and no fluid could be expressed from it. The upper lobe was very slightly congested. The aorta and œsophagus appeared normal and healthy. The trachea contained much mucus but was otherwise healthy. On opening the posterior surface of the left bronchus a large blood-clot was found. This proved to be the contents of the left auricle, which was very greatly enlarged and had come into relation with the posterior surface of the left bronchus. Further examination of the left bronchus showed that there was—at about ¼ inch beyond the original bifurcation of the bronchus—a definite kinking, the kink being at the point where the left auricle had been pierced while opening the bronchus. *There was evidence of a* considerable degree of obstruction at that point, although the removal of the organs from the body had partly reduced it. The right bronchus was normal.

FIG. 2.

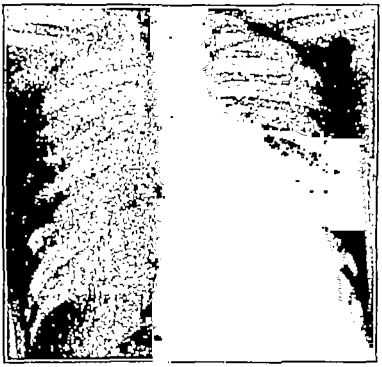


Anterior view of trachea and bronchi. Above: normal condition. Below: widening of interbronchial angle.

The heart was greatly enlarged and weighed 15 oz. In situ there was marked enlargement to the left, fullness in the pulmonary area, and slight enlargement to the right. The pericardium contained half a teacupful of fluid. There was a patch of pericarditis over the apex, which was united to a corresponding patch on the parietal pericardium by a thin fibre ¼ inch long. The right auricle was slightly enlarged. The left auricle was very markedly enlarged upwards and to the left, and contained a large clot of blood. The exact size could not be made out. The right ventricle was slightly enlarged. The left ventricle was markedly enlarged and its walls much thickened. No gross valvular disease was present. The mitral valve was widened. In the fresh specimen three fingers and in the hardened specimen two fingers could be passed through the mitral orifice with ease. The mitral valve was thicker than normal and showed some roughening at its edge. The chordæ tendinii were definitely shortened and thickened. The aortic, tricuspid, and pulmonary valves appeared competent and normal in structure. There was some free fluid in the abdomen, and the liver and spleen showed evidence of congestive failure.

The clinical picture was one of active rheumatic carditis. The clinical signs of persistent tachycardia, frequent extrasystoles, and at one time a continued ventricular rate of 100 per minute, unaffected by exercise or change of posture and possibly constituting evidence of auricular flutter, suggested particular involvement of the auricular musculature in the *disease process. The physical signs were those typical* of mitral stenosis, especially the localised apex-beat, the diastolic thrill, and the full diastolic and systolic bruits. The terminal signs denoted left ventricular failure. The *radioscopic* appearance in the antero-posterior view was that of mitral stenosis. Unfortunately with the technical facilities at our disposal an oblique view could not be taken.

FIG. 3.



Radiogram showing enlargement of the left auricle.

At autopsy the picture was that of rheumatic carditis; a large heart with a wide but thickened mitral orifice, showing no evidence of mitral stenosis, and a very large left auricle. This is an association which I have never seen and to which there is no reference in the literature. A large left auricle is invariably described in association with mitral stenosis, and is exemplified by the cases described by various clinicians. The radiological appearance of "mitral stenosis" was shown although at autopsy stenosis of the mitral valve was not present. Collapse of the lower lobe of the left lung due to constriction of the bronchus by the pressure of a large left auricle—*as in this case—is rare.*

Our thanks are due to Dr. Remington Hobbs for permission to publish this case.

THE MENTAL FACTOR IN BRONCHIAL ASTHMA.

REPORT ON TWO CASES.

BY M. K. EL KHOLY, M.R.C.S. ENG., D.P.M.,
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THE following notes demonstrate the important part which a mental factor may play in the causation of bronchial asthma:—

CASE 1.—The patient was a married youth, aged 27. When seen in November, 1926, he had been suffering from almost daily attacks of the disease for 18 months and his condition had been diagnosed as bronchial asthma by three of the leading physicians in Cairo. The disease started with daily attacks of panting which used to come on in the morning half an hour after leaving bed; they lasted about two hours each and were accompanied by profuse sweating, running from nose, and coughing with bringing up of phlegm. The attacks increased in severity and two months later the patient began to wake up suddenly about 2 A.M. with a feeling of suffocation, dyspnœa, wheezing in the chest, cough, expectoration, sweating, and coryza. After treatment by different doctors for a year the attacks became within seven hours of the onset of otitis, but that did not prevent his having to operate later for severe mastoid disease. In some cases it was not safe to wait a week after incising the drum before operating on the mastoid. It was a good working rule to hold one's hand for about five days; whether the mastoid operation should be done earlier depended on whether the patient was very toxic. A good rule was that if the deep part of the meatus sagged the mastoid must be opened. He did not intend to deal with the chronic ear on this occasion. The cessation of an ear discharge was sometimes due to the bursting of a bulla. He did not pin his faith to any particular material for swabbing and syringing the ear. In cases which were painful syringing should be deferred for a few days. For incising the drum he now always used a general anæsthetic. He did not think the wrong method of blowing the nose caused otitis media; if the drums were intact when the nose was blown, infective material could not be injected along the Eustachian tube and into the ear. The routine use of gargles and snuffles was a matter which did not come into his experience; medical officers of schools were themselves in a position to supply valuable information on those points. He had ordered leeches only once in 25 years; he did not favour their use.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS.

A MEETING of this Section was held on Oct. 8th, when Dr. P. **HAMILL** delivered a presidential address entitled

SOME PRINCIPLES OF THERAPEUTICS.

He pointed out that an accurate appreciation of the underlying conditions is essential as a basis for rational treatment. Departures from the normal physiology may be but manifestations of compensatory processes and attempts at "correction" are not then helpful but may hinder recovery. A high blood pressure may be necessary in a given case; nitrites will then be harmful. Antipyretics are little used in fever nowadays; on the contrary fever, artificially induced, may even be beneficial, for example in the treatment of general paralysis by malaria, and in those conditions which are improved by protein shock therapy. Many conditions which call for treatment are the result of previous illness. Damaged organs must be sustained and protected from further injury, and here lies the importance of eradicating septic foci—e.g., the removal of infected tonsils in rheumatic heart disease. Where part of a gland of internal secretion has been destroyed, the effects of the loss may sometimes be circumvented if its active substance can be isolated and easily administered; thyroid gland or thyroxin given for myxœdema, and insulin for diabetes, are good examples. Disorders of infective origin well illustrate therapeutic principles, for elimination of the cause lies for the most part within the sphere of preventive medicine. In the therapeutic sphere direct attack on organisms within the body has been made with success in many protozoal infections—e.g., malaria and amœbic dysentery. Organic arsenic preparations have proved valuable in syphilis and relapsing fever, and antimony compounds in leishmaniasis. In bacterial infections direct attack has been less fruitful; urinary antiseptics and mercurochrome are but partial successes, but the results obtained with sanocrysin in tuberculosis and chaulmoogra in leprosy augur well for the future of chemotherapy. To confer or exalt immunity is perhaps the ideal method of coping with infection if the cause cannot be eliminated or directly combated. Prophylactic immunisation and serum therapy have been very successful in many infections, but fail to fulfil all demands, owing to their inherent specificity, and in some cases owing to the brief duration of the immunity conferred. We have as yet no Mithridatium. For many infections immunising agents of sufficient potency have not yet been developed, and the body must, therefore, rely on its own powers of resistance.

To raise resistance to a high pitch and maintain it there should be our constant aim. Can it be said that adequate attention is devoted to the problems involved? Nutrition, elimination, rest, and general hygiene are the foundations on which resistance to infection and the power of developing immunity are based. Observations by Edward Mellanby and his colleagues indicate that deficiency of vitamin A in the dietary lowers resistance to infection in experimental animals, and a generous supply of this vitamin to patients with puerperal septicæmia is said to have lowered the mortality to zero in a series of cases. In a London business house during the influenza epidemic of the early part of this year a preparation rich in vitamins was supplied to those who desired to take it. There was hardly an absentee owing to influenza or "cold" amongst those who availed themselves of the offer. The conclusion that diet is a large factor in controlling resistance to infection and the development of immunity may fairly be drawn, and the complete proof of this proposition will be a therapeutic advance of the first magnitude. The consumption of milk, dairy products, and oily fish in this country is far too small; incidentally, advocacy by the medical profession of dietary improvement will benefit agriculture as well as the health of the community. Rest is still underrated as a factor in treatment. The widespread use of hypnotics is disquieting; the avoidance of the necessity for their use is desirable. In spite of the importance of quiet, especially for the sick, hospitals and nursing homes still mention the fact that "trams pass the door" as a recommendation rather than a drawback. The rebuilding of hospitals in the inner zones of large towns is surely not consistent with the requirements of rest and hygienic surroundings. The removal of wards to the outskirts of the towns, and the erection of less permanent buildings which can be rebuilt and modernised every 40 or 50 years according to the advance of knowledge and changing conditions is surely a way of progress that demands consideration.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 713.)

SECTION OF TUBERCULOSIS.

Apical and Subapical Tuberculosis.

Dr. D. P. **SUTHERLAND** (Manchester) presiding, Dr. **MAURICE FISHBERG** (New York) opened the discussion. Pathological anatomists and clinicians had, he said, long known that the number of people with tuberculous lesions in the lungs was much higher than recorded. The vast majority of tuberculous lesions were found in the apex of the lung and remained in that region. Nearly all cicatrised lesions which remained inactive and gave no trouble during life were in the apex. These lesions were often found clinically, and with the aid of X rays during periodical examinations of healthy persons, which were becoming the vogue in the United States. In patients with non-pulmonary tuberculous lesions, sent for chest examination, changes in resonance were almost invariably found at the apex of the lung, along with altered breath sounds and, perhaps, small adventitious signs; but such patients hardly ever offered significant pulmonary symptoms. In these cases, if death ensued because of the tuberculous infection, it was the result of acute pneumonic phthisis or more commonly miliary tuberculosis. Similar apical lesions were found among persons who suffered from frequent "colds"; they might spit blood and have tubercle bacilli in the sputum, but with or without therapeutic intervention they did well. It was such cases as these which were diagnosed as tuberculous by the ultra-cautious physicians, and supplied the material for any "cure" which happened to be introduced at the time. They also supplied the "early" and the "curable" cases considered suitable for sanatorium treatment. They were apparently the residua of childhood infection which had become obsolete. While 10 per cent. of civilised mankind died from active and progressive tuberculosis, it had been shown that only about 7 per cent. of the persons with apical lesions developed active tuberculosis or died from the disease.

Turning to subapical lesions, Dr. Fishberg remarked that valuable time might be lost in the diagnosis unless microscopic examinations of the sputum revealed tubercle bacilli, or unless X rays disclosed a soft clouded patch isolated in the midst of apparently healthy lung tissue just below the clavicle, often towards the axillary portion of the lung. The nature of the patch was broncho-pneumonic, of the type seen in primary tuberculosis in children or in tuberculous pneumonia in adults. Over 60 per cent. of subapical lesions manifested themselves in persons under 25 years, as against 30 per cent. of apical lesions. Over 35 years the percentages were 11 and 32 respectively. Under 25, unless a good radiogram was taken, or the sputum found positive, the case was missed. He stressed the importance of X ray examinations; in the United States every tuberculosis doctor had an X ray plant in his surgery right at hand. Early cavities were not as a rule revealed by physical signs, it needed X rays to disclose them. The differentiation of apical from subapical lesions was of immense therapeutic importance. At Bedford Hills Sanatorium, of the patients with subclavicular lesions, 66·4 per cent. had a positive sputum against only 15 per cent. with apical lesions. Strict isolation, the backbone of tuberculosis prevention, was not indicated in 85 per cent. of apical cases, which rendered prolonged and costly institutional treatment unnecessary.

Sir **Humphry Rolleston** (Cambridge) agreed that tubercle did not begin at the apex; but the term "apex" was often employed when speaking of conditions in the upper lobe. It was an interesting question whether the infraclavicular site was due to exogenous reinfection in a person who had lost his immunity from infantile infection, or an endogenous and metastatic reinfection from dormant foci, such as tuberculous glands, lying perhaps in close contact with the bronchi. Possibly both explanations were true in different cases.

Prof. **A. Ramsbottom** (Manchester) believed the majority of apical (in the strict sense) lesions originated in childhood, and were really blood-borne. Many of the apical lesions were of bovine origin, as opposed to the subapical which were of human origin. It was extremely difficult to decide whether a case was one of apical or subapical disease, and he confessed difficulty in finding a pulmonary lesion in some of the cases in which tuberculosis had been suspected from the general symptoms and the discovery of acid-fast bacilli. He considered the so-called "abortive" tuberculous case, with bacilli found for a short time, more of a pathological fact than a clinical entity.

Dr. **J. Watt** (Godalming) said some of his observations conflicted with those of Dr. Fishberg. He had compared two groups of cases, apical and subapical, similar in history and clinical course; in 72 per cent. of the apical and 81 per cent. of the infraclavicular tubercle bacilli had been found at some time or other. These figures were in contrast with Dr. Fishberg's 15 and 66·4 per cent.—a complete inversion for the apical. From the sanatorium at Godalming 58 per cent. of the apical cases and 48 per cent. of the infraclavicular were discharged with disease quiescent. Practically all the new work on apical and subapical tuberculosis was, he said, based on radiography, which was not yet infallible. Apical tuberculosis was not diagnosed in this country with anything like the frequency it was in America or Germany. His own figure of 72 per cent. showed that British sanatoriums did not needlessly keep cases. He believed that: (1) the initial lesion in the adult type of phthisis occurred in diminished frequency from the lung apex (sc. above the first rib) downward; (2) in general the nearer the tuberculous lesion lay to the apex the greater the chance that it would heal.

Dr. **W. Brockbank** (Manchester) said that pulmonary tuberculosis was almost unknown among workers in lime and plaster-of-Paris, and he described special investigations made in the North-East States of U.S.A. and in Canada, from which remarkable figures of immunity had been collected.

Dr. **Fishberg**, replying, said more of the apical cases would be found in private or consulting practice than in sanatoriums. In the United States they were using X rays to the utmost—they owed it to their patients. He thought the British statistics would assume a different character if every case was X rayed.

Sanocrysin Treatment.

Dr. **J. R. Gillespie** (Belfast) presided when Dr. **B. R. Clarke** (Belfast) read a paper on sanocrysin treatment in pulmonary tuberculosis. Sanocrysin in a pure state, he said, was not injurious to healthy mammals in doses of 0·1–0·15 g. per kilo of body-weight; tolerance was increased by graduated dosage. The kidneys were mainly responsible for its elimination which took place more slowly than was at first supposed. It was much more liable to damage a tuberculous organ than a healthy one. In afebrile patients it was safe to begin with 0·25 g., and to increase by the same amount in arithmetical progression until 0·75 g. had been reached, which dose might then be repeated four or five times. This sequence would usually be tolerated well by patients weighing from 8 to 10 st. Over 10 st. the final dose might be increased to 1·0 g. In very light or emaciated patients 0·5 g. should be the maximum. Interval between the early doses about a week, between the larger doses 10 to 14 days. In 16 per cent. of patients treatment had to be abandoned when less than 2·0 g. had been administered; some patients could not tolerate the drug, even in smaller doses. At the end of 1928 102 patients at the Forster Green Hospital had been discharged after sanocrysin treatment. Five cases given the original large doses all showed a loss of weight varying between 1¼ and 10½ lb., and developed some complication. In the remaining 97 treated by graduated doses, complications—the most serious being prolonged fever with a spread of the disease—occurred less frequently. Do not, he said, use sanocrysin unless there was a definite probability of obtaining better results with it than by conservative methods. Where sanocrysin was well tolerated, beneficial results followed in a high proportion of cases. The effect on fever cases which had not yielded to prolonged rest in bed was often very marked. For the positive sputum cases discharged from the hospital from July, 1925, to December, 1928, the after-histories were traced in the spring of 1929. Of the sanocrysin-treated, 80 per cent. of the moderate grade were alive against 63 per cent. of those not so treated; in the advanced grade, 58 per cent. of the sanocrysin-treated were alive, against 30 per cent. of the untreated. To sum up: sanocrysin was of value in two types, the early exudative cases with some resistance, and the predominantly fibroid type with symptoms and persistent tubercle bacilli in the sputum. In the exudative case he used sanocrysin as soon as possible; in the fibroid, not until sanatorium treatment had had a trial. Sanocrysin could in some cases be successfully combined with artificial pneumothorax. It was not a cure for pulmonary tuberculosis, but it was a valuable aid to treatment.

Dr. **F. R. G. Heaf** (Warwickshire) gave his experience of 120 positive pulmonary cases at the Warwickshire Sanatorium. He, too, had found the Danish initial doses too large. If loss of weight and rise of the sedimentation test occurred the interval between dryness of the throat. Early diagnosis was of the very greatest importance for the sake of treatment. Treatment should be primarily general, as the pulmonary lesion was the important one. Local treatment consisted in: (1) absolute voice rest; (2) galvano-cautery in selected cases. With voice rest even very large lesions might heal completely; it might need to be continued for as much as six months and the patients required constant encouragement. The cautery was valuable in carefully selected cases; it did not destroy the actual lesions, but acted as a counter-irritant. He had had little experience of direct sunlight treatment of the larynx, but found that the dose required very careful regulation. With artificial sunlight the treatment was lengthy, and he doubted whether a corresponding advantage was secured. In rare cases where the lung condition was inactive and the laryngeal progressive a tracheotomy might secure the complete rest of the larynx that was essential. In the later stages treatment should be symptomatic and directed to relief of cough and of pain. For the latter he relied on insufflations, and had been disappointed with nerve-blocking injections.

Sir StClair Thomson (London) recalled that one case in every three of phthisis suffered from a laryngeal complication, and estimated that 55,000 such sufferers existed to-day in England. Fortunately not only was phthisis becoming more rare, but the incidence of laryngeal tubercle was also declining. Formerly males had been more affected, but since the entry of women into the labour market the sex difference had largely disappeared. The more advanced the pulmonary disease the greater the incidence of laryngeal lesions. Further, the presence of a laryngeal complication was of great prognostic significance. Of the cases from a sanatorium without laryngeal tubercle two-thirds were alive ten years later; of those with laryngeal tubercle only one-third survived ten years. The difference was most pronounced among the early cases. When a laryngeal complication occurred during sanatorium life it was of grave significance. Of cases treated by silence alone the larynx was cured in one-third and improved in one-third. Among the rare cases selected for cauterisation 62 per cent. were cured. Of all sanatorium patients one-fourth were cured.

Mr. H. Morriston Davies (Ruthin) emphasised the importance of routine examination, even in cases of phthisis with no laryngeal symptoms. The presence of laryngeal tubercle was of material significance where operative treatment for the lung was under consideration. Healed laryngeal tubercle, if attended with much deformity, so that a good cough could not be produced, was a contra-indication for artificial pneumothorax. On the other hand, the presence of a laryngeal complication might determine one to do a pneumothorax operation, where without it one would not. Though of less significance where phrenic avulsion was contemplated the condition of the larynx needed even greater regard when a thoracoplasty was under consideration.

Sir James Dundas-Grant (London) pointed out that in cases of doubt a biopsy presented great advantages, especially where a thyrotomy might be contemplated. He relied on galvano-cautery for many cases of laryngeal tubercle, and thought pain especially was a pressing indication.

Mr. R. Scott Stevenson (London) had seen cases in which careful clinical and radiological examination failed to reveal any pulmonary tubercle, but where there was advanced laryngeal disease. Laryngoscopy was therefore important with any obscure chest condition.

Dr. S. Moritz (Manchester) emphasised the importance of using the galvano-cautery to effect deep punctures, to produce fibrosis, and not superficially. He referred to the difficulties presented by the simultaneous occurrence of syphilis and tubercle in the larynx.

Reviews and Notices of Books.

Stone in the Urinary Tract.

By H. P. Winsbury White, M.B., Ch.B. Edin., F.R.C.S., Assistant Urological Surgeon, St. Paul's Hospital. London: J. and A. Churchill. 1929. Pp. 344. 35*s.*

Close upon Mr. Swift Joly's recently published work on "Calculus" comes another treatise on the same disease by Mr. Winsbury White. The ground covered is the same, but the subject is treated differently. Whereas Mr. Swift Joly produced a monograph for the expert Mr. Winsbury White caters for the practitioner and for the general surgeon who deals occasionally with cases of stone. For this reason such matters as the ætiology of calculus formation are dealt with less fully in the book now under review, and more space is devoted to such practical points as lithiasis in pregnancy and in children. This addition will be appreciated by the expert as well as those for whom the book has been more particularly written. But as a matter of fact the book contains a vast amount of information interesting to all genito-urinary surgeons. The only criticisms we would offer are that (1) the arrangement of the subject matter is somewhat haphazard; when the book is used for reference it is difficult to find information without first consulting the index; (2) the important points in the treatment of stone do not receive enough emphasis at the expense of unessentials. The plates are excellent and are more numerous than is usual in a work published this side of the Atlantic. The bibliography at the end of the book is excellent. The author has searched out the literature of stone from the years 1910–28 so that those who require information not found in the text may know where to obtain it.

Orthopædic Surgery.

Second edition, revised. By Sir Robert Jones, Bart., K.B.E., C.B., F.R.C.S., F.A.C.S., and Robert W. Lovett, M.D., F.A.C.S. With the collaboration of Nathaniel Allison, M.D., F.A.C.S., Frank R. Ober, M.D., and Harry Platt, M.D., M.S., F.R.C.S. London: Humphrey Milford, Oxford University Press. 1929. Pp. 807. £2 12*s.* 6*d.*

In the interval of six years since we welcomed the first edition of this work the untimely death of Dr. R. W. Lovett, of Boston, has put an end to a fertile collaboration. Sir Robert Jones has wisely sought the help of two well-known orthopædic surgeons of Boston and of Mr. Harry Platt, of Manchester. The work has been brought thoroughly up to date, and the omissions which we called attention to in our former notice have been remedied. The excisions of obsolete matter have not balanced the additions, and the book is more than a hundred pages larger than it was. The number of figures has also been increased. Otherwise there is no great change in the book, nor is any revolution in treatment recorded. Scoliosis, which was a subject that the late Dr. Lovett made peculiarly his own, is dealt with at greater length than before, and details of new methods of applying plaster jackets are described. The sound, conservative opinions expressed in the first edition on arthroplasty of the knee, and the treatment of Pott's disease and scoliosis by bone-grafts or the methods associated with the name of Russell Hibbs, of New York, are repeated. The subject of backache or low back pain, as the Americans prefer to call it, is still discussed cautiously; the waves of enthusiastic surgery based on supposed subluxations, minor bone injuries, and abnormalities of development of the spine, seem to spend their energy before they reach these shores. The chapter on Volkmann's ischæmic paralysis is a valuable addition, and fills a gap which was left in the *first edition.* That on acute osteomyelitis is of notable value, and follows to a great extent the lines of the discussion in the Orthopædic Section of the Royal Society of Medicine last year. Fractures are dealt with at greater length in this edition, and this will especially enhance the value of the work to the practitioner who is not concerned with the more specialised branches of orthopædics.

PRINCIPLES AND PRACTICE OF MINOR SURGERY.

Sixth edition. By EDWARD MILTON FOOTE, A.M., M.D., Visiting Surgeon, St. Joseph's Hospital, &c.; and EDWARD MEAKIN LIVINGSTONE, B.Sc., M.D., Assistant Visiting Surgeon, Bellevue Hospital. London and New York: D. Appleton and Company. 1929. Pp. 787. 35*s*.

THIS work presents the principles and practice of minor surgery in all its branches in a logical, scientific, and readable manner. It is divided into three parts—minor surgical technique, the principles of diagnosis and treatment, and the practice of minor surgery. The author's interpretation of "minor" surgery is almost too liberal, for the volume includes consideration of every surgical procedure, outside the abdomen, with which the practitioner could legitimately be called on to deal. Details of the pathology and treatment of surgical conditions, as grave as rupture of the urethra, loose bodies in the knee-joint, or the operation of colostomy are given; yet there is no mention of appendicitis or of perforation of gastric or duodenal ulcers. *Apart from such curious regional* limitation the volume should prove invaluable to the practitioner, who is called on to deal with surgical cases and to the young surgeon. The teaching is quite modern and at the same time sound and practical. The majority of the illustrations are beautifully reproduced photographs.

ENDOCRINOLOGY AND ORGANOTHERAPY.

Diseases of the Thyroid Gland. Second edition. By A. E. HERTZLER, M.D., Surgeon to the Halstead Hospital, Kansas. London: Henry Kimpton. 1929. Pp. 286. 32*s*.

IN this new edition the result of a continuation of Dr. Hertzler's studies on the pathology of goitre and thyrotoxic conditions is presented. There are also included chapters dealing with the management of goitre patients and the technique of thyroid surgery, but the author's views on the pathology of these diseases are the chief point of interest. The most usually accepted classification of goitres divides them up into colloid goitres, adenomas without toxic symptoms, adenomas with toxic symptoms, and Graves's disease or true exophthalmic goitre. Dr. Hertzler holds that these groups do not represent separate diseases, but merely stages for the most part of one progressive disease. The same individual may run the gamut of the whole series. The colloid goitres are smooth in outline and the patient has no constitutional symptoms; their beginning depends on a uniform increase of colloid within the acini resulting in the homogeneous enlargement of the whole gland. This is the early stage. After a time new acini appear, adding their part to the increase in size of the gland; with their continued development the thyroid becomes irregular or bosselated. These are the glands which some authors call "adenomas." Hertzler believes that they are not truly "adenomatous," and he would reserve the term adenoma for the true benign tumours or fœtal adenomas. The latter develop from a single nodule and are isolated, encapsulated, and completely surrounded by the substance of normal thyroid on which they rest, but are independent of it in structure and growth. He suggests that the confusion in terminology is due to the failure to distinguish between the bosselations of an old colloid goitre and the fœtal adenomas. The clinical significance of these two varieties is entirely different. Hertzler holds further that the bosselated colloid goitres sooner or later become toxic, generally after about 10 years. The fœtal adenomas are not subject to the periodic progressions and recessions of the bosselated goitres and grow gradually. They may degenerate and form cysts or they may become malignant; sometimes they become mildly toxic, but this is comparatively rare. Finally, he would differentiate true Graves's disease from the toxic bosselated goitres. In true Graves's disease it is the proliferation of the epithelium of the original acini which is the characteristic feature, while in the toxic bosselated goitres the toxicity is due to the proliferation of acini developing in the interstitial cells.

These views require careful consideration, and their presentation in the present volume is clear and concise.

Organhormone und Organtherapie. By Prof. AUGUST BIER and others. Munich: J. F. Lehmanns. 1929. Pp. 91. M. 4.50.

THE principal thesis of this little book, which is made up of reprints from the *Münchener Medizinische Wochenschrift*, is that, since organs normally regenerate and give rise to substances which preserve the normal physiological balance, it should be possible to approach something like regeneration or at least re-established function by the administration of preparations of appropriate organs in cases of disturbed structure or function. This conception is, of course, being widely applied in many directions, but those followed in this book merit special attention, because a measure of success claimed by so distinguished an authority as Prof. Bier cannot be ignored. The book is divided into four parts. In the first Prof. Bier deals with the general principles of organotherapy and in particular with the work of his pupils, set out in the succeeding sections. The second part consists of a discussion of diseases of the liver and bile passages which have been treated by various extracts of liver, gall-bladder mucosa, and extrahepatic accessory glands. The substance chiefly used was choloton, and the authors frankly state that they are concerned with the clinical effectivity of the preparation and not with its mechanism of action. Cases of many varieties of liver and gall-bladder diseases have been treated with an improvement of symptoms (jaundice, pain, rigors, enlargement of liver, &c.) which impressed the observers. In the third part the treatment of tabes, progressive paralysis, and multiple sclerosis with a complex preparation of nervous tissue, vitamins, calcium, iron, and carbohydrate is described. This preparation is called Promonta, and is prepared in the cold on the principle of keeping the nerve substance unchanged. Treatment by the mouth with this substance combined with strychnine nitrate is said to have produced extraordinary symptomatic improvement. The last and shortest part deals with the treatment of Graves's disease by injection of animal blood. Sterile defibrinated ram's and calf's bloods were used, 5 c.cm. doses being injected intramuscularly at eight-day intervals. Anaphylaxis is obviated by using the different animals' bloods alternately, two to four injections being generally sufficient to produce a distinct improvement in symptoms. It is claimed by the authors that it is not merely the febrile reaction which determines the degree of improvement, but some more fundamentally important process. Time and large numbers of controlled cases only can decide on the reliability of these findings. The principles involved are vague, but the book is commendable in so far as it insists on a broader physiological outlook and gives many useful suggestions for further research.

Die Pathogenetischen Grundlagen der Thyreotoxicosetherapie. By JOHAN HOLST. Oslo: I. Kommisjon Hos Jacob Dybwad. 1928. Pp. 170.

THE introduction of iodine into the treatment of exophthalmic goitre has during the last few years given results which opened a new chapter in our knowledge of the diseases of the thyroid gland. It is quite clear that the theoretical basis for such a treatment is something totally different from that of the treatment of endemic goitre by iodine salts; for, whereas the latter is now well established as due to a deficiency of iodine, the former is associated rather with a flooding of the tissues with the active principles of the thyroid which are certainly in some way combined with iodine. Holst's work presents a definite advance in the direction of explaining this apparent paradox. He examines the problem by chemical, histological, and clinical methods. Administration of iodine (Plummer's method) in Graves's disease is followed by a rapid clinical improvement, fall in metabolic rate, and an increase in stored colloid in the gland itself. Analysis of the blood for iodine shows that this substance occurs in two main forms, one inorganic and alcohol soluble and the other organic, alcohol insoluble, and associated with protein. Both these fractions are much increased in thyrotoxic conditions. Treatment with iodine produces the effect of very largely increasing the inorganic fraction in the blood but of diminishing the organic to almost normal. Taking this in conjunction with the other observed effects of iodine Holst puts forward the view that the thyrotoxic condition is due to the flooding of the tissues with the active secretion of the thyroid, that this active secretion is identical with the organically combined iodine in the blood, and that the controlling factor is inorganic iodine in the blood. No information is given about the factor which gives rise to the so-called thyroid diarrhœa, for the high inorganic iodine in the blood cannot be the controlling factor normally. Throughout the book no mention is made of other glands which certainly have to do with the normal endocrine balance. Dr. Holst pays careful attention to the selection of the best period for operation after the preliminary iodine treatment, and to the fact that if this period is missed thyrotoxic symptoms again supervene as a result of hyperiodism. Emphasis is laid on the danger of intermittent treatment; once treatment with iodine is begun it should only be discontinued for operation. Clearly this treatment is not yet suitable for application in general practice. Its main value lies in so diminishing the thyrotoxic symptoms that [illegible]peration can be safely undertaken. Continued treat[illegible]nt after operation with small doses of iodine has in [illegible]lst's cases yielded good results.

The book is well worth studying because it is written by one who is both an endocrinologist and a surgeon. It is written in pleasant style, easy to follow, and the diagrams are excellent.

DIAGNOSTIC METHODS.

Diagnostic Methods and Interpretations in Internal Medicine. By SAMUEL A. LOEWENBERG, M.D., F.A.C.P., Assistant Professor of Clinical Medicine, Jefferson Medical College. Philadelphia: F. A. Davis Company. 1929. Pp. 1032.

THIS book has a wide scope, for the author's aim is to cover the field of diagnosis in medicine. The chapters devoted to the circulatory and respiratory systems are adequately dealt with and physical examination is lucidly explained; the examination of the abdominal viscera is not so well described, while the section on the endocrines suggests rather the small booklets thrust upon practitioners by commercial firms—for example, a differential table is given to distinguish between pineal and thymus hyper function. That such tables, which have no scientific foundation, should be incorporated and a method of such diagnostic value as the use of lipiodol omitted detracts greatly from the value of the book. The author likes differential tables, although the ones supplied are not of much diagnostic value. One table given is that of the differential points between "gall duct" (this term is new to us and its significance uncertain), "gastric ulcer," and "pyloric spasm." According to this table application of cold is supposed to ease the pain in gastric ulcer and to intensify it in pyloric spasm; this is not our experience. There are several omissions—for example, the reticulocytes are not mentioned in connexion with pernicious anæmia nor are Froin's syndrome and the protein content of the C.S.F. in the examination of the cerebro-spinal fluid. The photographs are numerous; many are good, others such as that showing the difficulties of percussion of the heart in the "extremely modest," are quite unnecessary. A photograph of the technique of entering a vein is given showing the operator equipped with a rubber glove, syringe in hand, piercing the dusky skin. The outcome of a close study of this work is that the task of writing a comprehensive book on diagnostic medicine is too heavy a task in modern times. If the author had confined himself to a monograph on the diagnosis of respiratory and circulatory diseases alone he would have achieved more success.

CLINICAL ELECTROCARDIOGRAMS.

Their Interpretation and Significance. By FREDERICK A. WILLIUS, B.S., M.D., M.S., The Mayo Clinic, Rochester, Minnesota. London and Philadelphia: W. B. Saunders Company. 1929. Pp. 219. 30s.

THIS book consists essentially of a large collection of electrocardiograms illustrating the various abnormalities which occur in different pathological conditions. Many of these records are interesting, and some are rare, as, for example, those given in the last chapter, which deals with the dying human heart. At least 50 per cent. of the records might have been omitted with advantage, for although good in themselves they are redundant; the remainder would have amply sufficed to illustrate all the points to which the author refers. Apart from a few tables dealing with mortality statistics, the text is of a most elementary character, and falls far below the standard of what might reasonably be expected in a book dealing with such a technical subject. Each chapter is followed by a comprehensive list of references, but these are unselected, and few of the papers to which they refer are even mentioned in the text.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE, September.—This issue is devoted to three papers, each concerned with some form of tuberculosis in industry. In the first B. S. Coleman points out how industry groups the adult community in a way which is convenient for fighting tuberculosis. By medical examinations on engagement, and supervision during employment, the tuberculous can be detected early and their fellows protected from contact infection, whilst industry can also provide for the convalescent that remunerative occupation which is so advantageous to cure.—In the second paper E. R. Hayhurst and his colleagues describe exposure to silica dust in a sandstone quarry in Ohio, where, notwithstanding the presence in the stone of some 95 per cent. silica, the death-rate from pulmonary tuberculosis is low. The evidence of this low mortality, based on statistics, is supported by the result of a careful medical examination of over 900 workmen. Illustrations are given which leave no doubt about the presence of a dust hazard at the quarry, and the puzzle is why the silica dust does not produce its usual effect. A clue may lie in the matrix or bond which holds the silica crystals together; it forms 3 to 8 per cent. of the mass and is composed of ankerite (carbonates of calcium, magnesium, and ferrous iron). At present, however, no other comparable instance can be quoted.—The last paper is by D. E. Cummings, who deals with the separation of particulate matter smaller than screen sizes into graded fractions. He describes a method by which dust particles can be accurately separated one from the other according to size. This method may be of value in preparing material for inhalation experiments. The article is one of a series of studies of experimental pneumonoconiosis.

THE LANCET.

LONDON: SATURDAY, OCTOBER 12, 1929.

THE FUTURE OF VACCINE THERAPY.

THE modern practice of vaccine therapy rests in effect less on any theory of immunity than on JENNER's success in protecting from subsequent infection with small-pox those who had been vaccinated with material from cow-pox. Indeed, the word vaccine introduced to describe this specific virus is now used in ampler connotation to cover any virus or bacterial body, even any foreign protein, which evokes a response when introduced into an animal body by inoculation. A vaccine has come to be almost synonymous with an antigen. It was PASTEUR who saw in JENNER's results the germ of a law of general validity—namely, that by causing an animal or inoculated person to undergo successfully a mild infection, protection is thereby obtained from a more severe infection of the same nature brought about naturally or artificially. The results of such active immunisation are essentially protective, and are specific for the virus inoculated. They are limited in applicability when a living virus is used, owing to the difficulty of finding one whose potency is naturally reduced, so that as a rule artificial ways of reducing the virulence must be adopted. Active immunisation by such attenuated viruses is used successfully in the treatment of rabies, and forms the foundation of the methods of producing immune sera in animals.

For use in man any virus, however attenuated, which is still able to propagate itself and thus increase in the site of inoculation or spread throughout the body is dangerous. Bacteria for vaccines in human therapy are therefore at least killed, usually by heat; the bacterial bodies may even be disintegrated chemically, as in detoxicated vaccines. Experiments with such bacterial vaccines, sometimes together with their soluble toxins, have been made in the treatment of human infections for a generation, but so far no therapeutic principles have been evolved that have received general acceptance. The choice of patients suitable for vaccine treatment, the methods of preparing the vaccinal material and of administering it, and the results that may reasonably be expected, even the successes claimed for vaccine therapy, are still debated. Certain facts have, however, accumulated. The body responds to any parenteral introduction of foreign protein by a reaction which may be so violent as to constitute shock, with profound effect on the nervous system, the circulation, and the heat-regulating mechanism. The reaction may be a local one, limited to the site of inoculation, and sometimes a focal one at the site of infection. On the other hand, there may be no apparent reaction. A consideration of experimental work on animals, and of the methods used in fighting animal diseases on a large scale, throws some light on the way vaccines work in therapeutics, if it be granted that the presence of antibodies in the blood gives an indication of the degree of immunity obtained, a proposition not yet established. In animals inoculation, especially intravenous inoculation, on three or four successive days produces a serum with high but evanescent content of antibodies. Vaccines at intervals of some weeks give sera with antibody of long duration. ALMROTH WRIGHT's opsonic work led to vaccine administration at intervals of several days to avoid a possible negative phase, and to the use of small doses of vaccinal material; his careful immunisation experiments were carried out with the control of the opsonic index. Since this method has lapsed into disuse, no real control is made in vaccine therapy applied to man, except that to avoid active and immediate harm to the patient. Under rather than overdosage is the rule. The tendency, too, is to use less often the bacteria cultivated from the individual, and to depend rather upon stock vaccines. Indeed the specificity of the vaccine employed may be disregarded, as in the use of typhoid stock vaccine for many conditions. Substances other than bacterial bodies may be used, and vaccine therapy then becomes frankly a non-specific protein therapy, the dosage and results being decided empirically. Many laboratory workers refuse to see in the use of vaccines anything more than a specific protection against a reinfection. Pathologists, however, working in close touch with clinicians and with the patient, seem to advocate vaccine treatment in a great number of infective processes. Meanwhile, the practitioner is in a quandary, swayed to and fro by his inadequately controlled clinical impressions, and yet hesitating to omit from his means of treatment anything that is likely to benefit his patient.

Theoretically it should be possible to divide cases of infective diseases into three groups. In the first the patient is doing well, the infecting forces are being dealt with adequately by the natural resistance, and no anxiety about the outcome need be felt. In the second group the infection is localised, but there is a state of unstable equilibrium between the resistance of the patient and the infection which at any time may be upset. Thirdly, there is the group in which the patient is doing badly and is being overwhelmed by the infection. The first group obviously needs no specific treatment in order to ensure recovery. In the third group a procedure bringing about further toxic effects is not to be contemplated lightly, and adding more poison may be actively harmful. It is probable that in the developments of the new chemotherapy there will be found a better means of treatment for such cases. It is only in the second group, where there is already some degree of resistance, that the possibility of stimulating that resistance and calling up further antibodies to the infecting germs by injecting vaccines should be considered. (In hydrophobia immunising treatment is begun after infection takes place, and completed before symptoms of the disease show themselves; but this is essentially prophylactic treatment, which is not now under discussion.) In this group of cases, where symptoms have already appeared but progress is delayed and resistance is inadequate, or is liable to break down at any time, medical vaccine therapy is largely used in practice, and the success of this method of treatment has been assessed differently by various observers. The scientific basis for it has not been demonstrated; the advocates of vaccines in treatment base their claims upon the evidence obtained by clinical judgment. Evidence in support from the experimental side is wanting, but this may well be due to the fact that investigators of the problems of immunity have been working on other lines. Even from time to time), by restricting to registered chemists the power to sell, by prohibiting sales to persons unknown or not vouched for, and by requiring entries of sales to be made in a Poisons Book. No doubt it was deemed right that a dangerous poison should be sold only by a qualified chemist, who would use his skill and judgment in warning the purchaser of the nature and quality of the drug supplied. In 1908, however, came the important relaxation which has enabled ironmongers, storekeepers, and other unqualified persons all over the country to sell arsenic freely. Section 2 of the Poisons and Pharmacy Act of 1908 declared that the restrictions of the 1868 Act were not to apply to poisonous substances containing arsenic, tobacco, or tobacco alkaloids sold for agricultural and horticultural purposes, provided that the seller was duly licensed by the local authority and that he observed the prescribed regulations. The obtaining of a licence seems to be a mere formality; the renewal of a licence is an easier process still. Regulations of 1909 require that sheep-dip and weed-killer must be kept in a separate drawer or closed receptacle, apart from other goods, and must not be sold at the same counter as food for human consumption. Regulations of 1920 (replacing earlier requirements) add that the poisonous substance must not be sold except in enclosed vessels or receptacles as received from the manufacturers, secured from leakage and labelled with the name and purpose of the substance, the word "Poison," and the seller's name and address. These rules are excellent so far as they go; but the law places no restriction on the storage or possession of arsenic in this form, nor is there any prohibition on sale to persons under age. Thus, as our legal contemporary observes, a chemist may not sell half an ounce of powdered arsenic to a youth under age who wants it for killing rats; but a corn-dealer may sell a gallon of liquid arsenic, or a pound of powdered arsenic made up into a packet and called "weed-killer," to any boy of 16 whom he knows, and who says he wants it for killing weeds in his father's garden. Further, it appears that even unlicensed persons are often found offering weed-killer for sale, either in ignorance of the law, or in the mistaken belief that any tradesman may sell these goods if they are supplied in the original package sent out by the manufacturer. The time seems ripe for reconsidering [illegible] other arsenical preparations are so indispensable [illegible] the garden, or on the farm, as to justify the exception made in their favour in 1908, and also whether the conditions of their supply and use are not, in any case, too free from control. It may be said that the public is weary of incessant restrictions, and that a would-be murderer will always manage, somehow, to equip himself for his nefarious purpose. The present laxness of the law, however, is in marked contrast with the retraints imposed by statutes in 1920 upon the possession of firearms and of dangerous drugs. It would be instructive to have statistics of the proportion of poisoning cases in which the obtaining of arsenic in the form of sheep-dip or weed-killer has "facilitated the commission of the crime."

THE BROAD TAPEWORM IN NORTH AMERICA.

THE past year has added considerably to what is known of the distribution and hygienic significance of the plerocercoid of *Diphyllobothrium latum* in the region of the great lakes of North America.[1] This stage is by no means restricted to the Michigan Peninsula. Infected fish have been reported by T. Vergeer[2] from Lakes Winnipeg, Manitoba, Nipigon, and Winnipegosis, from Lac la Biche, and from the Lesser Slave Lake; while H. E. Essex[3] has proved that *Cyclops brevispinosus*, *C. prasinus*, and *Diaptomus oregonensis* act locally as first larval hosts. It must be emphasised, however, that man is not the only definitive host of this cestode. There is, for example, a moderate infection of fish in the smaller Canadian lakes far from towns. In these parts, when Indians or white men while fishing for trout catch wall-eyes and great northern pike—fish constantly infected with the plerocercoids—such unwanted fish are fed raw to dogs, of which every man seems to have at least one, and some a pack; and the dogs are readily infected, as many as 19 parasites having been found in one animal.[4] Moreover, the broad tapeworm has been reported from the fox, *Vulpes fulvus*, and from the domestic cat. The grey wolf, lynx, mink, marten, racoon, and otter feed on fish, and Vergeer has readily infected the cinnamon bear, which in the spawning season has been known to scoop as many as 20 fish out of the water on to the bank before starting his meal. Man is thus but one of a number of definitive hosts used by *D. latum*, and that he cannot be the main one is shown by Vergeer's calculation[5] that the United States imports yearly from Canada upwards of 6,000,000 plerocercoids hidden in fish, while only about 200 cases of human infection have ever been reported from the United States. The risk to man can hardly be considered great enough to justify that ruining of an important industry, with great loss to concerns dependent on it, which would follow the exclusion of Canadian fish from the United States. Careful disposal of human sewage is evidently insufficient to prevent infection of fish, but man is readily and fully protected by the cooking of his fish food, and woman will lose her preponderant tendency to infection when the Jewess gives up her habit of tasting raw fish to test her skill in flavouring it.

PECTOSE AND ITS ALLIES.

THE class of substances, known as the pectins or pectic compounds, which occur in apples, pears, and other fruits as well as in such roots as turnips and carrots, form a valuable stand-by for the jam maker, and this circumstance has brought them within the purview of the Food Investigation Board. Mrs. M. H. Branfoot (née Carré), the author of a study[6] made on behalf of the Board, has herself contributed greatly to the clarifying of our knowledge of these obscure substances to which over 300 workers have directed their attention during the last 100 years. The essential difficulty of studying the pectins is that they are uncrystallisable, they form no well-defined compounds, they are difficult to purify, and chemically they seem to lead nowhere; and this in spite of the fact that such skilled workers as Regnault, Cross and Bevan, Winogradsky, and other well-known botanists and chemists have sought to clear up their relations. Braconnot seems to have been the first to realise (in 1825) that these bodies existed, but Frémy first described (in 1840) the parent substance, pectose, as an alcohol- and water-insoluble body associated with cellulose in the cell-walls of plants, but chemically very unlike cellulose. Later workers found pectose difficult to isolate in an unchanged state; acids and alkalis may dissolve it with production of pectin and pectic acid, but they also change it. Pectose, indeed, appears from the work of Fellenberg and Carré to be formed by the union of cellulose with pectin; acid hydrolysis resolves it again into its constituents. Ehrlich concluded that the natural pectin of plants may be conceived as a complex anhydro-arabinose-galactose-methoxy-tetra-galacturonic acid. The replacement of a variable number of methoxy-groups by cellulose may be supposed to confer insolubility on the complex, which would be hydrolysable to varying degrees by acids and alkalis, or by other hydrolysing agents such as the natural enzymes found in plants. Having regard to the difficulty of ensuring that one is dealing with a chemical individual, it is not surprising that such different empirical formulæ as $C_{42}H_{62}O_{37}$ and $C_{41}H_{60}O_{36}$ should be attributed to pectins from different sources. Mrs. Branfoot, after fully discussing the matter, concludes that pectin is a neutral methoxy-ester of pectic acid, represented by the formula $C_{41}H_{60}O_{36}$, and yielding 11·76 per cent. of methyl alcohol, whilst the basal molecule of fully de-methoxylated pectic acid is $C_{35}H_{50}O_{33}$, with a characteristic calcium content of 7·60 per cent. Intermediate *tri-, di-*, and *mono-methoxy* forms appear to exist, the jellying power, according to A. G. Norman, diminishing with the number of methoxy groups. Laboratory methods for the extraction and determination of pectic compounds from fruits and other vegetable products are described in this study, as well as commercial methods useful for the maker of jams and fruit jellies who wishes to stiffen his products, and so to avoid the troubles of the housewife whose jam will not set. The use of these products is specially called for when fruits deficient in pectose, like apricots, pineapple, and strawberries, are concerned. This practice is vigorously defended by the author who has made a particular study of the apple, following the changes of pectose into pectic acid, cellulose and methyl alcohol via pectin and the pectinic acids during ripening and the disappearance of these substances during rotting. The changes are made visible by staining sections with ruthenium red and other appropriate dyes. The monograph should appeal to the plant physiologist as well as to the fruit preserver and to the flax retter whose interest in pectic substances is confined to getting rid of them.

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[1] See THE LANCET, 1928, ii., 337.

[2] Canad. Med. Assoc. Jour., 1928, xix., 692.

[3] Jour. Parasitol., 1927, xiv., 106.

[4] Jour. Amer. Med. Assoc., 1929, xcii., 607.

[5] Jour. Infect. Dis., 1929, xliv., 1.

[6] A Critical and Historical Study of the Pectic Substances of Plants. H.M. Stationery Office. Pp. 154. 3*s.* 6*d*.

THERAPEUTICS FOR STUDENTS OF PHARMACY.

THE large number of words derived from the Greek *pharmakon* must be a puzzle to the lay mind; some refer to the doctor and his art, others to the pharmacist and his craft. But the line of pharmacy for the chemist, and pharmacology and therapeutics for the doctor, is one overstepped on both sides, and one which must be overstepped in training, at any rate, if a sound and liberal education is to be given. The strife which sometimes arises between doctor and chemist is not over what each learns, but what each practises. The professor of pharmacology and chemistry in the University of Washington has deliberately decided to write for the student pharmacist a text-book[1] on pharmaceutical therapeutics, including in his sub-title "with pharmacology." The book is eminently readable, running smoothly to the English ear; its general arrangement is therapeutic, according to the bodily system for which the drugs are most frequently applied. In his preface Prof. Lynn sets out a reasoned and, it seems to us, a reasonable defence of his action. There are, he tells us, a number of modern and very satisfactory books on pharmacology and toxicology for the medical student and practitioner, but no one has attempted to present, for the pharmacist, such a field in simple manner with general but without a practical therapeutic application. It is this gap in general therapeutic teaching which the writer wishes to fill, for the teaching of pharmacy is otherwise difficult. In describing each drug he considers the physiological actions most important in the treatment of disease and most significant in the diagnosis and treatment of poisoning. The principles of its therapeutic employment, which are closely associated with these actions, are given in outline without any attempt to describe the practical application. Therapeutic information is supplied for students of pharmacy and for their education rather than for their practice.

The danger of imparting general information to those who are not meant to apply it cannot have been overlooked by Prof. Lynn. The temptation to prescribe for such common ills as headache, constipation, and general debility is seldom resisted by the pharmaceutical chemist when pressed by a customer dissatisfied with his medical attendant or reluctant to pay a fee. If the pharmaceutical chemist is more interested in the purpose than in the technique of his profession he will study therapeutics with zeal and may find irksome the limitation of his life-work to the dispensing of remedies prescribed by others. It must be remembered, however, that the status and responsibilities of the chemist vary in different lands and in different epochs—for example, in France his profession stands exceptionally high. In Great Britain, too, there are signs of the expansion of opportunities in pharmaceutical chemistry, since the laboratories of the Pharmaceutical Society of Great Britain and Ireland have, in recent years, taken on important new duties. It is, however, mainly in one direction of therapeutics that the modern student of pharmacy is enlarging his experience; the many biological remedies now on the market are being standardised year by year according to methods which require special training, and an entirely different outlook will be demanded in future years if the increase in the number and popularity of these remedies is sustained. The curriculum of the student of pharmacy is likely to become almost as crowded as that of the student of medicine. Whether there is room for therapeutics, even in its most general sense, remains doubtful.

ENOUGH BUREAUCRACY AND NOT TOO MUCH.

A SPEAKER who last week addressed the Law Society's meeting at Bournemouth on the Rise of Bureaucracy chose as one of his supreme examples the departmental order which requires a cowman to wash his hands before milking. Bureaucracy is undoubtedly a grave disease of the body politic. Lord Hewart has forsaken his judicial detachment to attack it as the "new despotism"; Lord Wolmer has been exposing the defects of a nationalised post-office; the medical profession knows its own troubles in the departmental aspects of health insurance and in the Statutory Rules and Orders about the supply of dangerous drugs; many members of the public have their favourite instances of petty restrictions tolerable only in war-time, and of official tactlessness and stupidity. But are there many champions of the ancient liberties of England who are anxious to go to the stake on behalf of the right to supply dirty milk? The direct legislation of Parliament specifically enacted that Milk and Dairies Orders should—amongst other things—prescribe the precautions to be taken for protecting milk against infection or contamination and for preventing danger to health from the sale of infected, contaminated, or dirty milk. Accordingly, the Order of 1926 directs that any person engaging in the milking of cows or the distribution of milk shall keep his clothing and person in a cleanly condition, and that all cowkeepers shall see that the hands of the milker are thoroughly washed and dried before milking—with other precautions for the same purpose. It is true that this adds to the list of crimes which sufficed Elizabethan England, and that prosecutions for dirty hands may encourage lawyers to take nice points as to the exact meaning of "thoroughly washed." But if the country wants clean milk Parliament must require the *observance of elementary precautions, and the* Ministry of Agriculture must frame certain minimum standards. Parliament might, of course, legislate about such details itself instead of delegating its authority to a department; but Parliament is one of the worst possible bodies for legislative purposes; it is too big and too busy to attend to details. As for the loss of personal freedom which the Bournemouth speaker's instance involves, there are copious parallels in other fields of public health. Where an individual's act or neglect can imperil the health and safety of others he may have to surrender [illegible]g of his freedom. The notification of infectious disease, quarantine, vaccination, the cleansing of verminous persons, and the detention of the insane—all these have elements of interference and compulsion which are familiar in our Public Health Acts and in the even more stringent variants of local legislation. If, in a matter like milk-supply, the choice lies between the Bournemouth speaker's remedy of laissez-faire and the Ministry of Agriculture's Order, the public may swallow a small dose of bureaucracy with no ill-results.

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[1] Pharmaceutical Therapeutics with Pharmacology, Posology, and Toxicology. By Eldin V. Lynn, Ph.D., Professor of Pharmacology and Chemistry, University of Washington, College of Pharmacy, Seattle. London: McGraw-Hill Publishing Co., Ltd. 1929. Pp. 431. 20s.

CONCERTED STUDY OF TUBERCULOUS INFECTION.

MANY of those who write in praise of team-work in research have never tried it; the research mind can only rarely be harnessed in a team. There are quick workers and slow, intuitive thinkers and plodders who add one to one with painstaking care, men whose gifts lie in manipulative skill, and those to whom technical laboratory work is an abhorrence. No doubt each individual can find work suitable to his needs, given the opportunities, but thrice blessed is he who can bring them together into an efficient and harmonious team. Such is seen in the record of a decade of work by a team of American investigators, organised by the Kenneth Dows Research Fund of Johns Hopkins University and Hospital, and published in a limited edition regardless of cost.[1] Each research is an entity in itself, but each bears upon the rest; all the papers have appeared from time to time in the *American Review of Tuberculosis* and an interval of seven years separates the first from the last. Throughout these studies the workers have had the advantage of the use of a culture of human tubercle bacilli isolated by Trudeau at Saranac in 1891. At the time of isolation it exhibited what might be called standard virulence for guinea-pigs, but after two or three years of incubator existence it underwent a noticeable diminution of virulence. This diminution proved, as time went on, not to be progressive to a vanishing-point, and the strain has retained a certain degree of infecting power for guinea-pigs, which has not changed during the last 20 years. Its newly acquired, though lessened, infectiveness has become a fixed and static property resisting all ordinary methods that have been aimed at changing it. The studies were designed primarily to elucidate two main problems in tuberculosis immunity—viz., the part played by the lymphatics in the localisation of tuberculous disease, especially in its chronic pulmonary form, and the mechanism by which this localisation favoured the development of the immunity processes. Early in the story comes Dr. W. S. Miller's study on the normal histological distribution of the lymphatics of the human lung, followed by his wax reconstruction models of a single tubercle in the lung, which enable the observer to visualise in three dimensions what he has hitherto only looked at on a plane surface. These models are probably unique. Then follow researches on the vascular supply and lymphatics of the lung of the guinea-pig and the rabbit by Dr. Miller, Dr. Krause, and Dr. H. S. Willis. Each research emphasises minute points of difference between these two animals which to the uninitiated might appear to be of no practical value whatever; but in subsequent papers the picture of lymphatic mechanism is built up to show that these differences are not devoid of meaning. Dr. Krause makes it clear that, although the tracheobronchial lymph nodes of the rabbit are small and unimportant, the intrapulmonary lymph tissue is large in amount and is supplied by blood from the pulmonary artery; consequently when intravenous infection with tubercle bacilli takes place, an intrapulmonary fixation of the bacilli by these lymph nodules follows. Here the anatomical distribution of the lymph nodules determines the focalisation of the disease. For the same reason the presence of large tracheo-bronchial glands in the guinea-pig determines the early localisation, in this case not in the lungs but in the hila. From this point Dr. Krause goes on to show how foreign particles passing through the lungs may be "embolised." If they are arrested there, they may remain in situ or they may be conveyed into tissue spaces and thence to the intrapulmonary lymphoid tissue as in the rabbit, or the hilum nodes as in the guinea-pig. Again, therefore, it is seen that the lymphatics are the determining points of focalisation. But not only do they focus infection, they control the rate of the dissemination of tubercle bacilli from the portal of entry onwards. In the normal guinea-pig dissemination takes place within three hours; in the immune pig, after subcutaneous reinfection with a virulent strain of bacilli, a great delay occurs in the transmission of tubercle bacilli from the point of entry to the customary places of localisation within the body takes place. The outstanding feature is not complete inhibition but retardation. This work on the lymphatics of these two animals, which are so frequently used in laboratory experimentation, is a valuable contribution to the pathology of tuberculosis. The importance of the lymphatics in the spread of this disease through the body has been recognised by all pathologists since the days of Sylvius, but the fact that variations in the lymphatic distribution in different animals might be responsible for so much variation in the pathological picture has hitherto not been clearly recognised. Its bearing upon the morbid anatomy of human tuberculosis is obvious. Finally, the work of Dr. Krause and Dr. Dorothy Peters suggests the existence of two factors in this mechanism—namely, tissue allergy and immunity. The allergic reaction is called into play by the tissue contact of immune animals with dissociated tuberculoprotein or with tubercle bacilli, and this is followed by an accelerated development of the characteristic nodular tubercle.

THE HEALTH OF SEAMEN.

THE Seamen's National Insurance Society is an organisation bound by its constitution to accept every seaman who applies for membership without regard to his age, state of his health, or any outside consideration. The membership is not of a specially selected class, and for this reason some figures set out at the annual meeting held in June last and now published in the report of progress for 1928 are of interest. Throughout the eight years ended in December, 1928, on the average 12 per cent. of their members received sickness benefit, but in both 1927 and 1928 the number represented 15 per cent. Detailed examination of the records does not indicate any exceptional causes for this increase in sickness. In 1927 influenza had a marked effect, but in 1928 the number of influenza cases was below the average. A more encouraging feature is the low incidence of tuberculosis and venereal disease. The membership of the Society as certified by the Ministry of Health has averaged a little under 60,000 during a period of 16 years, and the cases of tuberculosis have averaged little over 100 a year during this period. During the last eight years the deaths from tuberculosis have averaged one-seventh of 1 per cent. per annum. In the same period the known incidence of venereal disease has also been small. The Society's doctors have treated rather less than 150 cases a year, this number including members who have received medical benefit after being eligible for sickness benefit. The cases of venereal disease, as far as can be ascertained, represent one-fourth of 1 per cent. of the members of the Society. Sir Norman Hill, the chairman, in announcing these figures said that he believed them to present a very different picture from that drawn from other sources, but he knew of no grounds upon which their accuracy could be questioned. As regards tuberculosis there could be no possible reason for underestimate. Indeed, the Society was entitled to get substantial help from the local authorities in every proved case. He made no claim that the figures shown by the Society's records are generally applicable to all seamen, and put them forward only to suggest that those figures derived from other sources require closer investigation than appears to have been given them. Among the difficulties of assessing the sickness of seamen is, of course, the impossibility of obtaining reliable estimates of the total number of seamen. An individual may be described as a seaman on very slender grounds, especially in death certificates. The title is often used by those who find only seasonal employment at sea, and may be retained long after the man has left the sea to follow a permanent occupation on the shore.

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[1] Studies on Tuberculous Infection. By Allen K. Krause, William Snow Miller, and Henry Stuart Miller Kenneth Dows Tuberculosis Research Fund, Johns Hopkins University, Baltimore.

A TREATMENT FOR EMPYEMA IN INFANCY.

EMPYEMA is still a very dangerous condition in infancy. In the United States, Spence[1] in 1920 found in a total of 201 cases that the mortality was 64 per cent. in the first year and 50 per cent. in the second. Cameron and Osman's[2] figures in this country three years later are in close agreement with Spence's, showing 66 per cent. mortality in the first year and 50 per cent. in the second. Of many methods advocated as means of reducing this high death-rate, one which has found favour on the continent is the use of optochin, a preparation of ethyl-hydrocupreine hydrochloride which has been shown to have an inhibiting effect on pneumococci in vitro. Woringer,[3] of Strasbourg, employs it as follows. As much pus as possible is aspirated from the chest, and a 5 per cent. solution of optochin is then injected into the pleural cavity in a dosage of 25 mg. per kg. of body-weight, the total dose not exceeding 500 mg. (10 c.cm.). This procedure is repeated three or four times at intervals of one to two days, and it is stated that the general condition of the child usually improves and the fever diminishes. If not, a second course of injections may be given and even a third or fourth. Some authorities, after aspirating the pus, wash out the pleural cavity with 100–200 c.cm. of a 0·5 per cent. solution, but Woringer is opposed to this on the grounds that it may cause shock and death. He has treated 30 children by his own method and 24 of them recovered completely. Five were operated on secondarily and successfully—and in the light of later experience he thinks unnecessarily—and there were six deaths. The mortality in the first year of life was 29 per cent. (7 cases) and in the second year 36 per cent. (11 cases). Eighteen children over the age of two were treated without a death. Optochin is said not to have any effect on the staphylococcus or streptococcus, and its action is purely local. After the first injections pneumococci are still present in the pus and stain by Gram's method, but it is stated that they will not grow in culture. Fever sometimes recurs as a result of pocketing and if this happens each pocket must be injected separately or the pneumococci, deeply embodied in fibrous deposits, may soon recover their virulence. Hence in Woringer's opinion no case should be pronounced cured until fever has been absent for several weeks. The pus disappears usually in two or three weeks, and radiography shows that even big masses of fibrinous deposit may be entirely resolved within five or six months. But since optochin has been found dangerous when injected intravenously in pneumonia it may well be asked whether there is any risk in introducing it in the pleural cavity. To this question Woringer replies that he has never seen any bad effects from its employment in the dosage recommended, and he even suggests that in some resistant cases the concentration should be cautiously increased from 25 to 50 mg. per kg. It is, of course, difficult to say how far any benefit from the treatment recommended is attributable to the repeated aspiration of pus. Woringer himself does not hold that the use of optochin will supersede operative measures, but he thinks it may be very useful, especially perhaps when it is desirable to defer operation owing to the coexistence of pneumonia and empyema.

EPIDEMIOLOGY IN ICELAND.

ACCORDING to a correspondent who has lately visited Iceland, and whose paper is concluded on p. 801 of this issue, "There are many striking differences in the behaviour of diseases in Iceland and other countries. A study of these differences might well throw important light on the ætiology of these diseases." As examples it may be noted that tuberculosis, which is declining in most civilised countries, is increasing in Iceland at rather an alarming rate. Poliomyelitis, on the other hand, according to the data supplied, seems to be clinically milder than when it is epidemic in similar environments such as rural Sweden—in spite of the fact that the high morbidity for such a small country suggests that the virus is spreading in an unsalted population. Islands have often been a fruitful field for biological research, as is well brought out by Russel Wallace in his classic "Island Life," because an insular environment permits the segregation, preservation, and evolution of fresh varieties of organisms, including man and microbe. In epidemiological research isolation is a tremendous asset, if not an essential requirement, since the factors involved are so numerous and complex that in areas where continual intermigration is going on between the hosts and parasites of neighbouring areas, the problems become almost hopeless of solution. This shows the importance of another noteworthy remark in our correspondent's article. "In such an isolated and sparsely populated country," he says, "an invading germ can be followed almost visually, as it passes from one lone homestead to another." From this it appears that Iceland is an ideal hunting ground for the epidemiologist. Of recent years, however, it has become more and more clear that epidemiological research, if it is to produce any useful results, must be prolonged over many years, and include extensive studies of the healthy as well as the afflicted, during inter-epidemic, as well as epidemic, periods. Ideally, at any rate, such research requires a team of medical ecologists which include among them clinicians, statisticians, bacteriologists, and (last but not least) a general biologist. Governments rarely care to subsidise such expensive and lengthy academic studies, which are unlikely to produce a visible or immediate return for their money. But should some great scientific organisation, such as the Rockefeller Foundation, be looking for promising material for epidemiological research, it almost seems as if Iceland, with its highly educated population, its learned medical men, and its natural geographical advantages, is the most promising field left in the world. The time is now or never; for as transport and intermigration become more rapid, frequent, and extensive every year, it will not be long before Iceland loses its unique character as a potential key to the mechanism of epidemics.

REGULATION OF THE DIABETIC DIET.

NOWADAYS a large proportion of patients take an interest in their own complaints and try to understand them as far as they can. Dissatisfied with the diagnosis of "an internal inflammation," they wish to know if their ulcers are gastric or duodenal and are often able to argue at length about the relative merits of medicinal treatment and a short-circuit. When this attitude leads to self-prescribing and treatment, pitfalls inevitably open before patient and doctor, but so long as it only means intelligent coöperation it may be valuable to both of them. Diabetes is perhaps the outstanding example in which such coöperation is important, and several manuals and sets of tables have been published for the use of patient and practitioner alike. The latest contribution is a "Diet Summary in Average Servings for Diabetics,"[1] by Dr. P. J. Cammidge. The basis, as the title implies, is a standard diet made up of helpings of food as they appear at the table. From this the diet for any particular patient is determined by a process of trial and error controlled by the usual examinations of blood and urine. The main articles of diet are grouped under the headings of protein, carbohydrate, fatty and miscellaneous foods. Average helpings are given in ounces and the relative amounts of protein, carbohydrate, and fat are set out in grammes and also in "rations." The "ration" is an arbitrary unit which has been found to facilitate working; 20·0 g. of protein = one protein ration (P.R.), 5·0 g. of fat = one fat ration (F.R.), and 4·0 g. of carbohydrate = one carbohydrate ration (C.R.). Thus the average serving of boiled cod is 3½ oz. containing 20·0 g. of protein and 0·2 g. of fat, and forms one protein ration. The tables offer a ready means of varying a diet within the limits laid down. A patient taking, say, six carbohydrate rations at a meal may have it in any one of the following forms, each one of which is regarded as an average helping: ¾ oz. sago, 1 oz. wheat flour or macaroni, 2 oz. chestnuts, 4 oz. potato, 5 oz. broad beans, or one average sized pear (5½ oz.), banana (7½ oz.), or apple (7½ oz.).

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[1] Spence, J. L.: Amer. Jour. Dis. Child., 1920, xx., 545.

[2] Cameron, H. C., and Osman, A. A.: THE LANCET, 1923, i., 1097.

[3] Woringer, Pierre: Rev. Franç. de Péd., Feb., 1929

While this summary is apparently written in the first place for the use of medical men, it is one which could be handed with advantage to any intelligent patient if his diet had first been stabilised and if any experiments or alterations were made under supervision. The tables have been carefully compiled; they are practical and simple, and they should prove of real help in relieving the monotony of the ordinary diabetic diet. In the necessarily condensed introduction are several controversial statements. It will not be generally accepted that actual appeal to the balance is rarely required after a little practice. This may be, and often is, true in cases on diet only, but in insulin cases, particularly if large doses are required, a check should be made at least once a week even if daily weighing is not necessary to prevent errors creeping in. Discussion is also invited by the statement that if the patient is able to utilise less than 40 to 50 g. of carbohydrate daily, insulin will probably be required. Future editions would be made more useful by the addition of a general index of foods, arranged alphabetically for quick reference to the various groups. These criticisms apart, the brochure may be warmly recommended.

ASPIRATION DURING TONSILLECTOMY.

PULMONARY abscess is a very rare sequel of tonsillectomy but it is greatly dreaded, the more so because it follows a comparatively trivial operation. At one time it was taken for granted that inflammation in the lung was due to the anæsthetic, but its occurrence when local anæsthesia is used shows at any rate that this is not always so. As we pointed out a fortnight ago (Sept. 28th, p. 673) two theories at present hold the field: first, that the complication is a result of inhalation of infected material during the operation; the second, that it is caused by the lodgment in the pulmonary vessels of emboli from the site of operation. In this connexion it may be noted that pulmonary abscess is not uncommon after other operations, notably laparotomy. Our annotation described some experiments designed to test the inhalation theory, and it may be of interest to draw attention now to some other observations whose object was the same. Attempts have often been made to ascertain, by bronchoscopy and by indirect laryngoscopy, what is the quantity of material aspirated and what is its dispersion through the tracheobronchial tree during tonsillectomy under inhalation anæsthesia. Impressed by the inadequacy of these methods, R. V. May, T. W. Thoburn, and H. C. Rosenberger, of Cleveland,[1] have made an elaborate radiographic investigation of 25 patients, aged from 3 to 12 years, during and after the operation of dissecting out the tonsils under a general anæsthetic. The radiopaque material employed was iodised oil and olive oil in equal parts, of which 2 to 3 c.cm. was dropped slowly on to the posterior pharyngeal wall and immediately removed by swabbing. Radiograms of the anæsthetised patient were taken before and after the instillation of the oil, after the dissection of each tonsil, after removal of the adenoids, and six hours after operation. Secretions were removed on gauze sponges, except in two cases where a suction-pump was employed; these both showed aspiration into the bronchial tree. Of the results, 48 per cent., or almost half the cases, showed evidence of aspiration; in all but four cases the iodised oil had been eliminated by the time that the fifth radiogram was taken, after removal of the adenoids, and only one case showed any remaining after six hours. The authors justly claim that the use of skiagraphy in investigating the degree of aspiration during operation is much more informative than the methods previously employed. They conclude that aspiration may be diminished by the adoption of the extreme Trendelenburg position, by constant and thorough removal of all pharyngeal secretions, by a technique producing a minimum of mucous secretion and hæmorrhage, and by a degree of anæsthesia which preserves the irritability of the laryngeal and tracheal reflexes; further, that some degree of aspiration is unavoidable in all operations requiring an inhalation anæsthetic. The investigation does not, of course, decide the question whether pulmonary abscess is caused more often by embolism or by inhalation.

A POST-GRADUATE course for old students of the London Hospital will be held next week from Wednesday (Oct. 16th) until Saturday, and a provisional programme appears in our Medical Diary. Communications may be addressed to Mr. Hugh Cairns at the hospital.

THE Bradshaw lecture of the Royal College of Surgeons of England will be delivered at the College at 5 P.M. on Thursday, Nov. 14th, by Mr. R. P. Rowlands, and the subject will be a Review of the Surgery of the Gall-bladder and Bile-ducts. Students and others who are not Fellows or Members of the College may gain admission by presenting their visiting cards.

As we have already announced, the Harveian Oration of the Royal College of Physicians of London will be delivered at the College by Sir Wilmot Herringham on Friday next, Oct. 18th. Dr. J. A. Arkwright, F.R.S., will give the Bradshaw Lecture on Nov. 5th, his subject being the Virulence of the Micro-organism in Infective Disease. Dr. G. F. Still's FitzPatrick Lectures, on the History of Pædiatrics in the Seventeenth and Eighteenth Centuries, will follow on Nov. 7th and 12th; and the Lloyd Roberts Lecture will be given on Nov. 14th by the Rt. Hon. H. A. L. Fisher, F.R.S., whose subject is An Oxford Movement. The Harveian Oration will be at 4 P.M., and all the lectures at 5 P.M.

DONATIONS AND BEQUESTS.—Among other bequests the late Mr. J. D. Kay left £1000 to the Manchester Royal Infirmary.—Mrs. Polly Wharton, of Brights Cottage, Heckmondwike, left £1000 to the Heckmondwike Urban District Council upon trust to apply the income in defraying the expenses of sending to the seaside poor and sick children resident in the district, and £500 to the Heckmondwike Nursing Association.

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[1] A Diet Summary in Average Servings for Diabetics and others suffering from Disorders of Metabolism. By P. J. Cammidge, M.D. Lond. London: Baillière, Tindall and Cox. 1929. Pp. 8. 1s. (6s. per doz.).

[1] Jour. Amer. Med. Assoc., 1929, xciii., 589.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLVII.

THE MICROSCOPIC EXAMINATION OF FÆCES.

PART II.*—BACTERIA.

THE conditions of warmth, moisture, and pabulum obtaining in the intestinal tract are almost ideal for promoting the growth of micro-organisms, and a great variety of bacteria is to be found in the fæces. They are, however, really outside the body itself, and are to be regarded as essentially saprophytes, although under certain circumstances almost any of them may enter the body and become pathogenic. There are four great groups of bacteria normally appearing in the fæces; the coliform bacilli, the streptococci, the anaerobes, and the acidophile bacilli. The streptococci and acidophiles retain Gram's stain, as do most of the anaerobes, while the coliform bacilli are decolorised by Gram's method. A generation ago Combe advocated the simple staining of a smear of the fæces by Gram's method, and drew inferences from the proportion of bacteria which retained the violet coloration, to those which were decolorised and took up a counter-stain. Although this procedure has not led to results of practical application, a variation in the proportion of the bacteria of the four groups named does nevertheless occur, and one of the chief factors influencing this variation is the diet taken by the patient.

Influence of Diet.

The intestinal tract, which is sterile at birth, is soon found to contain bacteria. Normally about one-third of the dried fæces of healthy people on a mixed diet consists of bacteria. During the period of milk-feeding, the acidophile group predominates largely; but with the onset of mixed feeding, the bacterial distribution changes and soon resembles that of the adult, the coliform bacilli becoming the prominent group. The coliform and anaerobic bacilli preponderate with a high protein diet; whilst the *B. acidophilus* is increased on a high carbohydrate diet. Increase of streptococci follows an addition of glucose or cane sugar to the diet, and the numbers of viable streptococci are greater after a saline purge. Elimination of many putrefactive anaerobic bacilli and other proteolytic organisms, and reduction of the coliform bacilli, can be brought about by a lacto-vegetarian diet, with plenty of fruit and green vegetables, especially if lactose be added. Cultures of *B. acidophilus* may be given in milk to hasten the change of flora.

In addition to the normal inhabitants of the bowel, certain pathogenic organisms occur in *disease*, such as typhoid, dysentery, and tubercle bacilli. These will be dealt with before discussing the conditions under which the normal bacteria may cause disease.

The Typhoid-Paratyphoid Group.

In the typhoid-paratyphoid group of diseases the bacteria may appear in the stools from the first week onwards, and are recovered in one-third to one-half of the cases. Though other methods of diagnosis are more reliable—such as blood cultures during the first ten days, and the Widal reaction after that—culture of the stools is useful *as a control.* Bacteriological technique has much improved as the result of the experiences of the war; it is now agreed that before a positive finding is reported, the suspected organisms must not only conform to requirements in motility and fermentation of sugars, but also must be agglutinable by a standard serum. *Typhoid* and *paratyphoid* B bacilli, though less common than formerly, occur still in mild epidemics; *paratyphoid* A, an Eastern type, was more often met with during the war, brought by the troops coming from India. These diseases must be notified. The bacilli continue to be excreted in gushes for some time during convalescence, so that several negative reports at intervals should be obtained before the patient returns to ordinary life. Sometimes it happens that a patient, though apparently well, continues to pass enteric bacilli at intervals; he becomes a "carrier," and a source of unwitting infection of the rest of the community. Such a person should be isolated under medical supervision, and should be debarred from any occupation which entails the handling or distribution of foodstuffs. Unfortunately, in these cases, it is often difficult to get rid of the infection, which may continue for a long time in such places as the gall-bladder.

Dysentery Bacilli.

In cases of colitis due to infection with dysentery bacilli, the organisms can be recovered from the mucopus in a large majority of the cases in the acute stages; in chronic cases they are rarely found. Indeed it may well be that bacillary dysentery is always an acute infection, though sometimes quite a mild one; and that a chronic colitis following an attack of dysentery is kept up by non-specific bacteria as a secondary infection. The laboratory report should differentiate between dysentery bacilli of the *Shiga-Kruse* and of the *Flexner-Y* types. The former infection is a serious affair, since the *Shiga* bacillus has a toxic effect on the nervous system as well as on the intestine. Nowadays a good antitoxic serum is available. Infection with *Flexner* dysentery bacilli is milder; it may be troublesome, however, and even fatal in infants, or in elderly or debilitated patients. There are at least five members of this *Flexner-Y-Hiss* and *Russell* type, and no standard serum is available. Eliminative treatment, for example by sodium sulphate, is the best.

A number of bacilli, not true dysentery, but capable of producing colitis, are grouped together as *para-dysentery* bacilli, of which perhaps the best known are *Morgan's No. 1* bacillus in the summer diarrhœa of children, the *Sonne* bacillus associated with dysenteric symptoms, and the *Bacillus enteritidis* of *Gaertner* and *B. aertrycke* in food poisoning. The allied *B. suipestifer* (hog cholera bacillus) is important for animals and probably sometimes for man. There are also others whose claim to be regarded as pathogenic is not yet accepted. These will be dealt with later.

Tubercle Bacilli.

A report of *tubercle* bacilli can only rarely be unexpected. *Their presence in sufficient numbers to* be detected in a routine examination will occur only when there is gross clinical evidence of chronic bowel trouble. In children with phthisis, in whom all sputum is swallowed so that none is available for direct examination, pus containing tubercle bacilli may be *passed* in the motions. In suspected cases of intestinal tuberculosis, special methods of concentration with antiformin and inoculation of a guinea-pig may be required.

Cocci.

Staphylococci are not inhabitants of the intestine. When their presence is reported, a local infection of the lower bowel by abscess or fistula-in-ano should be sought for; otherwise it is a negligible contamination from the skin. *Streptococci*, on the other hand, form one of the important groups of the normal intestinal flora, and there are several varieties which may at *times be pathogenic.* The usual differentiation made is by their action on blood cells, so that they may be classified according as they produce a green pigment, or completely hæmolyse the blood corpuscles, or have no effect upon them. All three classes may be present in fæces. The non-hæmolytic one (*enterococcus*) is the commonest. It is usually not pathogenic, though it is reputed to be so at times, as a secondary infection following ulcerative states of the bowel. A variety of the enterococcus is believed by Bargen to be the causative organism in chronic ulcerative colitis; but this is not generally accepted by pathologists. The other two classes, green and hæmolytic streptococci, may also become pathogenic. If they invade the blood stream or tissues of the body, they may cause severe symptoms, but their presence in the fæces is not necessarily significant.

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* Part I., on Cytology and Animal Parasites, appeared last week.

Other Micro-organisms.

The vibrio of *cholera* may be found in epidemics in the tropics, but does not occur in these islands. *B. pyocyaneus* (the bacillus of blue pus), *B. proteus* (a putrefactive bacillus often found in great numbers in watery offensive stools), *B. lactis aerogenes* (allied to *B. Friedlander*, the pneumobacillus), *B. fæcalis alkaligenes* and *B. pseudoasiaticus* are rather harmless findings in the fæces, though possibly they may become pathogenic at times in other situations.

The other groups of fæcal bacteria, anaerobic and acidophile, as well as the spirochætes and yeasts—except the ray fungus of actinomycosis—are not important so long as they remain in the lumen of the bowel; though it may be expected that as our knowledge of the biochemical products formed by these organisms from food-stuffs increases, there will be some evidence found on which to form conclusions about a possible "intestinal toxæmia."

While one-third of the dried weight of normal fæces consists of the bodies of dead bacteria, these bacteria in the lumen of the bowel are really, as already mentioned, outside the limits of the body proper, and are as unlikely to gain entrance to the body, unless there is a breach in the mucous membrane, as are skin organisms without some damage to the skin epithelium. Such a break in the mucous membrane of the bowel occurs in any abrasion or ulcer, and there is no doubt that a secondary infection of dysenteric and tuberculous ulcers takes place with the ordinary cocci and bacteria of the bowel. Even when the site of invasion is not obvious, we know that a septicæmia with colon bacilli may occur, and that these are often excreted by the kidney causing irritation and inflammation of the urinary tract. Just before death, too, the blood is often invaded by bowel organisms, which can be recovered in blood culture; being a terminal state only, this septicæmia of intestinal organisms is not important, as by the time it sets in the bowel wall has probably lost its normal protective power.

Criteria of Pathogenicity.

These conditions are, however, exceptional. What importance should be assigned to the bacteria which remain in the lumen of the bowel? It must be noted that the media used for culture of micro-organisms are artificial ones; though selective for some bacteria, they may even inhibit others. The amount of growth on culture media may bear little relation to the numbers of bacteria present in the fæces, or to their pathogenicity. Too much emphasis should not be laid on an apparent increase in numbers, such as an excess of streptococci; it has been shown above that great variations in numbers of streptococci occur with change of diet, and of the consistency of the stools. In pernicious anæmia and other conditions with subacidity of the gastric juice, there is a great numerical increase of the normal inhabitants of the bowel, *B. coli*, *streptococci* and especially the anaerobe *B. welchii*. But there is no evidence that these organisms differ qualitatively from those found in healthy persons, or that any individual type of organism is specifically related to pernicious anæmia. It is necessary, too, to avoid the fallacy of treating the patient for such conditions as the presence of coliform bacilli, which are atypical in having a delayed power of fermenting lactose. The usual *B. coli* rapidly produce acid and gas in lactose media, whilst most of the known *pathogenic* Gram-negative bacteria do not show this reaction with lactose in ordinary media. There is an intermediate group which ferments lactose after an interval of several days—some of them may even produce so much ammonia from peptone digestion that an acid reaction never appears—which are described alternatively as *para-dysentery* or *para-colon* bacilli. A few of these are of known pathogenicity, a few of known harmlessness; there is little evidence that the majority of them exert a harmful action on the animal body. The quality of delayed fermentation of lactose is not therefore significant. A further group of these colon bacilli is found to grow in the presence of normal active serum; some even hæmolyse red blood corpuscles. These serum-resistant and hæmolytic *B. coli* may be pathogenic, but we have no certain evidence on this point. The same is true of hæmolytic streptococci. Their ability to live in blood, digesting and destroying the red corpuscles, makes them, at any rate, potential parasites, and if they are found elsewhere in the alimentary tract—at the roots of teeth, in the crypts of tonsils, or in the discharge from nasal sinus infection, as well as in the fæces—their possible importance cannot be denied. But if the evidence we have of the pathogenicity of these groups of bacteria is doubtful, evidence of their relevance in a particular patient is usually unattainable; the presence of any sort of specific immune body in the patient cannot be demonstrated by serological tests.

Vaccines from Fæces.

The value in treatment of vaccines made from the fæces, though widely assumed in this country, is not proved by bacteriological criteria, and does not rest on the same scientific basis as, for example, typhoid preventive inoculation, or the treatment of diphtheria and tetanus with serum. Nor has it the support of solid clinical proof, such as that of the value of vaccination against small-pox. It rests mainly on clinical impressions, which, as time goes on, may need to be revised, or, at the least, defined and classified.

In view of the great difficulties which confront anyone attempting to assess the possible pathogenic significance of fæcal organisms, therefore, no clear indications can be found for their use in vaccine-therapy. Antibodies to them may be formed by a patient into whom they are injected, but we have no means of knowing whether these have any specific action or are likely to help the patient in resisting his disease. Although vaccines have a proved place in bringing about protection against subsequent infection, their rôle in treatment is by no means securely founded. Until further positive evidence is accumulated, therefore, we have no warrant for using any but those derived from organisms with known pathogenic action; the promiscuous use of vaccines from other fæcal organisms is unlikely to lead to useful results.

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Physician, Ruthin Castle.

HOSPITALS AND MOTOR ACCIDENTS.—The British Hospitals Association is asking the Government to introduce a measure making it obligatory upon motorists to insure against third party risks, and empowering hospitals to recover from the insurance companies the cost of treating motor accident patients.

PUBLIC ASSISTANCE COMMITTEES AND HOSPITALS.—Under Section 1 of the Local Government Act of 1929 the London County Council will, on April 1st, 1930, take over the functions of the Metropolitan Asylums Board, as well as of the Boards of Guardians within its area. That area has been divided into ten sections, under a Public Assistance Authority of 48 members, 16 of whom will be coöpted from outside the Council, assisted by local committees. Hospitals are to be dealt with by a Central Public Health Committee, which is the Council's old Public Health Committee reconstituted. The county will be divided into five hospital areas, each of which will be coterminous with the boundaries of a group of boroughs. The scheme of rearrangements adopted by the Middlesex County Council provides that the Public Assistance Committee shall be composed of members of the Council only, coöption being confined to the local committees. Among the hospitals to be taken over by Middlesex are the North Middlesex (900 beds), the Hounslow Institution (800), Park Royal (778), Edmonton House Institution (700), and the West Middlesex (325).

Special Articles.

OXIDATION-REDUCTION POTENTIAL.

A SUMMARY OF RECENT WORK.

BY N. F. MACLAGAN, B.Sc.
(From the Courtauld Institute of Biochemistry, Middlesex Hospital.)

IT has been known for many years that the animal body derives its energy from combustion—that is, oxidation—and the exact analysis of this process is therefore of fundamental importance in physiology. In dealing with any form of energy there are two factors to be considered, which are best illustrated in the case of heat energy. Everyone is familiar with the distinction between temperature, which may be termed the intensity factor, and the amount of heat, measured in calories, which is the capacity factor. The different nature of these two quantities is made clear by the experiment of dropping a red-hot needle into a bowl of hot water: the heat capacity of the needle is much less than that of the water, yet heat passes from the needle to the water. Chemical energy may be split into two factors in an exactly similar way, and in the special case of oxidation we may regard the oxidation-reduction potential as the intensity factor, exactly analogous to temperature, which is indeed frequently called heat potential. Oxidation-reduction potential therefore decides which one of two systems will oxidise the other, just as the temperature decides the direction in which heat will pass when two systems are connected; to complete the picture oxidising capacity as estimated by titration may be compared with the heat capacity (calories).

The conception is perhaps made clearer by taking the further example of neutralisation of a base by an acid, where the acidic power may be factored into titrable acidity (capacity) and hydrogen-ion concentration (intensity). This case is also of special interest on account of the similarity in the methods of measuring hydrogen-ion concentration and oxidation-reduction potential. In both cases the first approach was through the use of certain dyestuffs called indicators. Litmus is an acid base indicator which is red in acid and blue in alkaline solutions; moreover, it changes colour in a certain relatively narrow range of pH, so that in this range its colour is an index of the pH. Similarly, methylene-blue is blue in the oxidised and white in the reduced condition, and changes colour in a narrow range of oxidation-reduction potential; to revert to the first example, it may be compared to a thermometer which indicates heat potential over a limited range. Ehrlich[1] was the pioneer in this field, and he was able to demonstrate differences in the reducing power of various organs with respect to indophenol blue and alizarin blue. Much work of a similar character failed to produce any definite advance owing to the fact that the relationships between the different dyes were not understood; also no zero of oxidation-reduction potential had been established, so that quantitative deductions from the experiments were impossible.

In 1920 Gillespie[2] published the first observations upon the electrode potential of bacterial cultures, and it was this work which led W. M. Clark and his colleagues to their "Studies on Oxidation reduction,"[3] which have thrown such a flood of light upon the whole problem. With the aid of electrode measurements they have been able to arrange a large number of dyes in an orderly series on a definite scale of oxidation-reduction potential, and as a result of their work it is now possible to make a fair estimate of the oxidation-reduction potential by observing the colour of a suitable dye. In order to understand the relation between the electrode and the dye methods, it is necessary to consider in more detail the chemistry of oxidation.

The Conception of Electron Transfer.

The older chemists regarded oxidation as an addition of oxygen or a subtraction of hydrogen, and reduction as the reverse. But with the development of the ionic theory this view has given place to a more general one, which may be conveniently illustrated in the oxidation of ferrous to ferric chloride

$$2FeCl_2 + Cl_2 = 2FeCl_3.$$

It is known that both $FeCl_2$ and $FeCl_3$ exist in solution mainly in the ionised form, so that this reaction may be written

$$(2Cl^- +)\,Fe^{++} + Cl \rightleftharpoons Fe^{+++} + Cl^- (+2Cl^-).$$

Evidently the essential part of this reaction is the transference of an electron—the unit negative charge of electricity—from the ferrous ion to the chlorine atom, which is thereby converted to an ion; so that the chlorine may be regarded as merely taking up the electron liberated in the oxidation of ferrous to ferric ion, which is therefore represented thus:

$$Fe^{++} \rightarrow Fe^{+++} + e.$$

This idea is of very wide application, and in general oxidation and reduction are associated with a loss and gain of electrons respectively

$$ox + e^{+} \rightleftharpoons red^{-} \quad \text{(Equation I.).}$$

On comparing this equation with that for the neutralisation of a base by an acid

$$H^{+} + OH^{-} \rightleftharpoons H_2O$$

it is evident that the reducing intensity of a solution is determined by the "concentration of free electrons" in the same way that the acidic intensity is determined by concentration of hydrogen ions. Apparently also a plate of noble metal may be regarded as an "electron electrode" in the same sense that a film of adsorbed hydrogen is regarded as a hydrogen electrode. Thus, when an electrode of plain gold or platinum is immersed in a solution, the potential set up is a measure of the reducing intensity of the solution and is called the oxidation-reduction potential E_h.

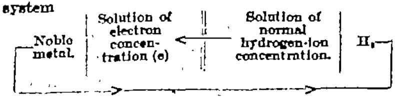
It should be noted that this treatment is purely formal, and that no objective reality is to be attached to such terms as "concentration of free electrons." There is, in fact, no evidence of the existence of free electrons in aqueous solution, and a difference in the mode of action of the hydrogen and oxidation-reduction electrodes is postulated which is probably fictitious; moreover, for the sake of simplicity, concentration is here substituted throughout for activity. The equations obtained by more rigid methods are, however, identical with those derived on the above hypothesis which has the advantage of presenting a clearer mental picture of the terms involved.

The oxidation-reduction potential is a single electrode potential whose absolute value cannot be determined, since a second single electrode must be coupled with the first before a measurement can be made. It is the practice to refer all such measurements to the normal hydrogen electrode, to which a potential of zero is arbitrarily assigned—that is, when an oxidation-reduction electrode is coupled with a normal hydrogen electrode the potential developed is attributed entirely to the former. This convention is expressed in the following equation:

$$E_h = -\frac{RT}{NF}\log(e) \text{ volts (Equation II.)}$$

when R = gas constant; T = absolute temperature; N = number of electrons transferred; F = the faraday.

This equation represents the potential difference of the system


Noble metal.
Solution of electron concentration (e)
Solution of normal hydrogen-ion concentration.
H_2

the potential at the liquid junction being neglected. It is further agreed that E_h be taken as positive when the current tends to flow as in the diagram. E_h is then an index of tendency to oxidise. Solutions having a positive E_h will oxidise, those having a negative E_h will reduce the normal hydrogen electrode. Also any solution will tend to oxidise one having a smaller, and tend to reduce one having a greater E_h than itself.

Reversible Reactions.

It is important to recognise that this treatment applies only to a perfectly reversible process, and herein lies the difficulty of applying it to living systems, whose processes are not in general reversible. However, we must consider together with this restriction the probability that many biological oxidations which are apparently irreversible proceed by a number of stages, some of which are truly reversible.

A further limitation of the theory outlined above arises when the reaction velocity is considered. The oxidation-reduction potential certainly decides in which direction the reversible reaction will proceed but does not say at what rate; this rate may be infinitesimally small, in which case the reaction does not proceed at all. The rate is, of course, frequently greatly affected by the oxidative catalysts, whose influence must therefore always be an essential factor in the problem.

The physical meaning of equation II. is revealed by application of the law of mass action of equation I.

$$(e) = K\,\frac{(\text{red}^-)}{(\text{ox})}$$

Substituting in II.

$$E_h = \frac{RT}{F}\log K - \frac{RT}{F}\log\frac{(\text{red}^-)}{(\text{ox})}$$

$$= E_0 - \frac{RT}{F}\log\frac{(\text{red}^-)}{(\text{ox})} \text{ (Peter's equation).}$$

E_0 is a constant for any one reaction and is obviously equal to E_h when $(\text{red}^-) = (\text{ox})$—i.e., at half oxidation.

It will have been noticed that the reductant in the above equations is an anion. This is a special case, but it is obvious that one or both of the reactants must exist in the ionised condition when an electron transfer is regarded as the essential process—e.g.,

$$\text{ox} + e \rightleftharpoons \text{red}^-$$
$$\text{ox}^+ + e \rightleftharpoons \text{red}$$
$$\text{ox}^+ + 2e \rightleftharpoons \text{red}^-$$

Thus the hydrogen-ion concentration may also affect the system as shown by the following equation:

$$H^+ + \text{red}^- \rightleftharpoons \text{Hred}.$$

In such a case it is usually only possible to measure the total reductant

$$S_r = \text{Hred} + \text{red}^-$$

and the relation of this to the active reductant red^- evidently depends upon pH. The following equation applies:

$$E_h = E'_0 - \frac{RT}{F}\log\frac{Sr}{So} \text{ (Equation III.)}$$

where E'_0 is a function of the pH.

It is interesting to note that this relationship between E_h and pH is a mutual one, so that changes in the oxidation-reduction system will affect the pH; the two equilibria are closely interconnected.

Equation III. is the basis of the indicator method of estimating oxidation-reduction potentials, which has been so thoroughly worked out by Clark and his colleagues. They have constructed E_h–pH percentage oxidation curves for a large number of indicators whose reduced and oxidised forms are differently coloured. If one of these dyes be added to a solution of known pH, in an amount so small as not appreciably to affect the existing equilibrium, the colour becomes an index of the oxidation-reduction potential. By choosing suitable indicators which change colour in the E_h (and pH) range under investigation a fair accuracy is obtainable.

Biological Applications.

The oxidation-reduction equilibrium is at least as important in the body as the acid-base equilibrium. It may therefore appear at first sight somewhat remarkable that the quantitative measurement of oxidising intensity—E_h—should have lagged so far behind that of acidic intensity—pH—in biology, but this is only the result of pushing the analogy too far. Neutralisation is evidently a unique process in aqueous solutions as it is a single reversible reaction in which the water takes part:—

$$H^+ + OH^- \rightleftharpoons H_2O.$$

On the other hand, the terms oxidation and reduction include a vast number of reactions, many of them irreversible, whose only common property is an interchange of electrons, and is thus not specifically related to the solvent. In addition, the interpretation of measurements is made difficult by our ignorance of the exact chemical mechanism of the simplest biological oxidation. The probable participation of reversible processes in these apparently irreversible oxidations has already been mentioned, but it would appear that few such processes have yet been found which are susceptible to electrode measurement.

It has been mentioned above that the earlier researches with indicators commenced by Ehrlich in 1885 did not produce any very definite results; the review of Needham and Needham[11] contains an excellent account of these researches. Clark and his collaborators have now removed many of the practical and theoretical difficulties, with the result that since 1920 there has been published much important work of which only the outstanding features can here be noticed.

The Reduction Potential of Bacteria.

The reduction potential of bacteria was first studied electrometrically by Gillespie,[9] who showed that anaerobic cultures developed increasingly negative potentials, the actual values obtained being very different in the few cases investigated. This was confirmed by Cohen, Cannan, and Clark,[4] who obtained similar results with cell suspension and who have also made some very interesting preliminary observations on the influence of glutathione on the development of these potentials. They conclude that the aerobic tissue cell or bacterial culture is roughly poised between +0·1 and 0·2 volts E_h. The system is not, however, in equilibrium with the atmospheric oxygen, which serves merely to oxidise the reducing substances elaborated in the cells at such a rate that the E_h is maintained within these limits. Under anaerobic conditions this controlling factor is removed and the E_h gradually falls, producing death of the cells (except in anaerobic organisms).

Evidently the classification of bacteria into aerobes and anaerobes has some reference to E_h. Quastel and Stephenson[12] concluded from their work on *B. sporogenes* that the behaviour of obligatory anaerobes is best explained on the assumption that they cannot grow above a certain potential. Similar results were obtained by Fildes,[8] who showed that the germination of spores of *B. tetani* failed to occur in media whose E_h was greater than +0·01 volts. Moreover, he explains the fact that this strain will not grow when injected into the guinea-pig by the incompatible E_h of the subcutaneous tissue fluid.

Intracellular Measurements.—In addition to these extracellular investigations, direct measurements of the intracellular E_h have been made by a method first introduced by Needham and Needham[11] which consists of making micro injections of suitable indicators into the living cell. This method has also been used by Brooks[1] Cohen, Chambers, and Reznikoff[5]

Rapkine and Würmser[13] Chambers, Pollack, and Cohen[3] and in view of the difficult technique it is perhaps not surprising that absolute agreement has not yet been reached. The aerobic potentials are mostly of the same order as those recorded by Cohen, Cannan, and Clark for bacteria and cell suspensions, but while the Needhams maintained that the E_h of the *amoeba proteus* was unaffected by anaerobiosis, the later workers found a fall of potential under these conditions. It has been emphasised by Cohen, Chambers, and Reznikoff that three factors are concerned in the interpretation of the results of these experiments—the intensity, capacity, and rate factors,—and it is no doubt the difficulty of allowing for the last two which is responsible for the existing uncertainty.

In this connexion, Cannan's work on *mercuralis perennis* is of great interest[2]; this plant contains a pigment, hermidin, which is in fact a reversible oxidation-reduction indicator, so that the E_h can be found in this case under perfectly normal conditions. It proved to be about —0·1 volts.

Oxidative Enzymes.

It was shown by Dixon and Quastel[6] that the system consisting of a mixture of reduced and oxidised glutathione was an anomalous one, for the potential proved to be independent of the concentration of the oxidised form. This implies that the change from reduced to oxidised glutathione is an irreversible one and therefore cannot be studied in this way, but the production of a stable potential is still of great interest, especially as it is not certain that glutathione acts through the change from reduced to oxidised forms. The cystine-cysteine system is in the same class, and the researches of Michaelis[10] and co-workers on the electrode potential of cysteine is yielding valuable information about its metallic complexes. Compounds of this type have been shown by Warburg[14] to be intimately concerned with tissue oxidation, and while the mechanism responsible for these potentials is still uncertain it is considered probable by Michaelis and Flexner[10] that the sulphydril group is the principal poising agent in the cells.

In conclusion, it may be emphasised that accurate work on oxidation-reduction potential in biology has only been going on for about nine years, and that much of the time has been taken up with essential chemical preliminaries. The importance of the subject cannot be doubted, and it is reasonable to expect considerable advances in the near future.

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SALE OF ST. BARTHOLOMEW'S HOSPITAL LANDS.—The Charity Commissioners have sanctioned the sale of 310 acres of building land at Stanmore belonging to St. Bartholomew's Hospital. The price paid for 240 acres of Kenton Lodge Farm, Stanmore, is £62,730. An option, exercisable within 12 months, has been given on the purchase, for £21,137, of a further 65 acres adjoining.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

THE post-graduate course held at St. Mary's Hospital during the first week-end of the winter session has become deservedly popular among practitioners. The attendance this year was as large as usual, in spite of the fact that other teaching hospitals are adopting the excellent plan of providing at this season of the year a short concentrated course. We publish on p. 751 of this issue one of the lectures delivered at St. Mary's, and abstracts of two of the other lectures are given below. We hope in the future to give further space to addresses delivered at St. Mary's and at other hospitals in London during this month. Mr. T. G. Stevens chose for his subject

Retention of Urine in Women.

Retention of urine, he said, though not a common trouble in women, might be a serious one if imperfectly treated. Its causes ranged from hysteria to a retroverted gravid uterus. Retention of urine might complicate or follow labour, and might also follow operations, especially those for prolapse. It might also be the result of the pressure of tumours and other lesions. Hysteria in young girls might lead to retention of urine, from simple functional failure of micturition. Before making the diagnosis, hæmatocolpos, of which retention may be the first symptom, must be excluded, and also rare pelvic tumours. Hysterical stigmata should be looked for. All ordinary efforts to promote micturition should be tried before a catheter is passed, but this operation should not be postponed longer than 24 hours at the utmost. Usually all simple methods fail, and one passage of the catheter may cure. No doubt the discomfort of the passage has some effect, but suggestion plays a greater part. According to Mr. Stevens, retroverted gravid uterus is the commonest cause of retention of urine in women, but is frequently overlooked. The history is misleading, some women stating that they are "always passing water," when they mean that they are always wet from the dribbling overflow of a fully distended bladder. A fatal mistake is to treat such a case as one of frequency of micturition without a careful examination. *Any* micturition trouble in the presence of a large abdominal tumour ought to raise the suspicion of a distended bladder, and demands the passage of a catheter. The danger of retention with overflow is that of infection of the distended and atonic bladder. In such a bladder the results of infection are far worse than in common cystitis with an empty bladder. Sloughing of the mucous membrane may occur, and infection may travel up the periureteral lymphatics to the kidneys, with the production of multiple abscesses (surgical kidney), septicæmia, and uræmia. In common cystitis with an empty bladder ascending infection seldom occurs. In the absence of overflow the passage of a catheter prevents all these dire results, and once the bladder is empty a retroverted gravid uterus can easily be felt filling the pelvis. If this can be replaced easily with the fingers, as it often can, the cure is at once complete. If, however, manipulation fails, a cure can still be obtained by keeping the patient in bed, lying in the semiprone position, and by passing a catheter to empty the bladder every eight hours. If this method is adopted the uterus usually replaces itself in about three days. A large ring pessary in the vagina often assists the replacement, but will have no effect if the patient is walking about. It is never necessary to induce abortion to cure these cases, but spontaneous abortion sometimes occurs, especially if efforts at finger replacement are too vigorous. Mr. Stevens pointed out that while retention during labour may be caused by the pressure of the fœtal head on the neck of the bladder, after labour inability to micturate is solely the result of fatigue and the stretching of the abdominal muscles. The patient is unable to make even the small straining effort necessary for micturition in women; it is interesting to note that few women realise that any effort at all is involved. After prolapse operations retention may also be due to the fact that the slightest strain causes pain in the new perineum, from stretching of sutured tissues; hence the patient at once inhibits the effort and micturition may fail. If with the first strain the act starts, the patient usually has no further trouble. Drugs, such as hexamine or boric acid, which irritate the bladder, will sometimes assist the act, but usually in post-operative cases a catheter has to be passed very gently every eight hours for several days. The only common tumours which compress or stretch the urethra and neck of the bladder are cervical fibroids, but occasionally fibroids in the body of the uterus may have the same effect, especially if the uterus is retroverted. It is rather a stretching of the urethra than actual compression which leads to retention in these cases, in which the catheter always has to be passed a long distance, sometimes as much as five inches, before the urine will flow. Mistakes may arise if the catheter is not passed sufficiently far, for no urine will be obtained, and the distended bladder may be taken for an ovarian cyst. Ovarian tumours rarely cause retention, but when they do it is because they are incarcerated in the pelvis. Incarceration may be brought about by adhesions in Douglas's pouch; but certain ovarian tumours have the broad ligament stretched over them, and thus tend to lever up the uterus out of the pelvis and to press it against the neck of the bladder and pubes. A pelvic hæmatocele, if large enough, may also press the uterus against the neck of the bladder, and so may widespread pelvic suppuration. Once any pelvic mass has caused retention an abdominal operation for its removal is imperative, the bladder being kept empty by catheter until the operation can be done.

Diabetes.

Dr. C. M. Wilson said that sepsis was like a magnifying mirror that stood between the observer and the diabetic, and until it was removed it was impossible to obtain an undistorted view of the diabetic's condition. He brought forward examples of recovery of carbohydrate tolerance following removal of sepsis. A woman who required 50 units of insulin daily was able to achieve the same results with 8 units a few weeks later after the removal of septic tonsils and septic teeth. A musician, whose unstable temperament made treatment by both dieting and by insulin equally unsatisfactory, had 10 per cent. sugar in his urine. After drainage of a septic bladder he became sugar free, without any change in the rest of the treatment. Dr. Wilson pointed out that the removal of tonsils since the introduction of insulin was a reasonably safe procedure if an adequate amount of carbohydrate was given and utilised, that the consumption of fat in the days previous to the operation was drastically curtailed, and that the minimum of anæsthetic was given. He was, however, far from advocating that surgical procedure should be lightly embarked upon. The evidence of sepsis must be adequate. When this was absent, or had been removed, it was necessary to decide whether the treatment should be confined to dieting, or whether insulin should be administered. Earlier he had been reluctant on grounds of expediency to use insulin except in those patients where its use could not be avoided, but at the present time he was using it in a much larger proportion of cases. The general condition of the patient was often much more satisfactory with insulin, and its use enabled him to cut down the amount of fat that was necessary. He aimed at giving a diet to an adult containing 80 to 100 g. carbohydrate, 1 g. of protein for each kg. of the patient's weight, and sufficient fat to maintain the weight rather below normal without acidosis. The limitation of protein was frequently neglected, since it was overlooked that sugar could be formed from protein, and that the proportion of protein given was an important factor in the production of acidosis.

Dr. Wilson then dealt with the development of premature arterio-sclerosis in the diabetic; coma, which had been the chief cause of diabetic deaths before the introduction of insulin, was being replaced in that rôle by arterio-sclerosis. It therefore became important to inquire why the diabetic was specially prone to arterio-sclerosis. He thought there was some evidence that the excessive fat in the diet of the diabetic was an important factor, by predisposing to excess of cholesterol in the blood. If that were true it was necessary to keep the fat in the diet within limits, and in doing this insulin was most helpful by keeping the carbohydrate element high, with a corresponding fall in the amount of fat. The diseased heart muscle of many middle-aged and elderly diabetics seemed to demand a higher level of sugar in the blood than normal, if it was to be properly nourished; a practical application of this demand was to be found in the caution required in any attempt to lower a high blood-sugar in a diabetic with diseased heart muscle by insulin. It was easy to provoke an attack of angina pectoris by the administration of insulin, and if insulin were used with patients liable to such attacks it was necessary to use a high carbohydrate diet. Dr. Wilson had been impressed with the importance of equal caution in the use of insulin in diabetics with retinitis. He then discussed diabetes in children, and particularly in children whose glucose tolerance curves were not typically diabetic, and yet were not normal. Such cases should be watched; he had seen two such children develop typical diabetic curves.

He felt that the education of the diabetic patient, upon which ultimate success largely depended, did not receive sufficient attention. The diabetic should learn his diet and the value of each element in it. It was possible to simplify this to a great extent for him. He should learn, too, how to test his urine for sugar, and how to avoid coma and gangrene. Many diabetic patients were seen in the out-patient department without inspection being made of their feet. Coma was largely a preventable accident. Nobody would think of driving a car without an insurance against third party risks; it was far more important for the diabetic to master the technique of insulin administration. He might not need it for the present, but the day would probably come when an infection would render it necessary, and his knowledge gained at leisure might then save his life. Exercise was very helpful; it was the tissues and not the kidneys that removed the excess of sugar from the blood, yet it was a common practice in hospitals to see diabetic patients confined to bed for weeks without any provision for exercise. The attempts made in recent years to persuade the practitioner that diabetes was a simple affair were very well in their way, but we had to realise that in few medical diseases could the doctor be of as much assistance to his patients as in diabetes, and that if he was to render this assistance he must himself master the broad principles on which the diabetic diet of to-day rests, and the details which make it practicable to transfer that knowledge to the patient.

CHILDREN'S HOSPITAL, BELGRADE.—Through the Save the Children Fund (28, Gordon-street, London, W.C. 1) an appeal is being made for this hospital by the members of the British Legion who have just returned from the annual congress of the Inter-Allied Federation of Ex-Service Men at Belgrade. They call to remembrance Dr. Katherine Macphail's work in creating a modern, well-equipped hospital of 50 beds and an out-patient department through which more than 100,000 children have passed during the last ten years. The infant mortality in Serbia is "appallingly high"—one in three. The hospital trains Serbian girls as nurses under the supervision of a British matron. It is partly maintained by the Jugo-Slavian Government, but a further £2000 has to be found, two-thirds of which has to be collected by Dr. Macphail. This is the only hospital exclusively for children in the country.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Association of Insurance Committees.

AT the annual meeting in Ayr of the Scottish Association of Insurance Committees Provost Irvine, of Coatbridge, the President, commented on the need for specialist and consultant services, not only as an advance towards a complete and satisfactory medical service for the insured population, but also as a sound financial proposition, saving its cost by reducing the amount paid out in sickness benefits, and ultimately enabling approved societies to make substantial contributions or even to meet the whole expenditure upon these services. He also criticised the hiatus now existing between the statutory age for leaving school and the statutory age for entering into national insurance. From the period of infancy till the age of leaving school health services were continuously available, at considerable cost it is true, but with satisfactory results. Yet, for those between the ages of 14 and 16 years, no provision for health service was made. This serious anomaly stood self-condemned. Provost Irvine is a well-known pioneer in Scottish public health work, and understands both sides of the question.

Drugs for Insured Persons.

One of the best parts of the Scottish system of National Health Insurance is the central checking bureau at Glasgow, through which all prescriptions pass, and are there subjected to technical criticism and pricing. It was stated at the Ayr meeting that the number of prescription forms handled last year on behalf of the 54 insurance committees in Scotland—namely, 2,055,737—was a decrease of 93,000 on 1927, and 104,000 less than the record year of 1926. The value of the prescription forms, exclusive of the cost of insulin, was £147,328, a decrease of £4410 on 1927. The average price per form at 13·31*d.* was very slightly above the average for the previous year, 13·24*d.* The tariff price of 100 units of insulin has been reduced by successive stages from £1 6*s.* 8*d.* to 2*s.* 7*d.*, and it was rumoured at the meeting that a German firm had offered to supply London hospitals for a year with insulin at 1*s.* for 100 units. The bureau has now handled 32½ million prescription forms at a total cost of 1¾ million pounds. The vexed questions of who should foot the bill for drugs for insured persons while in hospital led to the passing, by a large majority, of the following motion: "That the cost of drugs, including insulin, supplied to insured persons under treatment in voluntary institutions should be a charge against the drug fund of the insurance committee, instead of having to be met from the funds of the voluntary institution." The original Insurance Commission and the later Board of Health never saw their way to accept this proposition; it remains to be seen whether the insurance committees will be more successful with the new health department.

Working Out the 1929 Act.

Mr. John Jeffrey, Secretary of the Department of Health, gave the meeting his views on the effect that the Local Government (Scotland) Act, 1929, will have on the work of insurance committees. Endless complications would, he said, ensue unless steps were taken to achieve harmony in the relationship between the general practitioner and the specialist in hospital and dispensary services. When a patient was referred to a hospital or dispensary the very fullest medical history sheet should accompany him, and just as surely when he returned to the care of his insurance practitioner the fullest information regarding his condition and treatment should be supplied by the specialist in whose charge he had been. Mr. Jeffrey said he had been advised that 20 to 25 per cent. of insured persons receiving treatment from their panel doctors were in need of specialist advice. The health insurance funds had failed to meet that requirement, but under the hospital organisation of the 1929 Act it should be possible to bring to the aid of the insured person all the requirements of equipment and specialist services, while retaining the traditions of unfettered work. He went on to speak of the advantage to the general health of the community if some system could be devised whereby each insurance committee should supply to the local authority statistical information on the nature and extent of sickness among insured persons in the area. At present the local authority had no knowledge of the prevalence of ordinary sickness, or of the nature and causes of that sickness, or whether any action on its part could prevent or reduce such sickness. Now that the insurance committee and the public health authority were to coöperate the gap could be filled up.

Dr. Kinloch envisaged the development of a local authority hospital service with everything in the nature of elaborate equipment and specialist skill available for the insured population through their panel practitioners. This provision would in time release insurance committees from most of their present commitments on additional benefits, and enable them to plan a comprehensive extension of the insurance medical service embracing the dependents of insured persons not covered by the local authority service.

A Crematorium for Edinburgh.

Over 20 years ago a movement was started to provide a crematorium for Edinburgh, and a company formed in July, 1928, under the chairmanship of Lord Salvesen, lately acquired from the corporation two and a half acres of the Easter Warriston Estate, at a cost of £3000, on condition that dividends paid on the share capital should not at any time exceed 6 per cent. per annum. The late Sir Robert Lorimer was the architect, and the original mansion house has been adapted partly to form the crematorium and partly to form a chapel. The whole cost of buildings, roads, grounds, and furnishings is expected to be about £10,000. Hitherto all Scottish cremation has been done in the Glasgow Crematorium.

A New Hospital for Cripple Children.

On Oct. 1st the Duchess of York laid the foundation-stone of the new Edinburgh Hospital for Cripple Children. Sir David Wallace, chairman of the committee, said that sufficient money had been raised to justify the commencement of the building. The site extended to 14 acres, and its large size would permit of the children being educated in the open air. Some would be trained in workshops so arranged that the patients could work in the open air and the sunlight. It was proposed, said Sir David, that major and minor clinics should be formed throughout the various counties under the scheme, and at the earliest possible time children treated in the hospital would be sent to those clinics, after which the necessary treatment could be carried on in their homes under careful supervision, and in close relation with the central staff of the hospital. I understand that of the sum of £70,000 aimed at, some £55,000 has already been raised.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Dispensary Salaries in Co. Mayo.

FOR many years the salaries of poor-law medical officers in County Mayo have been markedly lower than those of any other county in the Irish Free State. Not only were the salaries inadequate, but they were very uneven, so that medical officers in certain districts were drawing only half the pay of their neighbours doing approximately equal work. Many appeals had been made to the county board of health to establish an equable scale of salaries for the whole county, but the appeals were fruitless. Attempts by the Department of Local Government and Public Health to persuade the Board of Health to move were equally useless. At length, however, the Minister has found it necessary himself to intervene, and by sealed order he has fixed the salaries of the several medical officers in the county. The new salaries are based on a scale of £200 a year, rising by annual increments of £5 a year to a maximum of £300. Each medical officer gets credit for all his pensionable service under the board. The immediate increase of salary to the several medical officers varies from nil to £160 a year, and averages £57 a year. The number of dispensary medical officers in the county is 30, and the immediate increase in salaries amounts to £1706 10*s*. This is the first occasion on which a whole scale of salaries has been established by sealed order over the heads of the local authority, and it is important for medical officers elsewhere that the precedent has been established.

Antivaccination and its Costs.

County Wexford has been the one county in Ireland in which the antivaccinationist movement gained any foothold, and for some years past its inhabitants have been very inadequately vaccinated. Within the past year or two, however, the Department of Local Government and Public Health determined to enforce the laws concerning vaccination, and legal measures were taken to compel the local authorities to fulfil their statutory duties. Reluctantly enough they are instituting prosecutions of those who neglect to bring their children for vaccination, and they find that each prosecution costs them nearly £1. There are said to be some 18,000 defaulters in the county, so that the total cost may prove to be considerable. At its last meeting the Board of Health made the naïve request to the Minister for Local Government and Public Health to give them a grant from public funds to enable them to enforce the laws. Having neglected its duty for years, the board finds the expense of fulfilling its accumulated obligations too heavy, and it suggests that the general taxpayer should come to its aid.

MEDICINE AND THE LAW.

The Law of Murder: Confession Without Corpse.

IT was not till 1926 that (as one result of the Coroners (Amendment) Act) it was possible to hold an inquest in the absence of a dead body. The possibility or impossibility of prosecuting a charge of murder without the proved existence of a corpse was discussed afresh last month. A man walked into a London police station and gave himself up as a self-confessed murderer. He said that one night in August last he met a woman named Rose while he was under the influence of drink, quarrelled with her, and flung her over the parapet of Waterloo Bridge, at an exact spot which he described. When he was charged before Sir Chartres Biron, the police informed the court that no body had been found, no woman named Rose was missing, and the man had not been seen in company with any woman that night, but had been seen alone in a public-house. They added that to throw a body over the bridge meant lifting the body up some seven feet, and required great strength, and that no screams were heard, either by a constable on duty 50 yards off or by a night-watchman slightly farther away. The magistrate, not wholly convinced by the confession, dismissed the charge. This course leaves the police free to prosecute afresh if new evidence becomes available. A confession, undoubtedly, can be adequate evidence, provided that it is clear and unequivocal. So said the Court of Criminal Appeal 20 years ago, in a case where a mother confessed that she had burnt her baby's body. But the police, who receive many strange confessions when any criminal mystery becomes a public sensation, are aware that abnormal mental states may prompt such statements, and they examine them with a care which sometimes becomes scepticism. English criminal procedure is reluctant to see an accused person self-convicted. This tradition or instinct militates against the acceptance of a well-known police magistrate's recent suggestion that an accused person should be not only a competent but also a compellable witness. And English judges know the dangers of finding murder charges to be established when no dead body has been discovered. Coke, in his Institutes, gives a quaint anecdote of a case where the murderee returned after the supposed murderer had been hanged. An orphan girl was brought up by her uncle, and, one day, when he was correcting her for some fault in the method usual at the time, she was heard to cry out "Oh! good uncle, kill me not." Next day she was not to be found, and as the uncle stood to inherit property at her death, he was put into jail on suspicion of murder. Released on bail to give him a chance to produce his niece, he stupidly produced another girl of the same size, dressed in his niece's clothes. The trick was discovered, and he was hanged for murder, but anon the niece appeared, proved her identity, and successfully claimed her estate. She had run away into the next county instead of going to school the morning after her uncle beat her, and she had been kindly entertained by strangers who took pity on her. Coke tells his tale to point the double moral that judges must not be too hasty in assumptions in murder trials, and that innocent persons must not play silly tricks as the uncle did. A famous case of the same kind, reported in the State Trials, is that of the Perrys. Two brothers and their mother were found guilty of murder and hanged, and in a few years' time the supposed victim reappeared. There is a dictum of Sir Matthew Hale that he would never convict of murder unless either a dead body is found or the fact of the murder is proved. The latter alternative occurs in murders at sea, where the body is thrown overboard. The leading case is R. *v.* Hindmarsh (1792), where a seaman murdered his captain. No body could be produced, but there was sufficient evidence of the accused's declared intention, and of the actual struggle in which the captain was seen to be pitched into the sea.

A Dangerous Rat Poison.

The death of an Alton farmer from cyanide poisoning, as a result of blowing a rat poison powder down a rat hole in a closed shed by means of a bellows, has been noted in several daily papers. It is not quite clear what was the exact nature of the powder in question, although its name "cyanogas" would suggest to anyone acquainted with drugs or elementary chemistry that it was highly poisonous. A man may, however, be a good farmer without much knowledge of the Pharmacopœia, and such a man has a right to expect that poisons should not be put in his hands without full instruction for use. The coroner in this case described the directions as, in his opinion, carelessly drawn. The technical adviser of the manufacturers said it was dangerous to use the powder with a bellows or, indeed, in an unventilated shed; he considered that the instructions were strict in regard to ventilation. It is, no doubt, very difficult for a technologist to realise the extraordinary risks which people unused to handling dangerous materials will take. For this reason such rat poisons as barium carbonate, squill mixtures, and the like should suffice the general public, and the use of more deadly preparations be confined to professed vermin killers. The use of cyanides was prohibited in the city of Paris by an edict of the police last year, and they should only be supplied with the most explicit instructions for their use. Poisonous gases are more easily evolved than controlled or dissipated, and it is dangerous to disperse poisonous powders by blowing.

A HOSPITAL BURNED DOWN.—Aberdare and District General Hospital was totally burned on Sept. 27th, when two firemen lost their lives and a third was seriously injured. There were over 80 patients in the wards but they were all safely removed, at great risk to the matron and nurses. The damage is estimated at £20,000.

Correspondence.

"Audi alteram partem."

MALIGNANT TUMOURS IN FOWLS.

To the Editor of THE LANCET.

SIR,—The explanation offered in your last issue (p. 697) by Dr. A. M. Begg and Dr. W. Cramer for the appearance of Rous sarcomata in fowls which they had injected with extracts of fowl pancreas and mouse carcinoma—namely, that sufficient traces of the Rous agent were retained in a mortar after the latter had been washed in running water—may satisfy them, but it does not apply to the experiment of ours which they cite. Our material was merely minced with sterile scissors in a sterile Petri dish, and was not ground in a mortar, nor had any Rous material been in use at or about the time. Further, the bird that developed the tumour was one in a series of 23 inoculated with the same tissue, and none of the series came in contact with fowls bearing Rous tumours.

Perhaps I may be allowed to add that our tumour was at first histologically distinguishable from the ordinary Rous sarcoma, that one at least of Dr. Murphy's tumours produced by testicular extract was quite distinct, and that the tumour produced by Dr. Maisin through the action of ionium nitrate on grafted embryo tissue was again different.

I am, Sir, yours faithfully,
ARCHIBALD LEITCH.

Cancer Hospital Research Institute, London, S.W.,
Oct. 7th, 1929.

INTERPRETATION OF THE WASSERMANN REACTION.

To the Editor of THE LANCET.

SIR,—As one who has long contributed to your columns on the subject of the interpretation of the Wassermann reaction, I venture to lay before your readers a few criticisms of Dr. T. E. Osmond's article on this subject appearing in your issue of Sept. 28th (p. 677). I begin by quoting three sentences from an admirable leading article in THE LANCET of March 2nd (p. 453):

> 1. "Even when the test is made in laboratories where routine procedures are most carefully standardised under the direct personal supervision of an expert, the reaction given by a patient not actually undergoing treatment may vary in an unaccountable manner . . ."
>
> 2. "Two years ago a series of comparative tests were performed by pathologists working in different laboratories, all of whom used substantially the same technique. The results differed by as much as 25 per cent."
>
> 3. "It is true that the exact relation of the degree of strength of the Wassermann positive readings to the severity of infection is unknown."

In the same issue of THE LANCET appeared an article by myself in which I said:—

> "During the last 20 years I have reiterated my opinion that while the Wassermann reaction was a good servant it was a bad master, that the test was clearly not specific, that there appeared no logical reasons why other similar chronic infections should not produce a like reaction, and that, therefore, no one should be dogmatically branded as a syphilitic on the evidence of a positive Wassermann reaction unsupported by any other historical, clinical, or pathological evidence."

The League of Nations has recently published the Report of the 1928 Copenhagen Conference on the "Sero-diagnosis of Syphilis." This conference was attended by pathologists of 16 nations, and the resolutions which they passed seem to suggest that Dr. Osmond's dogmatic assertion in the first sentence of his article is not corroborated by world opinion. Dr. Osmond says:—

> "Provided that a [illegible] is employed and the test carried out by a c[illegible]ist a positive Wassermann reaction (++ or +) means that the patient is infected with syphilis—recent or remote. The only exception to this rule is 'yaws.'"

It is true that this initial dogma is a little hedged against in some later sentences, such as "no case should be labelled syphilis on the strength of a single isolated positive Wassermann," "the fluctuating Wassermann—on one occasion positive and another negative—is now recognised by most workers." and in his concluding summary "a positive result nearly always means syphilis, if there is a doubt it should be repeated and confirmed." In view, however, of his initial dogma carefully placed so as to catch the eye of those who will not read the whole article, I cannot but feel that the subsequent less dogmatic remarks were made, not because Dr. Osmond doubted the truth of the dogma contained in his opening sentence, but because he had read the Copenhagen Report.

This report contains eight resolutions passed by the conference, from which I will make quotations from four; they are:—

> 1. "The Conference is of the opinion that the best of them (flocculation tests) may be regarded as equal in value to the best of those which depend on fixation of complement (Bordet Wassermann)."
>
> 2. "The Conference recommends that in order to secure the most reliable information to the clinician, at least two different sero-diagnostic methods should be used."
>
> 3. "The Conference recommends that the serologist should check the accuracy of his tests by regular and very frequent reference to clinical data."
>
> 5. "The Conference wishes to reiterate with particular emphasis: (3) that except in the case of a few well-defined pathological conditions, syphilis is indicated with a degree of probability, which closely approaches certainty, when several tests performed according to different methods give a positive result."

These resolutions contain opinions widely differing from, and in my opinion much more in accordance with facts than, that expressed in the opening sentence of Dr. Osmond's article which I have quoted, and which I believe to be incorrect and misleading.

I am, Sir, yours faithfully,
Harley-street, W., Oct. 2nd, 1929. H. WANSEY BAYLY.

CURES AND PREVENTION.

To the Editor of THE LANCET.

SIR,—I cannot allow the address of Sir Farquhar Buzzard to the students of the University of Birmingham to pass without the strongest protest. It is a frank confession of the failure of the accepted methods of treatment of disease that is mainly of lesions produced by microbes in the human body, and it is this incapacity of medicine to produce efficient intravital germicides that has led to this confession of failure of Sir Farquhar Buzzard and the public criticism of our profession which he acknowledges to be just. For there is only one efficient intravital germicide in the Pharmacopœia, and that is antidiphtheritic serum.

Is it not true that all our efforts in the teaching of the practice of medicine are concentrated on enabling the student to discover the tissues diseased, and to relieve the symptoms produced and most vitally to give that disease a name, with which the patient will be satisfied? We do not teach the student how to kill the microbes causing that disease and thus "cure" the disease. That is what our patients demand, and quite properly demand, and if we, as physicians, cannot do it, they will turn to those who say they can, as patients suffering from orthopædic troubles have turned to the unqualified, because qualified surgery was reputed not to be able to accomplish the very properly demanded cure. An accurately scientific method of preventing and aborting common cold is available, and we are in a position to say now that no catarrhal infection need ever become chronic. Anterior poliomyelitis can be so treated in the acute phases that the patient can be restored with little or no damage to his musculature. The causative microbes can always be found.

I am sure Sir Farquhar will think that such a disease as disseminated sclerosis is an absolutely incurable condition. I can assure him that it is not so, that the cause can always be found, the infection of the spinal cord arrested, and the patient restored to his normal avocations. And so with practically all other microbial diseases that are now considered incurable. I expect these assertions of mine to be received with the usual derision, but I warn authoritative members of my profession that the writing is on the wall, and that they had better turn to the study of the production of "cures" if they wish us to survive as a profession.

I am, Sir, yours faithfully,
W. M. CROFTON.

University College, Dublin, Oct. 7th, 1929.

HARMINE OR HYOSCINE FOR ENCEPHALITIS.

To the Editor of THE LANCET.

SIR,—In your issue of Sept. 28th (p. 647) Dr. T. R. Hill and Dr. C. Worster-Drought discuss the treatment of chronic encephalitis with harmine and contrast their results with those reported by Rustige in Germany. Although Rustige does not claim that his findings bring harmine within the range of practical therapeutics, yet the discrepancy between his observations and the more recent ones remains to be accounted for. May it not rest upon the form and duration of the previous treatment that these different groups had undergone? The cases reported in your columns had been treated with hyoscine hydrobromide gr. 1/100 hypodermically three times daily, for how long is not stated. Rustige's patients had been treated with "scopolamine-atropine," how much or how long again we are not told. Hyoscine, I think, has a greater psychical effect than atropine, habit is more readily established, and in some cases it seems that its influence is very largely subjective. Under the circumstances and in default of fuller information it seems reasonable to suggest that the patients of Hill and Worster-Drought had become more dependent on the treatment in force before the change than were those of Rustige. The insistence of the encephalitic who is under treatment by hyoscine on his need for hyoscine seems to offer a serious obstacle to successful results with any alternative. He is acutely aware of all his objective manifestations, and if he believes that hyoscine keeps them in abeyance he may quite conceivably recall every one when his hyoscine is withdrawn, for his memory of detail is far better than that of the general run of patients. That there should be, as Drs. Hill and Worster-Drought describe, a rapid improvement on resumption of hyoscine does not negative this suggestion.

I am, Sir, yours faithfully,
Dundee, Oct. 3rd, 1929. J. M. STALKER.

LIVER TREATMENT IN SUBACUTE COMBINED DEGENERATION OF THE CORD.

To the Editor of THE LANCET.

SIR,—In his review of the nervous and mental aspects of pernicious anæmia (THE LANCET, Sept. 28th, p. 643), Dr. Douglas McAlpine criticises an article by Dr. M. M. Suzman and myself on subacute combined degeneration of the cord. While in agreement with him that the type with pyramidal involvement and little anæmia is more resistant to liver treatment, we have found that many of the spastic cases with marked anæmia have done very well indeed. We have re-examined our cases after an average period of 16·6 months' liver treatment, and in two further cases, making five in all, extensor plantar responses have become flexor in type. We have had no occasion to modify our opinions as to the good results obtained in subacute combined degeneration with sufficient liver dosage, provided that there is no urinary or dental sepsis. It is essential, however, that the cases be followed up for a sufficient length of time, as the effects on the nervous system may not be apparent for months after the anæmia has disappeared. It must be emphasised also that the optimum amount of liver required for improvement in the nervous phenomena is considerably in excess of the minimum amount required to combat the anæmia.

Dr. McAlpine wishes to draw conclusions with regard to the degree of anæmia in our non-improved cases. A careful study of the article will render it obvious that the reasons for failure to improve in these were, not the absence of a marked anæmia, but the inadequate dosage of liver, and in some the presence of septic complications. We have not found the administration of hydrochloric acid to affect the rate of improvement; the majority of our improved cases had none. Its use, however, has been found beneficial at times for gastric symptoms.

In conclusion, may I point out an error on p. 646 in quoting our report. The sentence (col. 2, line 34) should read, "of the 31 cases that had no liver, 28 died within an average period of 14·6 months (not 4·6 months) from the onset of the disease."

I am, Sir, yours faithfully,
C. C. UNGLEY, M.D., M.R.C.P.

Newcastle-on-Tyne, Oct. 4th, 1929.

ABDOMINAL TENDERNESS AND UNNECESSARY OPERATIONS.

To the Editor of THE LANCET.

SIR,—In the note on this subject, on p. 740 of your last issue, your occasional correspondent in the United States describes Dr. J. B. Carnett's teaching as "certainly heretical." I am amazed at this late date to find such a statement in print. I have held these views and used the same tests as Dr. Carnett for some years, and find that the condition he describes is very prevalent. Because tender nerve segments occur in the abdomen and chest the profession, as a whole, have accepted the work of Head and Mackenzie as interpreting that the disturbance is due to disease in one or other organs innervated by that spinal segment. If, however, the pains are complained of in an extremity, then the diagnosis is neuralgia or neuritis!

I am, Sir, yours faithfully,
R. CHALMERS, M.D., F.R.C.S.E.

Darlington, Oct. 4th, 1929.

TRELOAR CRIPPLES' HOSPITAL.—The work of replacing the wooden wards at Alton has now begun. There are to be five ward blocks of 60 beds each, and each ward unit provides for two wards of 24 beds each, two wards of four beds each, and four cubicles. They will face south to a wide terrace nearly 1000 feet long, and the large wards will have folding doors to enable them to be used as open-air wards opening upon a verandah glazed with Vita-glass. The administrative block will be on the north side.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The opening lecture of a series on Common Complaints will be delivered by Dr. F. G. Chandler on Monday, Oct. 14th. Particulars of this and other lectures during the coming week will be found in our Medical Diary Sixteen lectures intended for candidates for the M.R.C.P examination will be held at 8.30 P.M. on Tuesdays and Fridays, from Oct. 15th to Dec. 6th, at the rooms of the Medical Society of London. From Oct. 14th to 26th a morning course will be given at the Hospital for Sick Children, and between the same dates there will be a course in gynæcology at the Chelsea Hospital. An intensive course will be held at the Central London Throat, Nose and Ear Hospital from Oct. 14th to Nov. 2nd; and an intensive course in medicine, surgery, and the specialties at the Metropolitan Hospital from Oct. 21st to Nov. 2nd. The latter course is intended to appeal to practitioners. Further information about special and general courses may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W.1.

Obituary.

THOMAS JENNER VERRALL, M.R.C.S. Eng., LL.D. Aberd.;

LATE CHAIRMAN OF REPRESENTATIVE BODY, BRITISH MEDICAL ASSOCIATION.

We regret to announce the death on Oct. 4th of Sir Jenner Verrall, one of the best-known workers in the country for the advancement of the whole medical profession.

Thomas Jenner Verrall was born in 1852 at Brighton, the second son of Henry Verrall, a well-known Brighton solicitor, his elder brother being Arthur Woollgar Verrall, the famous Cambridge Greek scholar. Jenner Verrall was educated at Marlborough, and on leaving school in 1869 proceeded to St. Bartholomew's Hospital, whence he duly qualified in 1876. He had previously gone through a part of his medical training at the Sussex County Hospital, and shortly after qualification was elected surgeon to that institution, a post which he held until 1912, when he was elected consulting surgeon. As a practitioner he won from the start the esteem and confidence of a large circle of patients and friends, and when, not long before the outbreak of war, he retired to Bath, at the age of 60, he set himself to further assiduously and assist practically the development policy of the British Medical Association, which had its origin in the reconstitution of that body in 1902. He had already for ten years studied the interests of the Association in connexion with the medical profession at large, had been elected to the Council and discharged many local responsibilities, and now the leisure of retirement gave him further opportunities of working along lines he loved.

To enumerate the many committees of the Association upon which he served would become tedious from the mere length of the list; it must suffice to say that wherever the conduct of medical practice came into contact with the constitutional or social life of the country to an extent that warranted the institution of a committee for the collection of information or the furtherance of reform, Verrall was always a prominent member of that committee. And to all the varying subjects which thus came within his ken he contributed sagacious counsel which gained in acceptance from the possession of a winning manner, a command of witty words, and obvious sincerity. A member of the Council of the Association since 1893, from 1913 to 1915 he was chairman of the Representative Body, and while occupying that responsible post he was the recipient of the gold medal of the Association in acknowledgment of his services. Of his multifarious Association committees he was at different times chairman of the Organisation, the Medico-Political, and especially of the State Sickness Insurance and the Central Medical War Committee, and his work on the last two was prominent. The institution of national insurance, owing to the sharply divided opinions, both on principle and in detail, as to the merits and demerits of the new legislation, placed the medical profession, and especially the British Medical Association, in a difficult position; while it was felt at the time that the Association was especially fortunate in having a competent body of men prepared to deal with the recurring professional difficulties, among whom none earned, or deserved, higher credit than Verrall and the late Dawson Williams. The Insurance Acts were not in working order when the war broke out, and almost immediately it was realised that much of the available strength of the medical profession would have to be used, and used over a considerable period, for military service, largely with the forces abroad, while the maintenance of the general health of the country was as necessary for the carrying on of hostilities as for the preservation of social conditions. The problem briefly was how far it would be possible to denude the country of medical service while preserving a level of general [illegible]d how at the same time to use those who, by economical arrangement could be set free for military objects, in the most efficient way. A prompt and fair arrangement of recruiting had to be instituted, and to this end the Central Medical War Committee was formed, as a medium between the medical profession on the one hand and, on the other, the War Office and the home population. The circumstances of each locality, and of each medical man residing therein, were inquired into, and as prompt and fair way as possible under which to adjust national claims and individual rights was arrived at. Verrall was chairman of the Committee, and presided over its deliberations with firmness and tact, conducting its complicated business with an expedition that was necessary, even while he showed himself ready in all circumstances to provide a clear and detailed explanation of any decision at which the Committee arrived. At the close of the war his energy and industry were rewarded with a well-won knighthood.

Verrall was first elected a Direct Representative for England and Wales on the General Medical Council in 1911, occupying thus a seat on that body for the unusual duration of 18 years. In discharging his duties on the Council he was never forgetful that he represented the medical profession as a whole and not the Association, and the vote of thanks which was accorded to him at the last meeting of the Association, upon his retirement from the Council, was in accord with a universal feeling in the profession that he had served the public, as well as his own calling, admirably in many important and responsible capacities.

His death occurred, at the age of 77, at East Lodge, Leatherhead, where he had lived for some years.

WILLIAM GORDON, M.D. Camb., F.R.C.P. Lond.,

LATE SENIOR PHYSICIAN TO THE ROYAL DEVON AND EXETER HOSPITAL.

On Oct. 1st, at a nursing home in Exeter, the well-known physician, William Gordon, died as a sequel to a severe attack of influenza in his sixty-seventh year. He was known for his scientific equipment and his zealous pursuit of knowledge, not only in the West of England, but throughout the country.

DR. WILLIAM GORDON.

William Gordon was born at Strabane in 1863, son of Mr. George Gordon, J.P., and was educated privately with such good effect that he *entered* Trinity College, Cambridge, with an exhibition which was later transformed into a scholarship. He justified his boy's promise by securing a first-class in both parts of the Natural Science Tripos, and later pursued his medical studies at University College Hospital, where he was a house physician, and Heidelberg. He qualified as M.B., B.Chir. Camb. in 1890, became M.R.C.P. Lond. in 1891, proceeded to the doctorate in 1894, and in 1903 was elected F.R.C.P.

Gordon commenced medical practice in Exeter, the city in which he passed all his professional life. Early elected to the staff of the Royal Devon and Exeter Hospital, he held also in the Exeter area the posts at various times of physician to the West of England Eye Infirmary and physician to the Exeter Dispensary. His learning and keenness commanded, almost from the beginning, a large domestic and consulting practice, while as a climatologist he was known throughout the scientific world. His deep interest in the subject of tuberculosis was closely associated with his views upon the interplay of meteorological conditions with the incidence of disease. Some of the conclusions which he arrived at were bold, and did not escape challenge, but his investigations into the cause and effect of phthisis in the western counties, and his intensive study of the connexion between the ravages of the disease and the prevalence of certain atmospheric conditions, brought up for consideration many points which too often escape attention. He was as enthusiastic here as he was on the subject of the diagnosis of cancer, and, like all enthusiasts, he made statements which were rather the result of personal belief than of actual proof, but of his intellectual capacity and of his complete sincerity none of his critics had ever any doubt. The Samuel Hyde Lectures on the Place of Climatology in Medicine, delivered in 1913 before the Balneology and Climatology Section of the Royal Society of Medicine, contain in brief his views on a many-sided subject; these were published in THE LANCET on delivery, and were recognised by readers as containing much valuable and suggestive teaching.

Gordon took an active part in the affairs of the British Medical Association, was President of the Section of Medicine at the annual meeting in 1907, and, in particular, was Chairman of a Subcommittee on Army Reform, a subject which deeply interested him. In this connexion, indeed, he is known to have given the late Lord Lansdowne, then Secretary of State for War, much support during the erection of the Army Medical Service into the Royal Army Medical Corps.

Dr. F. A. ROPER sends us for publication the following tribute to his dead friend: "I am glad of this opportunity to pay sad respect to the memory of one whom I have known all my life, and who has been my colleague at the Royal Devon and Exeter Hospital for 16 years. The grief following the loss of one who, during 38 years of active service for the hospital, had built up a commanding reputation in the South-West of England as a physician will readily be understood. At the bedside the dominant characteristic of his work was thoroughness and, arising from that, an earnest striving for precision; and, examination completed, it was then that the knowledge accumulated by his wide experience and lifelong and unremitting study showed themselves. For Gordon remained a student devoted to his books till the very end, and even more intensively so after his retirement from the active staff of the hospital 15 months ago. For his hospital work ever received from him a generous share of his time, and it was no unusual occurrence for him to visit an individual patient daily, or twice daily, where there was any doubtful or difficult problem of diagnosis or treatment to be faced. And his conscientiousness was at once revealed and illustrated to anyone who saw the classified records he kept for his own use of hospital and private cases alike. As a colleague the strength of his firmly marked and impulsive personality showed itself in an unswerving loyalty to, and care for the prestige and honour of his profession, a loyalty which at times evoked criticism by the very forcefulness of its expression; but, ever impatient as he was of opposition, this daunted Gordon not at all, but rather acted as a spur to increased earnestness. As a junior colleague, and friend of his in the personal sense, I can testify that during many years spent in intimate touch with him, frequently over difficult and controversial hospital and private problems, I never on any single occasion experienced from him any but the most scrupulous courtesy, kindness, and encouragement. He ever gave of his best, as the devotion and reliance he commanded of his patients further testified. His intellectual activities outside his profession covered a remarkably wide range. He was an enthusiastic and deeply-read historian, with an extremely retentive memory for facts; a student of architecture; and possessed a considerable degree of artistic ability. Until latterly he was a keen musician, and among his more intimate friends was known as a pianist of sympathetic touch and considerable interpretative insight; while in another direction his book of poems on the war—produced for private circulation only—evidenced among many other traits his admiration and respect for the private soldier. His literary ability was further displayed in his beautifully phrased concise speeches at gatherings, both scientific and social, and his scholarly attainments and methods generally make the gap caused by his loss one that will be felt for many a long day to come. With us his name has been a household word."

Dr. Roper's words set out Gordon's striking characteristics, and the accompanying portrait, taken in middle life, agrees with them.

The grief in Exeter and the surrounding district was accentuated by the unexpected termination to an attack of influenza, as Gordon was carrying on practice in his customary good health until quite recently. He leaves a widow, and an only son of 25, who is in India.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg. Lt.-Comdr. T. N. D'Arcy to *Warspite* (on transfer of flag); and Surg. Lts. L. J. Corbett to *Warspite* and L. P. Spero to *Queen Elizabeth* (on transfer of flag).

ROYAL ARMY MEDICAL CORPS.

Bt. Lt.-Col. F. D. G. Howell to be Asst. Dir.-Gen., Army Med. Servs., War Office, vice Col. W. R. P. Goodwin (vacated).

Maj. W. R. O'Farrell retires on retd. pay.

Capt. A. R. Barlas to be Maj.

Capt. W. Parsons, late R.A.M.C., is granted a temp. commn. in the rank of Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. J. E. H. Sawyer, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flight Lt. E. J. Jenkins resigns his permanent commission.

INDIAN MEDICAL SERVICE.

Maj. Gen. W. H. S. Nickerson, V.C., late R.A.M.C., to be Dir. Med. Services, India.

COLONIAL MEDICAL SERVICES.

The following appointments are notified: Dr. P. D. Johnson and Dr. J. E. McMahon, Medical Officers, Federated Malay States; Dr. A. W. H. Smith, Assistant Medical Superintendent, Tonjong Rambutan Central Mental Hospital, Federated Malay States; Dr. L. B. Haye, Medical Officer, and Dr. A. W. Rose, Pathologist, Nigeria; and Dr. E. J. Thomas, Medical Officer, Northern Rhodesia.

The following appointments in the West African Medical Staff have also been notified: Dr. G. W. Aynes, Dr. W. C. Davidson, Dr. C. N. Latham, and Dr. C. H. C. White, Medical Officers, and Dr. J. C. B. Craig and Dr. A. D. Cust, Medical Officers of Health.

THE King has granted permission to Lieut.-Colonel Sir Charles H. Bedford, I.M.S. (retd.), to accept and wear the insignia of Knight Grand Cross of the Order of Civil Merit of Spain, conferred upon him by the King of Spain. We understand that the only other British subjects who have received this honour are the Maharajahs of Patiala and of Kapurthala, on the occasion of their State visits to Madrid last year. Apart from other services to Spain for several years past, Sir Charles Bedford originated the King Alfonso XIII Chair of Spanish Studies at the University of Oxford in 1926, commemorating the Prince of Wales's visit to Spanish South America.

Medical News.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

D.P.H.

J. L. Clegg, R. L. Corlett, R. W. Eldridge, A. B. Follows, B. S. Jarvis, J. C. McVittie, R. J. Ormsby, D. E. P. Pritchard, D. Regan, and F. C. Speechly.

THE RED CROSS AND MUSTARD GAS.—The International Committee of the Red Cross offers a prize of 10,000 Swiss francs for a reagent capable of distinguishing without any ambiguity the presence of mustard gas in a concentration of 0·07 mg. per litre of air. The reaction should be characteristic and the reagent and the apparatus submitted should be simple to manufacture and moderate in price when turned out in large quantities. The jury which will decide on the award of the prize will consist of Prof. F. Haber, of Berlin, Sir William J. Pope, F.R.S., of Cambridge, Prof. M. F. Swarts, of Ghent, and Prof. M. G. Urbain, of Paris. Competitors must send their proposals in proper form to the Secretary of the International Committee of the Red Cross, in Geneva, before Dec. 31st, 1930. The reagent adopted will be called by its author's name and will become the property of the International Red Cross.

CHARING CROSS HOSPITAL POST-GRADUATE COURSE. A successful week-end post-graduate course was held in the Medical School on Oct. 5th and 6th, more than a hundred former students of the hospital attending. On Oct. 5th, in the morning, Mr. H. S. Clogg opened the course with a lecture on Diseases of Gall-bladder, and was followed by Mr. Bright Banister on Some Obstetric Difficulties, and by Dr. D. Forsyth on Some Everyday Neuroses. In the afternoon Mr. P. L. Daniel lectured on Common Ailments of the Rectum; Dr. F. G. Chandler on Puncture of the Chest: Its Occasions and Technique; and Dr. J. M. H. MacLeod on Tuberculosis of the Skin. On Sunday, Oct. 6th, the lectures given were as follows:—Mr. H. E. Batten: Fractures. Dr. Gordon Holmes: Syphilis of the Nervous System. Mr. Norman Lake: Injection Treatment of Varicose Veins. Dr. Howard Jones: A Short Review of Anæsthetic Practice. Dr. W. J. Adie: Early Symptoms of Some Common Nervous Disorders. Mr. E. D. Davis: Ear, Nose, and Throat Work in General Practice.

CHARING CROSS HOSPITAL DINNER.—The annual dinner of past and present students coincided with the first week-end post-graduate course ever held at the hospital, and was for this reason more than usually well attended. Nearly 100 covers were laid at Gatti's Restaurant on the evening of Oct. 5th when Dr. J. M. H. MacLeod took the chair and the toast list was agreeably short in order to give time for an admirable programme of music arranged by Dr. Taylor Harris. Mr. Norman Lake, in proposing "Hospital and Medical School," spoke of the completion of the additional wing which would relieve the general wards of overcrowding by providing a complete unit for the skin, orthopædic, dental, and other departments. Mr. J. Bright Banister, who replied in the absence, through illness, of the Dean, Dr. F. H. Young, recounted the signs of prosperity in the school and the prospect of an increasing number of students. Dr. W. C. Bosanquet proposed "The Chairman," who made a graceful reply. Among the items in the musical programme were three songs by Dr. Harris himself rendered with refreshing vigour and faultless technique, and a version, by Mr. Nelson Jackson, of Hamlet describing a cocktail.

ST. THOMAS'S HOSPITAL DINNER.—The annual dinner was held on Oct. 4th at St. Thomas's House, with Dr. H. G. Turney in the chair. There was an attendance of old students to the number of nearly 200, of every degree of seniority, who evidently appreciate the amenity of being able to meet and dine together in their own house. Among the invited guests were the Directors-General of the three medical services, the President of the Royal College of Physicians, the medical officer of health and the coroner for the area, a representative of London University, the headmaster of the Merchant Taylors School, and the architect of the new building. Dr. Turney, in proposing "Hospital and Medical School," opened with an amusing dissertation on doctors who are not doctors, but have deviated before or after qualification into one or other of the pleasant by-ways of life. He noted the curious fact that after being patron saint of the hospital for 300 years Thomas à Becket had been supplanted by the apostle of that name, and he pleaded with the treasurer for the restitution of the all-British patron. The partial eclipse consequent on the transplantation of the ancient hospital from the borough to its present site had, he felt, now fully disappeared. Sir Arthur Stanley, in replying, offered to look round for the best saint of the name, and spoke of the past year as one of extreme importance in the history of the hospital. For 12 years past he had been receiving demands on every hand for more accommodation. They were not allowed to build bridges, to approach the new site on the south side of Lambeth Palace-road, and tunnels must be so deep as to run the risk of flood. The new scheme would therefore transplant the medical school so as to build in its place a worthy out-patient department adjoining the wards. A joint appeal was shortly to be issued for certainly not less than £500,000, in the collection of which he looked hopefully to the aid of St. Thomas's men. The Dean, Prof. L. S. Dudgeon, replied for the medical school, sketching in a few sympathetic words the careers of the great men who had been lost to the school in the past year—Sharkey, Mackenzie, Caiger, George Maling, V.C., E. L. Atkinson, R.N., a member of Scott's expedition—and passing on to those retiring from the staff, especially Dr. J. S. Fairbairn, a man of ideas, a first-rate teacher and organiser, and a fine physician. Dr. H. Yellowlees had succeeded Dr. W. H. B. Stoddart, Prof. S. J. Cowell had delivered his first course on dietetics, Sir George Makins had received the honorary gold medal of the Royal College of Surgeons, a worthy successor of Lister and Paget. Finally he remarked that the new medical school would be six storeys in height, would cost £220,000, and would contain on the top 24 bedrooms supplementary to those in St. Thomas's House. Sir Percy Sargent proposed "The Guests," and Sir John Rose Bradford replied; it was, he said, a pleasing feature to entertain guests from other schools who had not much opportunity of meeting. The toast of "The Chairman" was proposed by Dr. A. E. Russell, who spoke of the service which Dr. Turney, after ten years of retirement, was still rendering to the hospital in his attendance on the nursing staff and as an almoner. The dinner concluded with the presentation of an illuminated address and a cheque to the school bedell, whose service with that of his father and grandfather covered a period of over 100 years.

ST. GEORGE'S HOSPITAL DINNER.—The annual dinner of the hospital and medical school was held on Oct. 1st at the Hyde Park Hotel with Dr. Digby Cotes-Preedy, K.C., in the chair. More than 100 past and present St. George's men attended, and a most enjoyable evening was spent. In reply to the toast of the "Hospital and Medical School" the Dean, Dr. Anthony Feiling, stated that the school *had had a successful* year, and that an excellent entry of new students was assured. The health of "The Chairman" wittily proposed by Mr. Ivor Back was replied to in like vein.

ST. MARY'S HOSPITAL DINNER.—Sir John Broadbent presided at the annual dinner at the Trocadero Restaurant on Oct. 4th, when the toast of "St. Mary's Hospital and Medical School" was proposed by Lieut.-Colonel H. E. Verey, as chairman of the Hospital Board. After referring to the large sums the School had received by the gift of Lord Beaverbrook and the bequest of Lord Revelstoke, Colonel Verey said it was hoped that rebuilding would begin early next year. If possible, work would start at the same time on the new inoculation department, for which Lord Iveagh's generous donation of £25,000 over a period of seven years would bring in a total of about £40,000. On the site of the old medical school a nurses' home would be built to accommodate four or five hundred, whilst the present nurses' home would provide ideal accommodation for paying patients—a most urgent necessity. The extensions of the hospital coming into operation this year had cost £63,000, of which £62,000 had been raised. The operating theatres were now as modern as any in the country, and the increase in the number of beds would mean better service for the locality. Colonel Verey congratulated the School on winning the Inter-hospital Cricket Cup, which had been absent since 1890. He went on to pay a tribute to Mr. Warren Low, whom he described as a tower of strength to the Hospital Board. He trusted that after Mr. Low's retirement from the surgical staff in November the Board would continue to enjoy his wise advice and tactful help. Another resignation which would be deeply regretted was that of Mr. Leslie Paton from the post of ophthalmic surgeon. In his reply, Dr. C. M. Wilson, the Dean, said it had been a wonderful year for the School, whose record, indeed, during the last ten years had been a romance. The late war had made the task of every medical school very difficult; expenses had been quadrupled, whilst income remained the same. Those who held that there were too many medical schools had welcomed this situation because they thought it would eliminate the weakest, but it was remarkable that the two most threatened with destruction—namely, the Middlesex and St. Mary's—were the two which had gone ahead most of all in recent years. St. Mary's had secured £160,000 for new school buildings, and hoped to get the remainder needed. They were out to make it the best school in London—best not because it had the best buil" or even the best staff, but because it had the best students. Sir John Broadbent, whose health was drunk with musical honours, responded entertainingly to the toast, and took occasion to recall the merits of many of his colleagues. The proceedings closed with a speech from the captain of the cricket team, the health of which was proposed by the chairman.

MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LTD.—The annual meeting of this Society was held on Oct. 7th under the chairmanship of Dr. F. J. Allan. The chairman in his address stated the report showed the Society had had a successful year. The premium income in the Sickness Fund was now £60,700. The sickness claims paid had increased from £31,000 to £38,196, chiefly on account of the influenza epidemic, for which claims were paid amounting to £6200. The total of the funds at the close of the year was £383,761. New life assurance policies were issued for £243,460 gross, and the funds had increased to £222,722. The total premium income of the Society was £98,050, and expenses of administration £13,348. The management expenses showed a gratifying fall in the ratio to premium income from 13·8 per cent. to 13·4 per cent. The gross rate of interest earned over the whole funds was £5 0s. 3*d.*, and net rate £4 3*s.* 2*d.* Dr. Allan stated that the investments of the Society were in a sound condition, and the auditors certified that the market prices of the stocks at June 30th, 1929, were £11,786 in excess of the values stated in the balance-sheet. The total funds of the Society now amounted to £628,588.

Dr. Harvey Hilliard, in moving three resolutions in respect of permanent sickness insurance contracts to age 70, fixing the date of the annual meeting, and printing and publishing a list of members, said that when he sent these to the office to be placed on the agenda of the meeting he was informed that they were matters arising out of the report, but he maintained that this was not the correct procedure. The chairman replied that he was informed by the legal advisers of the Society that the procedure adopted was in accordance with that usually adopted by other companies, but that the Board was prepared to consider a scheme for extending permanent sickness insurance to age 70. In the matter of fixing the date of the meeting, it was decided that the date should be published in the medical press six weeks beforehand. The motion for publishing a list of members being put to the meeting was lost by a large majority. The report was adopted, and the two retiring directors, Sir William Willcox and Mr. W. H. Dolamore, were duly re-elected. Dr. Harvey Hilliard's motion that all directors of the Society should retire at age 65 was withdrawn by him. After a vote of thanks had been unanimously passed to Dr. Allan the meeting closed.

GRESHAM LECTURES.—Four lectures on How England Learned to Control Disease will be given by Sir George Newman at 6 P.M. on Oct. 15th, 16th, 17th, and 18th, at Gresham College, Basinghall-street, London, E.C.

GUILD OF ST. LUKE.—The Annual Medical Service will be held at Westminster Abbey on Sunday, Oct. 20th, at 6.30 P.M., when the Bishop of Bradford will be the preacher. Medical men, women, and students are invited to attend. Those wearing academic dress will not require tickets, but will proceed to the Jerusalem Chamber and robe there. Tickets for others and their friends may be had from the Secretary of the Guild, King's College, Strand, London.

NATIONAL COUNCIL FOR MENTAL HYGIENE.—A conference on mental health will be held in the Central Hall, Westminster, from Oct. 30th to Nov. 2nd. The subjects to be discussed include Sex Education, the Personal Equation in Industry, the Child and the Parent, and Delinquency. There will also be group discussions on the Working of the Juvenile Courts, the Relation of the Work of Public Health Nurses and Social Workers to the Mental Health of the Community, and the Problem Child at Home and in School. Further particulars may be had from the Secretary of the Council, 78, Chandos House, Palmer-street, London, S.W. 1.

BRITISH SCIENCE GUILD.—The Norman Lockyer Lecture for 1929 will be given at the Goldsmiths' Hall, Foster-lane, London, E.C., at 4.30 P.M., on Tuesday, Nov. 19th, by Sir Walter Fletcher, F.R.S., Secretary of the Medical Research Council, who will speak on certain aspects of medical research and their applications.

A lecture has been established in memory of Sir Alexander Pedler, F.R.S., who was for many years honorary secretary of the Guild. The first Alexander Pedler Lecture will be given at Manchester, at 5.30 P.M., on Nov. 26th by Mr. G. C. Simpson, F.R.S. The subject will be Past Climates, and the lecture will be held under the auspices of the Manchester Literary and Philosophical Society at 36, George-street.

POST-GRADUATE COURSE ON ORTHOPÆDICS.—A fortnight's course will be held at the Royal National Orthopædic Hospital, London, from Nov. 18th to 30th. Particulars will be found in our advertisement columns.

INTERNATIONAL LEAGUE AGAINST TRACHOMA.—At the International Ophthalmological Congress recently held in Holland (see THE LANCET, Sept. 21st, p. 633) it was resolved to form an International League against Trachoma. Prof. Emile de Grósz, of Budapest, was elected president, and Dr. F. Wibaut, of Amsterdam, secretary, and they were entrusted with the formation of a committee from among the delegates of the ophthalmological societies and leagues already in existence. Prof. de Grósz's address is Baross-u., 10, Budapest VIII.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 28TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 108 (last week 119); scarlet fever, 2590; diphtheria, 1367; enteric fever, 101; pneumonia, 720; puerperal fever, 46; puerperal pyrexia, 86; cerebro-spinal fever, 10; acute poliomyelitis, 37; acute polio-encephalitis, 4; encephalitis lethargica, 12; continued fever, 1; dysentery, 11; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 1st–2nd was as follows:—Small-pox, 143 under treatment, 10 under observation (last week 122 and 19 respectively); scarlet fever, 1738; diphtheria, 1764; enteric fever, 18; measles, 172; whooping-cough, 190; puerperal fever, 24 (plus 8 babies); encephalitis lethargica, 126; poliomyelitis, 5; "other diseases," 13. At St. Margaret's Hospital there were 10 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 12 (2) from measles, 6 (0) from scarlet fever, 15 (3) from whooping-cough, 31 (9) from diphtheria, 186 (36) from diarrhœa and enteritis under two years, and 23 (5) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (which have increased by a bare quarter), 31 were reported from Birmingham, 18 from Liverpool, 12 from Sunderland, 11 from Hull, 8 from Manchester, 7 from Middlesbrough, and 6 from West Ham; while Glasgow, Dublin, and Belfast reported 15, 8, and 7 respectively. The deaths from enteric fever were reported from Wimbledon, Newcastle-on-Tyne, and Swansea.

The number of stillbirths notified during the week was 236 (corresponding to a rate of 35 per 1000 births), including 43 in London.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 14th.—5 P.M., WAR. Presidential Address by Group-Captain Hardy V. Wells, R.A.F.

TUESDAY.—8 P.M., PATHOLOGY. Prof. A. E. Boycott: The Blood as a Tissue (Presidential Address). 8.30 P.M., ORTHOPÆDICS. Dr. Fred Albee (New York) will give an Address on Original Surgical Applications of the *Bone Graft*, illustrated by lantern slides and moving pictures. Members of the Section of Surgery are cordially invited to attend.

WEDNESDAY.—8 P.M., TROPICAL DISEASES. Dr. G. Giglioli: Paratyphosus Infections in British Guiana—Sterile abscess in Treatment—Demonstration of Specimen. Dr. W. Broughton-Alcock: Section Showing Structures Morphologically Resembling Spirochætes of a Species Common to the Mouth, lying deep within its mucous membrane (for opinion).

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.)

FRIDAY.—8 P.M., OBSTETRICS, COMPARATIVE MEDICINE. Special Discussion on Causes of Early Abortion and Sterility. Openers: Prof. A. Robinson and Prof. Beckwith Whitehouse (Obstetrics); Mr. J. R. Barker and Mr. O. Stinson (Comparative Medicine). 8.30 P.M., ELECTRO-THERAPEUTICS. Presidential Address by Dr. C. A. Robinson.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Oct. 14th.—8 P.M., Annual General Meeting. 8.30 P.M., Mr. Donald Armour: Some of Lettsom's Contemporaries (Presidential Address).

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
Thursday, Oct. 17th.—7.45 P.M., Demonstration of some of Dr. Low's Original Preparations showing the Development of Filariæ in Mosquitoes.—8.15 P.M., Dr. G. Carmichael Low: A Retrospect of Tropical Medicine from 1891–1914 (Presidential Address).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Friday, Oct. 18th.—5 P.M., Sir Arthur Keith: Specimens of Trephining—Ancient and Modern.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
Monday, Oct. 14th, to Saturday, Oct. 19th.—Medical Society of London. Mon., 5 P.M., Dr. F. G. Chandler: The Treatment of Pulmonary Tuberculosis. No fee. Tues., 8.30 P.M., Dr. Parsons-Smith: The Symptoms and Signs of Myocardial Failure. Fri., 8.30 P.M., Dr. Parsons-Smith: The Treatment of Heart Disease. St. John's Hospital for Diseases of the Skin. Mon. 2 to 4 P.M., Dr. W. *Griffith: Demonstration. No* fee.—Samaritan Hospital, Marylebone-road, N.W. Thurs., 2.30 P.M., Mr. Andrew McAllister: (Gynæcology) Demonstration. No fee.—Hospital for Tropical Diseases, 25, Gordon-street, W.C. Tues. and Thurs., 2 P.M., Lecture-demonstrations by Dr. Manson-Bahr and Dr. Carmichael Low.—Chelsea Hospital, Arthur-street, S.W. Special Courses in Gynæcology for two weeks.—Hospital for Sick Children, Great Ormond-street, W.C. Special morning course.—Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C. Intensive Course. Further particulars from the Fellowship of Medicine.

LONDON HOSPITAL POST-GRADUATE COURSE.
Wednesday, Oct. 16th.—10.15–10.45 A.M., Dr. Russell Brain: The Therapeutic Uses of Luminal. 11–11.30 A.M., Dr. W. W. Woods: The Causes of Sudden Death (with specimens). 11.30–11.45 A.M., Dr. S. Phillips Bedson: Recent Work on Vaccination. 12–12.45 P.M., Mr. Hugh Lett: Hematuria. 1.30–2 P.M., Sir R. S. Woods: The Present Position of General Light Therapy. 2–3 P.M., Mr. W. S. Perrin: Demonstration of Cases Treated by Radium. 2–4 P.M., Mr. E. C. Lindsay: Surgical Operations. 2–3.30 P.M., Dr. George Riddoch: Demonstration of Neurological Cases. 3.45–4.30 P.M., Dr. John Parkinson: Non-valvular Disease of the Heart (Cases and Lantern slides).
Thursday.—10–10.45 A.M., Dr. W. J. O'Donovan: Occupational Dermatitis (Lantern Demonstration). 11–11.45 A.M., Dr. Maitland-Jones: Infant Feeding. 11.55 A.M.–12.10 P.M., Dr. Donald Hunter: Modern Treatment of Lead Poisoning. 12.15–12.45 P.M., Mr. Alan Perry: Injection Treatment of Varicose Veins (Lecture and Demonstration). 1.30–2 P.M. Mr. H. S. Souttar: Radium and Its Surgical Application. 2–3.30 P.M., Mr. Souttar: Surgical Operations; Dr. R. A. Rowlands and Mr. J. D. Driberg: Ward Demonstrations. 3.45–4.30 P.M., Dr. O. Leyton: Diabetes.
Friday.—10–10.45 A.M., Prof. A. W. M. Ellis: Use and Abuse of Intravenous Therapy. 11–11.45 A.M., Dr. P. N. Panton: Pernicious Anæmia. 12–12.45 P.M., Mr. Robert Milne: Pain in the Fore Part of the Foot. 1.30–3.30 P.M., Mr. A. J. Walton: Operations. 1.30–2.30 P.M., Dr. A. E. Clark-Kennedy: Cardiac Pain (Ward Demonstration). 2.30–3.30 P.M., Dr. Theodore Thompson: Ward Demonstration. 3.45–4.30 P.M., Mr. Eardley Holland: Uterine Hæmorrhage (Gynæcological Demonstration). 9 P.M., Dr. Ashley Daly: Methods of Anæsthesia (Demonstration).
Saturday.—10–10.45 A.M., Dr. Robert Hutchison: Dyspepsias of Childhood. 11 A.M. to 12 noon, Mr. Russell Howard: Ward Demonstration. 12–12.45 P.M., Mr. Walton: *Place of Surgery in Lesions of the* Stomach.

NATIONAL HOSPITAL, Queen-square, W.C.
Monday, Oct. 14th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Adie: Disseminated Sclerosis.
Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Central Disorders of Vision.
Thursday.—2 P.M., *Dr. Kinnier Wilson: Out-patient* Clinic. 3.30 P.M., Dr. Riddoch: Some Heredo-familial Diseases.
Friday.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educational Methods (in Exercise Room).

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General *Hospital*, Tottenham, N.
Monday, Oct. 14th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.
Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
Monday, Oct. 14th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Ward Visit. 2 P.M., Mr. Donald Armour: Operations.
Tuesday.—10 A.M., Medical Registrar: Ward Visit. 2 P.M., Dr. Shaw: Medical Out-patients. 4.30 P.M., (lecture), Mr. Tyrrell Gray: Surgical Aspects of Indigestion.
Wednesday.—10 A.M., Dr. Owen: Children's Out-patient Department. 2 P.M., Mr. Tyrrell Gray: Operations. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Department. 11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Out-patient Department.
Friday.—10 A.M., Dr. Pritchard: Medical Ward Visit. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Children's Medical Out-patient Department. Medical and Surgical Out-patients at 2 P.M., daily. Operations. Special Departments daily, 10 A.M. to 5 P.M., Saturdays, 10 A.M. to 1 P.M. Special Classes in Anæsthetics and Operative Surgery.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
Tuesday, Oct. 15th.—5 P.M., Dr. H. W. Barber: Bacteriology and Mycology.
Thursday.—5 P.M., Dr. H. G. Burford: Pathology Demonstration.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
Friday, Oct. 18th.—4 P.M., Mr. A. Wylie: Gleanings and Impressions of Oto-Rhino-Laryngology.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
Wednesday, Oct. 16th.—4.30 P.M., Mr. R. H. Jocelyn Swan: The Examination of a Urological Patient.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
Wednesday, Oct. 16th.—3.30 P.M., Dr. R. King Brown: Prophylaxis Applied to Infectious Diseases.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
Wednesday, Oct. 16th.—4 P.M., Dr. E. Graham Little, M.P.: Health and Conditions of Work of Medical Students.
Friday.—5 P.M., Prof. R. A. Peters: Coördinative Bio-Chemistry of the Cell and Tissues (First Harben Lecture).

GRESHAM COLLEGE, Basinghall-street, E.C.
Tuesday, *Oct.* 15th, and the following Wednesday, Thursday, and Friday.—6 P.M., Sir George Newman: How England Learned to Control Disease (Gresham Lectures).

UNIVERSITY COLLEGE, Gower-street, W.C.
Monday, Oct. 14th.—5 P.M., Dr. R. J. Brocklehurst: Secretion of the Digestive Juices. (First of four public lectures).

KING'S COLLEGE, Strand, W.C.
Tuesday, Oct. 15th.—5 P.M., Mr. J. W. *Pickering, D.Sc.*: Blood Plasma and Platelets (Second lecture).
Thursday.—5 P.M., Mr. J. A. Hewitt, D.Sc.: Metabolism of the Carbohydrates and Fats. (First of four lectures).

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, Albert Embankment, S.E.
Tuesday, Oct. 15th.—5 P.M., Dr. A. St. G. Huggett: Physiology of the Fœtus (Second lecture).

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.
Monday, Oct. 14th.—6 P.M., Prof. T. Madsen (Copenhagen): Seasonal Variations of Epidemic Diseases.
Wednesday.—6 P.M., Prof. Madsen: Milk Epidemics.
Friday.—6 P.M., Prof. Madsen: Diphtheria Toxin and Antitoxin.

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.
Friday, *Oct.* 18th.—5 P.M., Prof. V. H. Mottram: Human Nutrition (First of six lectures).

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
Tuesday, Oct. 15th.—4.15 P.M., Dr. D. E. Core: Functional Pain.
Friday.—4.15 P.M., Dr. G. Jessel: Differential Diagnosis of Pulmonary Tuberculosis (Illustrated by Skiagrams).

Appointments.

Bligh, J. M., M.D. Liverp., M.R.C.P. Lond., has been appointed Hon. Consulting Physician to Southport Infirmary.

Churcher, D. G., M.D., B.S. Lond., a Medical Referee under the Workmen's Compensation Act for Eastbourne and Hastings County Court Districts.

Claye, A. M., M.D. Leeds, F.R.C.S. Eng., Honorary Obstetric Surgeon to Leeds Maternity Hospital.

Dearn, E. M., M.B., Ch.B. Sheffield, Assistant School Medical Officer to the Newcastle Education Committee.

Johnson, R. G., Certifying Surgeon under the Factory and Workshop Acts for Bristol District, Gloucester.

Lobban, G. M. D., M.B., Ch.B. Leeds, School Medical Officer, Essex County *Council*.

Watson, Jessie R., M.B., Ch.B. St. And., Assistant School Medical Officer, Sunderland.

Bolton Infirmary.—**Biggane, E. F.**, M.B., Ch.B. N.U.I., and **Critchley, S. E.**, M.B., Ch.B. Manch., Assistant Surgeons.

City of London Maternity Hospital, City-road, E.C.—**Freeman, L. W.**, L.R.C.P. Lond., M.R.C.S., Resident Medical Officer; and **Price, J. A.**, M.B., B.Ch. Belf., Assistant Resident Medical Officer.

Vacancies.

For further information refer to the advertisement columns.

Adelaide University.—Elder Professor of Anatomy and Histology. £1100.

Bath, Royal United Hospital.—H.P. At rate of £120.

Barnstaple Dispensary, Area of the County of Devon.—Tuber. O. £750.

Bedford County Hospital.—H.S. Also Asst. H.S. At rate of £175 and £130 respectively.

Bethlem Hospital, Lambeth-road, S.E.—Res. H.P. £25 per quarter.

Birmingham City Hospital for Infectious Diseases, Little Bromwich.—Temporary Asst. M.O. At rate of £300.

Birmingham, Queen's Hospital.—Res. Anæsthetist. £70–£100.

Birmingham, Selly Oak Hospital.—Cas. O. at rate of £200.

Birmingham and Midland Ear and Throat Hospital.—Asst. Surg. O. £200.

Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £120.

Bradford Royal Infirmary.—Hon. Asst. P. Also H.P. £150.

Brighton, New Sussex Hospital for Women and Children.—Hon. Asst. Ophth. Surg. Also Hon. Anæsthetist.

Cambridge House Infant Welfare Centre, Camberwell.—M.O. £1 11*s.* 6*d.* per session.

Canterbury, Kent and Canterbury Hospital.—Third Res. M.O. At rate of £125.

Carlisle, Cumberland Infirmary.—H.P. At rate of £155.

Chelmsford and Essex Hospital.—Res. M.O. At rate of £150.

Darlington County Borough.—Deputy M.O.H. £750.

Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Anæsthetist. £10 10*s.*

Exeter, Royal Devon and Exeter Hospital.—Aural H.S. and Cas. O. At rate of £120.

Glasgow, Woodilee Mental Hospital, Lenzie.—Jun. Asst. M.O. £300.

Great Yarmouth General Hospital.—Jun. H.S. £100.

Halifax Royal Infirmary.—Third H.S. At rate of £100.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Hereford General Hospital.—H.P. At rate of £150.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Jun. H.P. for Frimley Sanatorium. At rate of £100.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100. Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Hôpital Français, 172, Shaftesbury-avenue, W.C.—Jun. Res. M.O. £100.

Huddersfield Royal Infirmary.—Jun. H.S. At rate of £150.

Hull Royal Infirmary.—Third H.S. Also Asst. H.P. At rate of £150 and £130 respectively.

Ilford Emergency Hospital.—Hon. Radiologist. £50.

Inverness Northern Infirmary.—Hon. Radiologist.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Loughboro' Junction Maternity and Infant Welfare Centre, 109, Sussex-road, S.W.—Medical Woman.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester, St. Mary's Hospital—Four H.S.'s. Each at rate of £50.

Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500. Also Asst. M.O. £350.

Manchester, Salford Royal Hospital.—H.S. to Orthopædic Dept. Also Cas. H.S. Each at rate of £125.

Margate, Royal Sea Bathing Hospital.—H.S. At rate of £200.

Metropolitan Ear, Nose, and Throat Hospital.—H.S. £150.

Metropolitan Hospital, Kingsland-road, E.—H.P.'s, H.S's., &c. Each at rate of £100.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Jun. Res. M.O. Also Asst. Cas. O. Each at rate of £100.

Miller General Hospital, Greenwich-road, S.E.—Orth. H.S. At rate of £150. Hon. Surgeon. Also Hon. Physician to Skin Dept.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Surgeon.

Norwich, Norfolk and Norwich Hospital.—H.P. £120.

Nottingham General Dispensary.—Res. Surg. £250.

Preston and County of Lancaster Royal Infirmary.—Res. Surg. O. £300. Also H.S. At rate of £150.

Prison Medical Service.—Medical Officer. Class II. £350.

Queen's Hospital for Children, Hackney-road, E.—H.P., Cas. O., and H.S. All at rate of £100.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Rotherham Hospital.—H.P. £180.

Royal Chest Hospital, City-road, E.C.—H.P. At rate of £100.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital and London (R.F.H.) School of Medicine for Women, W.C.—Obstet. and Gyn. Unit. Sen. Asst. At rate of £350. Third Asst. £270. Path. Dept. Res. Asst. Path. £150.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Hon. Asst. Surg. Also Surg. Registrars. Each £105.

Royal Naval Dental Service.—Dental Officers.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Gynæcological Reg. Also H.S. At rate of £100.

St. Andrew's Hospital, Dollis Hill, N.W.—Sen. and Jun. Res. M.O.'s.

St. Helen's County Borough.—Tuber. O. £600.

St. John's Hospital, Lewisham, S.E.—Res. Cas. O. and Res. H.P. Each at rate of £100. Radiologist. Also Res. M.O. At rate of £100.

St. Mary's Hospital, Institute of Pathology and Research.—Research Studentship. At rate of £200.

St. Peter's Hospital for Stone, Henrietta-street, W.C.—Radiologist. £25.

Salisbury General Infirmary.—Res. M.O. £150.

Sheffield, South Yorkshire Mental Hospital.—M.O. £400.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £120.

Swanley, Kent, Alexandra Hospital for Children with Hip Disease. Res. Asst. M.O. At rate of £300.

University College Hospital, Gower-street, W.C.—Hon. Clin. Asst.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. Med. Reg. Also Hon. Surg. Reg.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Physician.

West London Hospital, Hammersmith, W.—Hon. Registrar for Throat, Nose, and Ear Dept. Asst. M.O. At rate of £450. Also three Jun. Asst. M.O's. Each at rate of £350.

Westminster Hospital, Broad Sanctuary.—Wander Scholarship, &c. £250.

Woolwich and District War Memorial Hospital, Shooter's Hill, S.E. Res. M.O. £175. Also H.S. At rate of £125.

Wolverhampton, Royal Hospital.—H.S. Also Cas. O. and Res. Anæsthetist. At rate of £150 and £125 respectively.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at West Hartlepool (Durham) and Montrose (Angus).

Births, Marriages, and Deaths.

BIRTHS.

Bedson.—On Sept. 29th, at Arkwright-road, Sanderstead, the wife of Dr. S. P. Bedson, of a son.

Buckley.—On Sept. 29th, at Lorna Lodge, Barlow Moor-road, Didsbury, the wife of G. H. Buckley, F.R.C.S. Edin., of Blackpool, of a daughter.

Cooper.—On Sept. 29th, at The Georgian House, Chipstead, the wife of A. Basil Cooper, M.B., of a daughter.

MARRIAGES.

Batchelor—Glendinning.—On Oct. 1st, at St. Paul's Church, Lorrimore-square, G. F. Grant Batchelor, F.R.C.S., to Louise, daughter of the late Mr. and Mrs. John Glendinning, Dumfries.

McCay—Dobbie.—At Edinburgh, on Oct. 7th, 1929, Andrew William McCay, F.R.C.S.E., Chester, to Elsie Margaret, elder daughter of Sir Joseph and Lady Dobbie, 10, Learmonth-terrace, Edinburgh.

Middleton—Lavanchy-Clarke.—On Oct. 2nd, at the Scottish Church, Lausanne, Switzerland, E. L. Middleton, M.D., D.P.H., of London, to Bertha Jane, daughter of the late F. H. Lavanchy-Clarke and of Mrs. Lavanchy-Clarke, of Cannes.

DEATHS.

Brownfield.—On Oct. 5th, Harry Munyard Brownfield, O.B.E., V.D., M.R.C.S., L.R.C.P., of Lennox-road North, Southsea.

Frakes.—On Sept. 20th, suddenly, at Homecroft, Oakley, Hants, Henry Sowter Frakes, M.D., aged 77.

Gordon.—On Oct. 1st, at Exeter, William Gordon, M.A., M.D. Camb., F.R.C.P. Lond., Consulting Physician to the Royal Devon and Exeter Hospital and West of England, Eye Infirmary, in the 67th year of his age.

O'Leary.—On Oct. 7th, at Yateley Lodge, Yateley, Hants suddenly, following an operation, Arthur Price Evelyn O'Leary, M.R.C.S., L.R.C.P., late of Glenelg, South Australia, aged 62.

Pywell.—On Sept. 30th, at Fletton-avenue, Peterborough, Ernest Alfred Pywell, M.R.C.S., L.R.C.P., aged 43.

Verrall.—On Oct. 4th, at East Lodge, Leatherhead, Sir Thomas Jenner Verrall, M.R.C.S., L.R.C.P., LL.D.

Woodman.—At the Royal Hospital, Baghdad, on Sept. 10th, from hæmorrhage during enteric fever, Margaret Maxwell, dearly loved wife of G. S. Woodman, F.R.C.S. Ed.

N.B.—A fee of 7s. 6d is charged for the insertion of Notices of Births, Marriages, and Deaths.

London School of Dermatology.—The winter session began on Oct. 3rd with an opening lecture on the Rise and Progress of Dermatology delivered by Dr. J. H. Stowers at St. John's Hospital for Diseases of the Skin, Leicester-square. Lectures will be given every Tuesday and Thursday throughout the winter months.

Guild of St. Luke, St. Cosmas, and St. Damian.—The general meeting of the Guild will be held in the Cathedral Hall, Archbishop's House, on Sunday, Oct. 20th, immediately after the High Mass at Westminster Cathedral, which will be celebrated at 10.30 A.M. The annual report of the council of the Guild records a successful year, special mention being made of the care and helpful direction applied to every activity of the Guild by the Master, Mr. Ernest Ware. The hon. secretary of the Guild is Dr. W. J. O'Donovan, of 123, Harley-street, W.1, from whom further information may be obtained.

Notes, Comments, and Abstracts.

OBSERVATIONS IN ICELAND.

HISTORY AND HEALTH.

(FROM A SPECIAL CORRESPONDENT.)

(*Concluded from p. 750.*)

Other Diseases.

Enteric fever has long been endemic in Iceland, with serious outbreaks from time to time. In the period 1911–20 the annual notifications numbered 155, and in the following five-year period 110. In 1927 only 27 cases were notified. The disease has been most frequent in the towns in spite of a good water-supply, tolerably good drainage, and a standard of cleanliness higher, at any rate, than that of the country districts, where the disease is usually limited to single farms. The disease is often of a mild type, some of the cases being paratyphus. It is most frequent in the first and last quarters of the year. Much of the milk is pasteurised in Reykjavik.

Last century *scarlet fever* invaded the country periodically from abroad, each epidemic running through the country for three or four years, and then dying out completely. Early in the present century it became endemic. The last epidemic, which began in 1909, differed in certain respects from previous epidemics; its maximum was reached in 1920, when there were 700 cases, and it had almost died out by the end of 1924. Its extensive distribution and mild character rendered preventive measures difficult as well as superfluous, and isolation was but little enforced except in Reykjavik. In 1927 only five cases were notified.

Diphtheria was waning in the period 1908–19, but in 1920 a new epidemic wave began, reaching its maximum in 1921, and almost dying out in 1926. In the five-year period 1921–25 there were 201 cases notified annually. In 1926 only 71 cases were notified, mostly mild, and in 1927 this figure was further reduced to 26.

Acute anterior poliomyelitis had been rare in Iceland till 1924, when a serious epidemic broke out suddenly, the first case notified being in Reykjavik. There were 403 cases notified, with 89 deaths, in this year, and in 1925 25 new cases were notified. The epidemic raced through the country in about four months, being most severe in the north and west. As in the case of influenza, this epidemic reached its maximum in its second month. The most remarkable feature of this epidemic was the frequency of abortive cases (two-thirds of all cases according to one medical officer). Another medical officer found 11 abortive cases out of a total of 18. The disease was characterised by a slight sore-throat, nausea or vomiting, and sometimes by diarrhœa, slight fever, headache, and pain or stiffness in the back. Most of the patients recovered rapidly. In some cases the reflexes were a trifle impaired during convalescence from an abortive attack. About half of the members of three families, closely observed during the epidemic, showed some sign of the disease. Patients often had a slight attack without any paralysis at first, but on exertion or exposure a relapse occurred, and this was followed by paralysis. Strict confinement to bed from the onset of symptoms and for a week or two after recovery proved necessary. The proportion of patients who became paralysed varied from 15 to 25 per cent. Twenty-one cases of lethargic encephalitis, with seven deaths, were notified in the five-year period 1921–25.

An epidemic of *whooping-cough* was imported from Denmark in 1926. It raged throughout the country during 1927, as many as 6045 cases being notified, with 155 deaths. As many as 90 of these deaths occurred in the first year of life. Many adults, however, also suffered, several of them catching the disease for a second time. On the other hand, many children proved to be immune, and one medical officer observed that approximately one-third of the children who had been exposed to the disease did not develop it. Some medical officers succeeded by preventive measures in keeping their districts partially or totally free. In Akureyri the advent of the epidemic was greeted by the women of the town in a manner as drastic as it was effective. They formed a cordon round the infected district, and so effective was the day and night watch which the pickets kept that the rest of the town was saved. Preventive vaccination was apparently successful in the hands of several medical officers, and 73·4 per cent. of 158 vaccinated children failed to catch the disease, while 21·5 per cent. caught it only in a mild form. The remaining 5·1 per cent. caught it badly.

In 1922 the Icelandic Medical Society launched a campaign against *favus*, and though only 58 cases were discovered it is probable that this was little more than half the total. With the financial aid of the Government, measures for stamping out the disease were adopted, and in 1925 70 cases were discovered and cured.

Malignant disease is slightly on the increase, but cancer of the uterus still remains remarkably rare. The anatomical distribution of malignant growths notified in Reykjavik was as follows: stomach, 54 per cent.; breast, 14·4 per cent.; œsophagus, 5·8 per cent.; colon, 5·6 per cent.; and uterus, 4·8 per cent.

While *diabetes* is very rare, the rarity of *rickets* is in dispute. In one small district a medical officer, with special training in pædiatrics, found that not less than 18 per cent. of the children under the age of two suffered from this disease. So it may be that rickets in a mild form is not as rare as it was formerly supposed to be, but it is far from being as common as in the Faröe Islands, where 42 per cent. of the children have been found to be rachitic.

Cerebral apoplexy is such a frequent cause of death that in the five-year period 1921–25 there were no fewer than 81 deaths a year from this cause (8·5 per 10,000 inhabitants). This is the more surprising as syphilis is a most rare disease in Iceland. Some curious observations suggest that cerebral apoplexy is an hereditary disease.

Conclusions.

Iceland's public health problems may seem at first sight to be those of any other community, to be solved in the same ways that countries with an older public health service have found to be most satisfactory. But in many respects Iceland is unique, and the features which make it so justify it in adapting, rather than adopting blindly, the ideas and measures of the rest of the world. Take such a matter as the isolation of whole districts when epidemics have reached the country from abroad. As we have seen in the case of measles and influenza, barriers can be raised which are effective, for a time at any rate, against most highly infectious diseases whose very ætiology and mode of dissemination are still largely unknown. Even when such preventive measures have proved of only temporary value the results have merited the careful study of epidemiologists elsewhere.

In such an isolated and sparsely populated country an invading germ can be followed almost visually, as it passes from one lone farmstead to another, and it is subject to an attention as disconcerting and personal as that which would be bestowed on a foreign burglar misguided enough to choose Iceland for his field of operations. So much for the geographical character of the country which makes it so helpfully transparent in the eyes of the epidemiologist. It is transparent in another sense. In the crowded, patchwork civilisations of other countries it is a wise man who knows his own father, and a clairvoyant who knows his own grandfathers. But in Iceland everyone can follow his ancestry back a thousand years. Think what this must mean to the student of the problems of heredity! The country is transparent not only geographically and contemporaneously but also historically.

Iceland's comparative isolation for 1000 years has provided a vast mass of material for the study of environment as well as of heredity. The sheep brought over by the early Norwegian settlers differ in certain respects from the sheep in Norway to-day, and it is possible that the descendants of the settlers themselves have developed on lines not altogether identical with those followed on the Scandinavian mainland. Here again there is a very interesting field of study awaiting the anthropologist. Prof. Hannesson's anthropological studies have already blazed a track in this hitherto almost unexplored sphere.

There are many striking differences in the behaviour of certain diseases in Iceland and other countries. A study of these differences might well throw important light on the ætiology of these diseases. It is easy enough to understand why the bacillus of leprosy and the echinococcus should have been comparatively common in Iceland up to the end of the last century. But the country's remarkable immunity to certain other diseases, which are relatively common elsewhere, is to a large extent an unsolved problem. Why should acute rheumatism run so mild a course and the cardiac complications thereof be so infrequent? Why should diabetes be almost unknown, and cancer of the uterus so rare? Why should cerebral apoplexy be so common in the almost complete absence of syphilis? Why should this accident apparently run in families? The prospect of answers being found to these and other questions is enhanced by the high standard of the medical profession in Iceland and by its intimate and steadily growing contact with medical science abroad. Were this contact to be promoted by every possible means I am sure that the accruing benefit would not be one-sided. Iceland should prove a happy hunting ground for research workers, not only for the reasons already given, but also because the Icelandic medical profession receives the medical stranger within its gates with a most charming and spontaneous hospitality.

My most grateful thanks are due to Prof. Gudmundur Thoroddsen, Dr. Olafur O. Larusson, of the Vestmanöy Islands, and Dr. Gunnlaugur Claessen for the help they gave me.

THE EFFECT OF TOXÆMIA ON THE FORMATION OF ENAMEL.

HYPOPLASIA of the dental enamel, characterised by a honeycombed or pitted condition of this tissue, is comparatively common. It has long been recognised that it is often due to some disease or metabolic disturbance during the period of calcification, the subsequent eruption of the affected teeth remaining a permanent record of a past defect in nutrition. Hypoplastic teeth are still sometimes termed rachitic teeth on the supposition that rickets is the chief disease resulting in enamel defect. We know now that while rickets often brings about defective calcification, other diseases also, especially the infective diseases of childhood, may leave their mark on the teeth. Since the dates of calcification are known, the observer can usually predict with tolerable accuracy the times when the disturbance in nutrition affected the portion of the enamel defectively formed.

Dr. L. B. Stott and Mr. W. B. Grandison have investigated the occurrence of dental hypoplasia in children at the Papworth Village Settlement, and their results have been published in an attractively produced monograph.[1] They have been struck by the fact that during dental inspection of the children at this Settlement some showed perfect dentitions, while their general condition and personal hygiene did not differ from that of sufferers from varying degrees of dental caries. This has led them to examine the dental and medical records with a view to ascertaining the significance of this apparent immunity from dental disease. The correlation of the medical and dental records leads them to the view that infective disease during calcification produces hypoplasia while, as a necessary corollary to this, they suggest that acquired resistance to infectious disease is followed by satisfactory calcification.

The interesting suggestion is made that the calcium metabolism in the teeth follows those variations in the calcium metabolism of the body as a whole which occur in active tuberculosis and its arrest. In active tubercle the calcium excretion is high, so the teeth in process of calcification do not receive enough lime salts and are therefore defectively formed. When tuberculosis is arrested the process is characterised by the deposition of calcium in the tuberculous foci. Thus deposition of calcium is a tissue action which may be widespread in and is associated with a low calcium excretion. Hence it might follow that in cases of acquired immunity the teeth undergoing calcification receive plenty of calcium and are, in consequence, highly calcified and resistant to caries.

A further point of some theoretical importance raised by Stott and Grandison is whether this power of depositing calcium is part of a natural resistance or whether it is increased by exposure to infection and is thus due to acquired immunity. They suggest—though they do not bring much evidence to support the suggestion—that efficient calcification is conferred by acquired rather than natural immunity. This seems to mean that the dental enamel is more highly calcified in children who have been exposed to infection, which they have subsequently overcome successfully, than in children who have escaped exposure to infection altogether. The logical and somewhat surprising outcome is that immunity to dental caries, instead of being a function of a normal calcium metabolism leading to normally formed enamel, is rather a function of an abnormal calcium metabolism which causes excessive calcification of the enamel.

THE FUTURE OF MONOGAMY.

A PROPHECY that the years 1930 to 1975 will be a period of sexual reform, during which the institution of monogamy will undergo vicissitudes consequent upon the universal teaching of sex hygiene and the liberation of marriage from external inhibitions, is made in an addition to the To-day and To-morrow Series, which has reached us.[2] The period 2000 to 2030, however, will see the triumph of voluntary monogamy. The somewhat startling reason for this is that "no type of union has yet been discovered in which the maximum of intellectual variety may be so effectually combined with the minimum of emotional disturbance." The book is written in the form of a chapter out of a hypothetical history of moral institutions in the nineteenth, twentieth, and twenty-first centuries. The contemporary literature on which the survey is based is not representative, the chief sources being the series in which this book appears. In the course of the next hundred years, the author thinks, the institution of monogamy will have completed a circle, ending up much as it is now, except that it will be voluntary instead of compulsory, and based on sexual knowledge instead of upon ignorance. The psychological presupposition of this desirable change is that confidence will be gained in humanity's ability to impose voluntary restraints upon its conduct. No attempt whatever is made to analyse the growth of these morally inhibiting processes, and the relevant psychological literature is nowhere referred to.

MEDICAL MISSIONS.

A LITTLE book called "The Touch of Healing," by M. M. Wood,[1] will be welcomed by anyone who wishes to give young people a vivid description of medical missionary work. It is attractively written and illustrated, and is full of arresting anecdotes, drawn from every corner of the world where missionary work is carried on. The photographs come from India, China, Egypt, and Palestine. The training and work of a missionary nurse is sketched out, and the treatment—often in bulk—of all kinds of tropical disease is described. The value of medical missions is undisputed, and the tales in this book show how western science is appreciated by the races to whom it is taken by these devoted men and women.

CASH BEFORE NON-DELIVERY.

M. R. D. (Wembley) has received a call from a man desirous of obtaining orders for printing, corks, bottles, and the like, who presents as his credential the card of a professional colleague. After receiving payment in advance, nothing more is heard of him. Obviously any instances of frauds of this nature should be promptly reported to the police, in order to teach a lesson to the unscrupulous persons who seek to victimise medical practitioners. The number of these is large, partly because they can so easily obtain an interview, partly, one fears, because practitioners are regarded as readily imposed upon. We would once again warn members of the medical profession to be on their guard against dealing with persons who are entirely unknown to them, with a special caution against making cash payments for goods prior to delivery.

A NURSE'S SALARY DURING ILLNESS.

A. L. M.—The payment of salary during the illness of a nurse is a matter of usage rather than of obligation. The usual practice, both in institutions and on the district, is to pay full salary during sickness for a period dependent upon the length of service the nurse has rendered. Most institutions would retain her national insurance benefit, but some district nursing associations allow a nurse who has been in their service for some time, and who is not well off financially, to retain her benefit for a period. One well-known nursing institute is considering the equity of recommending full salary and allowance for board for six weeks, and after that half the amount. The private nurse must, unfortunately, make her own provision for sickness; but hospitals will often give her free accommodation and care.

DANGEROUS DRUG RECORDS.

H. E. S.—A duly qualified medical practitioner is "authorised" to be in possession of dangerous drugs and to apply them by personal administration. In purchasing the drugs he is subject to the conditions of the Pharmacy Acts relating to the sale of poisons—e.g., signing the poison-book, and so forth. If the practitioner requires the drugs solely for administration to his patients by himself personally, or under his own direct supervision, he is under no obligation to keep the records required by the Regulations in the case of dispensing doctors. If, on the other hand, he dispenses or supplies medicine (which the Home Office interprets as including the case of a doctor leaving a supply of any of the drugs with a nurse for administration to a patient during the doctor's absence), he must keep the prescribed registers.

THE British Social Hygiene Council would be glad to hear from medical men and women willing to give single lectures in London or to undertake short campaigns in the provinces. The fee for a single lecture in London is 1 guinea. Application to the Secretary-General of the Council, Carteret House, Carteret-street, London, S.W. 1.

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[1] An Investigation into the Effect of Toxæmia on Enamel Formation. By L. B. Stott, M.B., and W. Baird Grandison, L.D.S. With a Foreword by Sir Humphry Rolleston. From the Dental Unit of the Papworth Village Settlement, 1929.

[2] Halcyon, or the Future of Monogamy. By Vera Brittain. London: Kegan Paul, Trench, Trubner and Co. 1929. Pp. 92. 2s. 6*d*.

[1] Edinburgh House Press, 2, Eaton-gate, S.W. Pp. 92. 1s.

Murphy Oration

ON SOME PRINCIPLES IN ABDOMINAL SURGERY.

Delivered at the Clinical Congress of the American College of Surgeons, at Chicago, on Oct. 14th, 1929,

BY D. P. D. WILKIE, O.B.E., M.D., F.R.C.S. EDIN.,
F.R.C.S. ENG.,
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THE capacity of the peritoneum and the abdominal viscera to tolerate even gross interference has been fully tested during the past 50 years and has formed the basis and the backbone of modern surgery. So great is that tolerance that we as surgeons are apt to presume on it and to lose that sense of reverence for living tissues which should be a fundamental law in operative surgery. By an elaborate ritual we endeavour to ensure that our operations shall be aseptic; but ritual without reverence may be a mockery, and technique associated with trauma will be tolerated less well than much less perfect asepsis but gentle handling. If we had to epitomise our guiding rules in the surgery of the abdomen, I believe we might correctly do so by stating "no traction, no tension." The primary impression conveyed to the mind at the first sight of the interior of a normal abdomen is the remarkable flaccidity of all the hollow viscera; *in quietness and in relaxation lies their strength.* When disease or operative measures interfere with this relaxation and introduce tension, trouble and pain result. Our guiding principle thus will be to relieve tension when we find it, and so to plan our operative work that neither during nor after the operation shall tension on the abdominal wall, the viscera, or the mesenteries be present.

The signal advances in our standard of preoperative diagnosis has furnished us with the advantage of being able so to plan our incisions in the abdominal wall that we shall have the freest possible access to the seat of disease without recourse to forcible retraction. Whilst the integrity of the abdominal muscles and their nerves will ever command our respect adequate access must always be the first consideration in any major abdominal operation. Too small boots *beget corns; too small incisions beget complications.* If we visualise the tissues as living, delicate cellular structures we become less and less intrigued with elaborate mechanical appliances, such as powerful self-retaining retractors and mighty crushing clamps, instruments which not only injure directly the patient's tissues, but blunt obliquely the surgeon's sensitivity. Retractors should be used to retain out of the surgeon's way tissues which have been gently pushed aside—too often we have seen them used as if they were weapons.

THE PRINCIPLE OF DE-TENSION.

It is in the effective mobilisation of the tissues to be dealt with that our text is best illustrated. Deal only with the mobile organ; if it be immobile, mobilise it. Do it not by force but by strategy based *on the anatomical fact that all the abdominal organs* were mobile before some became fixed, and therefore all may again be rendered mobile. This sounds dangerously like a platitude and yet this rule is but imperfectly observed, and what should be easy and safe surgery is often rendered difficult for the surgeon and dangerous for the patient.

When William Mayo demonstrated so beautifully how a generous mobilisation of the proximal colon might be effected so as to render resection of a large segment both simple and safe, he illustrated a principle which has a widespread application in the abdomen. Other portions of the gut, such as the duodenum, the splenic flexure, and the descending and iliac portions of the colon, are equally susceptible of mobilisation. How often can a resection of the transverse or distal parts of the colon be rendered easy by a simple division of the phrenicocolic ligament when tissues, which would otherwise be united under tension—that unforgivable sin in abdominal surgery—will fall together in perfect relaxation. In the mobilisation of organs there are two structures to be divided, the peritoneal folds which retain them, and the underlying, and in the case of diseased organs usually thickened, extraperitoneal cellular tissue, or, as we usually designate it, the "fascia propria." It is the division of this fascial layer which renders the mobilisation complete, and this division can best be effected by the knife. Thus we find in the mobilisation of the duodenum a simple division of the peritoneum along its lateral border will free it considerably, but *it is only when we divide the fascial bands which hold* it, and especially its inferior border, that it can be brought up freely into the abdominal wound. In the case of the colon the systematic division of the extraperitoneal fascial bands by the knife is of equal advantage.

In one operation above all others, however, is this principle seen to greatest advantage—namely, in splenectomy. The greatest impediment to removal of the enlarged spleen is in my experience not inflammatory adhesions, which are rare, but the short outer leaf of the lieno-renal ligament. Without an adequate severance of the ligament the spleen cannot be delivered except at the imminent risk of a tear in the hilum. Not only must the peritoneum on the outer side of the splenic pedicle be divided but also the underlying fascia. Thereafter a spleen which was apparently fixed, *so as almost to defy safe removal,* comes forward into a field where easy control of the pedicle is readily secured.

Even when we consider such a simple operation as removal of the vermiform appendix we find that the usual impediment to easy removal is not the presence of inflammatory adhesions but the binding down of the middle third *of the organ by that congenital fold,* first described by Douglas Reid as the genito-mesenteric fold. This fold is practically bloodless, and a few touches of the knife, dividing it, will mobilise the appendix completely and allow it to come up without tension into the abdominal wound.

MOBILISATION OF VISCERAL COATS.

When a portion of the gastro-intestinal tract is resected, union, whether by end-to-end suture or by lateral anastomosis *after closure of the ends, must be* effected. When Murphy introduced his button he did a great service to surgery, not only by evolving an ingenious instrument which has stood surgeons in good *stead on many occasions* when ordinary suture methods were impracticable, but mainly by proving that if accurate peritoneal apposition was obtained, elaborate layers of suturing were quite unnecessary.

Whilst leak from a suture line may be referable in some cases to sepsis, in others to inadequate blood-supply, it is in my opinion usually due to tension either in the long axis of the gut, due to inadequate mobilisation, to tension in the suture line, or to postoperative tension within the lumen of the gut. If free mobilisation of the ends to be joined has been effected, I believe that in the principle of mobilising the coats of the viscera to be joined so that the layers *may be sutured* together without any undue tension lies the secret of safe anastomosis. When we remember that the peritoneal and muscular coats of the hollow viscera offer but a slender hold for sutures, that the strength of the wall in every case lies in the submucous coat, we realise that safe approximation of the outer coats can only be accomplished if carried out with these coats completely relaxed. Such relaxation can only be secured, and this particularly in the colon, if these are first divided down to the submucous layer in each end of the bowel entering into the anastomosis. In the colon it is the longitudinal muscular bands which, being shorter than

THE PRINCIPLE OF REPLENISHING PHYSIOLOGICAL LACK.

The cause of death in high intestinal obstruction is a subject which has attracted the intensive interest both of practical surgeons and laboratory workers. Gradually the factors which are operative in producing the condition of collapse, so characteristic of this type of obstruction, have been elucidated, and whilst much remains to be cleared up we have to-day in our possession a number of facts which point the way to ultimate solution of this difficult problem. Whilst doubtless a chemical substance of albumose type is absorbed from the distended bowel above the obstruction, and whilst drainage of this obstructed gut will give some relief, we know that death may yet ensue when free drainage is established. The pronounced dehydration which accompanies such obstruction and the call of the tissues for fluid is now recognised to be of primary importance and replenishment of body fluids the first indication in treatment. The very important fact that a notable and dangerous loss of chlorides occurs in such cases has led to the use of hypertonic saline injections with marked improvement in results. The aspect which I wish to emphasise, however, is that of the secretions which should normally descend into it from the upper portion.

We know that in animal experiments high obstruction with immediate drainage of the bowel is not survived for very much longer than an obstruction without drainage. The fluid, which in the bowel above the obstruction may appear to be toxic and threatening the patient's life, may be life-saving if introduced into the bowel below the obstruction. This fact was first borne in on me by a case of post-operative obstruction following acute appendicitis which is recorded in the *British Journal of Surgery* (1924, xi., 568), but to which I venture again to refer here.

In this case an enterostomy was performed but the coil opened was evidently below the really active obstruction, for no flow from the tube resulted. Later on the same day a second enterostomy was performed, this time on the highest jejunal coil, and a profuse discharge followed. In spite of copious saline infusion the patient continued to go downhill until the device of joining up the two enterostomy tubes was practised, when the abundant secretions from above the obstruction were conducted through the joined tubes to the intestine below. An immediate and remarkable improvement followed this manœuvre, and the patient made a satisfactory recovery and is alive and well to-day.

This call of deprivation of the empty intestine below in cases of high obstruction constitutes, I believe, an important principle in the treatment of such cases. R. St. L. Brockman has emphasised the benefit of enemata of bile in post-operative ileus, and has shown the important rôle which the absorption of bile from the lower reaches of the bowel has in liver function. There are, I believe, other factors besides bile in the profound physiological upset which results when an obstruction occurs between the active secretory upper part of the small intestine and the absorptive reaches below. The emptying of the upper distended coils at operation for acute obstruction of the small intestine, say from a band, may by reducing intra-abdominal tension permit of more vigorous peristalsis thereafter and thus be an advantage. It will not save the patient's life, however, unless subsequent peristalsis results in the propulsion of the content of the higher coils into the empty coils below. The conception of a physiological lack below, combined with a pathological retention above, is one which deserves our attention and will find a field for application in our practice.

CLAPHAM MATERNITY HOSPITAL.—This hospital, in Jeffrey's-road, London, S.W., which is staffed by medical women, is giving free training in midwifery to six daughters of unemployed Welsh miners. Last year, the annual report states, there were 708 maternity in-patients, 109 more than in 1927; 458 out-patients were attended in their own homes.

SYPHILITIC DISEASE OF THE PULMONARY ARTERIES,

WITH ACCOUNT OF A CASE.

By DOROTHY C. HARE, C.B.E., M.D., M.R.C.P. LOND.,
PHYSICIAN TO THE ROYAL FREE HOSPITAL;
AND
JOAN M. ROSS, M.D. LOND.,
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ANY case of arterial disease affecting the lesser circuit merits careful investigation because of the light it may throw on the problem of systemic arterial hypertrophy and degeneration.

In extreme cases of high pressure on the right side due to valvular disease of the heart, chronic bronchitis, and emphysema, &c., "the pulmonary artery suffers strain and injury more commonly than is supposed" (Allbutt [1]). The atheroma which may follow is, in Marchand's opinion, a crucial instance of atheroma due to high blood pressure. Posselt [2] (1909) was one of the first to point out that pulmonary atheroma arising as a result of chronic valvular disease of the heart could be held responsible for a definite clinical syndrome. Rogers,[3] in the same year, published the first account in this country of a similar clinical syndrome observed in Bengal, occurring in cases of syphilitic arterial disease affecting the vessels of the lesser circuit and independent of any valvular disease of the heart or chronic pulmonary condition. The next period of interest in diseases of the pulmonary arteries followed the publication (in the Argentine) of observations by Ayerza and by Arrillaga.[4] Following a more or less prolonged period of chronic pulmonary disease the Argentine cases developed cardiac symptoms with intense cyanosis (cardiacos negros) with dyspnœa, hæmoptysis, somnolence, and polycythæmia. These cases showed dilatation and disease of the pulmonary artery with extreme hypertrophy and dilatation of the right heart. Escudero[5] considered these cases as examples of pulmonary arteritis consecutive to syphilitic bronchitis. Veale and Coombs,[6] in 1915, in this country, and Mattirolo[7] and Gamna,[8] in 1921, in Italy, made other observations of importance, describing cases in which there was no evidence of syphilis, and no antecedent pulmonary or cardiac lesion responsible for the changes in the pulmonary artery. They established the existence (in a small number of cases) of a primary form of disease of the pulmonary artery.

Since this date there have been scattered references to the condition in the literature of nearly all countries. In France especially there has been increasing interest both in the primary (Durand,[9] 1927) and in the syphilitic form (Laubry and Thomas, Caussade and Tardieu, Darré and Albot, Trémolière, Tardieu, and Nativelle). In Italy Benedetto and de Castro [10] have published a comprehensive review (1928). In America (Bruce and Wilson, Bacon and Apfelbach) cases of the primary lesion have been described, and four cases of the syphilitic form have been published. (Cheney, Bruce and Wilson, Wharthin, Zeman).

That the syphilitic form of the disease is much the most common becomes a matter of importance when the symptomatology of the disease is considered. For, although syphilis is recognised in sanatorium practice as one cause of a destructive lesion of the lung simulating chronic ulcerative phthisis, it is not so frequently realised in out-patient practice that the *Spirochæta pallida* may also be responsible for a clinical state closely resembling chronic bronchitis and emphysema and usually diagnosed as such, while actually due to widespread endarteritis and periarteritis of the branches of the pulmonary artery.

Report of the Case.

The patient was a male house-porter aged 47. Previous army service for 14 years. Discharged in 1916 with tabes.

Possibly gassed, but army pension refused on ground of syphilitic infection. Mother had died of consumption.

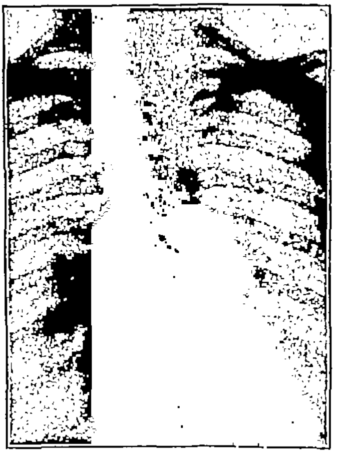
History.—Three years before the final illness he had attacks of giddiness and fainting; he fell down several times while at work. In the following year he had "bronchial asthma," and afterwards was unable to work, owing to breathlessness on exertion. Next year he had only one attack of faintness, but much discomfort from flatulence. He was in bed for six weeks before admission with œdema of legs during last three weeks.

Condition on Admission.—Admitted to Royal Free Hospital on Nov. 10th, 1928; he was in a distressed, dyspnœic condition, much cyanosed; pulse-rate 92, respirations 28. Venesection was performed a few hours later, the distress passed off gradually during first 24 hours, and no such acute attack recurred. Cyanosis of face and hands was present, but not extreme. No finger clubbing. Trunk was thin and there was a moderate degree of œdema of the legs, thighs, lower abdomen, and lumbar region.

He complained of sense of oppression over chest. Morning cough was infrequent and not paroxysmal; the sputum scanty, opaque, and muco-purulent. No tubercle bacilli were found. Respiratory movements were very poor, of diaphragmatic type, rate 20 to 24. The percussion note was not impaired; breath sounds were very weak, but otherwise normal. There were generalised sibilant and sonorous rhonchi. The heart was enlarged, but præcordial dullness could not be defined, owing to emphysema. The pulmonary second sound was accentuated and reduplicated. The pulse was of good volume and regular. The blood pressure was systolic 140, diastolic 110. He complained also of "flatulence." The bowels were regular. The abdomen was distended and rigid, with a small amount of free fluid. Palpation was difficult, but the liver was found to be enlarged to umbilicus, smooth, and not tender. The spleen was not palpable at any time.

A further complaint was of hesitancy on micturition and decrease in amount of urine. In hospital the amount of urine passed daily was 30 to 40 oz., with no albumin or other abnormality.

FIG. 1.



Skiagram showing bulging of the middle arc of the cardiac shadow.

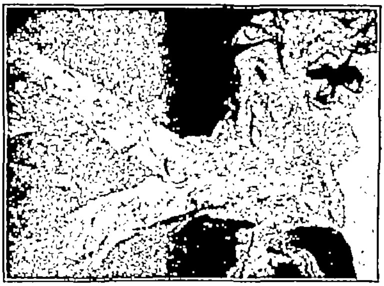
The pupils were irregular and unequal, and did not react to light. Knee- and ankle-jerks were absent.

Blood.—The Wassermann reaction (blood) was very slightly positive. The cerebro-spinal fluid was not examined. On Dec. 3rd the blood showed red blood cells 6,180,000 per c.mm.; hæmoglobin, 90 per cent.; colour-index, 0·75; white cells, 6900 per c.mm.

Electrocardiogram.—Report by Dr. Jenner Hoskin. Rate 76, regular. Marked right preponderance. T_1 adequate, T_2 and T_3 inverted. P_2 and P_3 large, suggesting auricular hypertrophy. Indicates changes in region of aortic base, at present right ventricle working adequately. (Nov. 20th, 1928.)

Skiagram (Fig. 1).—The following report was made by Dr. Ulysses Williams: "Generalised emphysema of moderate intensity, and distributed fairly uniformly throughout both lungs, more marked at the bases, especially the right. The interstitial fibrous tissue is about normal for a man of this age. Great enlargement of the first part of the pulmonary artery, and owing to the great hypertrophy of the right ventricle, and the rotation to the left of the whole heart, the base of the pulmonary shows more than usual."

FIG. 2.



Left lung. Arteries laid open to show atheromatosis.

Course.—The outstanding symptoms were attacks of great abdominal discomfort, described by the patient as due to flatulence, with tightness of the chest; usually nocturnal, preventing sleep. There was definite improvement for first four weeks. The liver shrank, the circumference of the abdomen fell from 35 in. to 31 in., the œdema disappeared. Later these symptoms, together with almost complete anorexia, reappeared. *The liver increased in size, forming a* prominence in the epigastrium. Some epigastric pulsation was present. A coarse systolic murmur, probably exocardial in origin, developed over the lower end of the sternum. The heart gradually failed, sleep became more disturbed, and the patient died on Jan. 10th, 1929, two months after admission.

Post-mortem Examination.

Externally considerable œdema of lower limbs, cyanosis of face, cyanosis of ears striking.

Thorax.—Universal pleural adhesions which separated with difficulty. Pericardial cavity contained a slight excess of fluid. Coronary sinus not abnormal in size. Visceral pericardium white and opaque over anterior surface of right ventricle and over whole of right auricle.

Lungs.—Somewhat deformed. Hard nodules palpable in subpleural tissue and in the substance of the lungs. Pleuræ thickened. On section, upper lobes extreme emphysema, fibrous nodules inconspicuous, lower lobes less emphysema, nodular fibrosis widespread. Fibrosis marked towards root of lungs here in form of strands of fibrous tissue rather than nodules. Intrapulmonary branches of pulmonary artery showed dilatation and numerous yellow intimal plaques of atheroma. These could be seen in all vessels down to those of 3 mm. *in diameter (Figs. 2 and 3).* The bronchi showed no gross change.

Heart.—Externally enlarged. Right ventricle lay entirely in front of left, forming apex of heart.

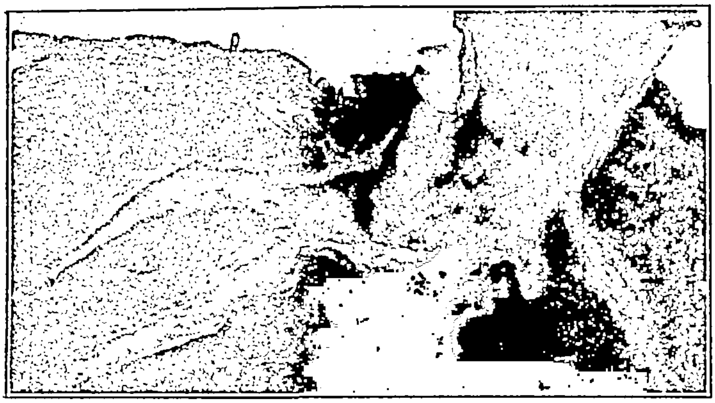
	Right Heart.	*Left Heart.*
Cavities.. ..	Greatly dilated ..	Normal.
Valves	Tricuspid normal .. Pulmonary " ..	Mitral normal. Aortic "
Myocardium ..	Firm and dark ..	Brownish in colour. Some subendocardial fibrosis.
Ventricle wall: thickness at apex.	9 mm. (Normal, *2·5–3 mm.)*	12 mm. (Normal, *9–12 mm.).*
Circumference at orifice.	Pulmonary 9·35 cm. (Normal 8·5–9 cm.)	Aortic 6·75 cm. (Normal 7·7–8cm.)

Ratio of circumference of pulmonary artery to that of aortic, 1·38. Normal, 1·1.

Coronary vessels: Normal.

Aorta.—First part of arch and upper half of the thoracic aorta showed considerable change. Intima, irregular pitting and depressions, some stellate. Pearly-white scarring. Also yellowish raised patches with calcification and, in first part, some ulceration. Changes became less severe and terminated somewhat abruptly about halfway down the thoracic vessel. The appearances suggested syphilitic mesaortitis with superimposed atheroma. The abdominal aorta showed no change, nor did the vessels of spleen, liver, and kidneys show any abnormality.

FIG. 3.



Right lung. Arteries laid open. The walls of the vessels are thickened, their course tortuous; the atheroma is more severe in the smaller vessels.

Pulmonary Artery.—Main vessel. Lumen dilated, some slight thickening of walls. Intima, no naked-eye changes. Main branches, some intimal change, but no large patches of atheroma till the root of the lung was reached (Figs. 2 and 3).

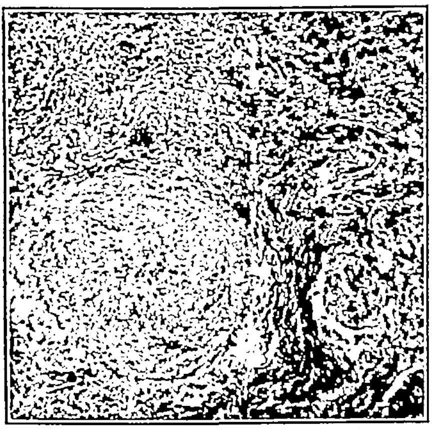
Spinal Cord.—Naked-eye and microscopic changes typical of tabes. Pal-Weigert preparations showed symmetrical degeneration in posterior columns.

The other viscera showed no changes of any importance except those due to congestive heart failure.

Histopathology.

The *aorta* showed vascular invasion of the media with accompanying lymphocytic and plasma cell infiltration typical of syphilis, and a superadded atheroma and some calcification.

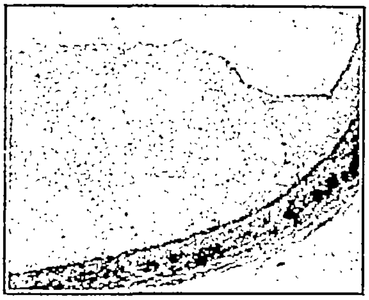
FIG. 5.



Artery in substance of lung showing extreme obliterative endarteritis, perivascular fibrosis with carbon deposit, and some infiltration by lymphocytes and plasma cells.

Pulmonary Artery.—(1) Vessels over 3 mm. in diameter: The main vessel had slight thickening of its walls, mainly due to increase of thickness of the strong band of elastic tissue visible in longitudinal section. The elastic tissue of the outer part of media was increased in amount, but here showed localised fibrous tissue areas. The intima, even in areas which appeared normal to the naked eye, showed some increase in fibrous tissue. The right and left pulmonaries and their larger branches showed atheroma without calcium deposit. There was no evidence of any inflammatory change (Figs. 2, 3, 4). (2) Vessels about the diameter of 3 mm.: Some of these showed invasion of their walls by lymphocytes and plasma cells. Atheroma present at the same time. There was periarterial fibrosis. (3) Vessels smaller than 3 mm.: The change was severe and took the form of a chronic panarteritis. In some of the vessels (Figs. 5 and 6) the lumen was almost obliterated owing to proliferation of the intima. In vessels lying near the more cellular areas of fibrosis the arteritis was subacute and some plasma cells and lymphocytes were present in the wall.

FIG. 4.



Right pulmonary artery. Longitudinal section through a plaque of atheroma.

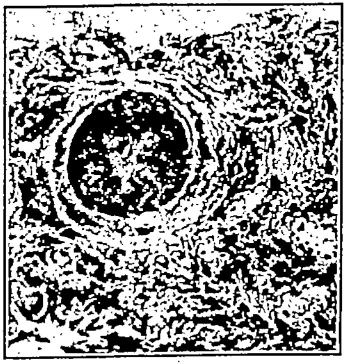
Lung: Fibrous Nodules.—Occasionally truly perivascular, the vessel lying in the centre of the nodule. More often the nodules lie near the vessels. In the subpleural region these nodules were vascular and showed a considerable amount of cellular infiltration (Fig. 7), and, since they contained elastic tissue deposed more or less regularly throughout, they may be supposed to have arisen by the obliteration of alveoli. There was a carbon deposit. Some of the nodules in the substance of the lung contained numerous lymphocytes and plasma cells, with an occasional giant cell.

Alveoli.—The changes in the alveoli in the neighbourhood of the sclerotic patches were: (*a*) proliferative. The alveolar lining cells were cubical and in places filled the entire lumen. Macrophages, laden with brown pigment, were present in large numbers (Fig. 8); (*b*) obliterative. Plasma cell and lymphocytic infiltration and, later, a development of collagenous connective tissue.

In other parts of the lung high-grade emphysema was present.

Bronchi.—The changes in the bronchi were relatively slight and of the nature of a compression rather than actual involvement in the inflammatory process. In some bronchioles involved in the sclerosis of the lung parenchyma the epithelium showed squamous metaplasia.

FIG. 6.



Subpleural arteriole, showing almost complete obliteration of lumen.

Clinical Summary.

Twelve years' history of tabes dorsalis. Blood Wassermann slight positive. Two years' severe progressive dyspnœa, accompanied by asthma and cyanosis. A few weeks' œdema of legs. Progressive right heart failure with regular pulse.

Summary of Post-mortem Examination.

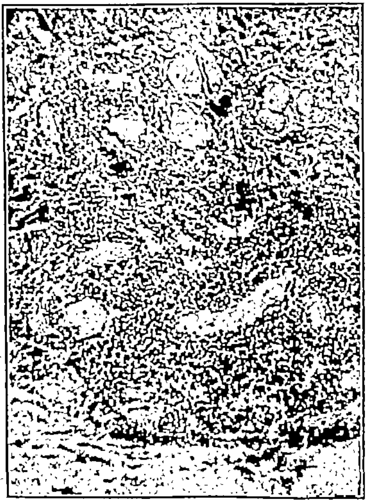
1. Chronic bilateral pleurisy with dense universal adhesion. 2. Chronic vesicular emphysema. 3. Diffuse and nodular fibrosis of both lungs, equal in the two sides. Emphysema of high grade in both upper lobes

and here fibrosis inconspicuous. Fibrosis marked at the roots and in lower lobes and here emphysema less. Nodular fibrosis present throughout both lungs, both subpleural and in their substance. 4. Marked hypertrophy and dilatation of the right heart. 5. Universal atheromatosis of the main right and left pulmonary arteries and their larger branches. Main vessel spared. 6. Widespread periarteritis and obliterating endarteritis of intrapulmonary branches of the pulmonary arteries; severe and accompanied by periarterial inflammatory changes in almost all vessels from 3 mm. diameter to precapillaries. 7. Mesaortitis and atheromatosis of thoracic aorta. 8. Degeneration of the posterior column of the spinal cord. 9. Chronic venous congestion of viscera.

Review of Cases.

Vaquez[11] has suggested the division of cases of sclerosis of the pulmonary arteries into two broad groups, "sclérose complication" and "sclérose maladie." In the first group the changes in the pulmonary artery arise as a complication of some antecedent cardiac or pulmonary condition and the clinical signs and symptoms of the underlying morbid changes are usually apparent. In the second group (and it is to this group that the present case belongs) the signs and symptoms are those due to or consecutive to the alterations in the pulmonary vessels themselves. That this second group does not consist of cases having a common ætiological basis is clear from the scrutiny of the published cases in the recent literature.

FIG. 7.

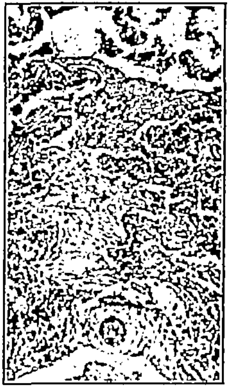


Section of subpleural fibrous nodule, showing new formation of vessels, carbon deposit, numerous lymphocytes, and plasma cells.

In reviewing these cases of arterial disease, confined or largely confined to the pulmonary circuit, it is proposed to disregard those cases with no post-mortem and those in which no exact pathological (based on histological evidence) diagnosis is possible. Only cases in Vaquez's second group will be considered. That such a restriction curtails the number of cases reviewed is obvious and some series of cases, notably five cases reported by Eppinger and Wagner,[12] are omitted on the grounds of inadequate histological reports.

It will be seen that among the collected cases many are syphilitic in origin. The diagnosis of syphilis has rested upon (1) the Wassermann reaction; (2) the presence of other stigmata of syphilis, especially aortitis; (3) the histological changes in the pulmonary vessels and in the lung itself. The final decision for or against syphilis rests upon the histological examination of the pulmonary vessels.

FIG. 8.



Proliferative changes in alveoli at the margin of a fibrous nodule.

Wassermann Positive or Strongly Positive (11 Cases).—All showed syphilitic arteritis of small pulmonary vessels. In addition aortitis in six cases (Nos. 6, 8, 10, 16, 17, 24). Arteritis of main pulmonary in ten cases (Nos. 2, 6, 8, 10, 12, 13, 14, 16, 17, 24). Tabes dorsalis in one case (No. 10). Alveolar lesions in three cases (Nos. 2, 10, 24).

Wassermann Very Slightly Positive (2 Cases).—One showed syphilitic arteritis of small pulmonary vessels and in addition aortitis, tabes dorsalis, alveolar lesions (No. 1). One showed no other evidence of syphilis, and the vascular lesions were non-inflammatory (No. 4).

Table of Collected Cases of Acquired Disease of the Pulmonary Artery.

No.	Authors.	Source.	Age.	Sex.	Syphilis.
1	—	Present case.	47	M.	Yes
2	Ajello, L.	Policlin., 1928, xxxv., 461.	29	M.	Yes
3	Bacon, C. M., and Apfelbach, C. W.	Trans. Chicago Path. Soc., 1927, xii., 293.	10	F.	No
4	Benedetto, P., and de Castro, U.	Cuore e Circolaz., 1927, xi., 353.	14	F.	No
5	Bruce, J. D., and Wilson, F. N.	Ann. Clin. Med., 1926, v., 9.	28	F.	No
6	Ditto	Ibid., p. 15.	53	M.	Yes
7	Cassade, G., and Tardieu, A.	Bull. Soc. Méd. Hôp. de Paris, 1928, iii., 871.	40	M.	Yes
8	Cheney, G.	Amer. Jour. Med. Sci., 1927, clxxiv., 34.	47	F.	Yes
9	Clarke, R. C., Coombs, C., and Hadfield, G.	Quart. Jour. Med., 1927, xxi., 51.	22	F.	No
10	Ditto.	Ibid., 60.	39	F.	Yes
11	Darré, H., and Albot, G.	Ann. d'anat. Path. et Méd., 1928, v., 861.	56	M.	Yes
12	Laubry, W., and Thomas, M.	Bull. Soc. Méd. Hôp. de Paris, 1927, ii., 9.	38	M.	Yes
13	Ditto	Ditto	36	M.	Yes
14	Ditto	Ditto	45	F.	Yes
15	Ditto	Ditto	60	M.	Yes
16	Ditto	Ditto	59	F.	Yes
17	Ditto	Ditto	58	—	Yes
18	Ditto	Ditto	48	M.	Dbt.
19	Ditto	Ditto	39	M.	?
20	Lang, G.	Deut. Arch. f. klin. med., 1924, cxliii., 350.	45	F.	No
21	Trémolière, F., Tardieu, A., and Nativille, R.	Bull. Soc. Méd. Hôp. de Paris, 1928, iii., 560.	42	M.	Yes
22	Wätjen, J.	Deut. med. Woch., 1924, i., 713.	11/12	F.	No
23	Warthin, A. Scott	Contr. to Med. and Biol. Res., 1919, ii., 1042.	53	M.	Yes
24	Zeman, F. D.	Proc. New York Path. Soc., 1923, xxiii., 38.	53	M.	Yes

Dbt. = doubtful.

N.B.—In referring to these cases in the text the number in the left-hand column will be quoted in brackets—e.g., (No. 11) refers to the case reported by Darré and Albot.

Wassermann Negative (3 *Cases*).—None showed any inflammatory element in the lesions of the pulmonary artery. Two showed no evidence of syphilis (Nos. 3 and 6). One had a definite history of syphilis (No. 10).

Wassermann, no Record (8 *Cases*).—Four cases showed arteritis of the small pulmonary vessels (Nos. 7, 11, 21, 23). In addition: aortitis (Nos. 11, 23). Arteritis main pulmonary (Nos. 11, 23). Alveolar lesions (Nos. 7, 11, 21). One case showed arteritis consecutive to typhus (No. 20). Three cases showed non-inflammatory lesions of the pulmonary vessels. No ætiological factor (No. 9). History of syphilis and bronchitis (No. 18). Congenital stenosis of pulmonary veins (No. 22).

The total number of cases under review is 24, and they may be divided into the following groups: (1) 16 diagnosed as having a syphilitic basis; (2) two in syphilitics with non-specific histology of arteries; (3) one following typhus; and (4) five diagnosed as primary. The average age of syphilitics is 47·8, of the primary cases 21, and of those in groups (2) and (4) 27·5. In groups (2) and (4) combined the oldest case (49) had a definite syphilitic history; the histology of the arteries was not diagnostic. None of the others was over 40. In group (1), in which the youngest was 29, only four were under 40.

We may draw two conclusions from these figures—viz., that syphilis is by far the more important ætiological factor in older patients, and that primary sclerosis of unknown ætiology is found in younger patients.

In the analysis of the post-mortem findings and the clinical signs and symptoms which follow reference is only made to the syphilitic cases.

Lesions in the Pulmonary Vessels and Lungs.

1. *Main Pulmonary Artery and Extrapulmonary Branches.*—Thomas[13] points out that, although the classical conception of the distribution of syphilitic vascular disease is that syphilis attacks the aorta, but respects the pulmonary circulation, in his series of cases there are numerous instances of both vessels being attacked. (Out of 10 cases showing arteritis of the pulmonary artery six had aortic lesions.) He shows that in some cases the aortic lesions are considerable, while the pulmonary artery is only mildly damaged, but that in other cases the alterations in the two vessels are of equal importance. Some of the cases described by Thomas are not included in the present series since the aortic lesion provides the clinical phenomena. Taking all the collected cases it is interesting to analyse the frequency with which syphilitic lesions of the main pulmonary vessels and syphilis of the aorta are associated with syphilitic arteritis of the smaller branches of the pulmonary artery. In 16 cases there was syphilitic arteritis of small pulmonary vessels:—

In 12 with main pulmonary and right and left pulmonary artery syphilitic: aorta syphilitic in 7, aorta normal in 5.

In two with main pulmonary and right and left pulmonary arteries, showing athero-sclerosis: aorta syphilitic in one; normal in one.

In two with main pulmonary and right and left pulmonary arteries, showing dilatation only; aorta normal in both.

These figures show that in syphilitics with an initial vascular lesion of the smaller pulmonary arteries the main pulmonary artery and its branches are more often (12 cases) affected than is the aorta (8 cases). The lesions in the large pulmonary vessels when purely syphilitic are similar to the classical picture of syphilitic mesaortitis due to syphilis. There is, in nearly all cases, superimposed athero-sclerosis. The vessel may be very greatly dilated. The ratio of the circumference of the pulmonary artery to that of the aorta is increased to 1·3 (No. 10), 1·38 (No. 1), 1·4 (No. 2), normal 1·1. In one case (No. 14) there was a saccular aneurysm of the pulmonary artery.

Thomas in his thesis states that the syphilitic lesions scattered and not intense in the trunk and great branches are more numerous and widespread in the branches at the hilum and in the medium and small branches; the majority of the collected cases show the same distribution. Trémolière, Tardieu, and Nativelle in their case, which also showed mitral stenosis, found the most severe lesions in the smaller vessels (about 5 mm. diam.) and in the trunk and first branches no longer specific panarteritis, but athero-sclerosis with atheroma (No. 21). The present case (No. 1) shows a similar distribution—whereas syphilitic arteritis was generalised throughout the intrapulmonary branches of the artery and most severe in the arterioles, the vessels at the hilum showed only slight inflammation with considerable athero-sclerosis and the trunk and first branches athero-sclerosis alone. Only one case in the series showed as healthy main pulmonary and healthy large branches (No. 7), the infundibulum of the artery alone showing dilatation.

2. *Intrapulmonary Vessels.*—All the cases show lesions in the intrapulmonary branches of the pulmonary artery. These lesions are more or less widespread (Nos. 11, 14), but tend to differ in severity and activity in the vessels of different calibre. In one case the lesions are stated to have been most severe in the vessels of the second and third degree (No. 23). In others the arterioles show the most extreme alterations (Nos. 1 and 10). The typical lesion is a panarteritis usually of a subacute form. All the vascular coats are altered and are infiltrated by plasma cells and lymphocytes with newly formed capillaries passing into the media and even to the intima (Thomas). The intima is thickened and the lumen may be partly or completely obliterated. Chronic panarteritis with periarterial fibrosis, with in some instances hyperplasia and in some cases destruction of the elastic tissue of the media (Thomas) may be present. Thrombosis occurs with considerable frequency. This may have been an incident during the course of the disease (Nos. 2, 7, 10, 21) or thrombosis with infarction of the lung may supervene without premonitory symptoms (No. 13). In some cases thrombosis has been followed by organisation with recanalisation, and a collateral circulation may have been established with a localised production of dilated blood-vessels (No. 2).

There is considerable uniformity in the vascular lesions throughout the series. Darré and Albot (No. 11) describe lesions which are identical with those in the present case. Trémolière, Tardieu and Nativelle and Thomas give valuable accounts of the vascular changes.

3. *Lung.*—Nearly all cases show the changes due to chronic congestion. Many cases show an extreme degree of emphysema (Nos. 1, 6, 8, 23, 24), in some there is a terminal œdema (Nos. 7, 13, 15, 21, 24), and infarcts of varying age were present in six cases (Nos. 11, 12, 13, 15, 16, 21). Lesions which can be truly referred to the results of syphilis are present in seven cases (Nos. 1, 2, 7, 10, 11, 21, 24). The changes take two forms: fibrosis spreading in broad bands throughout the lung and having origin in the dense fibrous tissue around the vessels (No. 10), and nodular areas of fibrosis.

The origin of the nodular areas of fibrosis may be interstitial or intra-alveolar. The interstitial nodules arise by organisation of perivascular or subpleural foci of lymphocytic infiltration. Such foci were described by Letulle and Dalsace[14] under the title of nodular cortico pleuritis, as one of the forms of latent syphilis of the lung reported by those authors. In later stages these foci become fibrous and often very vascular (Nos. 1, 7, 11). The intra-alveolar origin of fibrous tissue is described by French authors as "alveolite végétante." Alveoli or groups of alveoli become airless and filled with desquamated cells, many of which are loaded with brown pigment. Some mononuclear cells are also present. There is proliferation of the alveolar epithelium which has become cubical. Later the cells disappear and collagenous fibres take their place. Pigment may remain among the fibres. In sections stained with Weigert's elastic stain the remains of the alveolar walls can be made out in the resultant fibrous nodule (Nos. 1, 7, 11). In some cases true miliary gummatous foci are described (Nos. 1, 2, 21).

4. *Bronchi.*—The changes in the bronchi are slight in nearly all cases. Some catarrhal inflammation is reported (Nos. 8, 10) and some epithelial metaplasia (Nos. 1, 11). In one case only is there any evidence of the bronchial lesion being syphilitic and antecedent to or of the same age as the arterial lesion (No. 15). In reporting this case Thomas describes it as being a case of syphilitic arteritis arising in the course of bronchial syphilis, and therefore comparable to the cases described as "Ayerza's disease" by Escudero.

Changes in the Heart and Other Organs.

Two of the cases in this series had some degree of mitral stenosis (Nos. 7 and 21). None of the others showed any valvular disease. The characteristic change in the heart is great hypertrophy and dilatation of the right side of the heart. The right ventricle forms the whole anterior surface and the apex of the heart (Nos. 1, 2, 10, 12). The wall is extremely thickened, 2·5 times or even 3 times normal (Nos. 10, 8, 1). In one case the enlargement of the heart, which was very great, was due almost entirely to dilatation (No. 23). In this case also the right auricle formed about one-third of the heart bulk, but in the majority of cases the right auricle was dilated and hypertrophied in proportion to the changes in the right ventricle. The left ventricle shows hypertrophy and dilatation in some cases (Nos. 6, 7, 13, 14, 15, 17, 23).

This series of cases shows no lesions of any importance in the other organs beyond those due to chronic venous congestion. No case of splenic enlargement is reported.

Clinical Review.

In reviewing the cases an attempt has been made to determine which symptoms give the disease, syphilitic arteritis of the pulmonary artery, a true entity and distinguish it from other affections of the pulmonary artery.

The diagnosis from alterations in the pulmonary artery secondary to some underlying cause in the lungs or heart rests with the presence of the symptoms and signs of the underlying lesion. The syphilitic arteritis following on a prolonged history of chronic bronchitis (Ayerza, Arrillaga, Escudero) in the syphilitic subject may produce a terminal clinical picture not unlike the cases under discussion. The history and signs of severe bronchial damage must be taken into consideration. In distinguishing between syphilitic arteritis and non-syphilitic primary sclerosis there is no sure method; only the age and history of the patient will be of assistance.

Symptoms.

Two symptoms take on a significance of the first importance; they are of insidious development and follow a progressive course during the clinical history. These are dyspnœa and cyanosis.

Dyspnœa makes its earliest appearance as dyspnœa on exertion. This may be the only symptom for as long a period as four years (Nos. 6, 7, 11). Nocturnal paroxysmal attacks are frequent (Nos. 6, 7, 14, 21, 23). Later dyspnœa becomes constant with attacks of orthopnœa.

Cyanosis is one of the most characteristic signs but it may be early or late in its appearance and varies greatly in its intensity. Eight cases showed intense cyanosis. Where radiological reports are given it is found that intense cyanosis is associated with increase in the hilar shadows and enlargement of the middle left arc of the cardiac shadow, confirming the views expressed by Thomas that cyanosis in these cases does not appear without general dilatation of the main pulmonary vessels. In some cases (No. 23) cyanosis may be constant, while during attacks of dyspnœa and thoracic discomfort the cyanosis deepens to "black."

Other Symptoms.—A sense of oppression in the thorax (Nos. 1, 8, 23) is sometimes present, often coming on after exertion or during attacks of dyspnœa and increased cyanosis (No. 23). None of these cases has complained of severe pain, such as is described as "angor cœruleus," "angine pulmonaire hypercyanotique," &c. (Vaquez). *Hæmoptysis* may be due to purely vascular change or due to thrombosis with infarction. Hæmoptysis was slight in four cases and profuse in two cases. One case (No. 13) had slight hæmoptysis for three years and then had a sudden attack of hæmoptysis with cyanosis two months before death. This later hæmoptysis was due to thrombus formation in the middle branch of the right pulmonary artery with infarction of nearly the whole of the middle lobe of the lung. On the other hand quite extensive thrombosis or infarction may take place without hæmoptysis (No. 11). *Palpitations* occur during the course but are not constant. *Attacks of vertigo* may be the earliest symptom (No. 1, 2) or may occur later (No. 6). *Somnolence* has been described as a constant and characteristic symptom by various writers but in the present series only two (Nos. 21, 23) cases are reported as showing this symptom. *Clubbing of the fingers* is not described in these cases. It appears to be present in nearly all cases where alterations in the pulmonary artery are secondary to lung or bronchial conditions.

Physical Signs.

The clinical examination of these cases allows the exclusion of more usual causes of cyanosis and dyspnœa by ruling out chronic pulmonary conditions, congenital lesions, or acquired valvular disease of the heart, &c. The total absence of physical signs is one of the most characteristic peculiarities of primary arteritis or sclerosis of the pulmonary artery.

Cardiac.—The pulse is regular. The heart is enlarged both to right and left. The only alteration in the cardiac sounds which appears to be constant is that of reduplication or accentuation of the pulmonary second sound—occasionally a diastolic murmur of pulmonary insufficiency symptomatic of dilatation of the pulmonary artery (Thomas, No. 16). Later, signs of right heart failure or of total cardiac failure appear. Thomas describes a gallop rhythm in many of his cases (Nos. 12, 14, 15, 16, 17, 18) and in some refers it to the right ventricle (Nos. 14, 15).

Pulmonary.—There are no constant physical signs in the lungs. Signs of emphysema or various râles may be present.

Œdema is present in all cases and varies in intensity, some cases showing œdema of the hands, feet, and legs, some showing generalised anasarca (No. 24) or ascites (Nos. 2, 6, 12) in addition. The spleen is not enlarged in the majority of cases (exception No. 23).

Special Examinations.

The Blood.—There are eight records of the number of red blood corpuscles. The counts vary from 5,200,000 to 8,700,000, the average being 6,605,000. There are only six records of the leucocyte count giving an average of 11,160. The counts in individual cases may vary from time to time. In two cases two results are given (No. 15), 5,500,000–7,000,000 and (No. 23) 7,200,000–8,700,000.

The *electrocardiogram* gives valuable information about the state of the right ventricle. There are reports in three cases which correspond fairly closely. Right ventricular preponderance. Rate increased. No arrhythmia in two cases, occasional extrasystoles in one. Inversion of T_2 and T_3 and P_2 large, suggesting auricular hypertrophy.

Radiography.—There are radiographic reports in ten cases. Examination by X rays gives the most characteristic findings and the radiographic appearances are fully discussed by Thomas in his thesis. He points out that the characteristic findings are:

(1) Increase in length and projection of the left middle arc (Nos. 1, 12, 18, 21). (2) Increase in size of the arterial shadows at the hilum with pulsation greater in amplitude and more visible than normally (No. 21). (3) The branches of the pulmonary arteries show more clearly than normal

and can be followed in their course towards the periphery of lung. Some cases show pulsation (No. 14).

These three points he refers to the increased arterial tension.

(4) Modifications of the cardiac shadow due to the enlarged right ventricle with enlargement of the infundibulum of the pulmonary artery and rotation of the heart, causing bulging of the middle arc. (5) When pulmonary insufficiency is present "La danse hilaire" can be seen. The hilar shadows are seen to move with expansile impulses with each beat of the heart. The aneurysm of the pulmonary artery in No. 12 was diagnosed from the radiological examination.

Skiagrams also show the presence of fibrosis whether spreading from the hilum or in the substance of the lung (Nos. 11, 21), and may show the presence of infarcts.

Conclusions.

A well-defined group of cases exists in which arterial disease is confined or largely confined to the pulmonary circuit. These cases differ from other cases with arterial lesions in the lesser circuit in that there is no antecedent pulmonary, cardiac, or bronchial lesion. Twenty-three fully reported cases have been collected from the literature, and a further case is now described.

It is found that syphilis is by far the most important ætiological factor in older patients. Primary non-inflammatory sclerosis of unknown ætiology is found in younger patients. In the syphilitic cases the lesions in the intrapulmonary arteries take the form of an obliterative arteritis, usually most severe in the smaller branches and arterioles. This condition leads to a raised blood pressure in the lesser circuit. Dilatation and hypertrophy of the main pulmonary artery follows with atheroma of the right and left pulmonary arteries and larger branches, whether the latter show inflammatory lesions or not. The right side of the heart becomes greatly dilated and hypertrophied. Clinically the cases are characterised by dyspnœa, cyanosis, and hæmoptysis, and in the later stages by progressive congestive heart failure with a regular pulse.

Syphilitic arteritis of the pulmonary arteries, while admittedly rare, is worthy of notice, since by early diagnosis antisyphilitic treatment might afford some hope of amelioration of the symptoms.

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A BIRMINGHAM POOR-LAW HOSPITAL.—The Birmingham Board of Guardians have adopted a scheme for the enlargement of their Dudley Road Hospital at a cost of £80,000. The pressure upon the institution has become very severe. The in-patients have increased from 8867 in 1924 to 13,232 in the year ended with March last; in the same period out-patients grew from 3701 to 17,003. So great is the pressure that of late non-resident nurses have had to be engaged, an expensive process justified only by the lack of accommodation. The existing nurses' home holds 103 nurses, 49 live in adjoining buildings, and over 90 are housed in hospital wards. The proposed extension of the home will accommodate 142 nurses, and is so planned as to permit of further enlargement. It is intended in the future to provide a new mortuary, and post-mortem and pathological departments.

SUBCUTANEOUS NODULES IN THE SCALP

IN FATAL CASES OF GLANDULAR ENLARGEMENT WITH MONONUCLEOSIS.

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THE following two cases present such a remarkable likeness to one another, and such unusual signs and symptoms, that they seemed to us worthy of record, the more so because in one of the cases a post-mortem examination was carried out. How to give a title to this contribution which will enable others to recognise the condition we are attempting to describe is in itself a difficulty, and equally difficult for the same reason is a search of the literature for similar cases. Their interest is increased by the great difficulty in diagnosis, and the liability of falling into the mistake of calling such a case one of rheumatism. It is an interesting fact that rheumatic symptoms are not uncommon among the early warnings of such fatal diseases in childhood as the leukæmias and the grave anæmias. Radiographic appearances in these two cases seem to us to throw some light on these symptoms, though this by no means explains the swelling of the wrists in the second case, which were suggestive in their appearance of Still's disease.

Account of Two Cases.

CASE 1.—A boy, aged 3 years and 3 months, was admitted to the Hospital for Sick Children on Oct. 5th, 1928. He was the only child of parents who are first cousins. He was breast fed as a baby, and remained perfectly healthy up to the beginning of 1928, when he twice had bronchitis. In April, 1928, enlarged glands first appeared in the right side of his neck, and two weeks later he developed some fever, with pain and swelling of his joints. These swellings were fleeting in character, and affected the ankles, knees, wrists, and elbows. During this illness the glands became enlarged in both sides of the neck and in both groins, and these glands remained large up to the time of admission. In June, 1928, the pains in the legs recurred, and the boy was admitted to the Metropolitan Hospital, where he remained for two months, when he was removed by his parents.

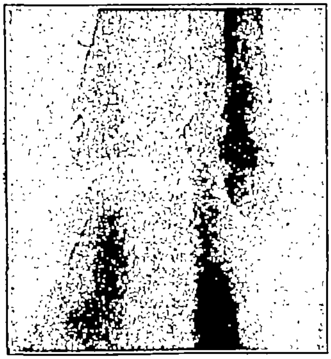
The house physician at the Metropolitan Hospital kindly furnished some particulars of the investigations carried out there. A gland was excised, and the pathological report said: "No evidence of new growth: there is some hyperplasia, but nothing to suggest lymphadenoma." A blood count showed a secondary anæmia with a slight leucocytosis (10,000 per c.mm.), and the differential leucocyte count was normal. The Wassermann reaction was negative.

The boy's condition became worse after discharge from the Metropolitan Hospital, and he was sent to the Hospital for Sick Children.

On admission he was a pale boy, with a somewhat puffy face, of average development for his age. There were masses of enlarged, discrete glands on each side of the neck and on the posterior aspect beneath the occiput. The axillary, inguinal, and epitrochlear glands were also considerably enlarged, and over the mass of glands on the right side of the neck—the largest collection—were many dilated venules. Scattered over the skull were several small hard masses, about the size of a pea, not fixed to the bone, and apparently in the scalp. There were similar swellings, rather more fixed, deep to each eyebrow. The heart was not enlarged, there were no murmurs to be heard, but the first sound was very short and accentuated. The pulse was rapid, 140 per minute, soft, and of poor volume. The temperature was normal. The abdomen was slightly distended, the liver being enlarged about two fingers-breadth below the costal margin, while the spleen was not palpable. There were no signs of disease in the respiratory or central nervous system, and the urine was normal.

Progress.—The pulse remained very rapid, and the swellings on the head became more enlarged. The temperature was now raised, and had a swinging character. Pain occurred in the regions of the left elbow-joint and the right knee.

Radiographic examination showed evidence of rarefaction in the regions where pain was experienced (see figure), and the appearances suggested infiltration of new growth. The parotid glands became enlarged, and on Oct. 20th the spleen became palpable for the first time. The boy's condition became worse, the temperature being more raised, often as high as 102° to 103° F., the pulse was more rapid, 160 to 180 per minute, and the glands became more enlarged, especially in the parotid region. There were no hæmorrhages to be found anywhere over the body nor in the retinæ. He was removed by his parents on Nov. 3rd, and died at home two weeks later with great abdominal distension.



Radiogram showing rarefied areas at end of long bones.

The blood counts in this condition were very puzzling, and are summarised in Table I.

TABLE I.

Date in 1918 ..	Oct. 5th.	Oct. 19th.	Oct. 28th.
	Per c.mm.	Per c.mm.	Per c.mm.
Red corpuscles	3,700,000	3,237,500	2,637,000
Hæmoglobin	40 %	25 %	35 %
	Per c.mm.	Per c.mm.	Per c.mm.
White corpuscles	10,000	32,000	62,000
Polymorphs	29 % (2,900)	8 % (2,560)	6 % (3,720)
Small lymphocytes ..	52 % (5,200)	32 % (10,240)	3 % (1,860)
Large lymphocytes ..	12 % (1,200)	60 % (19,200)	83 % (42,460)
Mononuclears	2 % (200)	—	
Eosinophils..	1 % (100)	—	—
Transitionals	4 % (400)	—	3 % (1,860)

In the last cell count there was also about 5 per cent. of myelocytes, but the predominating cell was a large mononuclear with non-granular cytoplasm, which did not show any granules with the "oxidase" stain. This was called a lymphocyte in earlier films, but was possibly a "pro-myelocyte."

CASE 2.—A boy, aged 2 years and 1 month, was admitted to the Hospital for Sick Children on March 27th, 1920. He was the only child of healthy parents, and was quite well until January, 1920, when he is stated to have had "ulcerated tonsils," and he was ill for three weeks. About a fortnight after this he was suddenly seized with pains in his joints. These pains were somewhat fleeting in character, and affected his hips, knees, wrists, ankles, and especially the finger-joints on the left hand. He improved for a week, and then relapsed, and a fortnight after the beginning of his arthritic pains the glands in his neck became swollen. Feverishness was stated to have been present throughout the illness.

On admission he was a well-nourished, pale child, very fretful, and apparently in pain. The glands on both sides of the neck were obviously enlarged, discrete, and rather tender, while the glands in the axilla and groin were easily palpable. There was some indefinite swelling of the wrists, the left being slightly tender. Radiographic examination of the long bones showed in positions corresponding to the situations of his pain somewhat irregular rarefied areas in the shafts close to the epiphyses. The tonsils were enlarged and red, but without an exudate. The heart was not enlarged, but there was a systolic murmur at the apex with abrupt heart sounds. Over the head were several hard swellings about the size of a pea, not attached to bone, and movable with the scalp. The liver was enlarged to about two fingers-breadth below the costal margin, the spleen was not palpable, and there were no enlarged glands palpable in the abdomen. The respiratory and nervous system were normal, and the urine contained no abnormality. The temperature was raised on admission (100° F.), and the pulse-rate was 140 per minute, the pulse being soft and easily compressible.

Progress.—At first there was some improvement, and the glands became a little smaller. The nodules on the head varied from time to time, occasionally almost disappearing. A right-sided ear discharge developed, and early in May, 1920, the glands in the neck all became larger, while glands over both parotids also enlarged. Some œdema, redness, and tenderness over the right side of the lower jaw developed in association with a septic tooth socket, and shortly after this on May 18th the spleen became palpable. From this time onwards the progress was downhill. The temperature became higher (102°–103° F.) and swinging, a brassy cough developed, and a purpuric rash appeared over the right side of the trunk and legs. The swellings on the head became at first rather larger, but towards the end almost completely disappeared. The heart developed a "bruit de galop," and death occurred on June 14th. The Wassermann reaction was negative.

The blood counts throughout the illness also were somewhat puzzling, and were complicated by the various septic processes which occurred (otitis media, septic tooth). The counts are summarised in Table II.

TABLE II.

Date in 1920 ..	March 28th.	April 16th.	May 3rd.	June 13th.
	Per c.mm.	Per c.mm.	Per c.mm.	Per c.mm.
Red corpuscles ..	4,950,000	2,900,000	3,375,000	806,000
Hæmoglobin ..	60 %	50 %	50 %	Less than 20 %
	Per c.mm.	Per c.mm.	Per c.mm.	Per c.mm.
White corpuscles ..	24,000	11,400	19,000	1,760
Polymorphs ..	50 % (12,000)	28 % (3,192)	54 % (10,260)	—
Small lymphocytes	6 % (1,440)	—	8 % (1,520)	—
Large lymphocytes	28 % (6,580)	46 % (5,244)	24 % (4,560)	—
Mononuclears ..	14 % (3,290)	24 % (2,736)	13 % (2,470)	—
Transitionals ..	2 % (480)	2 % (228)	1 % (190)	—

The large lymphocytes and mononuclears were very similar to the abnormal cells present in Case 1, being non-granular single nucleated cells, giving a negative "oxidase" reaction.

Post-mortem examination was performed 12 hours after death by Dr. C. Kellett.

The scalp showed only a few indefinite areas of thickening; no definite nodules could be found. The skull, brain, and meninges were normal. The thymus was small, the thyroid normal, but all the glands in the neck were distinctly enlarged, as also the lymphoid tissue in the nasopharynx. The glands on section were white and hard, and showed no caseation. The lungs and pleuræ were normal, and there was no enlargement of the mediastinal glands. The heart was slightly enlarged with pale and easily friable muscle. In the abdominal cavity there were numerous enlarged lymphatic glands, especially in the pre-aortic region in the neighbourhood of the pancreas. The liver was pale, somewhat enlarged and firm, and the spleen was moderately enlarged, weighing 60 g., and showed some hyperplasia of the lymphoid areas. There were no naked-eye deposits of any abnormal material in either liver or spleen. The kidneys were pale, and suprarenals somewhat shrunken. The intestines showed hyperplasia of the lymphoid elements, both in small and large bowel. The left femur showed very pale bone-marrow throughout, but there were no definite infiltrations of bone found in the portions examined.

Histological examination showed some evidence of bronchopneumonia in the lungs, and cloudy swelling with fatty degeneration in the kidneys. The liver showed fatty degeneration of the liver cells, and the portal tracts were infiltrated in an irregular manner with small round mononuclear cells with poorly stained cytoplasm. The spleen and lymphatic glands showed definite changes which were similar in both series of sections. These consisted of (*a*) definite increase in the fibrous tissue elements; (*b*) hyperplasia of all the cells with a slight predominance of the endothelial cells; (*c*) slight increase in eosinophils; and (*d*) no evidence of any tubercle formation or of abnormal malignant cells. Some of the endothelial cells were larger than normal, but no definite multinucleated cells were found. On the whole the sections seemed to conform to the "lymphadenoma" type of glandular hyperplasia.

Discussion.

The early age is a remarkable feature of these cases, and this, combined with the pains in the joints and limbs at an age too old for scurvy and, in general terms, too young for rheumatism, is at once perplexing and warns the clinician of difficulties ahead. The deposits in the scalp in these two cases appeared to us very remarkable. They were especially numerous on the vault of the cranium and not in the occipital region; but except for this they were suggestive of unusually large and numerous rheumatic nodules, such as may occur in occasional examples of virulent rheumatism. Further, they varied in size, diminishing in the second case so obviously that everyone was struck by such an occurrence when the disease itself was clearly advancing. There were no nodules on the elbows and knees or elsewhere, except in the first case those lying below either eyebrow. The rheumatic pains in the joints and muscles were striking and in the second case puffy swellings around the wrist-joints were observed in the hospital. In the first case the arthritic symptoms had disappeared before he came under our care, but the history was sufficiently definite to have made the diagnosis of acute rheumatism a probable one to the earlier observers. The blood picture in the first case gradually developed along the lines of an acute leukæmia, and when this child was taken from the hospital the pigeon-hole into which the case was placed was that of leukæmia. In the second case the nearest pigeon-hole appeared to be lymphadenoma.

These two cases appear to us to illustrate a view which we believe to be a valuable one in the study of the blood diseases in young children, which is to throw over boldly any classification based upon classical leukæmia and lymphadenoma, and start anew on the assumption that we are dealing with infective processes to which there is a reaction by the tissues, and by the blood, in particular, of an unusual kind. We recognise that in suppurative infections, such, for example, as empyema, the usual reaction is an increase in the polymorphonuclear leucocytes, that in glandular fever there is a mononucleosis, that in mumps there is a lymphocytosis, and in typhoid fever a leucopenia. It seems a reasonable hypothesis to suppose that the leukæmic and aplastic conditions met with in childhood may represent some disordered response to infection or some curious type of infection which calls forth these unusual results. In both these cases, and in many of the cases of leukæmia in childhood, we find suspicious evidence of previous infection such, for example, as tonsillitis or bronchitis.

It has already been stated that in attempting to search the literature for other similar cases we have been hampered by the problem of under what heading to look. There was a case, however, under the care of Dr. Hugh Thursfield some years ago, and shown at the Section for the Study of Disease in Children of the Royal Society of Medicine in 1925,[1] which was in the memory of one of us as being very similar to the two cases under discussion.

Dr. Thursfield's case was a boy of 4¼ years, who had enjoyed good health until five months before admission to hospital, when the glands in the neck and axillæ enlarged. He had curious nodular swellings in the scalp which, according to the mother, "came and went," and certainly varied in size while he was under observation. His blood count showed a secondary anæmia, while the white cells numbered 7800 per c.mm., of which 90·6 per cent. were lymphocytic. He had severe epistaxis on several occasions, developed a purpuric rash, and had retinal hæmorrhages. His right ear began to discharge freely while he was in hospital, and a septic condition of his lower jaw developed. His spleen was only just palpable, and after making an apparent recovery he became worse again, and died with great enlargement of the spleen. At a post-mortem examination large, pale lymphatic glands were found all over the body, and on section the liver showed a patchy infiltration, with small lymphocytes along the portal tracts, while the spleen was greatly congested and infiltrated with similar small round cells.

This case was presented by Dr. Thursfield as either an unusual type of lymphocytic leukæmia or an abnormal lymphocytic response to some infection, and one subsequent speaker suggested the term "leukæmic lymphadenosis." Whatever label be applied, the case shows remarkable similarity to our two cases: glandular enlargement, sepsis of ear and jaw, nodules in the scalp, a mononuclear type of response in the blood without leucocytosis, and a fatal termination.

The hypothesis we put forward, which this third case would seem to support, may not be sound, but it would lead to a study of the reactions of the blood to infections in childhood unhampered by the conception of certain primary blood diseases. It is well known that the present pigeon-holes set aside do not serve to find a place for many of the unusual blood pictures we find among the anæmias and leukæmias of childhood, and these unusual blood pictures may eventually be found to mark stages in a faulty reaction to infective processes, the final picture being in some cases the classical anæmias and leukæmias which we all recognise.

Summary.

In conclusion, we should like to summarise the salient features of the cases we have described, so that other observers may be able to recognise the condition—subacute onset, glandular enlargement, arthritic pains and swellings, nodules in the scalp, fever, mononuclear response in the blood, slight enlargement of the spleen, serious course and severe nature of the malady, with terminal hæmorrhages in various situations.

TUMOUR IMMUNITY.

TREATMENT BY AUTO-VACCINATION OF IMPLANTED MOUSE CARCINOMA (M. 63.)

BY THOMAS LUMSDEN, M.D. ABERD.

(From the Department of Experimental Pathology, Lister Institute, London, S.W.)

SOME 18 months ago it was shown in THE LANCET[1] that sarcomata (Jensen's) growing in the flank of rats could be caused to regress by injecting 1 per cent. formalin into them, and that the rats so treated were thereafter immune to reinoculation with this tumour in all parts of their bodies. This procedure was named vaccine treatment, because it was held that at some stage of the destruction of tumour cells by formaldehyde, a soluble antigen was produced and absorbed into the circulation in sufficient quantity to arouse immunity.

The justness of this view was evident to those who observed systematically the animals while under treatment, but was less apparent to cancer research workers who had no actual experience of the treatment. This was not unnatural, since Jensen's rat sarcoma is a tumour which induces some concomitant immunity, and hence even rats from which it has been simply excised exhibit thereafter a considerable though lesser degree of resistance to reinoculation.

In order to demonstrate unexceptionably the mechanism involved, it was necessary to show that comparable results could be obtained in the case of a tumour which, it was universally admitted, did not evoke effective concomitant immunity and which could therefore always be successfully reinoculated into an animal from which it had been excised. Such a tumour is the mouse mammary carcinoma, M. 63 of the Imperial Cancer Research Laboratory. Russell[1] stated that this is "a strain giving progressively growing tumours in practically every animal inoculated," and that "its power of inducing resistance is nil." With these dicta all other investigators have agreed. The results obtained by vaccine treatment of this tumour are detailed below.

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[1] Proc. Roy. Soc. Med., 1925, xix., 26 (Section Proceedings, p. 4).

[1] THE LANCET, 1927, ii., 1283.

Experiments.

A single fragment of very active tumour material (M. 63), weighing from 0·005 to 0·01 g., is inoculated into the right flank of each of a series of mice. The mice are examined after a week, and those (generally about 60 per cent.) in which a progressively growing tumour has resulted are separated for treatment. This is begun usually on the eighth to tenth day after inoculation, when the tumour has attained a diameter of 4 to 5 mm—i.e., a size comparable (allowing for the difference in body-weight) to a tumour the size of an orange in man. By means of a very fine hypodermic needle a solution of formalin (1 per cent. in *normal saline*, not distilled water) is injected slowly into the centre of the tumour so as to distend it as much as possible without bursting its capsule, some of the solution is then injected around and deep to the tumour. About 0·1 to 0·25 c.cm. of the formalin solution is inoculated altogether. This procedure is repeated daily until the tumour is evidently disappearing. The decision as to whether treatment should be continued or stopped and the appropriate dose for injection is always difficult and only experience makes the best results attainable. The thing to aim at is gradual regression of the tumour, without so much damage to the surrounding normal tissues and the skin over it as to cause ulceration. In an animal so small and fragile as a mouse this entails delicate and sensitive handling.

—	T_1 I_5	T_1 I_4	T_1 I_3	T_1 I_2	T_1 I_1	T_2 I_3	T_2 I_2	T_2 I_1	T_3 I_1	T_3 I_3	T_3 I_1	T_1 I_1	T_1 F	T_2 F
1	W												W	
2	W												B	
3		Br											F	
4		W											G	
5		Br											GW	
6		F											GW	
7		W												W
8		W												W
9		Br												BW
10			Br											B
11			W											BW
12			W											F
13			BW											B
14				Br										BW
15					Br									W
16						Br								Br
17							B							F
18							W							BW
19							W							Br
20							Br							W
21							W							GW
22								W						W
23								W						BW
24									W					FW
25									GW					W
26									BY					
27										Br				
28										B				
29											F			
30												BW		

T_1, T_2, T_3 represent the number of tumours which had to be treated before immunity (I) or failure (F) resulted. I_5, I_4, I_3, &c.—Immunity evidenced by 5, 4, or 3 consecutive negative tests. The letters W = white, B = black, Br = brown, G = grey, F = fawn, BW = black and white, &c., indicate the colour of each mouse.

As soon as the tumour has regressed and any inflammatory reaction which was present has disappeared, a second—i.e., first test—inoculation of active tumour material is made into the left flank of each treated mouse, controls being inoculated with similar material and dose in *every* instance. In a proportion (about half) of the treated and tested mice no tumour appears, but even so the mice are not judged to be certainly immune until they have been tested three or four times with inocula of increasing amount (0·02 to 0·05 gr.).

If the first test inoculation on the left side gives rise to a tumour it frequently indicates that the tumour originally treated had not, in reality, been eradicated and recurrence on the right side is apt to take place if the test inoculation on the left side is made too early. When this happens both the left flank tumour and the recurrence on the right side are treated with formalin, and only after both have entirely disappeared is the mouse retested.

In a few mice it has been necessary to treat more than two tumours in this way. The detailed results are as shown in the table.

It will be seen that the experiment concerned 55 tumour-bearing mice. Of these 30 were ultimately cured, while in 25 mice treatment failed, and these 25 mice, though the course of the disease was much delayed, ultimately died from cancer. Of the 30 cured mice, 26 were tested for immunity; of these, 15 were found to be immune after treatment of one tumour only, 8 after treatment of two tumours, and 3 after treatment of three tumours. The remaining four cured mice died of intercurrent diseases (such as diarrhœa and pneumonia) before the result of the test inoculation was evident. Of the 26 cured and immune mice:

2 were tested negatively on 5 consecutive occasions.
7 ,, ,, ,, 4 ,, ,,
5 ,, ,, ,, 3 ,, ,,
8 ,, ,, ,, 2 ,, ,,
4 ,, ,, ,, once.

The average number of consecutive negative tests in the 26 immune mice was thus 2·8 per mouse.

While these results are inferior to those obtainable when treating rat tumours[2] they are considered sufficiently striking to demonstrate that the conclusions arrived at previously were sound. Although others have, in rare instances, observed spontaneous regression in the case of tumours of the strain here dealt with (M.63), it is clear from the sentence quoted above that this was not Russell's experience, and in my laboratory spontaneous regression has never been noticed in a series of over 7000 implantations. To have caused regression followed by immunity in 50 per cent. of the treated animals is therefore a significant result, especially since mice are so small and fragile as to make successful treatment of this sort difficult for purely mechanical reasons.

Remarks.

It will be appreciated that in this experiment all the mice were proved to be *not naturally immune*, since they were chosen for treatment only after a progressively growing tumour had resulted from implantation of a fragment of M.63. Any confusion from this source is thus entirely excluded. The virulence of the test material was in *every* instance demonstrated by inoculating it into an equal number of normal mice. In these controls the implantations grew progressively in 80 per cent. to 100 per cent. of the different batches of normal animals. The degree of immunity evoked and the percentage of cures obtained depends on the skill and judgment exhibited by the experimenter, yet it is believed that even an investigator with but little experience of the method will obtain results good enough to convince himself as to the principles concerned, which is, after all, the most important point.

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[1] Fifth Sci. Rep. Imp. Canc. Res. Fund, 1912, p. 5.

[2] The Lancet, 1927, ii., 1283.

It may be well to recapitulate here some of the details of technique which should be meticulously followed:

1. The original inoculations should consist of a single fragment of very active material about 0·01 g. in weight, and the injecting needle or cannula should be inserted as far as possible from the inguinal glands, since if these get infected cure is more difficult to effect.

2. After sucking the fragment into the injecting cannula the point of the latter should be washed in saline.

3. When treating the tumours inject through a very fine hypodermic needle about 0·1 to 0·25 c.cm. of 1 per cent. formalin in saline very slowly into the growth, trying to distend it without bursting its capsule. Some of the formalin should, before withdrawing the needle, be injected around the tumour.

4. Begin treatment when the tumour has a diameter of 0·4 to 0·6 cm. and continue the injections daily, as long as any definite circumscribed growth can be felt, through the œdematous swelling caused by the injections.

5. Do not test for immunity until it seems certain that the treated tumour has completely disappeared, otherwise the test inoculation is apt to grow and the original tumour to recur. If this happens, repeat the treatment.

6. Keep a careful record of the dates on which each individual mouse has received a formalin injection, and the dates of each test and retest inoculation.

7. Do not inject formalin into the inguinal gland unless it is progressively enlarging or the skin over it looks purplish. It often gets enlarged as the result of simple inflammation and regains its normal size when treatment of the tumour is finished.

A high degree of immunity as indicated by failure of the first and all subsequent test inoculations is most likely to occur when the original tumour was of considerable size—i.e., in the neighbourhood of a quarter to a half gramme in weight—and where its regression has been achieved without ulceration of the skin or much destruction of normal tissue. Since tumours of a variety (M.63) which does not tend to regress naturally are caused to disappear completely, and the animals in which this has been effected are thereafter immune to recurrence or reinoculation, there need be no hesitation in using the word "cure" in relation to the results of auto-vaccination of this sort in the case of the implanted cancers of rats and mice. With the slower growing Twort's carcinoma results equivalent to the above are much more easily attained.[4]

Taken along with the results previously reported the above findings indicate that by means of auto-vaccination we are either (1) aiding by our intervention some natural protective mechanism which every animal possesses, or (2) evoking some new curative process. The former appears to the writer the more probable of these alternatives. A general review of the pertinent observations suggests that all animals exhibit in varying degree resistance against the growth of any variety of tumour cells inoculated into them. If this be so, any sharp classification of tumours into two distinct groups—viz., those which give rise to concomitant immunity and those which do not—is misleading.

The facts that implantations of heterologous tumours never grow progressively, that homologous tumour implantations sometimes fail to grow and sometimes spontaneously regress, and that in rats tretted by auto-vaccinatinn autoplasties of spontaneous tumours are not invariably successful, all lend support to this view. The rare but well-authenticated cases of spontaneous recovery which have been observed in man give justification for the hope that even in the case of human cancer the body resists the invasion of its tissues by malignant cells, by means of a mechanism comparable to that by which it resists the growth of implanted tumours—a mechanism which it may, in like manner, be possible to assist to the extent of rendering it effective in a large proportion of cases.

In the long series of experiments previously reported[5] the aim has been to discover the mechanism of the spontaneous control or cure of cancer, and the conclusions arrived at are that natural recovery is, in the case of implanted tumours, characterised by the production of anti-malignant-cell bodies in the serum of the affected animal, along with the elaboration by extravasated leucocytes of a lytic substance capable of destroying (even homologous) cancer cells.

The facts observed suggest that the agency which induces this process of regression is the absorption from the tumour area of some product of dying tumour cells which provides the necessary antigenic factor. Evidence in favour of this view has been published in previous communications.[6]

In the above schema the facts herein reported are of interest as indicating that the methods which evoke increase of immunity against a tumour which gives rise to a high degree of comcomitant immunity—e.g., J.R.S.—are applicable to a tumour of which it has been agreed that, in the words of Russell, "its power of inducing resistence is nil"—viz., the mouse carcinoma, M.63 of Imperial Cancer Research.

One further step has to be taken in lower animals before human tumours can be hopefully treated along these lines. It is necessary to discover whether vaccine or serum treatment can be effectively applied to spontaneous mouse and rat tumours. The author has now bred some 700 mice from a strain kindly sent him by Dr. Burton T. Simpson, of Buffalo, U.S.A. Seventy per cent. of the *females of this strain* are, in America, found to develop spontaneous mammary cancer when they reach the age of 5–20 months. If a similar proportion of these mice develop tumours in this country (none has done so yet), the great initial difficulty of obtaining an adequate amount of experimental material should be obviated. It seems certain that it will be especially difficult to evoke immunity against spontaneous and therefore autologous tumours, but it may nevertheless be found possible to overcome this final difficulty. In any case the attempt must and will be made as soon as sufficient material is available.

Summary and Conclusions.

1. In 30 out of 55 mice in which mammary cancer (M.63) was growing progressively, the tumours were caused to regress by auto-vaccine treatment (injection of 1 per cent. formalin saline into the growth) and the mice so cured showed a high degree of immunity against subsequent implantations of the tumour.

2. The facts reported indicate that all animals resist the invasion of their tissues by implanted (and possibly by spontaneous) tumour cells, through a mechanism which can be strengthened by auto-vaccination. In the case of certain animals and tumours this natural mechanism is without further stimulation occasionally sufficient to prevent progressive tumour growth—e.g., Jensen's sarcoma in rats. In other instances the unaided natural resistance is inadequate—e.g., M.63 in mice. It is misleading to think of implantable tumours as falling into two discrete groups—viz., one group in which concomitant immunity is evoked and another in which no such immunity appears. No hard-and-fast line can be drawn between the one group and the other. Any differences seen, appear to be not in kind but only in degree.

The author gratefully thanks Sir Charles Martin, F.R.S., for helpful criticism and for facilities at the Lister Institute, the British Empire Cancer Campaign for its grant, and Miss A. C. Kohn Speyer, M.A., for assistance in keeping records of the experiments and in other ways.

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[4] Cancer Conference, London, 1928, p. 216.

[5] THE LANCET, 1927, i., 116.

[6] (*a*) THE LANCET, 1927, ii., 1283; (*b*) Cancer Conference, London, 1928, p. 216.

THE SOUTHEND HOSPITALS.—New mental wards of Rochford Poor-law Hospital have recently been opened. The institution will be taken over by the Southend Town Council when the guardians are disestablished, and cases will then be received from the area outside Southend. The Rochford Board of Guardians have refused to renew their subscription of £125 to the Southend Victoria Hospital unless they are represented on the governing body.

Clinical and Laboratory Notes.

A CASE OF
SEBACEOUS CYST UNDERGOING MALIGNANT CHANGES.

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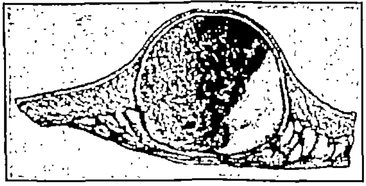
THE danger of neglecting to act upon medical advice with regard to the treatment of a simple tumour has been well exemplified in a case which recently came under our observation.

Colonel A., aged 75, consulted one of us about four years ago on account of a swelling on the back just below the angle of the right scapula. He had had no pain, and his attention had been drawn to its presence by the attendant at a Turkish bath. On examination the tumour proved to be a simple sebaceous cyst. The patient was told that its removal was an easy matter and entailed very little discomfort, but nothing more was seen of him until December, 1928, when he once more asked for an interview. His story was that he had enjoyed good health since his last visit, and that he was only seeking advice because the Turkish bath attendant had informed him that something seemed to be going wrong with the lump on his back. Investigation revealed the fact that a hæmorrhage had occurred into the cyst which was the size of a walnut, and that there was considerable infiltration of the subcutaneous tissues. There was no evidence of inflammation.

It was represented to the patient that excision of the tumour was now urgently required, and permission was obtained to operate under local anæsthesia. A 1 per cent. solution of novocaine was injected beneath the skin and into the cellular tissue around the cyst, and by an elliptical incision the whole mass down to the muscles of the back was removed. The convalescence calls for no comment.

FIG. 1.



A drawing of the tumour as it appears on vertical section.

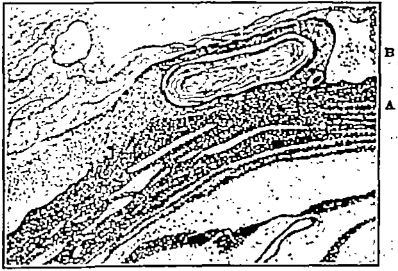
The interest of this case lies in the pathological changes which apparently occurred during the course of the last four years.

Sebaceous cysts commonly become inflamed and suppurate. They may even fungate, producing a foul offensive mass which has been mistaken clinically for a cancer. Rarely an encapsuled tumour somewhat resembling a sebaceous cyst has been observed growing from the scalp. This is filled by a folded ingrowth of squamous epithelium, and has been given the name of "benign epithelioma." The case which we record is clinically a sebaceous cyst, but on histological examination proves to be a basal cell carcinoma. Most of the red mass (which appears dark in Fig. 1) consists of fairly recent blood clot which is beginning to organise. The white mass in the bottom right hand segment consists of structureless homogeneous material.

The capsule is formed of rather cellular fibrous tissue, and externally forms a definite boundary everywhere except at the most prominent part of the tumour where it blends with the skin epithelium. Internally the capsule is less defined and at places shows island of fairly normal squamous epithelium forming horny pearls. Lying beneath the capsule and tending to blend with it is a mass of cells of basal cell type arranged in anastomosing strands to produce a reticular appearance, some of the spaces of which are occupied by a loose connective tissue with very thin-walled blood-vessels, some by only a thin-walled blood sinus, and others by homogeneous acellular material.

At certain places the basal cells can be seen to be originating from one of the islands of squamous epithelium mentioned above; this is well shown in Fig. 2. At other parts these cells are arranged in a manner recalling the structure of a sweat gland. This tissue lines the whole of the internal surface of the capsule, except opposite the white mass of structureless material. It varies in thickness, and in one place forms a band which can be recognised microscopically as a mass somewhat lighter than the blood clot.

FIG. 2.



Microscopic section showing outgrowth of basal cells (A) from an island of squamous epithelium (B).

The presence of the epithelial islands in the position described bears out the clinical finding that the tumour was originally a sebaceous cyst; the origin and type of cells in the new growth are those of a basal cell carcinoma (rodent ulcer). The somewhat unusual arrangement is what might be expected from the fact that the tumour has grown into a non-resisting structureless mass and has had to form its own stroma and blood-vessels. To this fact also the extensive hæmorrhage may be attributed.

AN OUTBREAK OF SCARLET FEVER AMONGST ADULTS.

BY J. TODESCO, M.D. FLORENCE, M.R.C.S. ENG.,
RESIDENT MEDICAL SUPERINTENDENT, BOROUGH HOSPITAL, CROYDON.

DURING the first six months of 1929 322 cases of scarlet fever were admitted to the Borough Hospital, Croydon, and 74 (23 per cent.) of these were in-patients between the ages of 15 and 50 years. In the corresponding period of 1928 there were 259 scarlet fever cases, of which only 34 (13 per cent.) were in this age-group. Most of the scarlet fever admissions in 1929 were in March and May, whereas in 1928 the number was greatest in February, after which there was a steady fall. The greatest incidence of the disease was in the age-group 15 to 20 years, as shown in the table.

Ages.		M.		F.	Ages.		M.		F.
15–20 years	..	12	..	13	40–45 years	..	1	..	1
20–25 „	..	6	..	13	45–50 „	..	—	..	2
25–30 „	..	7	..	4			—		—
30–35 „	..	3	..	4					
35–40 „	..	2	..	0	Total ..	..	31		43

M. = males. F. = females.

Many of the 74 cases were of the septic type with intense rashes, marked injection of fauces, and dirty tonsils, glandular enlargement, and high fever. The complications were as follows: adenitis, 6; albuminuria, 2; rheumatism, 2; rhinorrhœa, 5; otorrhœa, 1; secondary sore-throat, 5. There were two relapses on the 17th and 24th days.

Of the cases of septic type 25 were treated with scarlet fever streptococcal serum, of which they received 10·0 c.cm. intramuscularly on admission—i.e., between second and fourth day of disease. Serum rashes with slight rise of temperature and joint pains, either scarlatiniform, urticarial or papular, were noted in 12 cases, the rash appearing within 7–14 days of injection and usually lasting 24–36 hours, but there were no cases of serum sickness. The giving of serum did not seem to bring down the temperature more rapidly, but no relapses occurred in the serum-treated cases. The average stay in hospital for the serum cases was 30 days, whereas it was 31 days for the others.

The interesting feature of this outbreak is that 23 per cent. of the cases occurred after the third quinquennium of life, whereas the disease is usually commonest between the ages of 2 and 6, two-thirds of the cases occurring, as a rule, in the first and second quinquenniums. According to Kerr, cases are few in number after the age of 15 years. The giving of scarlet fever streptococcal serum did not seem to affect the incidence of complications or the length of stay in hospital to any great extent. All but one of the serum cases which developed complications were females.

I wish to thank Dr. Oscar Holden, medical officer for Croydon, for permission to publish this note.

A CASE OF
BRUCELLA ABORTUS INFECTION IN MAN.

By H. E. Bloxsome, M.R.C.S. Eng.,
SURGEON TO THE FAIRFORD COTTAGE HOSPITAL.

With a Pathological Report by
E. N. Davey, M.D. N.U.I.,
PATHOLOGIST TO GLOUCESTER ROYAL INFIRMARY.

A DISPENSING chemist, aged 50, was attacked at the end of last March by what I called influenza.

The onset was sudden, with chilliness and sweating, and some headache and fleeting pains. The temperature was moderate, and I thought he would be well in a week; but at the end of that time his temperature was still 101° F. at night, and his pulse-rate kept steadily high (120). He sweated a great deal, but had no aches or pains, and on examination I could find no physical signs. There was no previous medical history of note, except occasional febrile attacks in winter.

The patient was thin, and had a slight cough, so I asked Dr. W. A. Dickson, the Gloucestershire tuberculosis consultant, to see him, but he could not find any physical signs in the chest, abdomen, or central nervous system. The urine was free from albumin and sugar. The bowels acted normally. The features of the illness were the drenching sweats and the undulant character of the fever, and the rapid and weak pulse. He had no joint pains, and no enlargement of spleen or liver. After about a fortnight of this pyrexia I sent a specimen of his blood to Dr. Davey, who reported no signs of typhoid or the paratyphoids. He found, however, that the serum agglutinated the *Brucella abortus*—a strain of which he was working with at the time. The patient lived a very sedentary life, and seldom went out except on his motor-cycle, so that he had not come into contact with any animals; he drank very little milk, and had only once been out of his market town in a year, for half a day. No one else in the town had shown any signs of a mysterious disease. His brother had rather a prolonged influenza, which we afterwards thought might have been this infection, but his blood did not clump the bacilli.

The drug treatment used was urotropine grs. x t.d.s. Quinine in 5-grain doses had no effect on the temperature. After a course of urotropine the patient himself suggested salol, and from the moment it was employed the fever abated—post hoc probably, but worth remembering in a future case. The febrile period was about three months, and the temperature was normal by June 25th. On August 21st, however, the patient had to be readmitted to the Fairford Cottage Hospital with a recrudescence of a milder type. On this occasion his pyrexia lasted only ten days. He has now (Oct. 12th) resumed work.

There is always a great deal of contagious abortion in this neighbourhood, the veterinary surgeons tell me; but there is no clue to show how this patient picked up the organism.

Pathological Report by Dr. Davey.

Owing to the prevalence of contagious abortion amongst cattle in this area, we have been making it a practice to examine all sera submitted for agglutination reaction for typhoid fever, against the *Br. abortus* Bang, Oxford standard cultures.

The serum of this patient was submitted on May 7th. It gave a negative reaction with *B. typhosus* and *B. paratyphosus* A and B, but was found to agglutinate *Br. abortus* in dilutions of 1 : 25 to 1 : 250. When the agglutination was carried to its highest titre it agglutinated in as high a dilution as 1 in 5000 after four and a half hours' incubation. It also agglutinated *Br. melitensis* in dilutions of 1 : 25 to 1 : 500.

We saw the case in consultation on May 13th, and beyond the tachycardia and high temperature there were no objective signs present. The blood count was: red cells, 3,000,000 per c.mm.; white cells, 5600 per c.mm. Differential white cell count: polymorphonuclears, 42 per cent.; small lymphocytes, 45 per cent.; hyalines, 8 per cent.; and myelocytes, 5 per cent. Blood cultures in Douglas's broth and trypsin broth and on serum and blood-agar were sterile after six days' incubation; both aerobically and under partial CO_2 pressure. Urine cultures were sterile.

On July 12th, after the temperature had subsided, a further agglutination reaction was performed, the titre then being *Br. abortus* 1 : 25 to 1 : 2500, and *Br. melitensis* 1 : 25 to 1 : 500. The patient was again seen on August 19th, when he was convalescent. His only symptom was tachycardia, and his blood picture was: red cells, 4,500,000 per c.mm.; white cells, 4600 per c.mm.; hæmoglobin, 60 per cent.; colour-index, 0·66. Differential count: polymorphonuclears, 47 per cent.; small lymphocytes, 30 per cent.; hyalines, 18 per cent.; myelocytes, 5 per cent.

The interesting points in connexion with this case are: (1) The very high agglutination titre, the fact that it was higher for *Br. abortus* than *Br. melitensis* being diagnostic of an infection with the former organism. (2) The leucopenia with relative lymphocytosis, which persisted well into convalescence. (3) The absence of any signs beyond the undulant character of the temperature which would lead to a diagnosis of the condition other than by the presence of agglutinins in the patient's serum. It is becoming increasingly important in this country to examine sera in cases of pyrexia of unknown origin for *Br. abortus* agglutinins.

Donations and Bequests.—Mr. Henry Dakin, of Millers Dale, Buxton, left one-third of his estate amounting to over £4000 upon trust for his brother for life with remainder to the Derbyshire Royal Infirmary, part of this bequest to be used to endow a Henry Dakin bed.—Miss Ellen Constance McKee, of Bentinck Mansions, Bentinck-street, Marylebone, left £500 each to the Elizabeth Garrett Anderson Hospital, Euston-road, and the South London Hospital for Women, Clapham Common; £250 to the London (Royal Free Hospital) School of Medicine for Women; and £100 each to the National Education Association, Caxton House, and the Association for Moral and Social Hygiene, Great Smith-street, Westminster.—Miss Evelyn Winifred Riley, of Harrington-gardens, South Kensington, left estate of the value of £178,189, and made many bequests to charities, including £1000 each to the Royal Surgical Aid Society, the United Kingdom Beneficent Association, and the National Society for the Prevention of Cruelty to Children; £500 each to the West London Hospital, the Hospital for Women, Soho-square, the Middlesex Hospital, and the National Institute for the Blind, Great Portland-street; and £100 to the Society for the Prevention of Cruelty to Animals. She left £14,500 in trust to pay certain annuities and subject to such annuities between the Surgical Aid Society, the United Kingdom Beneficent Association, the Society for the Prevention of Cruelty to Children, the West London Hospital, the Hospital for Women, the Middlesex Hospital, and the National Institute for the Blind.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PATHOLOGY.

ON Oct. 15th Prof. A. E. BOYCOTT, F.R.S., delivered a presidential address to this Section on

THE BLOOD AS A TISSUE.

Besides being a carrier of food, excreta, and hormones, the blood, he said, is a tissue. As such it has a life of its own, malformations (e.g., acholuric jaundice) and tumours (e.g., leukæmia, splenomegalic polycythæmia), and can be studied for itself. There being no name for the total quantity of red corpuscles with the marrow cells from which they come, he suggested the word "erythron" as convenient. Hypertrophy of the erythron is caused by relative lack of oxygen whether this is due to high altitudes (anoxic type of Barcroft) or slowness of circulation (stagnant type), though in many cases of heart disease the associated increase in viscosity would be harmful and the reaction does not occur. Similar active growth (regeneration) in anæmia is also due to anoxæmia (anæmic type). Atrophy of the erythron is caused by relative excess of oxygen as in compressed air, persons returning from high altitudes to sea-level, and after transfusion. Hypertrophy and atrophy are both conditioned by the needs of the animal; similar conditioned responses (atrophy and regeneration) in the liver and kidney in mammals, in the claws of a prawn, and in the tentacles of a worm were considered. In all cases the result has the appearance of a purposive action, and it was urged that a frank acceptance of a teleological outlook made pathology more intelligible and formed a sound guide in investigation. The normal quantity of hæmoglobin and its concentration in the blood is a compromise between the desirability of having plenty of oxygen and the disadvantage of having blood which is too viscous, the best balance depending on the rate of the circulation.

SECTION OF NEUROLOGY.

AT a meeting of this Section held on Oct. 10th, the retiring President, Mr. DONALD ARMOUR, introduced Dr. GORDON HOLMES, who delivered his presidential address on

DISSOCIATION OF THE OCULAR MOVEMENTS.

It was often assumed, he said, that the almost ceaseless movements of the eyes were purely voluntary; indeed, clinical pathology and physiology had shown that the majority occurred without the intervention of the cells in the higher regions of the cortex. These movements were, however, profoundly influenced by labyrinthine activity, other sensory impressions, proprioceptive stimuli from the muscles of the neck, and probably also by the basal ganglia. A very large number of ocular palsies were theoretically possible. Dr. Gordon Holmes said that some of these had been recognised and these would form the subject of his address, together with observations on five patients who had been under his care.

The essential feature of a lesion of the pons in the neighbourhood of the sixth nerve nucleus was the loss of conjugate movements towards the paralysed side; these could not be obtained voluntarily, reflexly, or by any other means. The result was like that of an interruption of the final common path, but that the internal rectus contracted normally on convergence. The paralysis was therefore not of muscles but of movement. The possibility of loss of associated movements of the eyes, in spite of the integrity of muscles, nerves, and nuclei, had been described in 1883, and the first example had been recorded in 1895 (Oppenheim's case). Many cases manifesting very varied clinical signs had been recorded since then.

A typical case had first been seen by Dr. Gordon Holmes three months after the acute onset of the trouble. At that time the vertical and convergent movements were quite normal, but there was absolutely no deviation to the right. The eyes moved very slightly to the left of the midline, but the movement was incomplete, jerky, irregular, and required a great effort; it showed what Hughlings Jackson had called "punctuation of movement." The patient could, however, follow a moving object if it were not moved too rapidly or jerkily. If he fixed a stationary object and rotated his head his eyes remained fixed on the object; they therefore deviated fully and regularly—i.e., they responded normally to proprioceptive impulses from the neck muscles. When the eyes were fully deviated to the right he could not move them back to the centre; they only returned when the object was brought back or the head was rotated to the left. Later on he learned to bring his eyes back by blinking repeatedly and firmly closing the lids. In the street he relied on head movements, and if any object excited his attention just as he wanted to turn the eye would remain fixed and would not turn with the head, which was often very awkward. Reading was slow and awkward; he had to pick out each letter in succession. The end of each line offered great difficulty; almost the only therapeutic success obtained was in teaching him to fix his eyes on his finger at the end of each line, and move it back to the beginning of the next. Irrigation of the left ear with cold water, which normally causes vertigo and nystagmus with a quick component to the right and a slow one to the left, brought about no change in this patient, even after three minutes, and when 600 c.cm. of water had been used, but his outstretched arms deviated normally to the left. However, as soon as the irrigation ceased his eyes deviated slowly and forcibly to the left, and remained there for two or three minutes. When the right ear was similarly irrigated there was no nystagmus or deviation, but at the end of the process the eyes moved slowly to the right and became fixed, so that for a few seconds he could not even follow a finger or move them by rotating his head. He was remarkably tolerant to galvanic stimulation of the labyrinth; even 12 milliampères caused no vertigo, but it induced some deviation of the eyes to the right. Briefly, therefore, the quick phase of nystagmus was absent in this patient, who was by no means an isolated example. Another patient who had lost voluntary vertical movement showed forcible, almost violent, deviation upwards when rotated clockwise in a chair with the head bent to the right shoulder. With the head on the left shoulder both eyes deviated downwards, but in neither case did the rotation cause the normal nystagmus with a quick component downwards. Other observers had recorded the same phenomenon.

The Quick Phase of Nystagmus.

The highest levels of the central nervous system were probably concerned in the quick phase of nystagmus, which might be located in the cortex. On the other hand, typical labyrinthine nystagmus could be induced in animals from which the whole brain above the mesencephalon had been removed; the cortex might, however, play a more important part in the optic reflexes of the higher animals. There was no evidence in favour of the influence of the cortex on the quick phase of nystagmus, except that cold aural irrigation produced conjugate deviation instead of nystagmus in patients comatose from various causes. This phenomenon had been ascribed to inactivity of the cortex in coma.

The inevitable conclusion seemed to be that the symptoms seen in these patients were due to damage of some mesencephalic structure by a lesion which at the same time interrupted the paths of voluntary movement of the eyes in the immediate neighbourhood of the vestibular apparatus. In some of these palsies stimulation of the labyrinth might make voluntary deviation possible. There had been much discussion of this relative movement, which was generally regarded as a labyrinthine reflex. Certain observations, however, were hard to explain on this hypothesis, and suggested a calcarine-cortical reflex. The weight of evidence, however, was in favour of the labyrinthine origin.

If the head of the first patient were passively rotated in a dark room with his eyes closed, the eyes deviated to the opposite side, but more promptly and forcibly to the right than to the left, while vertical movements could not be provoked. Since retinal impressions were certainly not active, this deviation must have been excited by proprioceptive impulses, either from the labyrinth or from the muscles of the neck, probably the labyrinth. Later on, when he had begun to recover, he was tied in a chair with his head fixed so that no neck movements were possible; his eyes were closed, the room was darkened, and the chair tilted to the right through 90°. No deviation was obtained, but by this time a fair range of voluntary movement to the left had been recovered. If the chair were tilted to the left through the same angle, the eyes deviated strongly to the right and stayed there. The deviation was always more marked if the movement were slow and uniform than if it were quick or irregular. The fact that the semicircular canals were more stimulated by rapid movement suggested that spastic deviation of the eyes in the direction in which movement was lost might be excited by the otoliths.

The Maculo-calcarine Reflex.

The ability to follow a fixed object if moved slowly and steadily had been noticed in most of the recorded cases, but was defective or absent in some. One patient could not bring her eyes above the horizontal; clockwise rotation in a chair with her head on her right shoulder produced no nystagmus or deviation, but opisthotonus and faintness. In some patients the eyes failed to follow an object, but they could usually follow it if it were moved at a uniform slow rate. There must be separate mechanisms involved in these two forms of deviation. No part was played by the labyrinth when the head was fixed; retinal impressions only were active. Some authorities thought the deviation was evoked by a short direct reflex through the superior quadrigeminal body and external geniculate body, but this was disproved by the fact that only objects in the field of attention and fixed by the conscious will could be followed; it was of no use to move some chance object. The reflex was a true cortical one in which the calcarine visual sphere was active. The affective stimulus must come from the region of the maculæ, therefore the reflex was maculo-calcarine. Apparently only impressions from the immediate neighbourhood of the fovea were potent, so that steady movement of the object was essential in order that the eyes might make a series of minute movements, each of which brought an extra-foveal image on to the fovea, in the same way that the first patient climbed from letter to letter in reading. The patient was, in fact, able to deviate his eyes through a very small angle. The path of the maculo-calcarine reflex was conjectural.

In two patients optic nystagmus had been investigated from another point of view. A drum with figures on it had been rotated vertically. Normally this led to nystagmus with its slow phase in the direction of rotation as seen by the patient. In this nystagmus the cortex intervened; it depended on the integrity of a path between the visual area and the frontal lobes. In one patient the drum produced normal nystagmus when rotated on a horizontal axis, but rotated on a vertical axis it caused no nystagmus but extreme deviation of the eyes in the direction towards which the slow phase of nystagmus would have occurred. The eyes remained fixed for several seconds. Another patient had lost voluntary upward movement. When the drum was rotated upwards on a horizontal axis the eyes deviated upwards spasmodically. It was, therefore, possible to evoke spasmodic deviation like that of labyrinthine stimulation by visual stimuli alone. The deviation was always in the direction of the slow phase of the absent nystagmus and persisted for some time, in one case for five minutes; the patient was unable by voluntary effort to return the eyes to the position from which they had been deviated. Neither labyrinthine nor proprioceptive neck mechanisms were concerned in this deviation, which must be caused by retinal or ocular stimuli. No other form of prolonged retinal stimulation had the same effect, so the cause was probably proprioceptive apparatus in the orbits or ocular muscles. There was a release of some subcortical mechanism, probably in the mesencephalon.

Oculogyric Crises.

One patient had complained that her eyes were "not under control." The first patient had given an intelligent description of the same sensation. Six months after the onset of his trouble, when rapid improvement was setting in, he had first experienced double vision, which he attributed to the spasmodic inturning of the right eye, which might remain fixed for a couple of hours. A few months later the left eye began to do the same thing, and might stay fixed for two or three days. Three years later, when some voluntary movement had been regained, the eyes would at times, especially first thing in the morning, turn to one side and stay fixed for a few seconds. The patient said they seemed "too loose" and that they "rolled about, so that he could not get them on the thing he wanted to see." This suggested the oculogyric crises of epidemic encephalitis. There were two types of spasm: spasm of individual muscles and conjugate deviation as in oculogyric crises, and the deviation excited by labyrinthine and retinal stimuli. Compulsive ideas and other mental stimuli appeared in oculogyric crises. The patient in whose eyes a rotating drum caused deviation complained of discomfort and, as deviation increased, of actual pain, until finally he sweated and shrieked that his eyes were being torn out of his head and the test must stop. He used the same word "agony," so often used by sufferers from oculogyric crises.

Although these patients eyes could not be moved voluntarily they often moved involuntarily, as if exploring space around them, when the attention was diverted from the eyes. This often suggested an hysterical origin of the trouble but really indicated lower level mechanisms which had escaped damage. Dr. Gordon Holmes said he had tried to provoke these movements, but had only succeeded in one man who was unable to deviate his eyes to the right. If his head was fixed and a loud and unexpected sound was made to his right, his eyes would sometimes come round for a moment in the direction of the sound. Oppenheim had also obtained this reaction to sound.

No anatomical findings had been published in these dissociated supranuclear ocular palsies. In most cases the trouble was undoubtedly a thrombosis or hæmorrhage. Localisation had been determined in two patients, and in both the site had seemed to be in the mid-brain. In a few of the earlier cases extensive bilateral softening of the forebrain had been found.

A vote of thanks to the President was proposed by Dr. A. S. BARNES and seconded by Prof. EDWIN BRAMWELL.

BIRKENHEAD GENERAL HOSPITAL.—Last week a new out-patients' department of this hospital was opened. The accommodation includes a large waiting-hall, the usual examination rooms, an orthopædic room, eye, ear, nose, throat, and dental departments, an almoner's office, and a buffet for the refreshment of patients from a distance.

"TINFOIL BEDS."—The Province of Mercia of the Ancient Order of Druids last week completed the payment of £1250 for the dedication of a bed in the Birmingham General Hospital. The money has been derived from the sale of tinfoil. The Druids have from this source endowed 20 beds in various hospitals since 1910.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

Dr. J. F. Halls Dally delivered the presidential address before this Society on Oct. 4th. The following is an abstract of what he said on

Low Arterial Blood Pressure.

Hypopiesis includes all forms of absolutely low arterial pressure, whether these be physiological or pathological, temporary or permanent. Any pressure which falls below the limit of 110 mm. Hg systolic is said to be absolutely low, since those above 110, which may be relatively low for age, sex, and body-weight, fall into a different category. The diastolic is prone to vary more widely. One person, for example, may have a systolic of 100 and a diastolic of 80, while another may have a similar systolic of 100, but a diastolic of 55. Of the two pressures, the diastolic is of by far the greater importance, since it is a more constant indicator not only of the propulsive force of the heart and of the eliminatory capacity of the body, but also of peripheral resistance and vasomotor nervous tone. Hence, in the absence of disease of the heart muscle or valves, a notable fall in diastolic pressure, such as occurs in conditions of shock, points to peripheral damage to the vessels. A further illustration may be noted during the acute stage of influenza. Often the lowest average diastolic pressures are found in association with autonomic-endocrine disturbances, and the highest in nephritis. In general it may be said that the common range of absolutely low arterial pressures is from 110 to 90 for the systolic pressure, and from 80 to 60 for the diastolic pressure at adult ages in men, and slightly less for women.

Low Pressure as a Symptom.

Low arterial pressure is met with as a symptom of many diverse conditions. Physiologically it is induced temporarily as a result of quiet sleep, recumbent rest, fatigue, moist heat, the menstrual cycle, pregnancy, and labour. It tends to become permanent in athletes, in those of placid and gentle temperament, in routine occupations, uncomplicated old age and warm climates. It follows acute collapse and shock, intoxications and circulatory disorders. It may be congenital and persistent, or acquired and persistent. It accompanies nearly all the acute infections, chronic states attended by wasting, certain constitutional affections, the anæmias, chronic infections and intoxications, and as a terminal event. Thus the list of associated conditions is a long one, and since low arterial pressure has been stated by every previous observer to be compatible with perfect health, it will readily be appreciated that the scanty literature on this subject has reach no definite conclusions about its ætiology.

The only way in which the paradox becomes simple is first to dismiss groupings based solely on clinical or anatomical conditions of association, and next closely to examine hypopiesis in the light of modern conceptions of metabolism.

Any factors that upset metabolic balance cause either nutritional or endocrine disequilibrium, or both. Hormonic dysfunction in combination with vasomotor disturbance leads to variations in arterial pressure, and inability to respond to stimuli in adequate fashion tends to produce symptoms of insufficiency of which low arterial pressure is one of the most important. Thus I have sought a comprehensive and unifying principle that would explain the striking diversity of association of low arterial pressures, and would link them with the incidence under opposite conditions of high arterial pressures. This unifying principle has been arrived at along the lines of biochemical investigation, and by expansion of the well-known dictum of the late Sir James Mackenzie that "response to effort" is the most valuable test of circulatory efficiency. Hence I have stated as "The Biological Law of Hypopiesis" that "low arterial blood pressure is always to be regarded as an expression of a low vitality state." In other words, the hypopietic subject is never a normal individual, but exists in an inferior constitutional state in which he suffers from inadequate and low reactive capacity to normal and abnormal stimuli. Up to a point stimulation is beneficial but, even so, the reactive capacity is diminished as compared with that of subjects in perfect health, and, if stimulation be carried to a point just beyond the narrowed limits of reserve force, depression of vita energies rapidly ensue. The whole matter resolves itself into cellular, lymphatic, capillary, and endocrine balance.

For diagnosis and prognosis it is necessary (1) to differentiate the case capable of reacting to stimuli from that which is incapable, and (2) in the former case to assess the degree of reactive capacity. This may be done by hypodermic injection of 1 c.cm. of 1 in 1000 adrenalin solution. Pressures are recorded at the end of each five minutes for four consecutive readings. Such a series of observations shows that, whilst in some people after injection the pressure levels rise, in others there is little or no change.

Clinically, low pressure subjects tend to poor bodily build; they are thin and pallid, with narrow chests, low diaphragms, and small elongated hearts. Length predominates over breadth. Through errors of assimilation they are deficient in calcium and other vital salts. Hence they are prone to respiratory diseases. At school unstable and unsatisfactory they do little that is worth while. Mental response is slow, although given sufficient time a correct answer may be elicited. In games they are usually ineffective, and though able to sprint 100 yards, they cannot last a 220 yards' race, nor keep up with their fellows in long-distance runs. Lethargic and easily fatigued, the capacity for sustained interest is lacking, and they soon become bored. Notwithstanding a poor youth, as life goes on these subjects tend to improve, and, though during childhood and adolescence frequently requiring medical attention, seldom need a doctor after 50, and often live to a ripe old age. Tardy in development and sluggish in habit, they are static rather than dynamic, taking long in their profession or business to make good, but in later life are often found to have shot far ahead of their high pressure competitors, who in early days carried all before them in work and sports. The last stages of these high pressure people are worse than the first, whereas low pressure subjects, having fought through their initial disabilities, from the standpoint of longevity are welcomed by life assurance companies. Naturally there are exceptions to the rule, hypopiesis being at times encountered in those of sthenic habitus, but, even in these, careful investigation often reveals evidences of narrowed reserve capacity. The basic proposition that hypopiesis is invariably an expression of low vital capacity based on inherent or acquired nutritional defects has proved a stumbling-block to those who cite the performances of certain athletes in support of their contention that low arterial pressure is compatible with well-sustained effort such as long-distance running. If one analyses these cases, however, one finds that the majority do not belong to the class of absolute hypopiesis with systolic pressure below 110 mm. to which my law refers, but are in reality instances of relatively low arterial pressures ranging above 110.

Control of Low Pressure.

Touching control, low pressure cases fall into three groups:—

1. Those who require no treatment. The acquired class including many athletes who present no symptoms, and in whom the diagnosis is made solely by the sphygmomanometer, fall into this group, as well as those apparently fit for all ordinary affairs of life, and particularly for those above 50 in whom low pressures are often salutary.

2. Those in whom treatment is usually ineffective. With increasing knowledge this group becomes smaller. It includes diatheses, such as status lymphaticus, infantilism, myasthenia gravis, adiposis dolorosa, &c., which appear to rest upon a basis of disordered

endocrine function. Certain of these may be relieved by hormone therapy.

3. Those in whom treatment is required:—

(*a*) *General Measures.*—Daily life should be so regulated as to conserve energy and to raise the standard of vitality. It is a mistake to try to raise pressures too rapidly. In the former case metabolic balance may be still further upset, whilst in the latter throbbing in the head, followed by irritability, may be induced. Seldom is it necessary, or even possible, to raise pressures to any great extent. Experience shows that a rise in pressure of only a few millimetres makes all the difference between comfort and discomfort. One should be content gradually to raise pressures to and maintain them at a level which appears to be the optimum, checking results by readings at regular intervals. Diet should be nourishing, balanced, and easily assimilable. A sufficiency of vitamins should be ensured. In addition to ordinary drinks, a pint of water for each 5 st. of body-weight should be taken daily. As a general rule alcohol is best avoided, but in cases of gastric neurasthenia, or anorexia due to mental or physical exhaustion, a little stimulant with meals tends to restore vital balance. For exhaustion bed is indicated, followed by rest after the chief meals, and by early hours. Exercise should never be persisted in till breathlessness, palpitation, or other symptoms supervene. Horse-riding and dancing, within moderate limits, by sending up arterial pressure to more standard levels, act as beneficial stimuli. Excessive exertion depletes vitality and drops pressures to levels of discomfort. Graduated exercises, at first on the level and later on prescribed gradients, favour oxidation and counteract respiratory deficiency. These objects are also furthered by physical exercises of stretching and bending, in combination with deep breathing. For most hypopietics who live in cold, damp, and changeable climates holidays and sunshine are beneficial. The craving for sunshine is often greater than that for food.

(*b*) *Special Measures.*—Relaxation, passive movements, massage with graduated resistance exercises, ultra-violet radiation, static electricity, oxygen foam baths or injections, and hydro- and balneo-therapy all have their appropriate uses. In the majority of cases of hypopiesis endocrine dysfunction is present. Thyroid gland should not be given in too large doses, otherwise further instability may be added. It should be combined with other glands in accordance with definite indications. Next in importance comes the pituitary. Whole gland, in doses up to two grains, thrice daily is given until slight throbbing in the head or palpitation point to the limit of tolerance. Thereupon the dose should be reduced by half, continued for several weeks in accordance with pressure readings. A convenient method of giving posterior pituitary is by an intranasal spray. As pitrescin it may be given hypodermically. Whole gland pituitary and suprarenal when administered by mouth are best prescribed with a coating so as to render these glands insoluble in the gastric juice. Pure suprarenal crystalline substance (tab. supramedulla) is active by mouth, and may be given in dosage of gr. 1/1000 up to gr. 1/100 twice daily. Pluriglandular syndromes may originate in disorders of the gonads, but up to now I have found no testicular or ovarian preparation to fulfil its promise. Most parathyroid preparations by mouth are inert, parathormone hypodermically or intramuscularly being the only one that yields appreciable results. As regards drugs, ephedrine is one of the most generally useful. It possesses low toxicity and stimulate cardiac action, at the same time increasing basal metabolism and urinary output. The usual dose is gr. ½ in tablet form by mouth, or hypodermically if more rapid action is desired. For emergencies, cardiazol or coramine are serviceable. In cardiac failure, nothing equals standardised preparations of digitalis in sufficient amount. Similarly with auricular fibrillation, quinidine being also useful in certain of the more chronic forms if cautiously administered.

In acute infections low arterial pressure is brought about by a combination of vasomotor paresis with myocardial weakness and hormonic depletion. Treatment should be directed to whichever of these factors is in the ascendant. After diphtheria, influenza, and pneumonia it is essential that during convalescence the heart shall be given prolonged rest. For rheumatic fever rest must be continued for three months or even longer, otherwise a state of permanent low pressure may be entered upon.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Continued from p. 774.)

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY.

PHYSIOLOGICAL TESTS OF RENAL FUNCTION.

Prof. H. S. RAPER (Manchester) being in the chair, Prof. E. B. VERNEY (London) opened the discussion by defining tests of renal function as observations of the response of the kidney to stimuli superimposed upon that which it is already receiving, and interpreted in terms of renal reserve. Renal reserves, he said, were *structural*, in that there was a large excess of renal tissue over and above that which was competent to carry on the excretory work during resting metabolism, and *functional*, represented by an inherent and variable capacity for the performance of increased work. He briefly reviewed the work of A. N. Richards and his colleagues which so clearly establishes the existence of these reserves, which, he held, constituted a first line of defence against the inroads of disease. First, as the work demanded of the kidney increased more units (glomeruli plus tubules) would become active and the rest pauses would be diminished. As the work demanded of each unit increased further its commencing failure would be reflected in changes in the composition of its secretion, a change exhibiting an approach towards the composition of blood plasma, such as is seen in the polyuria of chronic nephritics. This change in composition indicates a drain on functional, as against merely structural, reserves, and is probably initiated by a change in the glomerular capillary pressure.

An analogy was here suggested, said Prof. Verney, with the work of the heart as observed in the Starling heart-lung preparation, and he went on to develop the comparison between right auricular and glomerular capillary pressures. In the kidney, however, the work is osmotic in character, and to all intents a kidney engaged in producing a urine having the same composition as the protein-free filtrate of the blood plasma is doing no work; failure is complete. As Rose Bradford had demonstrated, a diminution in the amount of kidney substance led to an increase in the urine production of the remaining tissue. Similarly, a diminution in the anatomical reserves of the kidney was partially or completely compensated by an encroachment upon its functional reserves. Further guidance in the interpretation of a case was afforded by the facts that the excretion of urea and the substances eliminated by a similar mechanism was dependent mainly upon the *amount* of kidney substance, that of chloride mainly upon the *rate* of urine flow.

In renal failure there were theoretically three types to be considered: (1) that due to a severe diminution in the number of renal units; (2) that due to a fall in the magnitude of the pressure stimulus; and (3) that due to impairment in the tone of the secretory units, and possibly there was a clinical parallel to all three of these, or all might be involved together. Caffeine had been shown to affect the number of effective glomeruli and the pressure stimulus, and much might be learnt from the response to its exhibition under controlled conditions. The surest indication of renal function would, he concluded, be given by administering urea or some such substances as phenol red, and comparing the elimination in a given time at any given concentration in the blood plasma with that of the normal. Any assessment of renal reserve was, however, fraught with difficulty.

Discussion.

Sir WILLIAM WILLCOX (London) said he regarded the information given by blood-urea determinations as most useful, especially in colon bacillus infections, and in chloroform and alcohol nephritis, but we must remember that the blood-urea concentration might be high without serious import. The indigo-carmine test was useful, but he did not use phenol-sulphone-phthalein as he had found that its excretion might be identical with that in the normal subject in a patient at the very onset of uræmia. Observations on the rate and concentration of chloride excreted were of great value. He had found caffeine citrate useful for a short time only, a few days at the most. There was no doubt, though it was liable to be overlooked, that uræmia might be purely cardiac in origin instead of being due to damaged kidneys.

Prof. E. C. DODDS (London) said that in assessing the value of a test we must ask ourselves to what aspect of kidney function the test was directed. The tests were of value in estimating the extent of the lesions in chronic nephritis, with or without œdema, in albuminuria prior to the administration of an anæsthetic, and in renal dwarfism. He recommended the estimation in the blood of urea, non-protein-nitrogen, cholesterol, and total protein, these last two being especially helpful in the œdematous type of nephritis. Patients with low cholesterol and total protein responded well to a high protein diet. As an aid to prognosis in cases of uræmia he recommended the estimation of blood calcium and phosphorus. He would like to emphasise his view that the mere estimation of blood-urea was liable to lead to a fallacy, if a look out was not kept for dehydration, which alone might account for a blood-urea of over 100 mg. per 100 c.cm. An estimation of the total solids of the blood in such a case might show a rise from 20 to 28 per cent. As regards urine analysis, if the urea reached 2 per cent. or over gross renal changes might be regarded as excluded.

Prof. J. SHAW DUNN (Manchester) described the results of his observations on animals, both normal and diseased. He had so far failed to produce experimentally the equivalent of human nephritis. In man the damage was usually glomerular at first, in animals there was a tubular necrosis affecting urea excretion, but water and chloride excretion was not affected till later, with the onset of œdema. He had repeated Frankson's work on urea excretion, urea being given by the mouth, and was able thus to induce the non-drinking rabbit to become a water-drinker for the elimination of the urea. In animals with nephritis urea by the mouth caused a large rise in blood-urea when on a dry diet, but no rise in urinary urea, and it was clear that the rise in blood-urea was greater than could be accounted for, as Prof. Dodds had suggested, purely by a concentration of the blood. He would like to stress the importance of free water-supplies for the excretion of urea, and the value of dry diet as a test of urea excretion.

Mr. H. D. KAY said that a simple and conclusive test, devoid of ill-effects on the patient, was still to found, but that the glycerophosphate test, which had now been tested on 70 cases at the London Hospital, had definite advantages over the urea-concentration and phenol-sulphone-phthalein tests. The principle of the test lay in the estimation of the excess phosphate excretion after the administration of sodium β-glycerophosphate, a chemically pure substance which was cheap and easily obtainable, harmless, and sterilisable. The routine of the test was as follows: At 8 A.M. the bladder is emptied, 400 c.cm. of water or weak tea is taken, and at 9.30 A.M. 10 c.cm. of a sterile 8 per cent. aqueous solution of the drug, corresponding to 550 mg. of phosphate, is given intravenously. The urine is taken in an hour, and its phosphates estimated after precipitating the proteins. The excess of phosphate may vary from nil (in chronic nephritis) to 250 mg. or more. After a solution had been prepared only two urinary analyses were required, and these could be satisfactorily performed by any sensible laboratory attendant. There was no decomposition of the substance to be estimated if the analysis could not be done at once, and the test was independent of the volume passed and unaffected by urinary pigment or blood. Their results so far had been as follows:—

1. A normal subject excretes at least 150 mg.
2. If there be less there is renal involvement, which varies inversely as the amount excreted.
3. The test compares favourably with any other test as regards the correspondence of its finding with the whole clinical picture.

Mr. J. B. MACALPINE (Manchester) spoke as a genito-urinary surgeon who was using these tests constantly. Estimation of the blood-urea, he found, brought precision to his knowledge, and was a great help as a supplement to the clinical picture. He regarded the tests as widening the rungs of the uræmic ladder; for example, before a prostatectomy he carried out bladder drainage until the blood-urea fell below the 40 mg. level. Sometimes the drainage provoked a profuse polyuria. He had got over 200 ounces from one case within 12 hours. This polyuria, when extreme, was an unfavourable omen, tending to end with a fatal anuria. As regards tests of the separate function of the kidneys this was a cystoscopic problem, and he liked the indigo-carmine test because it was simple, quick, and avoided ureteral catheterisation. He was unwilling, where it was avoidable, to catheterise a possibly aseptic kidney through a septic bladder, and he was not a strong believer in the quantitative value of the urea-concentration and phenol-sulphone-phthalein tests because he had satisfied himself that urine escaped around the average ureteral catheter. Mr. Macalpine also dealt with the problems of hypertrophy and the great value of pyelography, especially in stone, and particularly where a stone was seen on one side and the other kidney seemed to be inactive.

Dr. F. H. SMIRK (Manchester) described the effects on the normal and the nephritic of the administration of water, urea, and caffeine by the mouth. In the nephritic the loss of water was slow and delayed, and, after urea, the urinary urea concentration might even fall. After urea the sodium chloride excretion rises in the normal but not in the nephritic, and of 22 normals examined 18 had above 0·8 per cent. sodium chloride, while of 60 nephritics only 4 had above 0·8 per cent. He had tried giving grs. 5 of caffeine by mouth as a routine test, and found this increased the chloride excretion out of all proportion to the other constituents. The urea increase was less marked. Caffeine caused a greater rise in chlorides than urea did.

Prof. E. P. POULTON (London) took Prof. Verney to task for not developing, from his extremely valuable observations on kidney function, a physiological theory of Bright's disease. To the glomerular filtrate, which could be increased by caffeine, the tubule added urea and subtracted chloride and (at a more distal point) water. Bright's disease was primarily due to impervious glomeruli. He did not approve of Calvert's test, and thought that half the value of the urea-concentration test was lost if the total excretion was not considered as well as the concentration.

Mr. J. SWIFT JOLY (London) thought that, from the surgeon's point of view, an excretion of 1 gramme of urea per hour was satisfactory. He agreed with Prof. Poulton that for this water was necessary.

Reply.

Prof. VERNEY said there was so much disagreement as to the precise location of the functions of the kidney in the organ itself that he preferred not to dissociate entirely glomerulus and tubule. He had been very pleased to hear of the use of the caffeine test by Dr. Smirk, and was full of admiration for Mr. Kay's contribution to the discussion.

SECTION OF PUBLIC HEALTH.

HUMAN TUBERCULOSIS OF BOVINE ORIGIN.

Dr. W. G. SAVAGE (M.O.H., Somerset), in opening the discussion, estimated the human deaths caused annually by the bovine tubercle bacillus at 2000 to 2300. Most of them were the deaths of children, and we had no knowledge as to how many non-fatal infections occurred. As to the extent of bovine tuberculosis among cattle in this country, he thought that about 40 per cent. of the cows were infected; that about 1 per cent. of the cows were "open" cases; and that about 0·3 per cent. had tuberculosis of the udder. He passed on to consider methods for the reduction of the prevalence of tuberculosis in cattle under five heads:—

(1) *Elimination of all tuberculous cattle*—viz., by the destruction of reactors. This could be done successfully in small areas—e.g., the Channel Islands. It was the official plan in the U.S.A., where 207,830 tuberculous cattle were slaughtered in 1927. The average percentage of reactors in the U.S.A. was only 8·3, and it would be impracticable in England with more than ten times that percentage of reactors to adopt the elimination plan.

(2) *Building up of herds free from tuberculosis.*—The procedure advocated by Prof. Bang was theoretically easy, but there were many administrative difficulties, and the method even in Denmark had not made the progress that was expected. The same principle had been followed in England with regard to Certified and Grade A (T.T.) milks, but the increase in the number of herds, which produced these two designated milks, had been slow. At the end of September, 1928, there were only 152 Certified and 207 Grade A (T.T.) milk producers—an entirely insignificant proportion of the whole. In Somerset, with at least 7300 producers, there were only 11 producers of these two types of milk at the end of 1928. This method could not, therefore, be regarded as a practical solution of our problem.

(3) *Elimination of particular classes of tuberculous cows.*—Theoretically we could reduce the infection among bovines and the risk to humans if we eliminated all infectious cows. In fact, however, partly from administrative but mainly from scientific difficulties these animals were not removed from the herds as soon as they became "open" cases, but only after they had done most of the harm they were capable of doing. The discovery of the infectious cases was not being followed up by a systematic examination of the other animals, and the cases of tuberculosis of the udder were not being detected until after the milk-supply had been affected for long periods. Systematic veterinary inspection was being urged as a means for the reduction of the amount of bovine tuberculosis. The first difficulty was that the ablest veterinary inspector could not detect infectious animals in their early stages, and the second difficulty was that financial considerations severely limited the frequency of inspection. The third difficulty was: Would the removal of some of the infection in the case of physiologically overlooked cows play any decisive part in reducing the amount of bovine tuberculosis? The figures available from places where routine inspection has been in vogue for years did not show any such reduction. He estimated the cost of an adequate system of veterinary inspection at about £300,000 a year, and was of opinion that veterinary inspection must stand or fall on its merits as a means of reducing bovine tuberculosis. The onus was on their veterinary friends to demonstrate that veterinary inspection could bring about such a reduction. If it could, it was a true preventive measure and worth the price.

(4) *Measures directly aimed at reducing the amount of tubercle bacilli in milk.*—When milk was found to contain tubercle bacilli, it was feasible in something like 60 per cent. of the cases to find an infective animal and eliminate her, but only an insignificant proportion of the milk-supply was tested for tubercle bacilli, and after the expenditure of public money in searching out the cow with the tuberculous udder the farmer was in no way penalised, but, on the contrary, received compensation for the cow. Pasteurisation of the milk-supply would probably largely eliminate the dangers of tuberculous milk. Its adoption would be a confession of failure, and the acceptance of the second-best.

(5) *Immunisation of cows against tuberculosis.*—Calmette's vaccine was on trial, and should be very fully tested, but the latest results were not very favourable.

After considering the various remedies advocated, Dr. Savage went on to summarise his suggestions. Routine veterinary inspection as a thing by itself he considered was not worth doing, but it occupied quite a different place as part of a comprehensive attack on bovine tuberculosis. The cow should be kept under much more open-air conditions. A more active educational campaign must be undertaken. Part of the onus of preventing the spread of infection must be put on the cow-keeper. Feeding problems and other factors likely to affect tuberculosis must be carefully considered. In such a comprehensive scheme immunisation experiments, the formation of tubercle, free herds, the operation of a modified Tuberculosis Order, and the routine veterinary inspection of cows will all find a place. If the agricultural community was not prepared to coöperate actively in the schemes of the State, and of local authorities for reducing the incidence of bovine tuberculosis, pasteurisation seemed less of an evil than "the present tinkering procedures." He himself, however, favoured the adoption of a comprehensive scheme such as he had indicated.

Discussion.

Colonel J. W. BRITTLEBANK (Chief Veterinary Officer, Manchester) thought that Dr. Savage was unduly pessimistic. He estimated the loss to agriculture through bovine tuberculosis at £1,000,000 annually. He thought something had been done to reduce the incidence of tuberculosis by veterinary inspection in Manchester from 1904 onwards. The West Riding, Cumberland, and Durham had all adopted veterinary inspection, and such schemes should not be limited to inspection, but include feeding, housing, management, &c.

Mr. A. GOFTON, M.R.C.V.S. (Edinburgh), thought Dr. Savage's figures of the incidence of bovine tuberculosis were too low, and that the percentage of cows with tuberculous udders in Edinburgh was nearer 0·5 than 0·3. The designated milk scheme had made a great appeal to the agricultural community, and the safe milk in question, in both Edinburgh and Glasgow, very largely went to the children who were most at risk. He regarded the Tuberculosis Order as purely a public health measure, and he believed that the Order and veterinary inspection had been instrumental in bringing about a reduction in the incidence of tuberculosis among Edinburgh children.

Dr. F. H. MORISON (M.O.H., Cumberland) thought that 5 per cent. of the cows had diagnosable tuberculosis. He referred to the dope use of tuberculine, and to the difficulty in maintaining herds free from tuberculosis. He had found Certified milk highly infected with tubercle bacilli. The graded milks were a failure, and pasteurisation was only doubtfully safe. He believed that milk dried by the roller process was the best solution, and he looked forward to the establishment of milk-drying factories throughout the country.

Dr. T. EUSTACE HILL (M.O.H., Co. Durham) said that his county had just appointed a chief veterinary surgeon and four whole-time assistants. They would both inspect the cattle and preach sanitation. He anticipated an enormous improvement in the sanitation of the cow-sheds as a result. When milk samples were found to be tuberculous they usually succeeded in finding the offending cow. They had found the direct microscopical test quite useful in saving the delay incidental to the biological test.

Dr. MIDDLETON MARTIN (M.O.H., Gloucestershire) said that their cattle were examined every half year by part-time veterinary surgeons, but that they seemed to get the same percentage of emaciation, &c., at each inspection.

Dr. VEITCH CLARK (Manchester) stated that they had succeeded in maintaining a tubercle-free herd for supplying the local hospitals.

Reply.

Dr. SAVAGE remarked that Colonel Brittlebank had not answered his question as to the resistance to infection of a physiologically overworked cow. If inspection was to be adopted it must be thoroughly done, and at least every quarter, and, of course, if the cows were out at grass, it was the farmer's business to bring them in for the inspection.

SECTION OF ANÆSTHETICS.

SPINAL ANÆSTHESIA WITH SPINOCAIN.

Dr. GEORGE P. PITKIN (New Jersey, U.S.A.) gave an account of the experimental work done by himself and his co-workers in producing what he claims to be a controllable spinal anæsthetic. They set out, he said, to produce a spinal anæsthetic that would minimise toxic reactions, be certain in effect, constant in duration, act in direct ratio to the amount of anæsthetic agent injected, and be without effect on the heart action, vascular tension, and respiratory function. The chief factor in the control of a spinal anæsthetic being to prevent its diffusion in the subarachnoid space, they had tried to find a substance which would prevent this diffusion until the anæsthetic had been absorbed. They had evolved what, for the lack of a better name, was called amyloprolamin; it was derived from gliadin, the mucilaginous content of wheat starch. They had also determined the capacity of the dural sac at various heights in adults and in children of different ages. Novocain was chosen from the other drugs used in spinal anæsthetics as giving a complete anæsthesia of the sensory nerves, affecting the tactile and muscular sensation only slightly, not increasing the cell count of the spinal fluid, and not raising the intradural pressure. Faulty technique was responsible for the production of hypotonic headaches, which were more often seen when the puncture was made with the patient sitting up, owing to the greater amount of spinal fluid lost. To prevent extensive trauma of the dura the use of needles of small gauge with a short bevel was advisable. As a result of these experiments and reports on over a thousand inductions they were now justified in asserting that spinocain was controllable within the dural sac. This method of producing spinal anæsthesia had been developed as a protection to the surgeon, owing to the difficulty of procuring expert anæsthetists, the large proportion of anæsthetics in the United States being given by nurses who were merely technicians. He considered it important that the technique of giving spinocain should be in expert hands. Dr. Pitkin concluded by showing on the screen the essential points of his method.

Dr. FRANK A. KELLY (Detroit) limited himself to the clinical aspects of controllable anæsthesia. He said that Dr. Pitkin's technique had negatived all previous objections to spinal anæsthetics. The transitory nature of the anæsthetic had been corrected by the addition of a mucilaginous substance, the height and extent of the anæsthesia was controlled by the tilting of the table, the depression in blood pressure—so often a serious objection in the past—was prevented by the preoperative injection of ephedrine. Another safety factor of great importance was the use of the lighter gravity solution, for if a serious fall in blood pressure occurred the head of the table could be lowered so as to prevent cerebral anæmia. What they called low anæsthesia was a true sacral or caudal anæsthesia where only the perineum, vagina, and rectum were involved, together with the saddle area on the inner side of the thigh. In order to obtain this, one-half of an ampoule of spinocain was injected at the fourth lumbar interspace, and the patient immediately tipped into at least a 15° Trendelenburg position, the degree being reckoned by Dr. Pitkin's tiltometer. What they called high anæsthesia extended to the costal arch, and was obtained by injecting the anæsthetising agent into the first lumbar interspace and mixing it with 6 c.cm. of spinal fluid: when this anæsthesia extended to the costal arch it was considered complete, and the patient was placed in the Trendelenburg position to stop the upward extension. His experience in doing very high abdominal work was that if the anæsthesia was carried to a level high enough to allow the operation to be completed without difficulty, some patients complained of difficulty in breathing and a feeling of weakness. It was therefore his practice to limit the spinal anæsthetic, and to supplement it with an intercostal block of the eighth, ninth, tenth, and eleventh costal nerves at the angle. Ephedrine before the spinal injection prevented any fall in blood pressure; the drug, given intramuscularly or subcutaneously, acted as rapidly as when it was given intravenously, in contrast to adrenalin which, in skin or muscle, caused a local ischæmia, but was quickly absorbed intravenously, though its action was transitory. In a cinema demonstration Dr. Kelly showed points of technique, including a common fault in the position of the patient, resulting in a "corkscrew spine." He demonstrated the presence of peristaltic action during an abdominal operation under spinal anæsthesia, and explained it by the unopposed action of the sympathetic and vagal nerves, due to the blocking of the vasomotor nerves. Barbital, he said, was regarded as an antidote to novocain poisoning, but he had never had occasion to use it.

Dr. E. FALKNER HILL (Manchester) agreed that Dr. Pitkin's method did away with previous objections to spinal anæsthesia. From his own experience of the method, however, he was inclined to think that there was some fall in blood pressure due to operative procedure, but this was not a bad thing for the patient. He gave illustrations from bad surgical risk cases in some of which he had given chloroform and ether as well. He did not think that strychnine should be included in the anæsthetic solution, as it increased the irritability of the spinal canal.

Dr. A. L. FLEMING (Bristol) said he hoped Dr. Pitkin and Dr. Kelly might come to give their patients the benefit of inhalation anæsthetic as well. Peristalsis, he thought, was not always inhibited under an inhalation anæsthetic; he had seen it on one or two occasions.

Dr. K. B. PINSON (Manchester) gave his experience of stovaine and novocain anæsthesia; he had had only 55 per cent. of complete success on all counts, from the point of view of patient, operation, and recovery. He was much struck by the absence of shock with this method. He considered that 45 per cent. of failures made the use of spinocain something of an experiment; they might have been due to the human response to novocain. An improvement in the solution might obviate the difficulties.

Dr. W. SALISBURY (Northampton) narrated his success with stovaine and glucose in shock-producing operations. He always used the heavy solution, and attributed his success to attention to small points of technique.

Dr. DONALD said he had had a happy experience of spinocain in some cases; his six partial failures were all in young virile men with acute appendicitis. He thought that women and patients with lowered resistance did better under spinocain. He found it difficult to decide whether the good effects he noted were due to the spinocain or ephedrine.

Dr. E. A. **Gerrard** (Manchester) gave an account of the use of spinocain in obstetrical work, noting the ease with which the cervix dilated, the extreme relaxation of the perineum, and the delight of the patient. The parturient woman could bear down better, because the pressure of the head on the perineum was not too painful. For instrumental delivery he advised that the anæsthetic should be carried higher than the sacral or caudal type; pituitrin should in any case be used with care.

Demonstrations.

Dr. G. A. **Schwartz** (New York) gave a demonstration of the apparatus used in intratracheal anæsthesia and resuscitation by the Flagg method. He showed on the screen the intubation of the larynx by a flexible catheter, and a simple method of maintaining the anæsthesia by fixing a tube connected with the catheter to a can of ether. He also demonstrated on the screen the resuscitation of a new-born child with oxygen and carbon dioxide through a pharyngeal tube.

Dr. F. L. **Richardson** (Boston, U.S.A.) gave a cinema demonstration on the teaching of anæsthetics. The student, he said, should be taught to give one or two drugs well; it was not possible to teach everything by the film, but important points could be brought out by slowing down the projection. The demonstration included the administration of spinocain and ether vapour.

Avertin.

Dr. G. **Edwards** (London) read a paper on the use of avertin or tri-brom-ethyl-alcohol, a white crystalline solid, soluble in water to the extent of 3½ per cent. at body temperature. Introduced in solution into the rectum it was readily absorbed, appearing in the urine in combination with glycuronic acid. Avertin was a basal narcotic; once a patient was under its influence only a very small quantity of inhalation anæsthetic was required to make the anæsthesia complete. The anæsthetic could be given in the ward without fuss, induction was gradual, and though the narcosis had been light there was no memory of anything unpleasant. Avertin was of particular value in dealing with highly nervous patients, with cases of Graves's disease, and with children. Avertin was contra-indicated in ulcerated conditions of the rectum and colon, in the presence of severe renal and hepatic disease, acidosis, and serious blood diseases. On the other hand, cases of hyperthyroidism tolerated massive doses of avertin and could eliminate them quickly. The fall in blood pressure was usually within the limits of that observed in deep sleep, between 10 and 30 mm. Hg. The respiratory centre was depressed, and a slight cyanosis was usually observed, more particularly after a preliminary dose of morphia. Marked cyanosis did not occur if the dose had not exceeded 0·1 g. per kilo of body-weight, and the airway was kept clear. Anæsthesia took 20–30 minutes to reach completion, the ocular reflexes disappeared in the usual way, and a skin reflex might remain. A sudden blast of strong ether vapour might produce a cough—a useful preliminary test to determine how much inhalation anæsthetic would be needed. The actual administration was simple; some observers thought it good to give a sedative overnight. The usual duration of narcosis was 1½–2 hours from the time of injection; about four hours from the start the patient was usually quite conscious. In only one case had he seen any trouble directly due to the avertin anæsthesia; in this case[1] the patient died 20 hours after the administration of a dose at the rate of 0·125 g. per kilo. Probably a deficiency of thyroid secretion had diminished the power of detoxicating and eliminating the drug. In delayed return to consciousness the respiration might be stimulated by injection of lobeline or inhaling carbon dioxide and oxygen, the circulation by injections of ephedrine.

Dr. E. F. **Hill** (Manchester) suggested that avertin, combined with spinal anæsthesia, would be an ideal anæsthetic.

Dr. H. P. **Fairlie** (Glasgow) described a case in which the patient did not respond well to avertin, but with gas-oxygen the operation went off well. The trouble with avertin began six hours after operation, when there was intense rectal irritation with diarrhœa and passage of mucus. He considered the death-rate with this method was unduly high.

Reviews and Notices of Books.

PHYSIOLOGY.

Bainbridge and Menzies' Essentials of Physiology. Sixth edition. Edited by H. **Hartridge**, M.A., M.D., Sc.D., F.R.S., Professor of Physiology, University of London. London: Longmans, Green and Co. 1929. Pp. 497. 14*s.*

Elements of Physiology. By E. G. **Martin**, Ph.D., Professor of Physiology, Stanford University, California; and F. W. **Weymouth**, Ph.D., Associate Professor of Physiology in the University. Philadelphia: Lea and Febiger. Pp. 784.

The sixth edition of Bainbridge and Menzies' "Essentials of Physiology" has been revised and brought up to date by Prof. Hartridge. The book retains its original character—that is, it gives in a clear, dogmatic manner a brief but adequate account of human physiology. Certain sections are perhaps too brief—for example, the section on reproduction. Prof. Hartridge has, however, found space to mention a great deal of new work without materially increasing the size of the book. The new chapters on exercise and work, and on the nervous system are excellent—the diagrams in the latter being particularly good. Unfortunately, a few mistakes have been allowed to creep in—for example, on p. 495 we read that "Parkes and his co-workers have extracted from ovarian tissue a substance 'œstrin' which causes menstruation when injected into the blood," whereas, of course, it does not. The use in the index of thick type for the principal subdivisions under each letter facilitates quick reference to any subject.

Dr. Martin and his colleague have written their book with the object of expressing a point of view rather than that of teaching examination students. They explain in their preface that they have tried to present the subject of physiology "by development of two key-principles." The first consists in the application of physico-chemical laws to physiological processes, and the second is that "every protoplasmic cell is inherently a self-sustaining system." The book is divided into four chief sections, the first two of which contain material usually found in works on general physiology. It is written with little regard for economy of words; moreover, these tend to be arranged in sequences which seem strange to English readers. The second section of the book deals more systematically with human physiology. It is, however, very unequal, and the arrangement makes it difficult to read. For example, the section on the respiratory system does not mention hæmoglobin—for that we must turn to the earlier section on general physiology; in the section on digestion, the pancreas is discussed without mention of insulin, and here, too, we must refer back to the earlier section for complete information. Great prominence is given to the special senses, at the expense of other subjects; the section on the special senses contains 216 pages, that on the central nervous system only 45. From these examples it will be seen that the "key-principles" have not enabled the authors to give us a very clear general view of physiology.

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[1] See The Lancet, 1929, i., 1365.

RECENT ADVANCES IN SURGERY.

Second edition. By W. H. OGILVIE, M.A., M.D., M.Ch. Oxon., F.R.C.S., Assistant Surgeon, Guy's Hospital; Surgeon to Out-patients, Hampstead General Hospital. London: J. and A. Churchill. 1929. Pp. 495. 15*s.*

THE revision of this useful book has been well done, and the reader who depends upon one manual to keep him abreast of surgical thought will find that the author has not failed to record any of the important advances in surgical science since the first edition was published. Even more assiduous readers of surgical literature will be grateful for the admirable summaries of various topics of interest here set out. The book is more than a record of new surgical methods, good or bad; it is a discriminating account of what has happened in recent years and well deserves its title. Its compilation must have been difficult. Certain omissions and occasional evidence of reluctance on the part of the author to give adequate prominence to views or methods which he regards unfavourably are not wanting. But generally he has shown wise judgment both in his selection of material and in the manner of its presentation.

TREATMENT OF RHEUMATOID ARTHRITIS.

By A. H. DOUTHWAITE, M.D., F.R.C.P. Lond., Assistant Physician, Guy's Hospital; Honorary Physician, All Saints' Hospital. London: H. K. Lewis and Co., Ltd. 1929. Pp. 80. 6*s.*

PRACTITIONERS will find this an interesting and useful book. The author skilfully avoids the dogma of any extreme school of thought and sets out the known facts of an obscure subject with clarity. On the question of focal sepsis he is eminently sane, and in dealing with treatment he has not overlooked the need for practical advice on such subjects as climate and the correction of deformities. These are of great importance but are often neglected when the treatment of rheumatoid arthritis is being considered. On the endocrine factor and on metabolic features of the disease his views would invite comment in another connexion, but the interest of these matters is too academic to justify criticism of a book which is essentially practical.

GYNÆCOLOGY.

By LYNN LYLE FULKERSON, A.B., M.D., F.A.C.S., Instructor in Obstetrics and Gynæcology, Cornell University Medical School. Philadelphia: P. Blakiston's Son and Co. 1929. Pp. 842.

THE scope of gynæcology in America extends to the urinary system, the lower bowel, and the lower abdomen generally, and the impression given by this book is that gynæcology as we know it is to be correlated with diseases of the urinary tract and rectum rather than with the physiology and pathology of parturition. This attitude finds no favour in this country, but that will not prevent this work, which includes operations on the intestines and abdominal wall, from finding interested readers among general as well as gynæcological surgeons. The systematic teaching given by Dr. Fulkerson is clear and up to date, and many erroneous statements which make their wearisome appearance in successive editions of well-known books are corrected. For example, chronic endometritis is correctly described as a rare disease. In America radium has entirely replaced operation in the treatment of carcinoma of the cervix, and the radical operation is considered to be so obsolete that it is not even described here. On the other hand, some of the operations advised are seldom, if ever, performed in this country, particularly the exploration of the pelvis through the anterior and posterior fornices of the vagina.

Rather less than half the book is devoted to operative surgery. A good deal of space is wasted on the author's methods of sterilisation and theatre management. Many useful points are to be gleaned from the operations for displacement and prolapse of the genital tract which include George Gray Ward's technique for prolapse of the pouch of Douglas and rectocele. The author seems to like ligaturing pedicles by means of continuous sutures. A method of performing hysterectomy in which not only are all the vessels ligatured by one continuous suture, but the pelvic peritoneum is closed by the same suture, seems on paper to be a risky procedure. Myomectomy through the anterior fornix is not likely to be practised by British gynæcologists; it appears to have every disadvantage and no advantage over addominal myomectomy. There are over 600 illustrations in this book and they are exceptionally clear and apt.

THE STUDY OF PHYSIC.

An Introduction to the Study of Physic. By WILLIAM HEBERDEN. Prefatory essay by LEROY CRUMMER. New York: Paul B. Hoeber; London: Humphrey Milford, Oxford University Press. 1929. Pp. 159. 10*s.* 6*d.*

DR. Crummer here prints, for the first time in book form, the manuscript of the elder Heberden's introduction to the study of physic and gives a reprint of the same author's classical account of angina pectoris—the whole being a reprint, with additions and corrections, from "Annals of Medical History" (Vol. X., Nos. 3 and 4, 1928). The author was lucky enough to discover in a second-hand London bookshop three manuscript volumes, one of which was the introduction to the study of physic in Heberden's holograph, and with his signature at the end of the preface. Comparisons with known Heberden manuscript at the Royal College of Physicians of London made it quite clear that this is a genuine Heberden item, and while congratulating the author on his good fortune, we may thank him sincerely for giving us the contents of a book by a very celebrated English physician, about whom we have always wished to know more. Heberden appears to have written the book for the benefit of any of his children who might contemplate taking up the study of medicine. It contains much shrewd advice as to what books to read and what practical studies are to be undertaken. Heberden's spelling is expressly preserved, but one or two odd mistakes have been overlooked in passing the essay through the press; Heberden was, we think, too good a classical scholar to have written "Demonsthanes" for Demosthenes, and there is a sad hash of Homer's description of Machaon on page 71. These slight blemishes do not detract from the value of this book as an addition to medical history. It is enriched with a fine representation of Beechey's portrait of Heberden, facsimiles of the preface to the book, and a letter from Heberden to William Hunter, the title page of the "Commentarii," and other illustrations.

ACUTE INFECTIOUS DISEASES.

Second edition. By JAY FRANK SCHAMBERG, A.B., M.D., Professor of Dermatology and Syphilology, University of Pennsylvania; and JOHN A. KOLMER, M.Sc., M.D., D.P.H., D.S.C., LL.D., Professor of Pathology and Bacteriology, University of Pennsylvania. London: Henry Kimpton. Pp. 888. 50*s.*

IN view of the mass of new knowledge accumulated during recent years on the acute infectious diseases this text-book has been thoroughly revised. Although a third of its bulk is devoted to the study of vaccination and small-pox, this volume deals minutely with the diagnosis and treatment and general care of practically all the infectious diseases met with in this country. One important omission is enteric fever, a disease which, though happily rare nowadays, is still worthy of a place in such a work as this. Many interesting tables and temperature charts are included, also 161 engravings and 27 full-page plates. All of these are excellent and lifelike; among them are pictures showing the old method adopted of holding a patient during the operation of intubation in laryngeal diphtheria. The writers themselves recommend a slightly different technique, with the patient lying down instead of sitting up in the nurse's arms. Their ideas on the feeding of intubation cases are very sound. The book is undoubtedly an excellent one and provides interesting reading. The authors quote much evidence obtained from America and from British sources in support of their opinion that small-pox is commonly spread by aerial convection. Some public health authorities in this country may agree with this view, but experts on infectious diseases are rightly sceptical on this subject. Evidence to be valid must include proof that rigid precautions have been taken to ensure that the infection could not have been transmitted through the staff of an institution. The chapters on diphtheria, scarlet fever, and measles have been largely rewritten in order to include an account of the extensive work which has been done, chiefly in America, on the treatment and prevention of these diseases. The Schick and Dick tests are clearly described, and the methods adopted—in the attempt to prevent other infectious diseases such as measles and chicken-pox—are carefully considered. The clinician will find this book useful, since the authors have made full use of the recent contributions to the literature of the subject—not only by American authorities but also by European ones—and have thoughtfully dotted the pages with many useful references.

SKIN.

Its Uses in Six Phases. By LEWIS E. HERTSLET, M.R.C.S. Eng., L.R.C.P. Lond. London: J. and A. Churchill. 1929. Pp. 206. 10*s.* 6*d.*

THIS book will gladden the hearts of the fresh-air and sunlight devotees, who from a handful of so-called cranks have in the past few years developed, the world over, into national armies whose ranks will yet engulf the faltering remnants of the overclad. It was written, the author claims (p. 107), without a headache. It is doubtful if the careful reader will so easily escape, for the information has been collected from no less than 106 essays and papers on a variety of dermatological, social, actinotherapeutic, hydrotherapeutic, and physiological subjects; all the authors receive their measure of thanks and acknowledgment in tabulated form. The skilful compounding of their statements has resulted in a veritable encyclopædia of the functions of the skin such as is contained in no single text-book hitherto published. To those with sufficient power of concentration the work will reveal new aspects of the subject. We trust it will find its way to the precincts of those who have the power to raise the blind and let in the sunshine on the commonwealth of peoples.

THE CASE OF MISS R.

By ALFRED ADLER. Translated by ELEANORE JANSEN and FRIEDRICH JANSEN, M.D. London: George Allen and Unwin, Ltd. 1929. Pp. 306. 12*s.* 6*d.*

THIS is an autobiography, beginning in childhood and leading up to the development of a compulsion neurosis soon after puberty, of a young woman. Her motives are an open book to Dr. Adler when elaborated in the light of his belief that the raison d'être of neurotic disease is the attainment of a goal by influencing the environment. The translators' preface explains that such is the way of all neuroses and psychoses, "for whose recognition and description, the theory, and for whose prophylaxis and treatment, the practice of individual psychology serves." Dr. Adler's views are marked by simplicity, in contrast to the difficulties of psycho-analytical theory, and appeal to the widespread feeling that the neuroses are nothing but unconscious malingering—an element admittedly so common that to handle it vigorously in Adler's way is often sound practice. Yet the reader, if he is familiar with cases in which symptoms are concealed by the patient and do not interfere with his task in life, may decide that Adler's individual psychology is not sufficiently individual, since neurotic symptoms can exist without the aim that he postulates as the foundation of their ætiology and the point of therapeutic attack. Except for more detailed anamnesis and explanation, Adler makes but little advance upon the medical use of morale and exhortation employed by Dejerine at the end of the last century; we can picture him using irony, severity, or kindness to urge the patient towards the renunciation of symptoms, and in this good work his certainty of belief in his own methods must give him an advantage denied to people of less confident temperament. His book will be useful to those who incline towards the methods of explanation and persuasion in the treatment of psychoneurotic disability.

A TEXT-BOOK OF MATERIA MEDICA.

Fifth edition. By HENRY G. GREENISH, D.-ès-Sc., F.I.C., F.L.S., Professor of Pharmacy to the Pharmaceutical Society of Great Britain and in the University of London. London: J. and A. Churchill. 1929. Pp. 561. 25*s.*

IN spite of the now half-forgotten depreciation of Huxley, materia medica has continued to occupy a place in medical study, and even to take on a new attraction as pharmacognosy, the generalised knowledge of such remedial agents as are selected for the purposes of a curriculum. Prof. Greenish's text-book has, for the past 20 years, been included among the really indispensable manuals. In the five years which have elapsed since the issue of the fourth edition, the work has been thoroughly overhauled; the historical introduction has been extended, and several illustrations have been added. The section on animal materia medica is not intended to deal exhaustively with anatomical features, which must be studied in other authorities.

The pattern of the work is clear and easy to follow. For example, if we turn to senna, we find (page 41) its chief constituents, and certain other substances of which the chemical constitution is specified; we are then introduced to several laxative drugs which "form a natural group allied by the similarity of their constituents" owing to the presence of oxymethylanthraquinones. An authoritative generalisation of this kind gives the student confidence; it delivers him from bondage to dry facts, and affords some inkling of the relation between chemical constitution and physiological effect.

INCOMPATIBILITY IN PRESCRIPTIONS AND HOW TO AVOID IT.

New edition, revised and enlarged. By THOMAS STEPHENSON, D.Sc., Ph.C., F.R.S. Edin., F.C.S. Edinburgh: "The Prescriber" Offices. 1929. Pp. 61. 4*s.* 6*d.*

THIS useful handbook first appeared in 1915 as a 32-page pamphlet. A revised edition and several reprints have borne witness to its acceptability, and it has now been subjected to further revision and expansion. The second half of the book, arranged in dictionary form, is easily consulted, and is likely to prevent many mistakes. Few busy prescribers, for instance, would be prepared to name off-hand the substances incompatible with mercurochrome. In a future edition two statements (on pages 47 and 31 respectively) should be modified. The well-known tincture of iodine of the French Codex, 1908, was, by ministerial decree, superseded in 1922 by a "teinture d'iode officinale," containing potassium iodide, and reduced in strength in iodine, and this important change should be made clear. Secondly, recent work by D. B. Dott has disproved the general statement that alkalis decompose acetylsalicylic acid. We find little to criticise in this work which is of proved value.

THE LANCET.

LONDON: SATURDAY, OCTOBER 19, 1929.

THE CHICAGO SURGICAL CONGRESS.

ON Monday last, Oct. 14th, the annual Clinical Congress of the American College of Surgeons was opened, and the proceedings will last throughout the week, while arrangements are outlined extending the time limits of the Congress until Oct. 30th in order to provide an opportunity for the congressists of visiting clinical centres in the environment. No more suitable city in the world exists for holding a massively attended congress than Chicago. Public buildings are on the large scale which characterises the architecture in the capital of the Middle West; the Murphy Hall, a remarkably handsome example of modern florid architecture, makes an excellent centre of reunion; such hospitals as the Wesley Memorial Hospital, the Cook County Hospital, St. Luke's Hospital, and the Montgomery Memorial Hospital afford perfect opportunities for carrying out an extensive clinical programme; while some 20 huge hotels, many of them placed within short walking distance of the headquarters of the Congress, afford accommodation at graded rates for an unlimited number of visitors.

Three addresses will be delivered in plenary congress when members can be accommodated in the ball-room of the Stevens Hotel; one by the new President of the American College of Surgeons, Major-General MERRITTE W. IRELAND, Surgeon-General of the United States Army, ushers in the meeting; one by Dr. GLENN FRANK, President of the University of Wisconsin, is directed to the convocation of Fellows; and a scientific discourse, the Murphy Oration, is delivered by Prof. D. P. D. WILKIE, professor of surgery in the University of Edinburgh, in which he reviews the present position of abdominal surgery. This oration is published in THE LANCET to-day and it is apposite that, in the city where MURPHY was so long a leading figure, the principles which at present prevail in abdominal surgery should be brought to mind. We have here a résumé of knowledge along lines where MURPHY himself made many valuable contributions, for although he traversed the whole field of his art his most fruitful energies were directed towards the improvement of abdominal surgery. MURPHY was gifted alike with remarkably clear vision, a fierce power of concentration, and boundless enthusiasm, and these qualities, which characterise all his work, were nowhere better exemplified than in his early endeavours to extend the range and improve the technique of operative procedure in connexion with the abdomen. MURPHY was one of the pioneers in the brisk and important development of American surgery which became so marked some 20 years ago, and his name occurs among the first Board of Regents of the American College of Surgeons, now engaged in its nineteenth annual session. The College derived much of its initial plan from the constitution of the Royal College of Surgeons of England, and acknowledged this indebtedness by inviting Sir RICKMAN GODLEE, then President of the English College, to be present at its first congregation held on Nov. 13th, 1913, at Chicago. A fundamental difference between the English and the American body is the absence, in the latter case, of strict examinational tests; but an elaborate system of scrutiny has been designed to keep the list of Fellows up to the standards demanded by the College, while the machinery of the College has been used, to great practical advantage, as a lever for securing proper surgical provision at provincial hospitals.

The subjects selected at the Chicago Congress for the operative clinics and demonstrations and the scientific symposia indicate a meeting of general and practical interest upon more or less familiar lines; but ample use is to be made of motion pictures in association with the spread of lymphangitis, with the story of intestinal peristalsis, and other phenomena where these films have been often employed. Pictorial representations also accompany the expositions of difficult labour and cardiac movements, and other communications—such as those upon inguinal hernia and rabies, where pictorial help will be a novelty to most of the audiences. The valuable interest taken by the College in the provision at hospitals of proper accommodation and equipment is represented at the meeting by a conference on hospital standardisation.

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THE STOMACH IN PERNICIOUS ANÆMIA.

INTEREST in Addisonian pernicious anæmia has received an impetus during the past few years from the discovery, announced by G. R. MINOT and W. P. MURPHY in 1926, of the successful treatment of the disease by means of liver. Since then various chemical fractions of liver have been isolated, and by their critical employment in the treatment of patients much knowledge has been gained of the changes induced in the patient, and of the nature of the effective principle, which is probably a nitrogenous base. These discoveries have naturally led to further speculation about the essential nature of the disease, and several new hypotheses concerning its causation have been advanced. MEANS and RICHARDSON[1] have reviewed the new facts available, and conclude that the disease must be in some sense a deficiency rather than an infectious, toxic, or neoplastic condition. However, they conclude that it is apparently not in close relation to the already recognised deficiency diseases, since the diet of the great majority of normal individuals will not suffice to relieve the condition once developed. MEANS and RICHARDSON believe that to develop pernicious anæmia some defect of the individual is probably necessary, as well as some defect in the diet. DAVIDSON[2] has reached somewhat similar conclusions, and has considered the liver as the possible site of formation of the effective principle in normal individuals. The attractive simplicity of this idea has appealed to others, notably S. HARRIS and E. SCHWARZ, but the fact that the kidney, and apparently also the stomach, of the pig[3] has been shown to contain the effective substance, makes it difficult to prove that the principle is formed in the liver, or, indeed, in any of these organs. It has, however, been repeatedly observed in the past that the stomach contents of the patient with pernicious anæmia almost invariably show no free hydrochloric acid. It now appears that under treatment with liver the achlorhydria remains unchanged,[4] though the patient remains well as long as he continues the treatment. Hurst [5] has insisted strongly upon the significance of the gastric defect in the causation of the disease. Although much has been written about the absence of hydrochloric acid in the stomach, no particular attention has been given to the possible significance of the lack of ferments accompanying the achlorhydria. Recently, however, the possible importance of the lack of ferments in the stomach of these patients has been brought into prominence by the work of Dr. William B. Castle[6] of the Harvard Medical School. His observations on patients, carried out in collaboration with Dr. W. C. Townsend, at the Thorndike Memorial Laboratory of the Boston City Hospital, may prove an important contribution to human gastric physiology as well as to the understanding of pernicious anæmia.

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[1] Means, J. H., and Richardson, W.: Jour. Amer. Med. Assoc., 1928, xci., 923.

[2] Davidson, S.: Edin. Med. Jour., 1928, xxxv., 322.

[3] Sturgis, C. C., and Isaacs, R.: Jour. Amer. Med. Assoc., 1929, xciii., 747; Sharp, E.: Ibid., 1929, xciii., 749.

From the facts concerning the relationship of the achylia gastrica to the disease, and in view of the circumstance that the improvement of the blood appears to bear a definitely quantitative relationship to the amount of liver consumed, a simple conception of a deficiency mechanism for the causation of the disease was evolved by Dr. Castle. He supposed that the secretory defect might be responsible for the failure of a principle necessary for preventing Addisonian anæmia. Accordingly, he decided to test the effect of substituting for the presumably defective digestion in the stomach of the patient the normal gastric activity of a healthy man. This experiment appeared to be feasible, since Minot and his co-workers had shown that the efficacy of liver extracts can be tested within a few days by estimation of the changes in the number of circulating immature red blood corpuscles (reticulocytes). From a study of some 30 cases of pernicious anæmia Castle and Townsend, using this reticulocyte reaction as a criterion, showed that feeding with 200 g. of beef muscle daily for ten days had no effect on patients with pernicious anæmia. On the other hand, if this amount of beef muscle, representing a convenient source of protein, was first eaten by a normal person, recovered by induced vomiting at the end of an hour, and thereafter given daily by stomach-tube to patients with pernicious anæmia, the same improvement in their blood occurred as is regularly produced by somewhat smaller amounts of liver. A precisely similar effect was observed on giving to the anæmic patient 200 g. of beef muscle after incubation in vitro with 300 c.cm. of human gastric juice secreted by normal men following the subcutaneous injection of histamine. The daily administration by stomach-tube of 300 c.cm. of normal human gastric juice was, however, found to be without effect. Apparently a principle capable of acting like liver or kidney was evolved from the interaction of the two individually inert substances, beef muscle and normal human gastric juice, whether combined within the lumen of the stomach or in the incubator. The presence of the beef muscle in the stomach of the patient with pernicious anæmia could apparently produce none of the effective principle; but either within the stomach of the normal man or with normal gastric juice in vitro this substance could be formed. Furthermore, it was found possible to produce the effective substance in the presence of normal gastric juice from beef muscle proteins free from fat and carbohydrate. This, however, could not be done if the gastric juice had previously been heated sufficiently to destroy its enzyme activity, or, curiously enough, if active commercial pepsin (in the presence of hydrochloric acid) instead of normal human gastric juice was used. It is clear, therefore, that hydrochloric acid alone is not responsible for the production of the effects observed.

If, then, the normal stomach can produce from beef muscle a substance effective in relieving the anæmia, it is reasonable to suppose that it could produce this substance in sufficient quantity to prevent the appearance of the disease in the normal individual. On the other hand, the defective stomach of the patient with achylia gastrica might, through a failure to produce this substance, permit the disease to develop. Such are the conclusions drawn by the experimenters, who believe their observations to suggest that the preventive process in the normal stomach is of the nature of an enzyme action upon protein in an acid medium. An obvious objection to the hypothesis is the fact that persistent achlorhydria is stated to occur in individuals who show no other features of pernicious anæmia. Many of these cases, however, can be shown to have only a temporary or an incomplete lack of hydrochloric acid, whereas the reduction of the acid of the stomach contents in the case of Addisonian pernicious anæmia is usually profound, as is also the deficiency of ferments. If Castle and Townsend's observations are substantiated a considerable simplification of the problem will have been achieved, and it will then become possible to focus attention on the causes leading to the gastric defect.

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CHRONIC NEPHRITIS AND LEAD POISONING.

Medical practitioners in Brisbane and other parts of Queensland have long held that chronic nephritis terminating fatally in uræmia is more prevalent in that State of the Australian Commonwealth than it is in other parts of the world. That this clinical impression has a strong basis of fact is proved by the statistical study recently published by D. Gifford Croll,[1] who shows that in the ten-year period 1917 to 1926, 1309 persons died of chronic nephritis in Queensland before the age of 40, whereas in the other three States the average number was only 425. Closer analysis of the figures from which these statistics were derived supports the belief that an unknown cause, non-existent or not operative in the other States, was responsible for this strangely high mortality. His paper is followed by a thoughtful contribution by L. J. J. Nye, who endeavours to explain the facts and by close inquiry and reasoning, which is a priori beyond criticism, reaches the conclusion that these cases of nephritis are a late result of lead poisoning in childhood.

The clinical characters of this chronic nephritis in young people appear to be a long hyperpiesis with cardiac hypertrophy and retinal changes in the late stages of the disease, albuminuric retinitis and "choked disc" being frequent. Chronic anæmia, lassitude, and gastro-intestinal disturbance are prominent. Œdema is inconspicuous, and renal failure ending in uræmia is the usual conclusion. Examining the question of streptococcal infections in the State, Nye is unable to find any evidence of undue prevalence, and whilst searching for some other possible cause, he was struck by the fact that an important proportion of cases of chronic nephritis admitted to the Brisbane General Hospital gave a past history of treatment for lead poisoning. Closer inquiry amongst the group of nephritics without such a history revealed that many of them came from wooden houses where the paint was often dry and in a powdery condition, and that as children they had been devotees of thumb-sucking, nail-biting, or a local pastime which consists in licking the rain-drops from the veranda railings. The investigator then made special inquiry into the renal function of twelve children known to have suffered from lead poisoning, and although in most of these the plumbism had occurred from six to ten years previously, he was able to show that unsuspected chronic nephritis with elevation of blood pressure was present in all of them to a sinister degree.

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[4] Johansen, A. H.: Ibid., 1929, xcii., 1728.

[5] Hurst, A. F.: The Lancet, 1923, i., 111.

[6] Castle, W. B., and Locke, E. A.: Jour. Clin. Investigation, 1928, vi., 2; Castle, W. B.: Proc. Roy. Soc. Med., 1929, xxii., 58.

[1] Mod. Jour. Australia, 1929, ii., 144.

Without accepting NYE's conclusions as final until they have been confirmed in a still larger series of cases, it must be accepted that he has made out an excellent case for the consideration of public health authorities in all countries. The prevalence of wooden houses in Queensland and the tendency for paint to crumble and flake in the hot climate make lead poisoning easier than in many countries, but there is perhaps too strong a tendency in England to regard plumbism as a disease which has been practically abolished by modern regulations in the potteries and other dangerous industries. Cases of chronic nephritis in children occur sporadically, and diseases such as renal dwarfism remain unexplained. The incidence of cardiorenal disease in older people continues to a distressing degree, and NYE's investigations should stimulate inquiry as to whether lead poisoning has been as fully eliminated as is generally imagined.

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THE WELFARE OF THE BLIND.

THE League of Nations, in response to a request made by the British Government in 1927, has issued a report[1] on the provisions made by the various Governments of the world for the welfare of the blind. The report is based on a questionaire, replies to which were received from 20 Governments representing all the principal States of the world. A difficulty which appears at the outset of any such inquiry concerns the definition of blindness. Stone blindness, that is to say, lack of perception of light, is comparatively rare, and for practical purposes all countries include in their statistics those with some degree of vision. Many countries, including England, recognise two standards of vision, a higher one for children and a lower one for adults, the standard for children being based on educational needs, that for adults on capacity to use the eyes for work, or on a numerical standard of visual acuity supposed to correspond with this. These standards vary in different countries, and the report recognises that though useful as a guide they are quite unsuitable for rigid enforcement. No universal definition of blindness as a disability is either possible or desirable. This is a fact which of necessity makes accurate comparison between the statistics of blindness in the various countries fallacious. Taking the different categories of the blind with which the report deals, it appears that infantile blindness has been materially reduced owing to the systematic campaign conducted in most countries during the last 20 years against ophthalmia neonatorum. There are, however, still enough blind children under 5 years of age to make it desirable to have a definite policy for their care and welfare. In Switzerland efforts are directed to inform the parents of blind children how best to bring them up. Special nursery schools for these children exist in many countries, including England and Switzerland itself. These nursery or preparatory schools are nearly always in the hands of voluntary societies with or without State grants. With regard to children of school age, in many countries where compulsory education is the rule, blind children are exempted. It is only possible to provide special day schools for the blind in large cities, and apart from them schools for the blind must be residential. Among countries where compulsory education is extended to the blind their education is a subject apart, to which a great deal of attention has rightly been devoted. The leaving age in Great Britain is 16 years; in the United States and elsewhere it is higher, up to a limit of 21 years. The curriculum includes most subjects taught in ordinary schools, with the addition of Braille reading and writing. Various outdoor games are possible, including rowing, and physical culture takes a prominent place in the curriculum. Tests of intelligence are in use both in the United States and in Great Britain. It is important to make special provision for blind children who are also mentally defective. The cost of the education of the blind is borne in varying degrees by the State, public authorities, and voluntary societies. Teachers in blind schools, it is generally recognised, must be specially trained. In Austria and Great Britain they must pass a special examination. The problem of the weak-sighted, such as high myopes, is far from being solved. In Great Britain, the United States, and Canada a beginning has been made by myope or sight-saving schools or classes; for rural districts nothing has even been attempted.

Vocational training generally begins when the period of elementary education is over, but though facilities for this exist in most countries they are not as a rule compulsory. In Great Britain the Blind Persons Act of 1920 requires the local education authorities to secure adequate provision for the technical education of blind persons ordinarily resident in their area, who are capable of being benefited by such education, and the statistics for 1927 show that only 1400 out of a total registered blind population of 46,000 had failed to obtain it when suitable. Occupations in which vocational training is given include music, piano-tuning, massage, basket-, brush-, mat-, and mattress-making, chair-caning, sewing and knitting, both hand and machine, poultry farming, gardening, and domestic science. Even when trained, the blind worker remains at an economic disadvantage compared with the sighted worker. Special workshops for the blind provide for a proportion of them, a system which has been most highly developed in Great Britain. Others are organised as home workers with outside help for the provision of materials and disposal of the products. In Germany the experiment is being made of bringing the blind into ordinary factories, setting them to work among sighted workers. In 1920 a Reich law was passed requiring employers to engage a certain percentage (usually 2 per cent.) of war-disabled men, and in 1923 all blind persons, whether war-disabled or not, were included.

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[1] League of Nations Publications. Health Organisation. III. 8. London: Constable and Co. 10s. 6d.

in this law. The success of this experiment is doubtful, but in a few branches of industry, such as clock-making and the production of small parts for electrical apparatus, it has been signally successful. Similar experiments have been made in England, where, of course, no compulsion exists, but there are several objections to the plan of allowing blind and sighted workers to compete with each other, even where that is possible. In ordinary industrial occupations the output of a blind worker is less than that of a competent sighted worker, by an amount variously estimated as 25 to 66 per cent., and in order that the former may earn a living wage additional payments known as "augmentation" are made to him in most countries, either from State or from voluntary funds. Numerically larger is the problem of the unemployable blind. In most countries it is dealt with by the poor-law organisation. In America the practice varies in the several States. In Great Britain, under the Blind Persons Act, the certified blind receive their old age pensions at the age of 50, and by the Local Government Act of 1929 the local authorities will have power to grant relief to poor blind persons under 50, apart from the poor-law. All these services involve a great expenditure. In England and Wales it was estimated to amount to £1,250,000 in 1924-25, of which £420,000 was contributed by voluntary societies and the balance partly by the State and partly by local authorities.

The sixtieth report of the National Institute for the Blind gives an encouraging summary of the position of the blind, so far as England is concerned. The work of the Institute is threefold: first, the organisation and allocation of charitable funds so as to avoid waste and overlapping; secondly, undertakings directly for the benefit of the blind—the publication of books and music in Braille type, the provision of homes for blind babies (the recent fire at Chorley Wood Sunshine House necessitated moving the children into Devon pending the rebuilding), the maintenance of various other schools, homes, and hostels—personal services to the blind, including the distribution of wireless sets; and thirdly, research into new openings for blind workers both in manual and non-manual occupations. Efforts are being made to increase the openings in those professions which a limited number of blind persons already practise. The Advisory Committee on the Welfare of the Blind is considering the question of promoting the further education of the adult blind by means of correspondence. Courses were organised by voluntary effort last year, and requests have been received for instruction in such subjects as English composition and literature, business correspondence, history, French, German, Latin, industrial history, and the theory of music. Such courses are likely to broaden the interest and outlook of blind persons in all phases of life and human activity. Those who are interested are asked to send in their names to the secretary of the voluntary association to which they are attached, or to their home visitor.

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THE RADIUM COMMISSION.

AT a meeting of the Commission on Oct. 11th it was decided to allot the four-gramme bomb of radium to the authorities of the Westminster Hospital, subject to agreement on the conditions of the loan. This bomb has been secured by the National Radium Trust for a period of three months from Nov. 1st, with an option to purchase at the end of that time. The Commission's policy of selection is based on the principle of concentration of radium at a limited number of centres in Great Britain, to which patients will be brought for treatment. At the same time it is proposed to distribute under proper safeguards supplies of radium emanation, prepared under the direction of the Commission.

Annotations.

"Ne quid nimis."

A STATIONARY POPULATION.

"WE are," says Sir George Newman in his annual report for 1928, "almost within sight of a stationary population" and the press and the public seem at last to be taking notice of a prospect of which they have been assured for the last ten years by Prof. A. L. Bowley, Prof. Raymond Pearl, and other statisticians. The population of this country was about 9 millions in 1800, 18 millions in 1850, 32 millions in 1900, 36 millions in 1910, and 40 millions now. The increase during the nineteenth century was unprecedented; from about 5 millions in 1600 the number of the people slowly grew to some 6 millions in 1700, and we have every reason to suppose that we are now returning to the almost stationary condition of the seventeenth century. Elderly and middle-aged people to-day were brought up in an atmosphere of rapid increase and universal expansion derived from their own experience of what was going on around them and from the literature of the preceding generation. What was to them the obvious fact that there were yearly more and more people, that towns were ever growing larger, that more and more public buildings were needed necessarily coloured their whole outlook on life, and their attitude towards social questions which has been passed on to those who are at present young has much the same complexion. It will need something of a mental convulsion to realise in all its implications that no further considerable increase of population is to be anticipated, feared, or hoped for, as the case may be. And it is difficult to see quite plainly what the change will involve though it is obviously of extraordinary importance.

Sanitarians will be concerned with migrations of populations rather than with changes in total numbers. No one can foretell how far the urbanisation of rural people will continue. Towns maybe will stop growing altogether and town-planning schemes will stay in the cupboard. The speculative builder will grow cautious, perhaps not till over-building has produced a useful decline in house prices and rents. Generous schemes of water-supply, sewage disposal, and other public services will suffice. Above all, sanitary authorities will have a breathing space in which they can make their equipment more nearly perfect without the immanent nightmare of unmanageable growth.

But in one important respect the stationary population of the twentieth century will be very different from that of the seventeenth. Numbers rose little between 1600 and 1700 because the death-rate was so high; they will increase only slightly between 1929 and 2000 because the birth-rate is so low. The average expectation of life at birth has enormously increased and the population of 1950 will differ from that of 1750 by containing a much larger proportion of old people. It is not our concern at the moment to discuss the effect of this on industry, production, and consumption; its medical implications are enough. Man's body in Western Europe nowadays begins to decay somewhere about 35; his elastic tissue loses its elasticity, he tends to become generally fibrous, his aorta begins to die and dilate, the glomeruli of his kidney perish a few at a time, his functional defects are obvious if he tries to run. And there is no suggestion that in increasing the average length of life anything has been done towards extending life's maximum possible duration; death at the end of the natural span is postponed, not averted, and the human body is where it has always been since vital statistics were collected. It follows that medicine and surgery will, progressively more and more, have to conduct their operations on bodies which are more or less decayed and senile. It is estimated that one-fifth of the whole population will soon be aged 55 years or over, which means that their bodies will have but an indifferent capacity of healing themselves and doing anything which involves cell growth. Medical men will spend more of their time in helping lame dogs over stiles; in its mercy civilisation is learning to put up fewer and fewer obstacles.

AYERZA'S SYNDROME.

THERE are two chief reasons or excuses for attaching a man's name to a particular disease or syndrome—one that he was the first to describe or called particular attention to it, the other that the use of a single name provides an escape from the use of a cumbersome phrase. These two reasons are often combined as they are in the case of Ayerza's disease (better called syndrome). Further, it often happens that a syndrome which appears clear-cut when first published is found to include a number of unrelated pathological conditions, and as time passes and additional similar or related cases are brought to light it becomes increasingly hard to define. At this stage, if it is to serve any useful purpose, its use should be limited to those cases which had escaped previous recognition or else to those which have distinguishing clinical or pathological features. The chief feature of the cases to which the term Ayerza's syndrome has been applied is a severe cyanosis developing secondarily to disease starting in the respiratory system. Associated with the disease of the lungs changes in the pulmonary arteries, atheroma, thrombosis, endarteritis, and hypertrophy of the right side of the heart were found.

Before Ayerza's teaching was made known by his students' publications it was recognised that many respiratory diseases, notably chronic bronchitis and emphysema, asthma, and tuberculosis might, and not infrequently did, terminate with severe cyanosis, following failure of a hypertrophied right heart and changes in the pulmonary arteries. It therefore seems unnecessary to introduce a new term for this familiar association. There remain, however, the rarer cases in which the primary lesion is in the pulmonary arteries themselves and for these a distinctive name might be advantageous. It is in drawing attention to this group of cases that Ayerza, his pupils, and subsequent writers have performed their chief service; the accounts of primary lung diseases, with secondary changes in pulmonary vessels, included in their papers have only obscured the value of their contributions. In 1920 Escudero, one of Ayerza's pupils, affirmed that there were two stages in the production of the syndrome: one bronchial, syphilitic bronchitis; and the other secondary to this, a degeneration of pulmonary arteries. This would limit the group to one in which the pathological basis consisted of syphilis of lung and either syphilitic inflammation or secondary degeneration of the pulmonary arteries. Arrillaga in 1913 had recognised the association with syphilis, but had only regarded it as playing the part of a sensitising adjuvant to chronic pulmonary disease such as chronic bronchitis and emphysema. Although it will differ markedly from the earlier conceptions and will be broader than that put forward by Escudero, it will be useful to suggest the limits of the syndrome as it is now emerging. In this sense it would be limited in its application to cases of severe cyanosis associated with diseases of the pulmonary arteries and right-sided cardiac hypertrophy in which primary lung and heart lesions can be excluded. In addition to the cyanosis, other signs of chronic venous engorgement and heart failure, such as dyspnœa, polycythæmia, œdema, and hæmoptysis, would contribute their quota to the clinical picture.

Of these primary diseases of the pulmonary artery only two kinds have been described so far, one due to primary atheroma with thrombosis, and the other syphilitic. Neither is common, and of the two so far reported the syphilitic cases have been twice as numerous as the atheromatous. It is possible that as the condition becomes better known other causes connected with such diseases as rheumatism or periarteritis nodosa may be added to them. As it is, taking the syphilitic and atheromatous together a sufficient number have been published to enable Dr. Dorothy Hare and Dr. Joan Ross to collect 23 cases to which they add another in the paper published on p. 806; whilst a further case not included in their list was contributed by Dr. Konstam to our last issue. It seems evident that cases are accumulating and are sufficiently distinctive and important to merit description and a label. Konstam evidently regards his as an example of Ayerza's syndrome; Hare and Ross, on the other hand, suggest that theirs is not. The two cases are nevertheless very similar. Each provided definite evidence of syphilis apart from the lesions in the lungs; each had a positive Wassermann reaction. The lesions in the smaller and the secondary atheroma in the larger pulmonary arteries, together with the fibrosis of the lungs and right heart hypertrophy, were so similar that although Prof. H. M. Turnbull (in Konstam's case) describes a more fibrotic and Dr. Ross a more cellular reaction they must be accepted as phases in the same process. Both cases would fit quite comfortably into the syndrome as defined above. Hare and Ross would probably, and quite legitimately, object that in the first descriptions of Ayerza's syndrome the chronic pulmonary disorders were regarded as primary and therefore we have not defined Ayerza's syndrome. As has already been explained, the chronic lesions of the lung with secondary pulmonary artery and cardiac changes are very numerous, many of them unrelated and were well known before Ayerza's teaching became public. The 23 cases collected by Hare and Ross, together with their own and that of Konstam, do form a definite group and are characterised by an equally clear clinical picture giving the necessary basis for a syndrome. Are we to call it Ayerza's when there are other authors who appear to have much stronger claims to the distinction of having it called after them? It would be easy to suggest alternative titles, but names creep insidiously into medical nosology and once established are very difficult to eradicate. Whether "Ayerza's syndrome" is so established or not it is impossible to say. In any case as first used it would be much better dropped, and if this is impossible it would, though illogical, be far better to confine its use to the only clear-cut syndrome which has emerged from the nebulous, ill-defined, and confused conceptions which first appeared.

AN ATTEMPT TO IMPROVE DOMESTIC DIET.

Mr. H. L. Mencken somewhere argues that American women provide shocking meals because they are too intelligent to bother about food. The Cattaraugus County Board of Health, on the other hand, attributes their shortcomings to ignorance, and in 1924 it appointed Miss R. M. Odell[1] as nutritionist in the hope that she would bring the findings of the laboratory and the clinician into daily life. An investigation into the food habits of the people was started by the study of school medical records and by a questionaire of representative homes. The latter inquiry was undertaken through the local groups of home bureau women (corresponding to our women's institutes) so as to obviate the natural resentment of the families to apparently impertinent questions from an outsider. Groups were selected from (1) professional workers, (2) town labourers, and (3) farmers, and their food intake was analysed for a week. Various groups were thus examined over a period of 12 months so as to avoid seasonal considerations, and it was found that in the rural districts there was a lack of green vegetables in the diet. The people were therefore stimulated into planting gardens, and home. This at present can only be a voluntary effort, for private dwelling houses are expressly exempted by all Acts so far passed by Parliament. In the 1926 Act permission is given to local authorities to unite with adjoining authorities to form statutory bodies for carrying out the provisions of the Act. Several such bodies have been formed. Two years ago, at the instigation of the Coal Smoke Abatement Society, 90 of the local authorities in and about London held a conference at the Guildhall which was addressed by Mr. Neville Chamberlain, the Minister of Health then in office. The conference appointed a committee to draw up recommendations to secure uniformity of administration of the Smoke Abatement Acts, and this committee on Oct. 15th brought its recommendations to the conference. Some of these recommendations were presented to the conference held in Buxton this month and have become an accepted part of the policy of the newly formed National Smoke Abatement Society.

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[1] Improving the Dietary Habits of a Rural Community. By Ruby M. Odell. Millbank Memorial Fund, New York.

GAS GANGRENE IN THE AMERICAN ARMY.

THERE were 2718 cases of gas gangrene, 1267 of them being fatal, among the 224,080 American soldiers wounded during the war on the Western front. This incidence of roughly one case of gas gangrene per cent. of the wounded, with a mortality-rate up to 50 per cent. of the cases, is consistent with the records of the British, French, and German medical services. The Americans on taking the field had the advantage of the considerable research already done by the other belligerents on the prevention of anaerobic infection. To counterbalance this, however, they found themselves for the most part fighting in a terrain which had been richly manured for centuries, and was thickly strewn with human and animal organic matter as a result of several years of intense stationary warfare. In Volume XII. of the archives of the Medical Department of the United States Army in the World War[1] a fully illustrated account of gas gangrene, as it affected the American army, is set out. It is interesting to compare the account of its pathology with that given in the first volume of the System of Bacteriology recently published by the Medical Research Council, which is also based largely on the experience gained during the war of this infection. In the American work gas gangrene is considered under two headings. First the virulent forms are described and subdivided into emphysematous, toxic-œdematous, mixed and putrefactive types. The illustrations provide a comprehensive atlas of the pathology and histology of these states. Secondly, an avirulent form is recognised and described, in which the infection tends to resemble in time a bronze-like erysipelas and has a good prognosis. The bacteriological descriptions are mostly concerned with the four anaerobes *B. welchii*, *Vibrion septique*, *B. œdematiens*, and *B. histolyticus*. *B. welchii* naturally receives most consideration. It is stated to be not a true parasite, but a saprophyte incapable of growth in healthy tissue, and able to thrive only if the body cells are first injured by some mechanical or chemical means. Its lesions are said to involve the muscles, the blood-vessels, and the subcutaneous connective tissues. On this point American views differ from those held in Great Britain, where the site of the local lesion is not regarded as of supreme importance. In a Medical Research Council report published in 1919[2] it is suggested, as the outcome of experimental infections, that the localisation of the infection in muscle is purely an accidental phenomenon; since the organism does not grow more readily in muscle than elsewhere. On the other hand, the importance of septicæmia with visceral dissemination is emphasised. Two small matters emerging from the American survey are at least of retrospective interest. The first concerns "laudable pus" which military surgeons in former times greeted with enthusiasm as of good prognostic significance; it is recorded that pyogenic organisms, with certain exceptions, though they might not alter the general outlook for the patient, yet tended to inhibit the growth of the gas gangrene organisms. The second concerns scabies. It was noticed that the burrow of the female provided an ideal and much-frequented culture tube for the anaerobes.

THE annual dinner of the Royal Society of Medicine will be held at the May Fair Hotel, Berkeley-square, London, W., on Thursday, Nov. 21st, at 7.30 for 8 P.M. The Prime Minister, the Minister of Health, and the French Ambassador have consented to be the Society's guests of honour.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLVIII.

THE DIAGNOSIS OF GONORRHŒAL INFECTIONS IN THE MALE.

THE bacteriologist can give considerable help in the diagnosis of gonococcal infections in spite of the elusive tendencies of the gonococcus. It is proposed here to deal solely with microscopical and serological tests in the male.

Collection of Specimens.

The more important points in the collection of specimens deserve attention. First, in order to make sure that the pus is coming from the meatus and that the condition is not one simply of balanitis, all pus surrounding the meatus and preputial sac should be wiped away. Then the patient should be instructed to squeeze up the pus from the base of the urethra. The pus is collected on one or preferably two swabs (one for films and the other for cultures). If more than a few minutes is likely to elapse before the swabs reach the bacteriologist it is advisable to make a couple of films from one of the swabs straight away. If delay is unavoidable, it is important to see that the tubes into which the swabs are placed are properly corked to prevent drying up. A thinnish film of even consistency is to be aimed at, and some prefer to use a platinum loop for this procedure.

When cultures are desired it is preferable for the patient to attend the laboratory, for the material must be inoculated and incubated immediately. The gonococcus very soon dies out at room temperature. Cultures should always be made in medico-legal cases. Ordinary agar is useless for this purpose, and the best medium is hydrocele fluid agar.

Examination of the centrifuged deposit of urine is valuable in the later stages when the discharge has disappeared. The urine should be held for at least four hours and then passed direct into one or more sterile wide-mouthed bottles, care being taken: (*a*) thoroughly to cleanse the meatus with spirit and allow it to dry off; (*b*) to cork the bottle immediately it is full; (*c*) to send the specimen to the laboratory for immediate examination. If the material is not examined at once contaminating organisms will probably multiply and obscure the result. Furthermore, pus cells if few in number are apt to disintegrate and become unrecognisable.

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[1] ngtor persons suffe ment Printing Office. 1929.
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[2] on Anaerobic Bacteria and
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In collecting a specimen following prostatic massage the patient is instructed to retain his urine for three or four hours and the meatus is then cleansed with spirit. After this the prostate should be massaged and any secretion coming away from the meatus can be collected direct on to a slide, which is put aside to dry in the air. The patient then empties his bladder into two or three wide-mouthed sterile bottles. This washes out the secretions and any pus that may be present, and these are eventually recovered in the laboratory by means of the centrifuge.

It must be emphasised that the gonococcus in vitro is a delicate organism. For this reason specimens of urine and prostatic fluid sent to the laboratory for examination should be as fresh as possible. In the later stages of the disease when the gonococcus becomes more and more difficult to find, it is liable to appear only intermittently in the discharges and in urine. To overcome this difficulty provocative measures may be employed. A discharge may be deliberately provoked by irritation of the urethra. The following methods have been adopted for achieving this: the passage of an instrument; the instillation of silver nitrate into the posterior urethra; the use of a provocative injection of gonococcal vaccine, and hard physical exercise and alcohol.

Bacterial and Cellular Elements.

In the interpretation of reports on material sent at various stages of the disease it must be remembered that during the first few hours of the infection gonococci may be scanty in the discharge, but very soon they appear in large numbers and can be identified with considerable ease. It is not long, however, before secondary infection takes place, and it is a rule for one or more of the following organisms to appear with the gonococcus: staphylococcus (usually albus), diphtheroid bacilli, enterococcus, *B. coli*. These organisms are probably mildly pathogenic and help to keep up the infective process, for they are found in chronic cases when the presence of the gonococcus can no longer be established. *B. coli* is not so common as the rest, but when it does occur it may prove very resistant to treatment. The distinction between a secondary and a primary *B. coli* infection can only be made by a study of the history in those cases where gonococci have not been found in the early stages.

Apart from bacteria in the pus, information of importance can be obtained from the cellular content. In the early days of an attack 90 per cent. or more of the cells are polymorphonuclears, the remaining 10 per cent. or so consisting chiefly of desquamated epithelial cells. This proportion lasts for a considerable time, and it is only when the infection is approaching its termination that the percentage of epithelial cells rises and the polymorphonuclears disappear.

While there are still polymorphonuclears to be found in the centrifuged deposit of urine, treatment should be continued. It is by no means uncommon to receive a specimen of urine or a smear from an old chronic case, and the only information demanded is "? presence of gonococci." Cases of this sort make one suspect that too much importance is apt to be placed by some practitioners on the presence or absence of gonococci and not sufficient attention on the presence of pus cells and secondary organisms. It does not seem unreasonable to aim at getting the centrifuged deposit of urine entirely free from pus cells as well as from gonococci and secondary organisms after prostatic massage and the various provocative methods have been applied, but this standard of cure is admittedly a high one.

The Complement-fixation Test.

Within certain limits this test has value in the diagnosis of gonorrhœal infections, though its value and reliability cannot be compared to the Wassermann reaction in the diagnosis of syphilis. The test depends on the detection in the blood of a complement fixing antibody, and the chief limitation of the test with the technique at present employed is the low concentration of the antibody in the serum. Owing to this some cases of undoubted gonorrhœa give a negative test throughout. However, it is possible that in the future, with improved technique, this disadvantage may be overcome.

The importance of the test at present lies in its specificity. Of 100 specimens of bloods from people who gave no history of gonorrhœal infection which were tested in this laboratory a few years ago, only two gave anything approaching a positive result. These exceptions occurred in patients attending the V.D. clinic for syphilis, and so there is just a possibility that the histories given to us by the patient were not correct. A positive result, especially if it is supported by a possible history or clinical symptoms, can be taken as very strong evidence in favour of a gonococcal infection. The reaction does not usually become positive until the disease is approaching the chronic stage, and a positive result can only be expected in somewhere between 50 and 80 per cent. of cases. The highest percentage of positive reactions is to be found in cases with complications such as pyosalpinx, arthritis, iritis, and the chief value of the test lies in the diagnosis of the nature of these conditions. About 2 c.cm. of blood are required for the test, preferably obtained from a vein, owing to the importance of keeping it sterile. The test cannot be performed in blood contaminated with bacteria. It is important to note that the test has no value in cases which have received vaccine treatment.

Tests of Cure.

In some cases it is exceedingly difficult to decide whether a patient who has been suffering from a chronic gonococcal infection is cured or not. Before a decision is arrived at the patient should be tested on at least three different occasions, and only if negative results have been consistently obtained should he be considered free from infection. It is unwise ever to accept one negative report as conclusive evidence of cure, and two out of the three tests should have been made *after* the use of a provocative measure. The ideal aimed at in treatment is the complete disappearance of not only gonococci but also of pus cells from the secretions. Unfortunately, this ideal cannot always be achieved. Even after prolonged treatment the prostatic fluid and urine may still contain a certain amount of pus, and the question arises as to whether such a patient should still continue under treatment. Some authorities are willing to overlook the presence of a few pus cells in these cases and discharge the patient, whereas others are not prepared to go so far. The question is undoubtedly one of considerable difficulty, since the fear must always exist at the back of the practitioner's mind that gonococci are still present, although undiscovered by the pathologist. Certainly in some of these cases the inflammatory process is kept up partly owing to the irritation of the antiseptics employed and the condition may clear up on the cessation of treatment.

The complement-fixation test has proved to be of little value as a test of cure in gonorrhœa, and is seldom employed at the present day for this purpose. Various continental authorities have recommended the use of spermo culture, and have reported that it has frequently yielded positive results when other attempts to find gonococcus have been negative, but the majority of patients will object to the carrying out of this test, and it is seldom used in England.

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Director of the Charing Cross Hospital Institute of Pathology.

THE WEIR HOSPITAL.—The report of this Balham hospital for 1928 shows that there were 933 in-patients and 10,627 out-patients, the figures including 10,106 casualties. The X ray department is to be enlarged as soon as means permit.

Special Articles.

THE RELATIONSHIP OF CORONER AND MEDICAL PROFESSION.

A Lecture delivered to Post-graduates, at the Manchester Royal Infirmary on Oct. 11th, 1929,

BY C. W. W. SURRIDGE,
H.M. CORONER FOR THE CITY OF MANCHESTER.

I SHOULD like at the outset to point out that the coroner is an independent official. He is not a police official, and within certain limitations he has a wide discretion and a heavy responsibility. He is not bound by the laws of evidence, although in criminal matters, in my opinion, he should strictly observe them. The practice and procedure varies amongst different coroners, and I am only speaking of my own practice and procedure.

A coroner can only act upon information. In all cases where a crime is concerned, or serious accident, he usually gets his information immediately from the police, but in a very large number of cases the police are not called in, and it is from the doctors that the coroner derives his information, or from the registrar, whose duty it is to scrutinise closely the doctor's certificates, and to refer them to the coroner if he is unable to accept them.

Obligation to Inform.

There is no statutory obligation upon a doctor to inform the coroner, though it is said to be his common law duty, as one of those about the deceased, to inform the coroner or his officer, or the police, where he has any reason to suppose an inquest may be necessary.

But although there is no statutory duty upon a doctor to inform the coroner, it is, in this city at any rate, an unwritten law of courtesy for the doctor to inform the coroner at the earliest possible moment of any case of his which calls for the coroner's intervention. If he disregards this courteous procedure, he not only ruffles the coroner, who is a very autocratic individual and capable of being extremely unpleasant on the telephone, but what is of more immediate concern to the doctor, he runs the risk of alienating the regard and possibly the future patronage of the family of the deceased. If the doctor contents himself with posting his certificate to the registrar, who, upon receipt of it, posts the appropriate form to the coroner, it is three days after the death before the coroner knows anything at all about it. It is very inconvenient and unpleasant for the relatives to be informed, perhaps on the eve of the funeral, that an inquest must be held.

The majority of doctors in this city fully realise the position, and are anxious to work in harmony with the coroner, but difficulties do arise through a doubt as to the circumstances under which a doctor should communicate with the coroner. This question is answered by reference to Section 3 (1) of the Coroners' Act, 1887, which enacts: "Where . . . . . there is reasonable cause to suspect that such person has died either a violent or unnatural death, or has died a sudden death of which the cause is unknown, or that such person has died in prison . . . . . the coroner shall . . . ." in effect hold an inquest.

Violent or unnatural deaths include all cases where death is due to an accident of any kind—however trivial the original accident may have been. They also include deaths from all forms of poisoning, including not only acids and alkalis, but alcoholic or food poisoning, or death from industrial disease, or deaths from suicide.

Deaths under Anæsthetics.

To this cause of death I should like to call your special attention, because I believe that the practice which I adopt is not universal. For my part, I cannot see how such deaths under anæsthetics can come under the category of deaths from natural causes, and I therefore always hold inquests in such cases. In most cases it is true that the inquest is a pure formality, and I sympathise very sincerely with doctors who have to attend an inquest in cases where they have been called upon to give an anæsthetic to a patient where the chances of his surviving the operation were very remote, but I can assure them that in such cases not the slightest reflection is cast upon their skill.

I am convinced that the holding of an inquest is a great public safeguard, and that it is a good thing to satisfy people that everything has been properly carried out, and that all proper precautions have been taken, and that all known means of resuscitation were at hand and employed. In some cases—fortunately very few—I have found that my Inquiry has been fully justified, and it is only on such occasions that I have any adverse comment to make.

With regard to cases of accidents, I find that sometimes a doctor fails to report a death from a simple accident, and the excuse given for his omission is that he did not report it as no question of compensation was involved. Of course, that is an entirely erroneous impression. The coroner has to hold an inquest in every case where death has been caused or accelerated by an accident, quite apart from any question of compensation. Another mistaken impression is that it is not necessary to inform the coroner where death has occurred more than a year and a day after the accident. This impression springs from the fact that no person who has inflicted the injury can be convicted of murder or manslaughter if death ensues after the lapse of a year and a day from the injury, but the coroner is solely concerned with the question as to whether the injury has or has not caused or accelerated death.

Compensation Cases.

Cases where compensation may be involved demand especial care. I very frequently get cases where the doctor gives a certificate of death from some natural cause, but where the relatives mention to the registrar or to me that the deceased had an accident at his work some months ago, or has been working amongst lead or chemical fumes, and the question is raised whether the accident or the work upon which the deceased has been engaged has attributed to his death. In such cases I always hold an inquest if desired to do so by the relatives and order a post-mortem examination. This does not mean that I distrust the diagnosis of the doctor, but the matter has to be fully investigated. If I were to refuse to hold an inquest and the case went for compensation, the county court judge might want to know why no inquest had been held. Very often the doctor has never been informed of the accident or condition of work, and he should always make careful inquiries on these points, and where he has reason to believe that the relatives consider that the accident has contributed to the death, he should always report it to the coroner.

Cases of sudden death do not necessarily demand an inquest. Where the doctor has attended a patient for heart disease, for example, and death occurs suddenly, a doctor is quite in order in giving a certificate if he is satisfied that no other cause, such as accident or poison, has contributed to the death, but under the regulations contained in the last Registration Act, 1927, the registrar has to refer to the coroner all cases where the deceased has not been seen by the doctor after death, or within 14 days of death, and in such cases it is a great convenience to all concerned if the doctor notifies the coroner at once. But informing the coroner does not relieve the doctor from his duty of issuing a certificate where the cause of death is diagnosed.

The Question of Fees.

The only payment authorised by statute is a fee for giving evidence at an inquest, or for making a post-mortem examination. No payment is made by me for any letter written to me by a doctor or any other communications. I want to emphasise the fact that I do not order a doctor to make a written report. The letters to which I allude are purely voluntary communications. In cases where I have to ask for information on the telephone, I am invariably assisted with the very greatest courtesy by the doctors in this city. If a doctor is in any doubt whatever about a case he should consult the coroner, for I am only too ready to assist them as they assist me. Content yourselves with stating the facts, and leave the responsibility to the coroner. Never try to evade an inquest. I have two golden rules. In all cases where the relatives desire an inquest I always hold one, and whenever any undue pressure is brought to bear upon me not to hold an inquest I always hold one. This practice I have found to be fully justified on many occasions.

It has never been my practice to call doctors unnecessarily—e.g., in simple cases of fall down stairs or burns, where I get evidence of the injuries from other sources, but in cases where compensation is involved I generally call the doctor, as the employers or insurance companies may desire to cross-examine the doctor through their counsel.

Evidence in Court.

On the question of giving evidence in court, perhaps I may be permitted to give you some hints.

(1) Always speak up, so that everyone may hear you. Do not act as if you were carrying on a private conversation with the coroner; remember that relatives have a right to hear what you say and an interest in your evidence.

(2) Make your language as simple and as untechnical as possible.

(3) Be as concise as you can, but at the same time be luminous.

(4) Formulate your opinion and conclusions with care, and do not allow yourself to be shaken by cross-examination. I do not mean by this that you can always be exact. Medicine is not an exact science, —e.g., you may say death was undoubtedly, in my opinion, caused or accelerated by the accident, or, in my opinion, the accident had no connexion with the cause of death, or you may say I am unable to say definitely whether death was caused or accelerated by the accident or not. But once you have made up your mind, hold your ground, and do not allow yourself to be shaken by cross-examination.

(5) Do not show any resentment at being cross-examined. Remember, it may be counsel's duty to try to weaken or negative your evidence. Content yourself with reiterating your conclusions or adding reasons for those conclusions.

THE PRACTITIONER'S EMPLOYEES.

THEIR POSITION UNDER NATIONAL INSURANCE.

MEDICAL and dental practitioners are often in doubt about the position of their employees under the various Acts which regulate national health insurance, contributory pensions, and unemployment insurance. An explanatory memorandum (317/X) has therefore been issued by the Ministry of Health and other departments concerned. The main facts may be summarised as follows:—

Health and Pensions Insurance.

Under the National Health Insurance Acts and the Widows', Orphans', and Old Age Contributory Pensions Act contributions have in general to be paid for everyone over 16 who is earning not more than £250 a year for whole-time service, and also for everyone whose employment is by way of manual labour. Thus, *subject to what is said below*, health and pensions contributions are payable f dispensers, secretaries and reception c mechanics and apprentices, domestic servants, hall-porters, and chauffeurs.

The contributions for such persons must be paid for each week during which they are employed; and in any week when they have been employed in an insurable capacity by more than one employer, the first employer is responsible. These requirements are explained in detail in Pamphlet A, which may be had from the Health Insurance Departments of the Ministry of Health, Whitehall, S.W. 1.

Rate of Remuneration.—In arriving at the rate of remuneration of employees (other than manual workers) account should be taken of the value *to the employee* of any emoluments in kind, such as board or lodging, provided at the employer's expense. The cost to the employer, though often a useful guide, is not necessarily to be taken as the value of remuneration in kind. "The employer and the employed person," says the memorandum, "will usually be in a position to agree as to what should be taken as a fair money equivalent of the value of such emoluments to the employed person, and it is only in cases of special difficulty that reference need be made to the Insurance Department. Ordinarily, the value of board and lodging is assessed at about 35*s.* a week. In the case of part-time employment the equivalent remuneration for normal whole-time employment should be taken."

Manual Labour.—The question whether an employment is or is not by way of manual labour is only material where the pay exceeds £250 a year, as persons who receive less are insurable in any event. The question arises principally in the case of dental mechanics and chauffeurs.

A dental mechanic is employed by way of manual labour, notwithstanding that he supervises assistants in addition to engaging in the manipulative work involved in making dentures, plates, artificial teeth, crowns, &c. A decision of the Minister of Health to this effect has been upheld by Mr. Justice Roche in the High Court. On the other hand, a dentist's assistant who is engaged in the ordinary duties of a qualified dentist and who attends to patients in that capacity is regarded as employed otherwise than by way of manual labour. But where such an assistant also takes part in mechanical work, regard must be had to the main and substantial nature of his duties. If he is substantially employed as a dental mechanic he is a manual worker. In case of doubt reference should be made to the Insurance Department for a ruling.

A chauffeur who is required to clean the car and to effect running repairs, besides driving, is normally regarded as employed by way of manual labour, and is, therefore, *compulsorily insurable irrespective of* his remuneration.

*Unemployment Insurance.**

From the practitioner's point of view there are three main classes in which liability to unemployment insurance does not coincide with liability to insurance under the Health Insurance and Pensions Acts—viz., employment as a female professional nurse for the sick, employment in domestic service, and employment in agriculture (including horticulture).

Female nurses have been excepted from unemployment insurance since July, 1922. The exception does not, however, extend to dispensers, secretaries, or persons employed by doctors or dentists on such duties as to receive patients, make appointments, answer telephone messages, clean and sterilise instruments, clean and dust surgery fittings, mix cement, hand instruments, &c., to the dentist, or attend on anæsthetic cases, unless the attendant is a duly qualified nurse and employed as such.

Employment in domestic service is excepted from liability to insurance only where the employed person is not employed in a trade or business carried on for the purposes of gain. It has been held by Mr. Justice Roche in the High Court that a doctor is carrying on a business for the purpose of gain within the meaning of the Acts, and domestic servants employed in that business are therefore required to be insured. The judge decided that a chauffeur employed primarily to drive a doctor on his rounds, and a domestic servant employed by a doctor in a nursing home carried on by him in addition to his practice, were employed in the business of their respective employers. These decisions are held to cover in principle chauffeurs employed to drive or accompany doctors on their rounds, servants employed to attend upon the patients or staff in a nursing home, and servants employed at the surgeries of doctors or dentists to admit patients, make appointments, or otherwise in connexion with the employer's professional requirements.

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* The requirements of the Unemployment Insurance Acts are set out in detail in *Leaflet U.I.L.4*, *which may be had from the* Ministry of Labour or from any Employment Exchange or Branch Employment Office.

Servants employed in doctors' or dentists' private residences solely in connexion with their employers' personal needs, and servants whose duties in connexion with their employers' business are confined to cleaning the surgery and admitting occasional patients, are not regarded as employed in the business and are not, therefore, required to be insured against unemployment. Servants employed by doctors or dentists in connexion partly with their employers' professional requirements and partly with the employers' personal needs should be regarded as insurable if their substantial employment is employment in the former capacity. It has been held by Mr. Justice Roche in the High Court that one-third is a substantial part of an employee's working hours.

Employment in agriculture—e.g., as a gardener, whether regular or jobbing—is totally excepted from unemployment insurance.

The Services.

ROYAL NAVAL MEDICAL SERVICES.

THE following appointments have been made: Surg. Lt.-comdr. G. S. Rutherford to *Calypso* and Surg. Lt. A. M. Lawrence-Smith to *Hermes*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. St. G. B. D. Gray to be Surg. Lt.-Comdr.
Proby. Surg. Lt. R. H. Enoch to be Surg. Lt.
Proby. Surg. Sub-Lt. K. E. L. Yuill to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. D. S. Buist, half-pay list, late R.A.M.C., retires on retd. pay on account of ill-health.

Capt. R. R. Evans to be Maj. (prov.).

TERRITORIAL ARMY.

W. G. Platt to be Lt.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. W. Parsons resigns his commission on appointment to a commission in the Royal Army Medical Corps.

INDIAN MEDICAL SERVICE.

Capt. (prov.) F. W. H. Caughey relinquishes his proby. appointment.

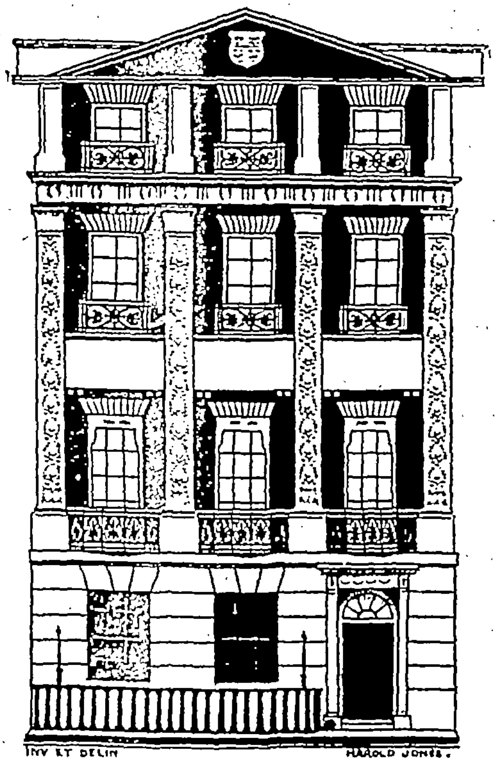
The undermentioned have vacated their appointments in India:—A.D.M.S.: Col. W. O'S. Murphy, I.M.S., A.D.M.S. (temp.): Maj. (Bt. Lt.-Col.) R. A. Bryden, R.A.M.C.

ELSIE INGLIS HOSPITAL, BELGRADE.—On Thursday last week Anne, Viscountess Cowdray, opened the hospital which has been erected in Belgrade in memory of Dr. Elsie Inglis, who went to Serbia during the war as Commissioner for the Scottish Women's Hospitals.

A CENTRAL ANÆSTHETISING PLANT AT ST. BARTHOLOMEW'S.—The basement of the new surgical block now being erected at St. Bartholomew's Hospital will be fitted with a central anæsthetising plant. Pipes from cylinders of hardened steel will carry oxygen and nitrous oxide to the various theatres where taps and a mixing chamber will facilitate the adjustment of the components. More than 20,000 gallons of gas are used in the hospital every week.

THE NEW HOME OF The Lancet.

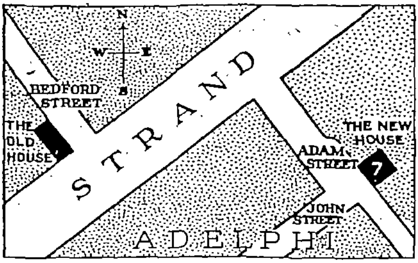
IN the course of the next few days THE LANCET Offices will be transferred from 1, Bedford-street, and the adjoining house in the Strand, where our home has been for the past 80 years, and more, to 7, Adam-street, Adelphi, London, W.C., premises only 100 yards from the old address.



NO. 7, ADAM-STREET, ADELPHI.

During the past 105 years the editorial office of THE LANCET has been in, or within a few yards of, the Strand, and in the immediate vicinity of the new address. Originally the paper was edited from a house in Norfolk-street, Strand—a very different street in appearance from the present Norfolk-street. Here Thomas Wakley, the Founder of the paper, was engaged in private practice; here he was discovered by Sir Astley Cooper abstracting (Cooper called it "pirating") the great man's lectures, which were in course of delivery before the United Medical Schools of Guy's Hospital and the then adjacent St. Thomas's Hospital. The business of the first printer of the paper, G. L. Hutchinson, was carried on within a few paces, in the Strand. During the first 25 years of our existence the editorial work was done largely in Wakley's private house, but the printing office was changed several times, there being, as a matter of fact, no particular anxiety on the part of any firm to be even partly responsible for the issue of a newspaper whose activities were being so often, and so expensively, discussed in the law courts. But in Bolt-court, Fleet-street, Wakley at last found printers who for ten years acted as publishers, the firm being that of Mills, Jowett and Mills, of whom Jowett was the father of the famous Master of Balliol. In 1836 Wakley decided to become—probably was forced to become—personally responsible for publishing, as well as editing, his paper, and this he did from an address in Essex-street, Strand. But six years later the firm of Churchill came upon the scene, providentially it appears, for Wakley was a reckless man of business, as well as much absorbed in Parliamentary affairs. A situation of pecuniary uneasiness was thus relieved, and five years later Wakley resolved to be again his own publisher. In 1847 the lease of the building at the corner of Bedford-street and the Strand, now being evacuated, was acquired, and in this building during the 82 years of tenure THE LANCET has been published. Until early in 1921 the paper was printed at these offices, as well as edited and published, and during that period considerable additions to the house were made, as well as many internal transformations carried out. But in 1920 the interests of Wakley and Son, Ltd., having passed into the hands of Messrs. Hodder and Stoughton, the composing rooms were done away with, and since 1921 Messrs. Hazell, Watson and Viney, Ltd., have been responsible for the printing.

The proprietors of THE LANCET have now purchased as a freehold 7, Adam-street, Adelphi, and the work of editing and publishing will be transferred there in the course of the next fortnight. The accompanying illustrations show the façade of our new home, and its situation in the famous quadrangle of symmetrical streets, erected on arches. This beautiful piece of building was designed and executed by John, Robert, James, and William Adam, on the site mainly of old Durham House, which had become a more or less derelict district of mud and slime, used only for the mooring of coal barges for the supply of a London and a Westminster which had then no existence beyond Hyde Park Corner. The streets in the Adelphi were named after the Christian names of the four brothers, though William-street has since been changed to Durham House-street. But to the bounding street on the east was given the name of Adam-street, while the beautiful pile facing the Thames received the name of Adelphi-terrace. It may require imagination to see the influence of Diocletian's famous palace at Spalato upon the architecture of the Adelphi, but Robert Adam, the most celebrated of the four brothers, made a careful study of that magnificent ruin, and has himself recorded that he did this designedly, when determining to apply classical models to modern dwellings; because the Emperor's huge villa—it now constitutes the skeleton of nearly all the town of Split—was built as a residence, and was not a public institution such as usually formed a model for imitation or a source of suggestion. The whole enterprise of constructing the Adelphi was attended with difficulty. The elegant streets had to be constructed on arches for the securing of a foundation and of provision for wharfage on the Thames below, while obtaining a level access from the Strand. The expense incurred was huge, and was swollen by the legal opposition to the scheme from the Corporation of London, which body put forward proprietary claims to the foreshore. However, one private Bill in Parliament disposed of this matter, while another private Bill sanctioned the institution of a lottery for raising further funds, and finally the work was completed.



No. 7 Adam-street is the central feature of a line of houses in the eastern street, and faces down John-street. It was, 100 years ago, the town house of Mr. Christopher Smith, then Member of Parliament for St. Albans. It became, 20 years later, the home of the Evangelical Alliance, which was inaugurated in Liverpool in 1845. Sir Culling Eardley, one-time Member of Parliament for Pontefract, and the founder of the Evangelical Alliance, resided at 7, Adam-street in 1858. Under his direction the early activities of this body, designed to constitute a working union between Protestant peoples, while forwarding the cause of religious liberty, were fruitful. For the Alliance secured recognition of the Christian faith from the Sultan of Turkey and the Khedive of Egypt, the repeal of penal laws in Sweden against Roman Catholicism, and elsewhere liberal reforms in favour of Jews. Later the religious atmosphere of the house became very pronounced, for its walls sheltered, in addition to the Evangelical Alliance, missionary, educational, and charitable associations. For the next 25 years this character was retained, but our immediate predecessors in the house were, appropriately enough, considering the character of the structure, a firm of architects. The reconstruction was carried out under the direction of Mr. Graham R. Dawbarn, A.R.I.B.A.

An informal At Home was held on Wednesday evening, Oct. 16th, on the new premises.

MEDICINE AND THE LAW.

Doctors Fined under the Dangerous Drugs Acts.

THE maximum penalty for failing to comply with Regulation 2 of the Dangerous Drugs Consolidated Regulations in the matter of keeping a register and making the prescribed entries therein is 12 months' imprisonment, or a fine of £250, or both. Fines considerably smaller than the maximum have hitherto been inflicted, but magistrates are disposed to warn defendants that the offence will be seriously regarded in future. Earlier in the month two London doctors were ordered to pay fines of £20 and £10 respectively at Marlborough-street police-court, with 10 guineas costs in each case. It appeared that the police had been pursuing inquiries into a case where it was suspected that a man and woman were obtaining drugs otherwise than for their personal use, and were trafficking in them in an improper manner. A detective-inspector visited a number of chemists, and found prescriptions signed by the two doctors, against whom proceedings were taken. One of the two doctors, who had omitted to enter a certain quantity of heroin, attended at Scotland Yard and was shown certain prescriptions. He admitted that these were signed by himself, and that the contents of four of them were in the handwriting of the patients. He also admitted that ten orders for drugs obtained for professional use, though signed by himself, were in the handwriting of the man whose dealings the police were investigating as already stated, and that although the orders were marked "for professional purposes," the drugs were obtained for, and were sent direct to, this man. He further admitted that he had kept no official register; he produced a list of drugs given to the man and woman, but it was stated on behalf of the Director of Public Prosecutions that the list in no way complied with the Regulations. In this case the doctor, who pleaded that he was an anæsthetist, not in the habit of prescribing dangerous drugs and entirely ignorant of the Regulations, was fined £10. In the other case there were similar features, prescriptions having been signed by the medical practitioner and filled in by the patient, and no proper register having been kept. The doctor produced a memorandum pad containing entries in pencil, but in this case, again, the prosecution contended that the document failed to comply with the Regulations, there being in particular no record of purchases. The defendant pleaded forgetfulness, due to overwork and ill-health, and added that the Act was difficult to interpret. The magistrate imposed a heavier fine in this case, on the ground that this defendant was aware of the need of keeping a register.

Members of the medical profession naturally find the meticulous compliance with the Dangerous Drugs Regulations a troublesome duty which, in moments of pressure, they may be inclined to postpone. The increased vigilance of the police in these matters brings irregularities to light sooner or later. It is not that the police invade the consulting-room at random in order to see if the Regulations are obeyed; it is rather that the police, in following up some allegation of improper traffic in drugs on the part of laymen, are obliged to trace the documents back to the source.

THE NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

ANNUAL CONFERENCE IN NEWCASTLE-UPON-TYNE, OCT. 10TH–12TH, 1929.

THE fifteenth annual conference of this Association was opened on Oct. 10th by the Lord Mayor (Councillor A. W. LAMBERT, M.C.), who welcomed the delegates on behalf of the city of Newcastle. Over 350 delegates attended including more than 200 members of the medical profession. We report the four chief sessions.

A Sociological Survey.

Under the chairmanship of Sir ROBERT PHILIP (Vice-Chairman of the Council) the first paper was read by Mr. HENRY A. MESS, Ph.D. (Director of the Tyneside Council of Social Research), entitled Tuberculosis on Tyneside. Dr. Mess said that a survey of social conditions in 13 industrial towns on Tyneside had been undertaken during the years 1925–28, and it had been found that with the exception of two middle-class "dormitories," all the towns had death-rates from pulmonary tuberculosis for the quinquennium 1921–25 considerably in excess of the national death-rate; in respect of non-pulmonary tuberculosis the figures were even worse. Overcrowding existed in the houses of Northumberland and Durham to an extent unparalleled in England and Wales, and this coincided, except in the mining districts, with the excessive death-rate from tuberculosis. The overcrowding was not only within the homes; in addition there was overcrowding of houses on the land resulting in an unusually large outpouring of domestic smoke, with depletion of sunlight together with the impossibility of effective isolation of diseased individuals. The local industries, shipbuilding and ship repairing, were very subject to violent fluctuations—livelihood was therefore uncertain and often scanty, leading to worry and malnutrition, which predispose to the disease.

Discussion was opened by Councillor JOHN BARKER (Chairman of the Tuberculosis Committee, Newcastle-upon-Tyne) who dealt with the local situation and the facilities provided for handling the problem, and made special reference to Newcastle's position. He warned local authorities against building types of low-rented houses which would in 20 years' time present another slum problem, suggested that the National Association should press the Ministry of H[illegible]lth for stricter obligation on local authorities to BARTH[illegible] now being adequate tuberculosis dispensaries, educa- fitted with a[illegible]es, and institutional segregation, and [illegible]ders of hard[illegible]he setting up of regional advisory [illegible] the vario. KERR (M.O.H., Newcastle) paid a will facilita[illegible]'s work locally, and said that it 20,000 gall[illegible]rculosis conscience of Tyneside. [illegible]x (M.O.H., Manchester) stated

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that while there must be earlier and more complete notification of all cases occurring, there should be assurance that something would be done for the persons notified.—Councillor GRIFFITHS (West Riding of Yorkshire) said that Dr. Mess's figures only applied to the years 1921–25, and that since 1926 the mining population were suffering from tuberculosis more than ever owing to malnutrition, unemployment, and low wages.—In reply to the last speaker, Dr. S. G. MOORE (M.O.H., Huddersfield) pointed out that while privation and poverty play an essential part in tuberculosis as well as other diseases, the children of the rich also suffer and die from the fell disease.

The Factors that Produce Adult Pulmonary Tuberculosis.

Dr. EDOUARD RIST (Paris), in introducing the subject, said that the old traditional idea that consumption was due to some mysterious constitutional or hereditary predisposition must be abandoned. In civilised communities the adult was not, like the infant, virgin soil for the tubercle bacillus—disease in the adult was not the result of a first infection. Infection occurred in childhood, leaving the subject healthy and immune for years until, under the stress of adverse conditions, he more or less suddenly fell a victim to the disease. Physical vigour in itself did not protect against tuberculosis; the intensive training of the pugilist offered no guarantee against the disease. While a rational and well-ordered, well-regulated mode of living would undoubtedly reduce the liability to infection, it must be admitted that the actual causes of a breakdown were largely obscure; only a few factors were more or less definitely known or suspected, and it was left to the coming generation to discover those of which we were to-day utterly ignorant.

Dr. A. F. BERNARD SHAW (College of Medicine, Newcastle-upon-Tyne) followed with a contribution from the pathological side. His paper dealt with the value of the experimental method and the phenomena of virulence, resistance, and allergy in the study of tuberculosis. Mentioning that it was extremely rare in civilised communities to find in adults progressive pulmonary lesions resembling those found in the primary infection of childhood, he maintained that the rarity of such cases was in strong support of the idea that the bacilli of childhood infection do not commonly survive to adult life in numbers sufficient to serve as the origin of adult phthisis, and was of opinion that pulmonary tuberculosis occurring in adolescence or later was due to reinfection from without.

Dr. C. G. R. GOODWIN (Medical Superintendent, Barrasford Sanatorium), dealing with the subject from the medical standpoint, said that infection with the tubercle bacillus, though an essential factor, was not the sole cause of manifest pulmonary tuberculosis, and was of opinion that active lung tubercle in adult life was not due to a new or recent infection, but was an extension from a pre-existing focus, laid down in childhood, and that this extension and spread were due to adverse environmental conditions in the home and/or prolonged chronic fatigue. To reduce the incidence of the disease, he advocated adequate separation of advanced cases from children, and improvement of the housing and social conditions of the poor. Further, he advised that the public should be clearly taught, first, that those who gave themselves no leisure were prone to develop a state of chronic fatigue with loss of weight and increased liability to tuberculosis; and, secondly, that when maintained loss of weight occurred medical advice should be sought.

Sir THOMAS OLIVER (Vice-Chancellor, Durham University) dealt with the industrial aspect of the disease and said that occupation might favour its development by locally predisposing the pulmonary soil for the reception of the bacillus and by reducing the general resistance of the worker. Speaking of the relationship of pulmonary disease to dust inhaled at work, he instanced the decreased incidence of phthisis among steel-grinders as a result of improved methods of ventilation and changed methods of operating. He considered the granite industry at home and abroad, and directed special attention to the work of the South African Miners' Phthisis Medical Bureau. He also detailed some experiments conducted by himself which showed that the finest particles of dust did not absorb water, and expressed the opinion that those particles were the cause of silicosis where rock-drilling was accompanied by water sprinkling.

Instruction of the Public, the Tuberculous, and the Medical Student.

Dr. WILLIAM BRAND (Medical Commissioner to the Association) gave an address on a Scheme of National Propaganda Regarding Tuberculosis. Quoting the aphorism of the late Dr. Herman Biggs that "health is purchasable," Dr. Brand said that this was the case for propaganda in a nutshell provided we knew what to buy. It was incumbent upon those with specialised knowledge to share it with the public and instruct the masses in tuberculosis, its causes, prevention, and the general principles of treatment. Antituberculosis propaganda must not be intermittent, but should be constant and insistent. The subject should be approached through every possible channel—e.g., the schools, the Boy Scout movement, the press, and the medical and nursing professions—besides the official public health services.

Dr. A. H. MACPHERSON (Medical Superintendent, Burrow Hill Sanatorium Colony) read a paper on the Combined Treatment and Technical Education of Tuberculous Youths. The Burrow Hill Sanatorium Colony had been reorganised, he said, to provide combined treatment and technical training for youths between the ages of 14 and 19 years. Courses of training were given in gardening and clerical work. The cost, £2 10s. per week, was defrayed by the authority responsible for the patient's admission. Forty-six youths from various parts of the country were in residence and the results were very hopeful, but the success of the scheme depended largely upon the coöperation of the local care committees and their ability to find permanent employment for the trainees. —Dr. NOEL BARDSWELL (Medical Adviser to the London County Council) followed with a glowing account of the colony, its situation, surroundings and its work, and expressed the opinion that the patients should derive great and lasting benefit from residence in the institution.

Prof. THOMAS BEATTIE (Durham University), speaking of the Teaching of Tuberculosis to Undergraduates, deprecated the institution of special courses in tuberculosis, and expressed the fear that the general standard of medical education would suffer if more special subjects were included in the curriculum. He held that tuberculosis was so intimately connected with general medicine and surgery that teaching in it could be best imparted by the professors of these subjects supplemented by instruction gained in the bacteriological and pathological departments. He hoped that the present inadequate supply of clinical material would be increased when the poor-law hospitals were taken over by the local authorities.—Dr. FERGUS HEWAT (Edinburgh University) said that the teaching of tuberculosis to undergraduates was regarded as an essential part of the medical curriculum in all Scottish universities. Such teaching should be given in the final year of study.—Dr. JAMES CROCKET (Glasgow University) said that only two things had to be considered: (1) Was there the need? and (2) Was there the time? He maintained that the need and the time for special study of tuberculosis both existed, and outlined the course at Glasgow.—Dr. A. TRIMBLE (Belfast) thought that the teaching of tuberculosis was so necessary that it would pay the municipalities to subsidise a lectureship in every medical school.—Dr. M. DAVIDSON (Brompton Hospital) remarked upon the lack of clinical material for the teaching of pulmonary tuberculosis in the general hospitals and advocated closer coöperation between these and the poor-law hospitals.

Dr. W. H. DICKINSON (Newcastle-upon-Tyne) read a paper on the

Training of Tuberculosis Medical Officers.

After the usual house appointments, he advised a period of general practice, followed by a post in some department of the public health service other than tuberculosis, so that the prospective tuberculosis officer might be imbued with spirit and ideals of prevention. A junior appointment in a large sanatorium or special "chest" hospital should precede application for a post as assistant tuberculosis officer. Dr. Dickinson laid special stress upon the importance of post-graduate study in general medicine as well as tuberculosis and the recommendations of the Astor Committee regarding study leave were quoted.—Dr. J. D. LEIGH (Sunderland) said that special training in surgical tuberculosis was necessary, and pointed out that some hospitals contended that non-pulmonary tuberculosis should be prevented and treatment ought to be a direct charge on the municipalities.—Dr. F. J. H. COUTTS (Ministry of Health) emphasised the importance of the subject and paid a handsome tribute to the zeal and enthusiasm of the members of the tuberculosis service under difficult conditions.—Dr. J. CROCKET (Glasgow) said that the course of study for the D.P.H., as at present constituted, was not of much value to the tuberculosis officer. He suggested that the value would be enhanced if the examination could be modified to allow candidates to pass in special subjects—e.g., tuberculosis.—Dr. J. C. GILCHRIST (Welsh National Memorial, Cardiff) pointed out the value of contact with students to tuberculosis workers, and mentioned that the tuberculosis officers and sanatorium superintendents were recognised teachers in the University of Wales. He also alluded to the value of the quarterly meetings of the staff of the Welsh National Memorial Association, with clinical discussions and pathological demonstrations.

Dr. HARLEY WILLIAMS (Assistant Medical Commissioner, N.A.P.T.), in the course of an address on Methods of Local Propaganda Regarding Tuberculosis, said that it was only in recent years that propaganda had come to be regarded as a legitimate part of the campaign against disease. The greatest difficulty was the ignorance surrounding the question of tuberculosis, and he urged a great extension of the teaching of the subject to the lay public, especially through the medium of the schools.

The session concluded with an address on Dentistry in Relation to Tuberculosis by Dr. WILLIAM GUY (Edinburgh), in which he laid emphasis upon the importance of preventive measures before infection occurred, and upon the necessity of an efficient dental service at all sanatoriums, clinics, and dispensaries.

A HOSPITAL BANNER.—A banner made by the patients of Grangethorpe Ministry of Pensions Hospital in 1927, in memory of the 330 patients who have died within its walls, has been placed in St. James's Church, Birch-in-Rusholme, Lancashire, and dedicated by the Bishop of Middlesex. Grangethorpe, which was originally a military hospital, ceases to be a Ministry of Pensions institution at the end of the present month.

WEST BROMWICH GENERAL HOSPITAL.—The report of the medical committee for the year ended on June 30th last, signed by Dr. L. A. Dingley, the chairman, states that the 1683 in-patients formed a "record." The general death-rate was 4·3 per cent.; 2·3 per cent. died within 48 hours of admission. In the casualty department 10,171 cases were treated, and the medical staff urge the importance of replacing this building, which is out of date and unsuitable to the heavy demands upon it.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Nursing and Midwifery.

ADDRESSING the annual meeting of the Midlothian County Nursing Association, Dr. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland, spoke of the need for a radical reorganisation of the training of nurses. At present any girl looking forward to making a comprehensive profession of nursing would be in a position of tutelage for ten years, including three or four years of general training, three years' experience of fevers, one year of maternity work, a year at mental diseases, and so on. The thing was ridiculous. He looked forward to the time when a woman going in for nursing would get a comprehensive training within four to five years. He aimed at the orientation of the county service of Scotland round the medical schools of Edinburgh, Glasgow, St. Andrews, and Dundee and Aberdeen. This would provide the utmost efficiency, with reasonable economy. A million and a half pounds a year were being spent on a national health insurance system that was breaking down at the vital point—where the person needed nursing and hospital treatment. In the women's wards of the general hospitals 75 per cent. were there to seek remedy from the results of the present state of midwifery practice in Scotland. These things could be put right by a proper system of prenatal service, which the local authorities were called upon to provide, and by a proper midwifery service; but it could only be done by a combination of the voluntary and official organisations. They had met the voluntary hospitals, and got them organised into regions. When they knew what the voluntary systems could do, they would say to the local authorities: "You fill up the gap." The same thing held as regards this great nursing service.

Highlands and Islands Medical Service.

The Secretary of State for Scotland has received Cabinet sanction to introduce a Bill to amend the Highlands and Islands Medical Service Act. Under this Act an annual expenditure of £42,000 was authorised, but after 15 years' experience it has been found that the sum is too small for the schemes already developed, and the annual total expended for the last few years has been over £60,000. The new Act will probably provide for a larger annual sum, and may contain some amendments indicated by experience. The medical service (including nursing) arranged under the Act is, at least in Great Britain, a unique experiment in so-called "State medical service." Its success is now recognised.

The Glasgow Mental Colony.

A considerable time ago the Glasgow District Board of Control decided to convert the house and grounds of Lennox Castle, Stirlingshire, into a colony for the care and treatment of mental defectives. The scheme is one of the largest ever undertaken by the Glasgow Board, which will now be able to classify their mental defectives in a much more satisfactory way. Lennox Castle will accommodate 1000 patients, and this will probably meet the needs of Glasgow and the west of Scotland for some years. Stone-Yetts, another large colony both for epileptics and mental defectives, which has been worked on modern lines under Dr. Chislett for many years, will now be available for other poor-law purposes. With the Gogar-Burn Institutions for Edinburgh and the east, Lennox Castle and Stone-Yetts in the west, and the Royal Institution at Larbert in the centre, Scotland is rapidly making up leeway in her provision for the selected feeble-minded and their permanent care.

The Young Offender.

Mr. Tom Johnston, Under Secretary of State for Scotland, at the annual meeting of the Glasgow Council of Juvenile Organisations, said that he thought there was great need for more careful examination into the causes and prevention of crime. The theory of public and legal vengeance was archaic. It got nowhere at all, and a deterrent theory was getting but a very short distance. It had been stated in America that nine-tenths of the criminals in prisons ought never to have been there. He had heard the chairman of the Glasgow Parish Council say that three-quarters of the unfortunates who reached the Council under the label of "mentally deficient" ought never to be there either. In view of such statements he thought it was time that they bestirred themselves municipally in an endeavour to prevent these institutions from being choked with boys and girls, young men and women, and also old men and old women, who ought never to have been allowed to drift that length.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Stresemann's Illness.

THE late Mr. Stresemann suffered from nephritis, which was discovered about six years ago. Notwithstanding the great strain of his political work, he felt comparatively well until he contracted pneumonia in 1926. After that his general health deteriorated and he nearly died of renal insufficiency in 1928. He recovered sufficiently to take up again the burden of his office as Foreign Minister, but attacks of cardiac weakness gradually developed and on his journeys to conferences abroad he had to be accompanied by his medical attendant. At the Hague Conference this summer, which was associated with an enormous amount of work and much excitement, his illness grew worse, and his foreign colleagues noticed a great change in his condition. After the Hague and Geneva Conferences he took a short holiday at Vitznau on the Lake of Lucerne. A few days before his death he returned to Berlin, where party troubles induced him to leave his bed against medical advice. He was not a very obedient patient and it was very difficult for his medical advisers to make him follow their prescriptions. He indulged in smoking and was not a total abstainer, contrary to dietetic rules. On the evening of Oct. 2nd he had a cerebral hæmorrhage with paralysis of the left side. His medical attendant, Prof. Zondek, and Prof. Kraus were called in, but he died six hours later without regaining consciousness.

Lead Poisoning as a Legacy of Gunshot Wounds.

Notwithstanding the enormous number of gunshot wounds received in the late war in which bullets or fragments of metal remained in the body, the number of cases of lead poisoning from this cause has been very small; in fact no more than eight seem to have been recorded. In the *Deutsche Zeitschrift für Chirurgie* Dr. Hage has lately described a new case, in which the patient was a meat inspector who had been wounded in the war in German South-West Africa 22 years ago. In 1926 he complained of tremor of the fingers, headache, and colics, and gradually his complexion got the characteristic lead pallor, whilst a blue line developed on the gums and there was weakness of the extensor muscles. The presence of basophile erythrocytes and an increase of hæmatoporphyrin in the urine left no doubt of the diagnosis of lead poisoning, and by radiography it was ascertained that there were some splinters of metal in the femur. As the man had nothing to do with lead, the poisoning was evidently due to those splinters. Hage draws attention to the lapse of 20 years since the injury, and suggests that this time interval may explain why but few cases of lead poisoning have so far been noticed among men wounded in the late war.

Boycott of a Medical Man.

A medical man whose motor-car was damaged by a railway car claimed damages which according to the railway company were excessive. The company thereupon told its employees not to consult this doctor, and the works committee, under pressure from the company, also recommended workmen to go to other practitioners. The doctor accordingly brought an action for damages against the company and won the case. By an injunction the company was first restrained from boycotting the plaintiff and was then ordered to pay him damages for the loss of a part of his practice. In judgment the court described the behaviour of the company as highly immoral and a kind of revenge. If they regarded the doctor's claim as too high their remedy was to apply to the courts or settle the matter extra-judicially. The claim of the medical man having nothing to do with his professional skill, they were obliged to recover the damages done to him. This judgment will certainly meet with the approval of the profession in general, since boycott of medical men for reasons not connected with their profession has also been tried on other occasions, though not in such an open and silly way.

Occupational Diseases of Dentists.

Dr. Mosenthal, a Berlin orthopædist, recently read a paper on the occupational diseases of the dental profession. Among these may be mentioned wounds of the fingers by bites, with or without infection, and dermatoses caused by frequent washing of the hands with sublimate of mercury. By over-exertion of certain muscles used in dental work neuroses may be caused, whilst conditions such as genu valgum and genu varum may be produced by long hours of standing. The position of the dentist at the operation chair sometimes leads to scoliosis, and flat-foot may develop as a sequel to relaxation of the muscles and ligaments. Varicose veins are also very common. Mosenthal advises dentists to remain seated at their work, as many surgeons already do in performing operations, and he recommends for that purpose a rotary chair. Certain pauses in the work when the dentist should rest in a sitting position are necessary, and he must also see that he has adequate shoes.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Post-vaccinal Encephalitis.

THE European experience with post-vaccinal encephalitis is the subject of extended comment in the current *Annals of Internal Medicine*, which reflects the very general reluctance of American pathologists to believe that a pure vaccine virus can produce encephalitis. It is not long since Dr. Richard Thompson, of Columbia University (a Fellow in Medicine of the National Research Council), reported his failure to produce vaccinal encephalitis in rabbits with a testicular virus. With direct intracerebral injection attempts to adapt the virus by brain and brain passage, at seven day intervals, gave negative results. Alternating brain and testicular passage, as used originally by Levaditi, was no more successful. Thompson considered that a possible explanation of the discrepancy between his results and those of so many European workers might be in variations in the strain of virus employed; that some would produce encephalitis without difficulty, others only after adaptation, and *still others not at all*. He mentions also the theory of Camus that the vaccine virus may be contaminated by some unknown neurotropic virus. It is to this latter theory that the editorial above mentioned very definitely leans. May not the unknown virus be simply the normal virus of rabbit encephalitis carried over with rabbit lymph, and may it not produce encephalitis in susceptible human beings? Up to the [illegible] four cases of post-vaccinal encephalitis have been reported in the United States. It is urged that, until the question of the ætiology of this disease is settled, the use of rabbit lymph in vaccination should be stopped.

A Healthy Summer in New York.

This summer has seen unusually healthy conditions in New York State. July saw two records broken: the infant mortality-rate of 48 per 1000 live births is the lowest July rate yet achieved, and represents a ratio of only 7·8 per cent. of all deaths; tuberculosis mortality (78·9) is also the lowest ever recorded in this month. The reported cases of tuberculosis show an increase of more than 400 over the corresponding month of last year, a striking example of improved diagnosis going hand in hand with falling mortality. The increase of 700 in the reports of syphilis is no doubt partly due to improved reporting, as well as to the fact that the venereal diseases, formerly reportable only by laboratories, have now been made reportable by physicians. Other changes made in the sanitary code relating to the reporting of disease are the dropping of erysipelas from the list of notifiable diseases and the addition of tularæmia and undulant fever. Five cases of undulant fever were reported during the month.

The Study of Morbidity.

Vital statisticians have for some years been pointing out that mortality statistics are a very poor index of the amount of sickness in a community. New York State has introduced a system of reporting sickness which already enables it to publish at regular intervals some very informing statistics. The U.S. Public Health Service is now projecting the establishment of a morbidity registration area, not only with the object of collecting important data for statistical manipulation, but also with the more immediate object of raising the standard of the reporting of notifiable diseases. As a basis for discussion it is suggested that the reporting of the following six diseases should be considered a basis for admission into the new registration area—viz., diphtheria, infantile paralysis, scarlet fever, small-pox, typhoid, and tuberculosis. The suggested minimum of efficiency which each State would have to reach before admission is 75 per cent. of all clinically recognised cases. The funds available to the public health service for this work at the present time are not large, and the success of the project will depend largely upon the coöperation accorded by the local units. If that is generously accorded it is hoped that the proposed registration area may be established by July of next year. In the meantime some valuable data are being correlated in the statistical division of the public health service from reports received from 35 different industrial sick benefit associations. One limitation of these industrial statistics is the absence from them of diseases for which benefits are commonly refused, including the venereal diseases and those which result from infractions of the law.

Phenol Wastes and the Water-supply.

The common practice in this country of adding chlorine to municipal water-supplies has given great importance to the elimination of phenol wastes on account of the fact that even small traces of phenol, when combined with a minimal quantity of free chlorine, will give to the water a most unpleasant taste. During the past five years a campaign has been conducted to exclude phenol wastes from the Ohio river. Although reliance has been placed upon education and persuasion unarmed by any legislative powers, the campaign has met with such success that to-day only four coke plants are discharging phenol wastes into the river in place of 17 such offenders in 1924. A careful record has been kept of the appearance of chloro-phenol tastes in the meantime, as well as of the flow of the river. There is a greater loss of concentration in the phenols as they pass down stream than can be accounted for by increasing dilution—the result, it may be, of biochemical oxidation.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of six towns:—

Name of town and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Croydon C.B. (214,800)	15·7	11·0	0·96	1·52	1·5	1·9	53/20	28	3·9
Coventry C. (161,600*)	14·4	9·6	1·0	1·24	1·5	1·5	66/30	33	4·7
Derby C.B. (138,900)	19·3	10·9	0·93	1·28	1·1	1·7	60/30	26	7·5
Preston C.B. (127,100)	15·1	12·7	0·95	1·41	2·2	2·0	91/42	34	6·3
Northampton C.B. (94,070)	13·9	11·3	1·06	1·59	1·5	2·3	53/25	21	3·0
Paisley B. (88,140)	20·2	13·1	1·33	1·23	2·3	1·6	105/49	50	4·4

* The city was extended on April 1st. The above is a special estimate for statistical purposes. The mid-year estimate for the extended city was 168,134.

C. = City. C.B. = County Borough. B. = Burgh.

Croydon.

Dr. Oscar M. Holden describes Croydon as an originally residential town, which is gradually assuming an industrial character. The chief industries are iron foundries for bell-casting and engineering, and the London terminal aerodrome is within the borough. At the request of the Ministry, three members of the medical staff have performed duties at the aerodrome under the Aliens' Order, 1925. The cost of this service does not fall on the rates, and Dr. Holden points out that if the work is to be done properly a full-time medical officer will be required in the near future. Dr. Holden's experience hitherto has been in northern industrial towns, and he comments on the comparatively small figures of deaths due to respiratory diseases in towns like Croydon, but adds a word of warning that a rise in the death-rate from these diseases is likely to occur in south-eastern England owing to increasing urbanisation and industrialisation unless adequate steps are taken to prevent atmospheric pollution.

St. Mary's Hostel provided by the Croydon Mothers and Infants Welfare Association, has 17 beds for maternity cases, of which the corporation retain 15, in return for an annual grant of £1800. All cases, other than emergencies, have to pass through the municipal antenatal clinics. During 1928 the 314 admissions to the municipal beds included 11 emergencies; 193 cases had to be refused. Thanks to a legacy of £7500, aided by a municipal grant of £3000, this institution is to be extended by the erection of a modern maternity block of 32 beds, of which the corporation will rent 30. Dr. Holden mentions that the closer linking up of antenatal, natal, and postnatal activities is perhaps the most urgent matter for consideration in the maternity and child-welfare scheme. One of the great lacks at present is suitable accommodation for mental deficiency cases, and the solution suggested is that Croydon should combine with other authorities to provide a large institution or colony.

From the school report we learn that ionisation and rheumatism clinics have been established. The former was opened in July under the charge of Dr. J. D. McLaggan. The cases dealt with, 48 in number, all had obstinate ear discharges. None had lasted less than six months, 1 six to twelve months, 4 one to two years, 14 two to five years, 11 over five years, and in 11 the duration was unknown. The results appear to be satisfactory so far, but no figures as to cures can be given as that implies at least six months freedom from discharge. The rheumatism clinic had a flying start on April 30th as for 18 months note had been made of suspects during routine school inspections. The full coöperation of parents and teachers has been obtained. There were 314 cases examined, of which 243 were classed as rheumatic. Interesting particulars are given of the incidence of the various rheumatic manifestations, family histories, and environmental conditions. There has been as yet no provision made for institutional treatment, but a few of the children were sent to West Wickham Heart Home.

Coventry.

Dr. E. H. Snell presents his thirty-second and farewell report, and appropriately includes in it a table giving the principal vital statistics of his first annual report for 1897 and of that for 1928. The comparison shows that the population has nearly trebled; the birth-rate has declined by 54 per cent., the death-rate by 43 per cent., infant mortality by 58 per cent., and the phthisis-rate by 23 per cent., while the mean age at death has gone up by 12·8 years. Among the advantages of Coventry, Dr. Snell enumerates a ring of commons on its borders, an almost non-existent smoke problem, a good average standard of living owing to regular employment, and the fact that two-thirds of the houses have been built in the last 30 years in accordance with modern by-laws. The insignificance of the smoke problem, he points out, is helped by the facts that practically all the works obtain their power from the electricity department, and by the large use of gas-stoves for heating and cooking. There are 40,000 gas-cookers and 14,000 gas-fires for slightly over 38,000 houses, and during the late coal stoppage there were less than 100 applications for coal permits on the ground of having no gas-cooker. Since 1916 practically nothing has been possible in the way of closing unfit houses. During the war the city was flooded with thousands of munition workers, and since the war there has been no alleviation in the great demand for houses, which is a long way from being satisfied. Some thousands of new houses could be let if they existed. Also a larger staff of sanitary inspectors is needed to deal with decay and dilapidation in the older property.

The recent extension of the city boundary raised its acreage by 4147 to 12,878 acres and the population of the added area at the middle of the year was 26,134. New problems have thereby arisen. Pig-keeping, except in such places as allotment gardens, was prohibited in the old city under a local Act of 1790, but pig-keeping in the rural added area has been an established custom from time immemorial. Other problems are polluted shallow wells and wooden shacks of all kinds used as houses. Again, there were only six cow-keepers in the old city supplying about 260 gallons per day, but the milk produced in the extended city is estimated at 1387 gallons per day. More than half the total quantity is delivered in bottles, the greater portion being pasteurised or sterilised. The question of institutional accommodation for mental defectives is a matter of growing importance. Owing to the generosity of the public to the organisations for the blind, the municipality only provides about a quarter of the amount expended in assisting unemployable blind persons. Progress has been made in the abattoir question. An ideal site has been approved close to the railway and to the cattle market, and it is proposed to erect a thoroughly up-to-date building, which will enable all the private slaughter-houses to be closed. Curiously enough the site, which is now approved, was under consideration 40 years ago for a similar purpose but on a much more limited scale.

The deaths from diphtheria show an increase recently. In 1926 there were 5, in 1927 21, and in 1928 42. The case fatality per cent. during these three years has been 5·2, 11·3, and 16·7. Immunisation has been recently adopted for the nursing and domestic staff of the hospital, and is being pushed at the welfare centres and in selected schools. The notifications of encephalitis lethargica numbered 8 and the deaths 11. There were 110 definitely known cases of small-pox. One 9-year-old girl, who had a very mild attack with other members of her family, developed acute primary pneumonia, which proved fatal, a few days after admission to hospital.

Derby.

Dr. Albert E. Brindley says the most unsatisfactory statistical fact is the increase in maternal mortality. The death-rate from puerperal sepsis alone was 3·0 per 1000 births. Antenatal work is only on a small scale as yet; the clinic was attended by 207 expectant mothers and the total births in the borough were 2070. Dr. Brindley objects to the term "filth-disease" being applied to small-pox, as it has affected some of the cleanest persons living in the cleanest houses in the town, and the use of the term may not only cause distress to sufferers but lead to concealment of cases. He mentions that counsel for one of the property owners at a recent improvement scheme inquiry tried to make a strong point of the fact that no small-pox had occurred in the area. There were 212 known cases of small-pox and no deaths during 1928. The corporation, in their 1929 Bill, are seeking powers to require information to be furnished under a penalty, when such information is deemed necessary for preventing the spread of small-pox and other infectious diseases.

In the recently added area 30 samples of well water from 28 wells were examined and only 8 were reported as fairly satisfactory for drinking purposes. The new houses erected during the year numbered 198, of which 63 were municipal. Pitiful applications continue to be received at the Health Office for municipal houses, and many cases of overcrowding come to the knowledge of the inspectors in visiting notified infectious diseases. During the year the corporation made a first attempt to deal with two slum areas. The first area comprised 120 houses with 482 occupants; the second 80 houses with 379 occupants. The intention was to rehouse the displaced tenants. The inquiry was held in October, but unfortunately, owing to legal difficulties, the efforts of the corporation have been, for the time being, at any rate, nullified. At the beginning of 1928 there were about 1700 objectionable tub or pail closets. These have now been practically all dealt with, the corporation paying a subsidy of £8 each for their conversion into water closets. Dr. Brindley again records the need for new premises for the health offices and for adequate and suitable accommodation for maternity and child welfare work.

Preston.

Dr. F. A. Sharpe points out that the main attack is no longer on the environment and that even the slum problem is a comparatively minor one in Preston, the chief aim being to see that a vast amount of rapidly ageing working-class property is maintained in reasonable condition. Work in the interest of the individual will receive, he says, a fresh inspiration and impulse from the Local Government Act of 1929. The care of the poor and their medical treatment will be in the hands of one authority, and there will be unification of public medical services and coördination of hospital treatment and of medical services for infants, mental defectives, and blind persons, opening out fresh fields of endeavour. At present the various departments are separately housed, and the outstanding need is the creation of a central office in which the administrative work of all branches can be organised and controlled.

The houses erected since 1911, numbering 3703, are more than sufficient to contain the natural increase of the population on the basis of 4·3 persons per house, which was the density at the 1921 census. Notwithstanding, bad housing conditions are to be found. When the corporation build houses they finish the roads, but this is not the case for private enterprise houses. The majority of persons who have bought "private" subsidy houses have stretched their resources to the utmost to do so, and many are not in a position to face the cost of road dedication, but in the absence of proper roads their property is bound to deteriorate. Less than 4 per cent. of the milk is produced in the borough. The biological examination of 257 bulk samples of milk showed that 28, or 10·9 per cent., were tuberculous. Dr. Sharpe shows that the present method of following up tuberculous milk samples is no incentive to the outside farmers to produce tubercle-free milk. One of the 28 tuberculous samples was from a farmer, who had already been twice dealt with. When his farm was visited in 1928 two tuberculous udders and one cow with advanced tuberculosis were found. These animals were obviously diseased and should have been notified under the Order.

The births in the borough numbered 1910 and the expectant mothers who attended the antenatal clinic were 311, of whom 85 were sent by midwives. An arrangement is now in force by which if a midwife-sent case has to be referred to hospital the midwife receives half her fee as compensation. Four midwives were so compensated during the year. A questionaire sent out during the year brought out much difference of opinion among medical practitioners and others as to whether prolonged industrial depression has affected the health of working-class mothers. The school report shows the need for the increase of the dental staff, and that the orthopædic scheme begun in the autumn of 1927 has done a satisfactory year's work.

Northampton.

Dr. Stephen Rowland reports that the chief interest has been centred in the small-pox outbreak which began in July, 1928, and is still in existence in the middle of 1929. During 1928 there were 82 cases with no deaths, and up to June, 1929, there had been altogether 450 cases. Dr. Rowland's experience suggests that vaccination confers immunity for at least 20 to 25 years, and that cases unrecognisable by their mildness may cause the disease in others in a much more severe form. Bacterial examination of the water-supply showed an unexplained increase in coliform organisms during the later months of the year. Dr. Rowland comments on the fact that it is quite common for persons suffering from active tuberculosis to marry. He cites one example, where a young married woman in the last stage rose from bed to attend the wedding of her sister, also suffering from active phthisis. The first-named died a few days after the wedding, her death being followed a few weeks later by that of her child from tuberculous meningitis. An X ray apparatus is needed at the dispensary for diagnosis and for the control of artificial pneumothorax. No attempt at the clearance of any large slum area has been possible. Of 24 houses condemned during 1928 14 were still occupied at the end of the year, owing to the lack of other accommodation. Dr. Rowland points out that when a closing order is made the tenants are in no hurry to leave as they are able to live rent-free.

Paisley.

Dr. G. V. T. McMichael describes a gallant fight against overwhelming odds. The proportion of one- and two-roomed houses is 63·4 per cent. A survey of 3083 of the oldest houses towards the end of the year showed that more than 25 per cent. were overcrowded, some of them being occupied by two or three times the number of persons they were fitted to accommodate. The average inclusive rent of a one-roomed house is 10*s.* per month, and of a two-roomed 25s. per month, and many of the occupants are not in a position to pay much more. 362 of the houses inspected were only fit for demolition. After considering a report on these lines the burgh council decided to proceed with a scheme for 200 two-roomed houses to be let at rents which the lower paid working-classes can afford. Another difficulty confronting the health department is that the clinics are overcrowded, and that the medical staff is inadequate for the provision of the extra sessions needed. The child welfare centres are being used as out-patient departments, and in Dr. McMichael's opinion the only remedy is the extension of the insurance service to dependents. One of the bright spots is Barshaw Municipal Maternity Hospital, which provides ample accommodation for both antenatal and labour cases. More mothers need to be attracted to the antenatal clinics, and a separate postnatal clinic is required for them. More dental work is wanted especially among the pre-school children whose teeth are "in a deplorable state." The present arrangements do not attract female patients to the V.D. clinic, and Dr. McMichael suggests that an extra session should be provided in the evening. The provision of a joint county sanatorium for non-pulmonary tuberculosis and the substitution of an up-to-date isolation hospital on the outskirts for the old burgh fever hospital have been long awaited but are now apparently approaching realisation.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 5TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 97 (last week 108); scarlet fever, 2913; diphtheria, 1402; enteric fever, 83; pneumonia, 853; puerperal fever, 45; puerperal pyrexia, 107; cerebro-spinal fever, 2; acute poliomyelitis, 29; acute polio-encephalitis, 4; encephalitis lethargica, 15; dysentery, 25; ophthalmia neonatorum, 116. No case of cholera, plague, or typhus fever was notified during the week.

The notifications of small-pox this week, as three weeks ago, are again below the 100 level which has been maintained since September, 1928.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 7th–8th was as follows:—Small-pox, 141 under treatment, 4 under observation (last week 143 and 10 respectively); scarlet fever, 1999; diphtheria, 1969; enteric fever, 27; measles, 165; whooping-cough, 163; puerperal fever, 25 (plus 9 babies); encephalitis lethargica, 125; poliomyelitis, 6; "other diseases," 15. At St. Margaret's Hospital there were 18 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 13 (3) from measles, 4 (1) from scarlet fever, 30 (4) from whooping-cough, 34 (9) from diphtheria, 189 (41) from diarrhœa and enteritis under two years, and 32 (7) from influenza. The figures in parentheses are those for London itself.

Of the deaths from diarrhœa (the number of which has now reached its fastigium) 17 were reported from Birmingham, 15 from Hull, 11 from Liverpool, 9 from Middlesbrough, 7 each from Salford and Leeds, 6 each from Manchester and West Ham, while Glasgow, Dublin, and Belfast reported 9, 8, and 10 respectively.

The number of stillbirths notified during the week was 269 (corresponding to a rate of 43 per 1000 births), including 53 in London.

A NEW SUNDERLAND HOSPITAL.—A new Monkwearmouth and Southwick hospital to contain 120 beds is about to be built at Sunderland at a cost of about £95,000. Sir John Priestman, shipbuilder and chairman of the hospital, who has already given £5000 towards the building fund, has announced that he will give a further £10,000.

Correspondence.

"Audi alteram partem."

GENERAL MEDICAL COUNCIL.

ELECTION OF DIRECT REPRESENTATIVES FOR SCOTLAND.

To the Editor of THE LANCET.

SIR,—The Registered Practitioners of Scotland will shortly be called on to elect a Direct Representative to the General Medical Council, and we, the undersigned, have ascertained that Sir Norman Walker, who has served with so much acceptance as our Representative for over 20 years, is willing to submit himself again as a candidate.

We recall with satisfaction the record of valuable and responsible work which he has achieved as our Representative. That he is a valued member of the Council is shown by the many important positions he occupies, and the special Missions with which he has been entrusted. On the Council he is Chairman of the Business and of the Examination Committees, and a member of the Executive, Finance, and Penal Cases Committees. In 1927, on the invitation of the Government of India, he visited for the second time the Medical Colleges and Universities of that Country, and reported on the progress made since his first visit in 1922; and last year, on the invitation of the Council of Medical Education and Hospitals of the American Medical Association, he revisited the United States, delivered Addresses on Medical Education and on Medical Registration and Legislation in Great Britain and in the British Dominions, and took part in the deliberations of their Annual Conference.

As Chairman of the Examination Committee he had important duties in connexion with the last Official Inspection of the Final Examinations of all the Licensing Bodies in this Country in Medicine, Surgery, and Midwifery, and should he again be returned as our Representative, it is probable that these will be again entrusted to him in connexion with the new cycle of Inspection which begins next year. We therefore venture to suggest to our medical colleagues in Scotland that Sir Norman's candidature might well be afforded our hearty support at this election.—We are, Sir, yours faithfully,

C. E. DOUGLAS (St. Andrews).
P. T. HERRING (St. Andrews).
D. WATERSTON (St. Andrews).
D. E. DICKSON (Lochgelly).
J. MACDONALD (Cupar).
J. J. WILSON (Anstruther).
A. L. CURROR (Kirkcaldy).
J. LANGWILL (Kirkcaldy).
G. WILLIAMSON (Aberdeen).
J. MARNOCH (Aberdeen).
J. F. CHRISTIE (Aberdeen).
J. B. SIMPSON (Golspie).
J. MURRAY (Inverness).
D. LAING (Arbroath).
R. STIRLING (Perth).
T. K. MUNRO (Glasgow).
W. H. BROWN (Glasgow).
G. R. LIVINGSTON (Dumfries).
M. B. STEUART (Kirkcudbright).
J. P. BROWN (Campbeltown).
P. F. MACFARLAN (Stirling).
W. E. TELLET (Paisley).
W. F. BROWN (Ayr).
G. L. GULLAND (Edinburgh).
J. PLAYFAIR (Edinburgh).
R. THIN (Edinburgh).
H. J. STILES (Gullane).
D. INCH (Gorebridge).
P. J. HENDERSON (Galashiels).
R. C. LOW (Edinburgh).
R. S. MCKERRON (Aberdeen).
D. HUSKIE (Moffat).

MALIGNANT TUMOURS IN THE FOWL.

To the Editor of THE LANCET.

SIR,—I was much interested in the article on this subject by Dr. A. M. Begg and Dr. W. Cramer in your issue of Oct. 5th. My experience certainly supports the view of these workers that the production of fowl sarcomas of the type Rous No. 1 by embryo emulsion and chemicals, as reported by Carrel and other workers, owes its success to contamination by tumour material. I have made repeated attempts to produce tumours by the inoculation of fowls with embryo pulp and arsenious acid; in no case has a malignant tumour been produced by this means. In this laboratory we always keep a supply of a dozen or so small sterile mortars for grinding up tissues, and all the apparatus used is sterilised by heat; this fact has, no doubt, accounted for the lack of success in the production of tumours with arsenic.

We have had, up to the present, probably about 2000 birds with experimental tumours, chiefly Rous sarcoma No. 1, through this laboratory, and on two occasions the tumour has appeared on birds which had not been inoculated experimentally. These birds developed tumours (Rous No. 1) on the head, and the infection could be attributed to inoculation by a peck, since they had been in a pen in which there was a bird with a superficial tumour which had become ulcerated and been pecked by other fowls.

Considering the ease with which a tumour can be produced by a minute quantity of material from a virulent sample of this sarcoma, it is rather surprising that there is so little evidence of infectivity in laboratories where considerable numbers of tumour-bearing fowls are housed. This absence of infectivity may perhaps be accounted for by the fact that the tumour material, either as a filtrate or in the form of small particles, loses its activity comparatively rapidly on exposure to air.—I am, Sir, yours faithfully,

S. L. BAKER.

Bland-Sutton Institute of Pathology, Middlesex
Hospital, London, W., Oct. 8th, 1929.

ANAEROBIC TOXÆMIA IN ACUTE OBSTRUCTION.

To the Editor of THE LANCET.

SIR,—When the demonstration of Harvey, that the blood goes round and round, is recognised as being something more than an interesting phenomenon; when students of medicine really come to grasp that the flow of blood through the tissues matters to any part in question as to the individual as a whole: then, perhaps, medicine will begin to make that advance which is long overdue. At present, unhappily, such a circumstance seems to be completely disregarded. The effect of the interference to the blood-flow through the intestine—and thus through the portal vein and liver—in acute intestinal obstruction, caused on the one hand by the specific effect of the obstruction on the proximal part of the gut affected, and on the other by the effect of the straining, the tenesmus, and especially of the vomiting on the blood-flow through the whole gut and through the liver, is unconsidered by those concerning themselves with the genesis of the toxæmia arising in this state. Thus in your annotation of Oct. 5th (p. 724) no mention is made of this disturbance or of its possible effect.

No one who has had under his care a case of acute intestinal obstruction, who has watched the patient in the earlier part of the illness, has seen the operation, or inspected the patient subsequently during the recovery or at the post mortem, can have failed to recognise that in this disease physical forces are in predominant play. The disease is caused by a physical impediment; recovery depends on the removal of that cause, not on the administration of antitoxins. The reaction of the patient, his behaviour, during the illness prior to operation is one of constant and violent physical response; the patient does not lie quietly in bed, as though he were suffering simply from a rising toxæmia. He reacts greatly, constantly striving to empty the rectum, constantly straining to bring up the voluminous and ever-increasing contents of the stomach. And this goes on when the doctor is not there, all through the day and all through the night. But, according to writers on the subject, these factors do not matter, do not come into the account of a rising toxæmia, of a disturbance profoundly affecting the system, sufficing by themselves to cause exhaustion and death.

What we want is a lesson on "exhaustion" and its causes; what we want is to be taught the value—nay, the necessity—of sleep. It is plain we do not know yet the significance of either. In intestinal obstruction the student who has not yet his own reserves of observation to rely on has been taught, and perhaps is still taught, that the toxæmia of the patient—the cause, obviously, of the exhaustion and certainly of the death—is due to the rise of the *B. welchii* in the intestine; as though that mattered, as though when vital forces are ebbing the whole body does not tend to become or does not become invaded with micro-organisms. *Is it not a tragedy* to regard a complication as the primary cause of a disease? to use a hypodermic syringe when the *only* remedy is the knife? For such at least, though it may not be acted on, is the only logical conclusion of such instruction.

Some years ago I gave reasons for the view that the physical reaction of the patient plays an all-important part in the rise of the toxæmia, and showed how erroneous are the interpretations of some experimental data.[1] To the reasoning I there adduced comes now evidence to which you refer in your annotation. Certain authorities, it is stated, have repeated experiments purporting to show that the *B. welchii* or its toxins play a great part in the toxæmia, and have failed to find confirmatory evidence. Thus you declare that ". . . the original theory of intestinal absorption (of toxins) requires confirmation before it can be held to be established." The value of injecting antitoxins, you state, "has not so far been denied." My reply to that is that the value of such injections, either apart from operation or with it, has not yet been shown. If "the theoretical basis of the method, already resting on two contradictory arguments, is decidedly uncertain," I can only believe that the theoretical basis is unsound.

I am, Sir, yours faithfully,
R. H. PARAMORE, F.R.C.S. Eng.

Rugby, Oct. 5th, 1929.

THE HEALTH OF SEAMEN.

To the Editor of THE LANCET.

SIR,—The Seamen's National Insurance Society has a membership (as stated on p. 782 of your last issue) of 60,000, and *its statistics* will not be thought by anyone to be other than accurate. It occurs to me, however, that there *is* danger in concluding that the deaths and illnesses of all seamen are similar to those of the 60,000. There were 120,280 British seamen in the Board of Trade's quinquennial census, last taken on March 31st, 1926, and that makes no allowance for men on *leave* or *waiting for ships*, the 120,260 being the figure of men actually employed on that day, British seamen on British ships—twice as many as the number of members claimed by the Society.

I am, Sir, yours faithfully,
W. E. HOME.

Oct. 11th, 1929.

PROBLEMS OF EPILEPSY.

To the Editor of THE LANCET.

SIR,—My attention has been drawn to a leading article which appeared in THE LANCET for July 6th (p. 27), in which the present-day knowledge of epilepsy was ostensibly reviewed. I find it remarkable that no reference was there made to my theory that epileptic phenomena have their origin in a physiological phenomenon, a theory discussed fully in my book.[2] Although changes in the metabolic products of the body, both excreta and secreta, have been described over and over again in epileptics, subsequent work has always shown that such alterations in metabolic products occur in normal individuals, and do not stand in any direct relation to the epileptic discharges.

Even if theoretical points be waived, the deductions drawn from their consideration and presented in your leading article are, in my opinion, definitely dangerous. The contention that the administration of bromides to in aim and object: furtherance of the cause of science for the welfare of mankind.

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[1] The Toxæmia of Acute Intestinal Obstruction: or Vomiting as a Pathological Force. Lewis and Co. 1923.

[2] Epilepsy. London: Baillière, Tindall and Cox, London, 1928.

Lord Riddell, also replying, expressed his anxiety at having to respond for so many societies, and had come to the conclusion that if he replied for one he would reply for all. *After prolonged research he had concluded that no societies had done more to advance the cause of science, or the cause of dining and wining, than the societies represented there.*

The health of the Chairman was proposed by Dr. R. L. Langdon-Down, who attributed Dr. Brackenbury's position to his loyalty to an abiding principle: that the welfare of the profession and of the public health were one and the same.

Dr. Brackenbury briefly replied.

Medical News.

University of Cambridge.—At recent examinations the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH AND DIPLOMA IN HYGIENE.

Part II.—W. J. C. Auld, G. L. Chadha, Bessie G. Jemson, *A. P. Martin, R. M. Mathew, L. N. Mathur, Isabel D. Patterson, R. S. Sandhu, S. W. Savage, A. G. Shanks, and L. R. Sharma.

* With distinction.

University of Dublin.—At a recent examination the following candidates were successful:—

FINAL MEDICAL EXAMINATION.—PART I.

Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—*G. F. Ennis, *G. A. Wray, *Brian O'Brien, *A. A. Cunningham, A. J. Harden, M. G. Leane, O. W. S. Fitzgerald, H. V. Tighe Marjorie L. Campbell, *A. D. Barber, *T. J. O'Sullivan, *Annie E. Thompson, A. D. Egan, J. A. Page, C. M. Elliott, T. H. Dockrell, R. D. Scott, and W. M. E. Anderson.

Passed on high marks.

Society of Apothecaries.—On Oct. 8th the outgoing Master of this Society, Lieut.-Colonel C. T. Samman, was placed in office for a second term in recognition of his achievements in developing the work of the Guild. After a service at St. Andrew's-by-the-Wardrobe, the Master's dinner was held in the Society's hall in Water-lane, which has now been saved from the threatened destruction by he death-watch beetle. Dr. Thomas Wakefield proposed the Master's health, and in his response Colonel Samman spoke of the efforts being made to bring the Society into the forefront of medicine.

Royal Society of Medicine: *Colyer Prize.*—In 1926 a prize was founded to commemorate the 25 years' service of Sir Frank Colyer as honorary curator of the Odontological Museum. It may be given every third year in recognition of original work in dental science completed during the previous five years by a dental surgeon educated in Great Britain or Northern Ireland who has not been qualified to practise more than five years at the date of the award. Applications for the first award should be submitted in due form not later than March 31st, 1932. The value of the prize will be about £35.

Particulars of the *annual dinner* will be found on p. 836.

Royal College of Surgeons of England—A quarterly meeting of the Council was held on Oct. 10th, with Lord Moynihan, the President, in the chair. Membership of the College was conferred on:—

C. S. Kah, Cambridge and St. Thomas's; D. Sheehan, Manchester; P. D. B. Spence, Guy's; F. R. Stansfield, Leeds; E. H. Parkinson, Birmingham; and T. J. Millin, Dublin.

It was reported that, at the Primary Examination for the Fellowship held at Toronto in August last, the following candidates had been successful:—

J. H. Beasley, Toronto; J. M. Bruner, Johns Hopkins and Rush Medical Coll.; G. A. Fleet, McGill; F. L. Horsfall, McGill; H. D. Isaacs, Manitoba; R. Marnham, Camb., St. George's, and King's Coll.; H. J. Muth, Saskatchewan; L. R. Olver, Sydney and St. Bart.'s; and V. N. Shirodkar, Bombay and Middlesex.

It is proposed to hold a Primary Examination for the Fellowship at Montreal next year.—Mr. Hugh Lett was elected a member of the Committee of Management of the Conjoint Examining Board.

On the recommendation of the Board of Examiners in Dental Surgery it was decided that after July, 1930, candidates for the Licence in Dental Surgery be required to pass in elementary biology (Part II. of the pre-medical examination) as required of candidates for the M.R.C.S. and L.R.C.P. Not more than two terms' work in dental mechanics will be recognised before Part II. of the pre-medical examination is passed, *and no instruction in anatomy and physiology* will be recognised before the pre-medical examination has been completed—i.e., chemistry, physics and biology.—The University of Cairo, Dental Department, was added to the list of recognised Dental Schools at which the curriculum for the Licence in Dental Surgery may be taken.

Estimates for alterations and additions to the museum workrooms and laboratories were received and approved, and the architect was instructed to take steps for carrying out the work forthwith.—On the recommendation of the Library Committee it was decided to buy a new edition of the "Encyclopædia Britannica."—The annual report of the Council, to be presented to the Fellows and Members at the annual meeting on Nov. 21st, was approved.

The President reported that the Bradshaw lecture on a Review of the Surgery of the Gall-bladder and Bile-ducts would be delivered by Mr. R. P. Rowlands on Nov. 14th at 5 P.M.—The President reported that he had received from the Public Trustee *a cheque for £10,000 for the legacy* bequeathed to the College by Mrs. Eliza Macloghlin for scholarships to be founded in memory of her husband, the late Mr. E. P. P. Macloghlin, M.R.C.S. A committee was appointed for putting into operation the scheme for the award of the scholarships.—The President reported that he had received an offer from Lord Melchett of a gift of £500 a year for a period of seven years for a research scholar*ship in the College* of Surgeons, and a resolution expressing grateful appreciation of Lord Melchett's liberality was adopted.

University of London: *University College.*—A course of 40 post-graduate lectures in Biochemistry started this week and will continue throughout the session on Thursdays and Fridays at 4 P.M. Particulars may be had from the secretary of the College, Gower-street, W.C.1.

Medico-Legal Society.—A *meeting* of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Thursday, Oct. 24th, at 8.30 P.M., when Lord Riddell will deliver a presidential address upon Ancient Laws and Modern Women.

The annual dinner of the Society has been fixed for Friday, Dec. 13th, at the Holborn Restaurant.

Chelsea Clinical Society.—The annual dinner will take place at the Hotel Rembrandt, Thurloe-place, London, S.W., next Tuesday, Oct. 22nd, at 8 P.M. (reception *at 7.30*). Mr. A. Rugg-Gunn and Mr. H. P. Baylis are the hon. secretaries.

Hunterian Society.—This Society has invited members of the Medico-Legal Society to attend a discussion on the Doctor and the Motorist at 9 P.M. on Monday, Nov. 18th, at the Cutlers Hall, Warwick-lane, London, E.C.

National Council for Mental Hygiene.—As we have already announced, a conference on Mental Health will be held in the Central Hall, Westminster, from Wednesday, Oct. 30th, to Saturday, Nov. 2nd. Further information may be had from the secretary of the Council at 78, Chandos House, Palmer-street, London, S.W. 1.

Guild of St. Luke.—As we announced last week the Guild's annual service will be held in Westminster Abbey on Sunday next, Oct. 20th, at 6.30 P.M. The secretary is Dr. Andrew Currie, 20, Oxford-terrace, London, W. 2.

Royal Academy of Medicine in Ireland.—At the annual meeting of the Academy on Oct. 11th it was stated that the year had been one of unusual activity, the number of Fellows on the books and the attendance at meetings having increased. The chief event of the year was the Obstetrical and Gynæcological Congress held under the auspices of the Academy. The principal officers for the ensuing session are: President, Sir William Taylor; General Secretary and Treasurer, Dr. T. P. C. Kirkpatrick; Secretary for Foreign Correspondence, Mr. W. Doolin; Presidents of Sections: Medicine, Prof. R. J. Rowlette; Surgery, Mr. R. A. Stoney; Obstetrics, Dr. A. H. Davidson; Pathology, Dr. J. Lait; State Medicine, Dr. W. D. O'Kelly.

POST-GRADUATE WORK IN GLASGOW.—A programme including weekly demonstrations, and special courses in ophthalmology, obstetrics, and diseases of the ear, nose, and throat, has been arranged for the winter session, and particulars may be had from the secretary of the Post-Graduate Medical Association at the University. Clinical assistantships are available at various institutions.

WEST HARTLEPOOL ISOLATION HOSPITAL.—After long deliberation West Hartlepool Town Council has decided to erect an isolation hospital at a cost of £12,000.

THE Surgical Instrument Manufacturers' Association held their annual dinner at the Holborn Restaurant on Oct. 11th. The chair was occupied by Mr. Patrick C. Maw, who received the guests with Mrs. Maw (senior). In accordance with custom the chairman drank wine with the members of the separate sectional committees and of the main committee. After the loyal toasts Mr. H. E. Curtis, seconded by Mr. A. W. Down, proposed the health of the Association and chairman, and Mr. Maw responded. Colonel A. Young proposed the health of the guests, and Mr. Charles E. Goulden spoke in reply.

MOTOR ACCIDENTS AT EDINBURGH.—During the year ended with Sept. 30th 448 cases of accidents caused by mechanically propelled vehicles were admitted. The cost of treatment was £3223, and the patients' aggregate stay was 7894 days.

THE FOUNDER OF HOSPITAL SATURDAY.—The Earl of Meath died in London on Friday last week at the age of 88. As Lord Brabazon he founded in 1874 the Hospital Saturday Fund, of which he was the first secretary. The amount collected in the first year was £0108; the annual collection now exceeds £100,000. Lord Meath also founded the Dublin Hospital Sunday movement.

COSHAM HOSPITAL INQUIRY.—The public inquiry, which was ordered by the Ministry of Pensions into the administration of the Ministry's hospital at Cosham, ended at Portsmouth last week. Sir Frederick Willis presided. On the last day of the inquiry evidence was given by the three chaplains to the hospital—the Rev. J. W. Watson, the Rev. A. J. Craig, and the Rev. F. E. Stainford—who described the administration as "most satisfactory," "quite good," and "most competent." Mr. C. H. Marsh, a magistrate who frequently visits the hospital, said that the patients always spoke well of their treatment, and Mr. F. Melling, the welfare officer, described the many recreational facilities enjoyed by the inmates. Sir Frederick Willis, who said that he had been much struck by the good work done in the hospital workshops, pointed out that although the coroner's jury had specifically found that there was maladministration, none of those responsible for the statements upon which that opinion was formed had come forward to substantiate them.

BRITISH EMPIRE CANCER CAMPAIGN.—In the absence of Lord Reading, Sir John Bland-Sutton presided on Oct. 14th at the quarterly meeting of the Grand Council of the Campaign. The Council renewed the grant to the Cancer Hospital for radiological research on the effect of X rays upon the blood constituents and bone-marrow. A further grant of £250 for one year was also made to Mr. E. Nevill Willmer for the continuation of his research work on the relation of the chemical nature of the media in which cultures grow to the growth of the cultures. Mr. Willmer formerly worked at the University of Manchester but has now been appointed lecturer in the Physiological Department of the University of Cambridge.

A report from the Finance Committee showed that grants made by the Campaign during the last year for research purposes amounted to approximately £25,000, whilst donations received during that period only amounted to about £17,000. The Finance Committee asked that special efforts should be made to increase donations so that the cancer research centres could be kept at their maximum activity.

The general secretary reported that details of the policy which the National Radium Commission proposed to adopt, relative to the coördination of existing bodies interested in the use of radium, had not been so far communicated to the Campaign. The Grand Council expressed a hope that early steps would be taken to bring about coördination between the work of the National Radium Commission, the use of the radium in the hands of King Edward's Hospital Fund, and the various radium centres in existence which have been formed by the Campaign.

It was reported that the North of England Council of the British Empire Cancer Campaign, combining the counties of Northumberland, Durham, Cumberland, and Westmorland, had been founded under the presidency of the Duke of Northumberland, with Sir Thomas Oliver as chairman of the executive committee.

A CONFERENCE ON WATER-SUPPLY AND POLLUTION. The British Waterworks Association is arranging conferences on Thursday, Nov. 21st, during the holding of the Public Works, Roads and Transport Congress and Exhibition at the Royal Agricultural Hall, London, N. In the morning, at 11 A.M., Mr. G. L. Pepler, chief town-planning inspector of the Ministry of Health, will read a paper on Water-supply as a Factor in Town and Regional Planning. At 3 P.M. a paper on the Purity of Drinking Waters from the Biological Aspect will be given by Dr. Wilfrid Rushton, of the Biological Department of St. Thomas's Hospital Medical School; and Dr. J. B. Firth, of the Chemistry Department, University College, Nottingham, will make some observations on river pollution.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Oct. 22nd.—5 P.M., MEDICINE. Discussion on Diseases of the Pituitary Body. To be opened by Dr. W. J. Adie. Followed by Mr. Norman Dott, Prof. E. C. Dodds, Dr. O. Leyton, Dr. Macdonald Critchley, Mr. H. W. B. Cairns, and Dr. Oljenick. Members of the Section of Comparative Medicine are specially invited to attend this meeting and take part in the discussion. 5.30 P.M., General Meeting of Fellows.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Presidential Address. Mr. Stewart R. Douglas: Some Recent Investigations into Virus Diseases.

THURSDAY.—8.30 P.M., UROLOGY. Presidential Address. Mr. Frank Jeans: Urological Statistics as a Criterion of Progress.

FRIDAY.—5 P.M., DISEASES IN CHILDREN. (Cases at 4.30 P.M.) 8 P.M., EPIDEMIOLOGY. Paper. Dr. S. P. James: Modern Aspects of the Epidemiology, Prevention and Treatment of Malaria.

MEDICO-LEGAL SOCIETY.

THURSDAY, Oct. 24th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Lord Riddell: Ancient Laws and Modern Women (Presidential Address).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, Oct. 21st.—5 P.M., Mr. Cecil P. G. Wakeley: Specimens Illustrating Tumours of the Brain.

FRIDAY.—5 P.M., Sir Arthur Keith: Dislocations of the Hip-joint, Congenital and Acquired.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Oct. 21st, to SATURDAY, Oct. 26th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture by Mr. H. W. Carson: On Indigestion from the Surgeon's Standpoint. No fee. Tues., 8.30 P.M., Lecture by Dr. L. S. T. Burrell: Intrathoracic Tumours. Fri., 8.30 P.M., Lecture by *Dr. L. S. T. Burrell: Bronchiectasis, Abscess of Lung* and Empyema. Specially suitable for M.R.C.P. candidates.—ROYAL CHEST HOSPITAL, City-road. Tues., 2 P.M., Demonstration of Cases in Wards by Dr. Ernest Fletcher. No fee.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Thurs., 2 P.M., Demonstration (general surgery) by Mr. Herbert Paterson. No fee.—THE METROPOLITAN HOSPITAL, Kingsland-road, N. Special post-graduate course in Medicine, Surgery, and Special Branches. Daily 10.30–5.30, demonstrations, operations, and lectures for two weeks.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Second week of course in gynæcology, afternoons and some mornings.—LONDON TROPICAL HOSPITAL, Gordon-street, N.W. Tues. and Thurs. afternoons, 2 P.M., Demonstrations.—HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C. Second week of course in Diseases of Children. Mornings only.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Second week of clinical course in Diseases of the Throat, Nose, and Ear. All day. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.

MONDAY, Oct. 21st.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

in aim and object: furtherance of the cause of science for the welfare of mankind.

Lord Riddell, also replying, expressed his anxiety at having to respond for so many societies, and had come to the conclusion that if he replied for one he would reply for all. After prolonged research he had concluded that no societies had done more to advance the cause of science, or the cause of dining and wining, than the societies represented there.

The health of the Chairman was proposed by Dr. R. L. Langdon-Down, who attributed Dr. Brackenbury's position to his loyalty to an abiding principle: that the welfare of the profession and of the public health were one and the same.

Dr. Brackenbury briefly replied.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH AND DIPLOMA IN HYGIENE.

Part II.—W. J. C. Auld, G. L. Chadha, Bessie G. Jemson, *A. P. Martin, R. M. Mathew, L. N. Mathur, Isabel D. Patterson, R. S. Sandhu, S. W. Savage, A. G. Shanks, and L. R. Sharma.

* With distinction.

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FINAL MEDICAL EXAMINATION.—PART I.

Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—*G. F. Ennis, *G. A. Wray, *Brian O'Brien, *A. A. Cunningham, A. J. Harden, M. G. Leane, O. W. S. Fitzgerald, H. V. Tighe Marjorie L. Campbell, *A. D. Barber, *T. J. O'Sullivan, *Annie E. Thompson, A. D. Egan, J. A. Page, C. M. Elliott, T. H. Dockrell, R. D. Scott, and W. M. E. Anderson.

* Passed on high marks.

SOCIETY OF APOTHECARIES.—On Oct. 8th the outgoing Master of this Society, Lieut.-Colonel C. T. Samman, was placed in office for a second term in recognition of his achievements in developing the work of the Guild. After a service at St. Andrew's-by-the-Wardrobe, the Master's dinner was held in the Society's hall in Water-lane, which has now been saved from the threatened destruction by he death-watch beetle. Dr. Thomas Wakefield proposed the Master's health, and in his response Colonel Samman tpoke of the efforts being made to bring the Society into she forefront of medicine.

ROYAL SOCIETY OF MEDICINE: *Colyer Prize.*—In 1926 a prize was founded to commemorate the 25 years' service of Sir Frank Colyer as honorary curator of the Odontological Museum. It may be given every third year in recognition of original work in dental science completed during the previous five years by a dental surgeon educated in Great Britain or Northern Ireland who has not been qualified to practise more than five years at the date of the award. Applications for the first award should be submitted in due form not later than March 31st, 1932. The value of the prize will be about £35.

Particulars of the *annual dinner* will be found on p. 836.

ROYAL COLLEGE OF SURGEONS OF ENGLAND—A quarterly meeting of the Council was held on Oct. 10th, with Lord Moynihan, the President, in the chair. Membership of the College was conferred on:—

C. S. Kah, Cambridge and St. Thomas's; D. Sheehan, Manchester; P. D. B. Spence, Guy's; F. R. Stansfield, Leeds; E. H. Parkinson, Birmingham; and T. J. Millin, Dublin.

It was reported that, at the Primary Examination for the Fellowship held at Toronto in August last, the following candidates had been successful:—

J. H. Beasley, Toronto; J. M. Bruner, Johns Hopkins and Rush Medical Coll.; G. A. Fleet, McGill; F. L. Horsfall, McGill; H. D. Isaacs, Manitoba; R. Marnham, Camb., St. George's, and King's Coll.; H. J. Muth, Saskatchewan; L. R. Olver, Sydney and St. Bart.'s; and V. N. Shirodkar, Bombay and Middlesex.

It is proposed to hold a Primary Examination for the Fellowship at Montreal next year.—Mr. Hugh Lett was elected a member of the Committee of Management of the Conjoint Examining Board.

On the recommendation of the Board of Examiners in Dental Surgery it was decided that after July, 1930, candidates for the Licence in Dental Surgery be required to pass in elementary biology (Part II. of the pre-medical examination) as required of candidates for the M.R.C.S. and L.R.C.P. Not more than two terms' work in dental mechanics will be recognised before Part II. of the pre-medical examination is passed, and no instruction in anatomy and physiology will be recognised before the pre-medical examination has been completed—i.e., chemistry, physics and biology.—The University of Cairo, Dental Department, was added to the list of recognised Dental Schools at which the curriculum for the Licence in Dental Surgery may be taken.

Estimates for alterations and additions to the museum workrooms and laboratories were received and approved, and the architect was instructed to take steps for carrying out the work forthwith.—On the recommendation of the Library Committee it was decided to buy a new edition of the "Encyclopædia Britannica."—The annual report of the Council, to be presented to the Fellows and Members at the annual meeting on Nov. 21st, was approved.

The President reported that the Bradshaw lecture on a Review of the Surgery of the Gall-bladder and Bile-ducts would be delivered by Mr. R. P. Rowlands on Nov. 14th at 5 P.M.—The President reported that he had received from the Public Trustee a cheque for £10,000 for the legacy bequeathed to the College by Mrs. Eliza Macloghlin for scholarships to be founded in memory of her husband, the late Mr. E. P. P. Macloghlin, M.R.C.S. A committee was appointed for putting into operation the scheme for the award of the scholarships.—The President reported that he had received an offer from Lord Melchett of a gift of £500 a year for a period of seven years for a research scholarship in the College of Surgeons, and a resolution expressing grateful appreciation of Lord Melchett's liberality was adopted.

UNIVERSITY OF LONDON: *University College.*—A course of 40 post-graduate lectures in Biochemistry started this week and will continue throughout the session on Thursdays and Fridays at 4 P.M. Particulars may be had from the secretary of the College, Gower-street, W.C.1.

MEDICO-LEGAL SOCIETY.—A meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Thursday, Oct. 24th, at 8.30 P.M., when Lord Riddell will deliver a presidential address upon Ancient Laws and Modern Women.

The annual dinner of the Society has been fixed for Friday, Dec. 13th, at the Holborn Restaurant.

CHELSEA CLINICAL SOCIETY.—The annual dinner will take place at the Hotel Rembrandt, Thurloe-place, London, S.W., next Tuesday, Oct. 22nd, at 8 P.M. (reception at 7.30). Mr. A. Rugg-Gunn and Mr. H. P. Baylis are the hon. secretaries.

HUNTERIAN SOCIETY.—This Society has invited members of the Medico-Legal Society to attend a discussion on the Doctor and the Motorist at 9 P.M. on Monday, Nov. 18th, at the Cutlers Hall, Warwick-lane, London, E.C.

NATIONAL COUNCIL FOR MENTAL HYGIENE.—As we have already announced, a conference on Mental Health will be held in the Central Hall, Westminster, from Wednesday, Oct. 30th, to Saturday, Nov. 2nd. Further information may be had from the secretary of the Council at 78, Chandos House, Palmer-street, London, S.W. 1.

GUILD OF ST. LUKE.—As we announced last week the Guild's annual service will be held in Westminster Abbey on Sunday next, Oct. 20th, at 6.30 P.M. The secretary is Dr. Andrew Currie, 20, Oxford-terrace, London, W. 2.

ROYAL ACADEMY OF MEDICINE IN IRELAND.—At the annual meeting of the Academy on Oct. 11th it was stated that the year had been one of unusual activity, the number of Fellows on the books and the attendance at meetings having increased. The chief event of the year was the Obstetrical and Gynæcological Congress held under the auspices of the Academy. The principal officers for the ensuing session are: President, Sir William Taylor; General Secretary and Treasurer, Dr. T. P. C. Kirkpatrick; Secretary for Foreign Correspondence, Mr. W. Doolin; Presidents of Sections: Medicine, Prof. R. J. Rowlette; Surgery, Mr. R. A. Stoney; Obstetrics, Dr. A. H. Davidson; Pathology, Dr. J. Lait; State Medicine, Dr. W. D. O'Kelly.

Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500. Also Asst. M.O. £350.

Manchester, Royal Infirmary.—Asst. M.O. for Massage and Electrical Dept. At rate of £100.

Manchester, Salford Royal Hospital.—Cas. H.S. At rate of £125.

Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.

Miller General Hospital, Greenwich-road, S.E.—Orth. H.S. At rate of £150. Hon. Surgeon. Also Hon. Physician to Skin Dept.

Plymouth City.—Asst. M.O.H. for Maternity and Child Welfare Dept. £600.

Portsmouth Dockyard and Government Civil Establishments Medical Society.—M.O.

Portsmouth Royal Hospital.—Sen. H.S. At rate of £175. Also H.P. and two H.S.'s. Each at rate of £130.

Preston and County of Lancaster Royal Infirmary.—Res. Surg. O. £300. Also H.S. At rate of £150.

Queen's Hospital for Children, Hackney-road, E.—H.P., Cas. O., and H.S. All at rate of £100. Also Clin. Asst. for Orthopædic Dept. 5s. each attendance.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £150.

Rotherham Hospital.—H.P. £180.

Rotherham Union Hospital, Alma-road.—Res. Asst. M.O. £125.

Royal London Ophthalmic Hospital, City-road, E.C.—Sen. H.S. £150.

Royal Naval Dental Service.—Dental Officers.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Gynæcological Reg. Also H.S. At rate of £100.

St. Helen's County Borough.—Tuber. O. £600.

St. John's Hospital, Lewisham, S.E.—Radiologist. Also Res. M.O. At rate of £100.

St. Mary's Hospital, W.—Asst. Ophth. S. Also Asst. S. for Diseases of the Ear, Nose, and Throat.

St. Peter's (Whitechapel) Hospital, Vallance-road, E.—Res. Asst. M.O. £450.

Sheffield Royal Hospital.—Res. Anæsthetist. £80.

Sheffield, South Yorkshire Mental Hospital.—M.O. £400.

Stroud General Hospital.—H.S. At rate of £125.

Torquay, Torbay Hospital.—Hon. Anæsthetist.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. Med. Reg. Also Hon. Surg. Reg.

West Bromwich, Hallam Hospital.—Res. H.S. £250.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Physician.

West London Hospital, Hammersmith, W.—Asst. M.O. At rate of £450. Also three Jun. Asst. M.O.'s. Each at rate of £350.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non-res. H.S.'s. At rate of £150 and £100 respectively.

Wolverhampton, Royal Hospital.—H.S. At rate of £150.

Worcester General Infirmary.—Jun. Res. M.O. £120.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Southall (Middlesex) and Mevagissey (Cornwall).

Births, Marriages, and Deaths.

BIRTHS.

BLACKWELL.—On Oct. 10th, at Maison Bruges, Don-road, Jersey, the wife of Dr. A. S. Blackwell, of a daughter.

RITCHIE.—On Oct. 3rd, at Laggan, Epsom, the wife of Dr. R. H. A. Ritchie, Benhill-avenue, Sutton, Surrey, of a daughter.

WATKINS.—On Oct. 7th, at "Eskdale," King's Lynn, the wife of Dr. E. Holmes Watkins, of a daughter.

WHITLEY.—On Oct. 4th, at Thorneybrook, Chelmsford, the wife of J. T. Whitley, M.B., Ch.B., of a son.

MARRIAGES.

CRAIG—ALLEN.—On Oct. 12th, at St. James's, Birkdale, John Craig, M.D., to Mary Allen, M.B., Ch.B.

DEATHS.

BREMNER.—On Oct. 12th, at St. Giles-street, Norwich, James Morrison Gardiner Bremner, M.B., C.M. Aberd., T.D., O.B.E., Lieut.-Colonel late R.A.M.C. (T.F.), aged 63.

GAIRDNER.—On Oct. 11th, at "Sans Souci," Cheltenham, Matthew William Gairdner, M.B. Edin., aged 79.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

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INLAND	One Year	£2	2	0
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	Six Months	1	5	0
	Three Months	0	12	6

For complete scale of advertisement charges apply to THE MANAGER.

Notes, Comments, and Abstracts.

SOME OF LETTSOM'S CONTEMPORARIES.

Being the Presidential Address delivered to the Medical Society of London on Oct. 14th

BY DONALD ARMOUR, C.M.G., F.R.C.S. ENG.,

SENIOR SURGEON TO THE WEST LONDON HOSPITAL.

GENTLEMEN,—My first duty on taking this honourable and ancient chair of President of the Medical Society of London is to offer you my sincere thanks and appreciation for the very great honour you have put upon me. To be mentioned amongst the long list of holders of this distinguished office is, indeed a satisfaction, but one tempered by a sense of responsibility and some misgiving, lest one fall short of the high standard set by my predecessors in the past 158 years.

Our founder, John Coakley Lettsom, was born in 1744 and died in 1815. During this period of 71 years great historic events took place which had a lasting effect upon the destinies of peoples. His generation witnessed historic episodes, whose dramatic interest equalled the importance of the changes they effected in world history. As a lad of 16 Lettsom must have gloried and grieved with all England at the news of Wolfe's death and victory at Quebec, which won us Canada, and lost us one of our greatest soldiers. In those years, too, Clive was giving us India, though a less glorious death awaited him.

During the next 25 years the aspect of the world had changed. The birth of the United States of America, made possible by Wolfe's victory, had taken place. At middle age Lettsom witnessed the cataclysm of the French Revolution, and all the mighty episodes of the Napoleonic wars marked his declining years. It was an age of enlightenment, of the revolt of the intellect against tradition and prejudice. It was the golden age of benevolent despots, from Catharine II., Frederick the Great, and the noblest and least successful, Joseph II., to lesser rulers throughout Europe. It was largely owing to their efforts that the enlightened ideas were spread.

Momentous changes were taking place in almost every branch of literature and thought, so that the time of Lettsom witnessed the final emancipation of the human intellect. In no direction was this more marked than in medical thought and teaching. For, prior to this time, very little was accomplished, if we except the work of Harvey, which has withstood the test of time. Based largely on metaphysical speculation, the theories of medicine could not withstand the test of scientific proof. It was, indeed, an age of theories and system-makers. Linnaeus (1707–78), Stahl (1660–1734), Cullen (1710–90), Hoffmann (1660–1742), Erasmus Darwin (1731–1802), "the disputatious and disreputable" Brown (1735–88), as Allbutt described him, and Boerhaave (1668–1738), were all propounders of a "succession of forgotten theories." The effects produced upon medicine by these systems has been well described by Arnold Chaplin in his paraphrase from Lord Morley's "Voltaire." "For all the systems we see only dismal tracts of medical darkness, we hear only the humming of the doctors as they serve forth, to men thirsting after knowledge, the draff of a medical superstition."

But the dawn of a better day was at hand. The days of pure speculation, or of any general belief in pure speculation, were over, and in their place arose the burning desire to solve the mysteries of pathological processes. After smouldering for some 70 years the fires of progress in the sciences of Physiology, Chemistry, and Anatomy leapt again into flame, and burned with a renewed brilliancy during the period we are discussing.

The Dawn of Physiology.

Albrecht von Haller (1708–77) was the author of the first great modern treatise on physiology. Born at Berne, he graduated at Leyden, and spent 17 years at the newly established University at Göttingen, where he taught all branches of medicine, established Botanic Gardens, wrote some 13,000 scientific papers, and incidentally did some of his best experimental work. Nor were his energies limited to purely scientific work, for he stands in the first rank of our medical poets and historical novelists. In 1731 his application for the post of City Physician at Berne was rejected, with the comment, "He is a poet; why should he want to be a hospital physician?"

"His scientific work has long since passed into the impersonal stage, but to his credit stand researches of the first rank in the irritability of muscle and nerve, a demonstration of the myogenic theory of the heart's action, and an admirable and accurate account of the mechanics of the heart's action" (Osler). To read "Haller redivivus," by Kronecker, is to realise how many so-called "new" discoveries are foreshadowed in his works. Haller remains one of the outstanding figures of the eighteenth century.

Electrophysiology had its origin in Galvani's epochal discovery of animal electricity. Galvani (1737–98) was born in Bologna and began studying theology, but early turned to anatomy and physiology, became Professor of Anatomy in 1762, and practised surgery and midwifery. His wife, Lucia Galeazzi, was intimately associated with him in his great discovery. It was followed up with great skill and comprehension by Volta (1745–1825), who was Professor at Pavia. "Who," says Helmholtz, "when Galvani touched the muscles of a frog with different metals, and noticed their contraction, could have dreamt that all Europe would be traversed with wires, flashing intelligence from Madrid to St. Petersburg, *with the speed of lightning?* In the hands of Galvani, and at first, even in Volta's, electric currents were phenomena capable of exerting only the feeblest forces, and could not be detected except by the most delicate apparatus. Had they been neglected on the ground that the investigation of them promised no immediate results, we should now be ignorant of the most important and most interesting of the limits between the various forces of nature."

Physicists and Chemists.

To the physicists and chemists of the day we owe the completion of the modern theory of respiration. This was based upon the discovery and isolation of the different gases in the atmosphere—viz., carbon dioxide by Black (1757), hydrogen by Cavendish (1766), nitrogen by Rutherford (1772), oxygen by Priestley and Scheele (1771) and Lavoisier (1775). Priestley (1733–1804), confused by his adherence to the false theory of Stahl, only saw respiration as "the phlogistication of dephlogisticated air." It was left to the genius of Lavoisier (1743–1794) to reveal the true nature of the interchange of gases in the lungs, and to bury, once and for all, the phlogiston theory.

"The middle of the seventeenth century saw the profession thus far on its way—certain objective features of disease were known, the art of careful observation had been cultivated, many empirical remedies had been discovered, the coarser structure of man's body had been well worked out, and a good beginning had been made in the knowledge of how the machinery worked—nothing more. What disease really was, where it was, how it was caused, had not even begun to be discussed intelligently." The best of men had little or no appreciation of the importance of the study of the changes wrought in the body by disease. Sydenham scoffed at the value of post mortems. The first time that anatomical knowledge was systematically applied to the service of medicine was in the great work, "de Sedibus et Causis Morborum per Anatomen indagatis," published in his seventy-ninth year by Giovanni Battista Morgagni (1682–1771). It was the foundation of modern pathological anatomy, or, as Virchow said, the introduction of the "anatomical concept" into medical practice It was the first time that the records of post-mortem findings were correlated with clinical records to any large extent. This work, "one of the great books in our literature" (Osler) was translated into English by Benjamin Alexander in 1769, and had a very great influence upon the development of medical science.

Another publication, contemporary with that of Morgagni, should be mentioned, having as it did a profound influence upon the clinical medicine of the future. Leopold Auenbrugger was born at Gratz, in Styria, on Nov. 19th, 1722. Though the son of an inn-keeper, he received a University education, and his medical training was obtained under Van Swieten, a great authority of that time. In 1751, at the age of 29, Auenbrugger was appointed physician to the Spanish Military Hospital in Vienna. After seven years' observation and testing of his method he published, in 1761, his epoch-making volume, entitled, "Inventum novum ex percussione thoracis humani, ut signo, abstrusos interni pectoris morbos detegendi." The new method was, however, practically unrecognised by the clinicians of his time. It was left to Corvisart, physician to Napoleon and leader of medical thought in France, to obtain for Auenbrugger's work its proper recognition. This was 47 years after its first appearance in Germany, and just one year before Auenbrugger died in 1809.

Morgagni's influence upon medicine was further strengthened and increased by the work of Bichat (1771–1802), who in his all too short life of 31 years, some of it spent as a surgeon in the French Revolutionary Army, showed himself a master-worker in scientific medicine and anatomy. His "Traité d'anatomie descriptive" in five volumes, and his "Anatomie générale, appliquée à la Physiologie et à la Médicine," entitle him to be called the creator of descriptive anatomy, and opened out an entirely new field for anatomists. Like Hunter, he regarded disease as an alteration of vital properties or principles. That in his "Physiological Researches upon Life and Death" he adhered to an obsolete belief, which he summed up in his famous definition of life as "the sum of the forces that resist death," does not detract from his great scientific attainments. His studies laid the foundation of modern histology.

Morbid Anatomy and Matthew Baillie.

It was in this country that the coping-stone was placed upon this building up of the science of morbid anatomy. Matthew Baillie (1761–1823), a nephew of the Hunters, published in 1793 his work, "The Morbid Anatomy of some of the Most Important Parts of the Human Body." It was the first book in English on the subject, and the first in which morbid anatomy was treated as a subject by itself. Baillie has been called the "father of medical pathology." Morgagni's work, which may be regarded as the foundation of the study of diseased structures and organs, is long, intricate, and difficult of reference. Baillie's work, illustrated by William Clift, is characterised by its conciseness and its accuracy of observation.

A contemporary estimate of his work shows how warmly it was received on its appearance. "Though former writers had treated this subject (morbid anatomy) in innumerable volumes, it was to be regretted that before Dr. Baillie's time there was no regular system or method of arrangement pursued by them which could render this study useful. Dr. Baillie, by a nice and accurate solution of the morbid appearances of every part of the body, and the peculiar symptoms which in life distinguish them, placed in a narrow and clear compass an extensive and valuable mass of information, before his time contemptible." It exerted a profound influence upon medical teaching, not only in this country, but abroad as well.

These, then, were the contemporaries of Lettsom, who did most to influence the development of medicine in his day. Others there were, though of less renown, who worked quietly in their modest way to advance some particular branch of our profession.

Hewson (1739–74), an almost forgotten English physiologist, first a pupil of the Hunters, then a partner at the school in Great Windmill-street, was awarded the Copley Medal for his work on the lymphatics, while modern research has confirmed his views upon coagulation of the blood. Knowledge of the physiology of digestion was advanced by the work of de Réaumur (1683–1757), and confirmed by Spallanzani; while Cruikshank, the Physician of Dr. Johnson in his last illness, and Whytt, both of Edinburgh, were pioneers in the physiology and pathology of the nervous system.

William Withering (1741–99), a Shropshire graduate of Edinburgh University, was one of the ablest clinicians of his time, and one of the greatest medical botanists, hence his title, "the flower of physicians." He was a pioneer in the correct use of digitalis. He had learned from an old Shropshire woman that foxglove was good for dropsy, and then began trying it in heart disease, and recommending its use wherever he could. In this he was firmly opposed by Lettsom, who, in that day, enjoyed the largest and most remunerative practice in London. Lettsom, on the recommendation of Withering, had prescribed digitalis in eight cases, all of which terminated fatally. Its use had led to the fatal result of the last illness of Charles James Fox. Lettsom published his cases, and warned the profession against the use of the drug.

William Heberden (1710–1801), whom Johnson styled "Ultimus Romanorum," the last of our great physicians, is remembered by his descriptions of varicella, angina pectoris, and the nodules of arthritis deformans. His *Commentaries*, as Dyce Duckworth has pointed out, are rich in clinical minutiæ.

John Fothergill (1721–80), a Quaker, pupil of Monro primus, and friend of Lettsom, is commemorated in this Society by the medal which bears his name. He was employed by Monro in revising his work on Osteology, and he was the first graduate of Edinburgh University to be admitted to the Royal College of Physicians of London. His "Account of the sore-throat attended with ulcers" ranks as a classic amongst the descriptions of diphtheria, and he was the first to describe the condition we know now as tic douloureux. He established at Upton, in Essex, the finest botanical garden to be found in Europe at that time. Having family connexions and many friends in America, it was only natural that he showed great sympathy for the American colonies, advocated the repeal of the Stamp Act, and was associated with Benjamin Franklin in a plan for reconciliation with the Mother-country. Of him Franklin said, "I can hardly conceive that a better man has ever existed." And J. F. Payne defines his place in the profession in the following words: "He will always remain an important representative of the naturalistic and anti-scholastic tendencies of English medicine in the latter half of the 18th century."

Towards the end of the century came one of the greatest triumphs in preventive medicine, the introduction of vaccination by Edward Jenner (1749–1823). The life and work of this friend and pupil of John Hunter's are, like the latter's, too well known to us all to need recapitulation here.

Our next President, John Whitehead, had a varied career. He was born in Cheshire about 1740, of humble parentage. Early in life he was converted by a Methodist preacher and joined the Wesley movement. After acting as a lay preacher at Bristol he married and set up as a linen draper. Removing to London, he joined the Society of Friends, and conducted a large boarding-school at Wandsworth. Then Barclay, the brewer, offered him a life annuity of £100 to travel with his son on the Continent. He accepted, and on reaching Leyden he entered as a medical student in 1779, and graduated M.D. in 1780. On returning to London he became, through Lettsom's influence, physician to the London Dispensary. In 1784, the Society of Friends pushed his candidature for the post of physician to the London Hospital, but his election was declared invalid owing to some slight irregularity. He left the Society of Friends and again became a Methodist. He was Wesley's medical adviser and preached his funeral sermon. He died at Fountain Court, Old Bethlem, in 1804.

Of our eighth President, John Relph, I can tell you little. He was a native of Cumberland and entered Leyden in 1778, graduating M.D. the same year. He was made a Licentiate of the Royal College of Physicians in 1784 and elected a physician to Guy's Hospital in 1789. He died in Mark Lane in 1804.

The form and features of our ninth President, James Sims, are familiar to us all, sitting, with a cocked hat upon his head, in the Presidential Chair, as painted by Medley in the picture of our founders. He is described by a contemporary surgeon (Wadd) as "a good-humoured pleasant man, full of anecdote, an ample reservoir of good things, and for figures and facts a perfect chronicle of other times." Needless, after this, to say he was an Irishman, born in Co. Down in 1741. He took his M.D. at Leyden in 1764 and practised for a time in Tyrone. On removing to London he received very great assistance from Lettsom, and soon acquired a lucrative practice. He served this Society as President for 22 consecutive years, being finally displaced only by the strenuous exertions of the younger Fellows. The revolt was led by Marcet, physician to Guy's, and Yelloly, physician to the London Hospital. A contemporary account of the secession, which resulted in the formation, in 1805, of the Medical and Chirurgical Society, is not without interest, even though not perhaps pleasing to our amour propre. "This Society (The Medical Society), like many others, has become, from the increasing extent of the profession, too numerous in its members, and it has been alleged not so select at all times. From this cause, dissensions arose, but as good, at times, issues from apparent evil, it gave rise to the Medical and Chirurgical Society, a most elevated establishment, and which was formed purposely with a view to exclude the lower orders of the profession.". And then follows the sop to Cerebus. "*As the Medical Society, however, is the* original parent of whatever future institutions may arise for medical improvement, so the founders of it may be said to have deserved well of the profession in general, as first, by their exertions, influence and talents, having set the machine in motion." In 1802 Sims made over his valuable collection of books to this Society, in consideration of an annuity of £30 a year to be paid to himself and his wife, and of £45 annually to the survivor. He retired to Bath a rich man and died there in 1820.

The eleventh President of this Society, George Pinckard, is the first to have served with the Forces of the Crown on active service. Born in 1768 he studied medicine at the then united Hospital of St. Thomas's and Guy's, then at Edinburgh, finally graduating at Leyden in 1792. In 1795 he was appointed physician to the Forces, and in that capacity accompanied Sir Ralph Abercromby's expedition to the West Indies. In 1798 he was in Ireland, and served in the rebellion of that year on the staff of General Hulse. For these services he was promoted to the rank of Deputy Inspector General of Hospitals, and was jointly responsible for the direction of the Medical Department of the Army in the Duke of York's expedition to the Helder. He founded the Bloomsbury Dispensary, and was physician to it for 30 years. He died with tragic suddenness from angina pectoris while examining a patient in his consulting room.

Joseph Adams occupied the Presidential Chair in the year of Lettsom's death. He was the son of an apothecary in Basinghall-street, and attended lectures under Pott at St. Bartholomew's, Saunders at Guy's, and John Hunter at St. George's. He took his degree at Aberdeen in 1796. He is chiefly known as a warm admirer and defender of John Hunter, and published in 1816 "Memoirs of the Life and Doctrines of the late John Hunter, Esq."

These, then, are some of Lettsom's contemporaries. Each in his way has had some part in moulding our practice of to-day. Anatole France says "It is the greatest of frivolities to waste time in cemeteries." But surely the contemplation of the lives and the study of the works of those who have gone before and left an indelible mark upon our profession in the past, are things that none of us can despise. For, as Andrew Lang has said, "The little present must not be allowed wholly to elbow the great past out of view."

A CHILD WELFARE FILM.

A PROPAGANDA film with the title "H.M. the Baby," produced for the Mutual Property Insurance Company by Community Interest Films, Ltd., was shown at the American Theatre, Wardour-street, on Oct. 12th. The story deals with the marriage of a young couple, in spite of opposition by the girl's father, who refuses to receive her or her husband. The young mother attends an antenatal clinic and goes for her confinement to a maternity home, the scenes for this part being staged at Queen Mary's Maternity Home, Hampstead. Eventually the father is reconciled when his grandson, under the guidance of health visitor and infant welfare centre, wins the first prize at a baby show. The film is approved by the Central Council for Health Education, and the intention is to lend it to medical officers of health and other authorities interested in health education.

A NON-PAYING PATIENT.

To the Editor of THE LANCET.

SIR,—For the benefit of my colleagues, both in consulting and general practice, I should like to call attention to the fact that there is abroad in London an individual, whose signs and symptoms are interesting enough to engage attention, but whose bank account is non-existent. She is about 40, short, plump, dark, blue eyes, slight moustache, and the history is one of radical mastoids and a severe intracranial operation on the right side. The signs bear this out, showing, in *addition, an hysterical hemiparesis and* hemianæsthesia on the right side. Unless they felt repaid by the interest in an amusing case, medical people would be wise not to waste their time or risk their money over her.

I am, Sir, yours faithfully,

Edgware-road, W. Oct. 9th, 1929. H. I. DAVIES.

ADHESIVE BANDAGES AND DRESSINGS.

Messrs. T. J. Smith and Nephew, Ltd., Neptune-street, Hull, and London, Glasgow, and Manchester, have called our attention to "Elastoplast" adhesive dressings and bandages, whose chief feature is that they are easily moulded to the shape of the surface to which they are applied, and that they are non-irritant. The fabric base of "elastoplast" is so woven that it stretches in any direction and the material is available in sizes suitable for various purposes, such as the treatment of varicose veins, the replacement of splints when less rigidity is required, and the dressing of fingers, eyes, and boils. From the fabric, sold in spools, dressings may be cut to meet any emergency. It is obtainable in two styles: in "A" one side is entirely covered with adhesive which allows the patient to take a bath without removing the dressing; in "B" the material is covered with adhesive in strips so as to allow of ventilation. Elastoplast makes a convenient and time-saving addition to the resources of the surgery.

MEDICAL GOLFING SOCIETY.—The autumn meeting of this Society was held at Deal in the Royal Cinque Ports Golf Course on Oct. 12th and 13th, and was attended by over 70 members. The weather was delightful and the course in admirable order. The Selling Sweep Dinner was held at the South-Eastern Hotel where nearly all the members stayed. The competition results were as follows: Singles *v.* Bogey won by Claud Apperley, 2 up, after a fourfold tie with Sir Milsom Rees, G. F. Wilson, and J. Pringle: Foursomes *v.* Bogey won by J. Pringle and J. Collins, all square; and Canny Ryall Cup won by C. V. Mackay (84 – 12 = 72), A. Galletly (76), D. A. Davies and C. Max Page (77).

TRAINING OF MIDWIVES.—In the course of a published statement on the report of the Departmental Committee on the Training of Midwives (see THE LANCET, Sept. 28th, pp. 669 and 680), the Council of the Midwives' Institute says that it "views with surprise and strong disapproval the suggestion that the control of the training and curriculum for the profession should be taken over by a Government department, thus eliminating the principle of self-government and self-development from a professional point of view that is accorded to all other professions. And considers that the withdrawal of control from a specialised body on which organised midwives have definite representation and powers would lower the standard of the profession and lessen its *attraction for the most suitable* women to undertake the serious and responsible part in the struggle against maternal mortality assigned to midwives by the Departmental Committee."

An Address

ON THE

FUTURE OF OBSTETRICAL PRACTICE.

Being the Presidential Address delivered before the Obstetrical Section of the Third Australasian Medical Congress, at Sydney on Sept. 5th, 1929,

BY HENRY JELLETT, M.D. DUB.,
F.R.C.P. IREL.,

PRESIDENT OF THE SECTION; CONSULTING OBSTETRICIAN TO THE HEALTH DEPARTMENT OF NEW ZEALAND; FORMERLY MASTER OF THE ROTUNDA HOSPITAL.

THE art of midwifery has passed through many stages. Originally it may be assumed that women delivered themselves of their children, as do wild animals, and with as little danger to themselves. Gradually, occasional difficulties introduced themselves, and in response to them elementary methods of assistance were devised. Difficulties increased, and methods of assistance became more developed. Greater use was made of the methods evolved, and, as a result, new difficulties and dangers appeared. Human life became more complicated, its relations more crowded and artificial, and pre-existing disease became more common. The mechanical complications of labour became greater and the need for assistance more frequent. To the ordinary risks were added risks of blood infections brought by those whose object was to assist, with the probable result that efforts, made to reduce *the risk of labour, instead* multiplied that risk. There can be little doubt that maternal mortality before the time of Semmelweiss was considerably greater than it would have been if every woman had been left unaided. There is even a certain element of possibility that, in the case of the healthy woman, this is still so. In the past interference during labour was limited, and asepsis was unknown. In the present, interference is frequent and asepsis is occasional. In the future, if the rate of maternal mortality is to be brought to the minimum, it will be necessary to reverse this relationship. Interference must so far as possible be avoided, and asepsis must be positive.

THE ESSENTIAL AIMS OF MIDWIFERY.

The art of midwifery has been devised with three aims before it, and it is being slowly perfected. The first is to bring a mother safely through a normal pregnancy, labour, and puerperium. The second is to ensure the delivery of a healthy infant. The third is to leave the mother in as normal a *condition* at the end of the puerperium as she was at the beginning of the pregnancy. Similarly, there are three basic essentials on which this art is built—knowledge, skill, and suitable environment. Knowledge is necessary to avoid both complications and interference, and to treat the one and to regulate the other should it become inevitable. Skill is necessary to obtain the fruits of knowledge. Suitable environment, by which I mean the circumstances under which a labour takes place, is necessary in order that the normal and abnormal events of labour may be conducted in an orderly and aseptic manner.

If these three essentials can be obtained, then the risks of childbirth will be reduced to their lowest. If they are absent, or if the possession of a due share of one is allowed to count as an equivalent to the absence of another, then the whole structure falls. Under such circumstances, as I have already suggested, it is quite possible that, so far as the rate of mortality is concerned, humanity as a whole would be just as well off without it, although individuals might still benefit.

Are these essentials obtainable? I think they are, at any rate to a much greater extent than is the case at present. But, before we shall get them, it will be necessary to throw aside a number of hampering ideas. The position of midwifery in the curriculum of the student, if judged by after consequences, is not and cannot remain inferior to that of medicine or surgery. Even if in the past the medical quack ranked before the surgical barber, and both before the "midwife"—male or female, the fact remains that to-day the badly taught "midwife" can kill more than the highly educated physician can cure, and that a good working knowledge of the art of surgery does not always make the surgeon more successful. If actual results are to be the criterion of relative importance, then I venture to suggest that the results of the obstetrical art, properly practised, *are at least as important, though less brilliant, than* those of medicine and surgery.

Then there is the public ignorance of the essentials of midwifery—an ignorance which takes many forms. There is one form which places the presence of a medical practitioner and prompt action before everything else, and which drives the practitioner into acts repellant to him. There is another form which decries the efforts of the practitioner to obtain an environment that will make asepsis possible, and which grudges the small incidental expense necessary. There is another form which considers that a medical practitioner is well paid for his skill, his time, and his assistance during pregnancy and labour, by a fee far lower than would be paid for a minor operation of general surgery.

It is popular to speak and to write as if medical science sprang yearly from one step to another, and that each step formed a permanent and desirable advance towards the top storey of knowledge. This may be so in medicine, but it is not the case in the art of *midwifery*. *It is now just 30 years since the first* edition of my small midwifery was published. It contained the teachings of Sir William Smyly. It contained the statistics of the Rotunda Hospital during his and during the first year of Dr. Purefoy's Masterships. It is of interest to note their treatment of the major complications of pregnancy and labour—sepsis, hæmorrhages, eclampsia—and to examine their results.

The aseptic technique of Sir William Smyly was far ahead of that of the average private hospital of the present day. The treatment of puerperal infection was no more unsatisfactory. The treatment of the hæmorrhages of pregnancy and labour was practically identical with that which is now generally accepted, although at the time students were threatened with rejection at their examination if they mentioned it! The treatment of eclampsia had not been placed on the firm basis on which Tweedy and Stroganoff have since placed it, but it was superior to that too often adopted to-day in private practice.

As for the general results, the following figures will show them. During the five years ending 1898, 7008 women were confined in the hospital. The total mortality was 22—that is, at the rate of 3·1 per 1000, including abortions.

Candidly, if we exclude the recognition of the necessity for a more rigid aseptic technique, I do not know of any very marked advance since the time to which I allude except the introduction of antenatal care. We seem to run after methods—principally operative methods, and to neglect men—and women. We are eternally looking for new advances—advances that must be built on knowledge, and neglecting the foundation on which that knowledge must be built. We create hospitals which make interference with normal labour easy, and we neglect the essentials which make interference safe, and the teaching which makes it unnecessary. We make medical practitioners and midwives, but we fail to provide them with a sufficient knowledge of midwifery. If it is true that in countries other than the British Empire, and even in some parts of the British Empire, the recognition of correct *principles and practices has solved the question* at which we stumble, then let us not rest content until they have become the principles and practices of the British Empire. The present system of caring for the pregnant and the lying-in woman is essentially wrong; I propose to show that by the adoption of a different system it is possible roughly to halve the present rate of maternal mortality.

CARDINAL FACTORS IN CONTROL OF MORTALITY.

I wish to draw your attention to certain factors in the management of maternity, the connexion of which with maternal mortality is so obvious that I think it is permissible to regard them as the cardinal factors which control the rate of that mortality. The first of these is the nature of what, for the sake of convenience, I shall call the midwifery attendant, that is, the person who is directly responsible, either in part or in whole, for the care of the pregnant and lying-in woman. The second is the skill and knowledge possessed by that attendant. The third is the degree of antenatal care and antenatal diagnosis which each woman receives. The fourth is her environment during labour.

If we could go back several centuries and examine the history of maternity at that time we should probably find that none of these things received any practical attention or even recognition. Further, we should probably find that while the mortality accompanying normal pregnancy and labour was very low, the mortality accompanying abnormal pregnancy and labour was very high. If, however, we go back only 50 years or so and again examine we shall find that, while some importance was attached to the nature of the midwifery attendant and to the degree of skill and knowledge possessed by him, little attention was paid to antenatal care or to the environment of the patient. The maternal mortality of the period was probably far higher in the case of the normal woman than it has been several centuries before, while in the case of the abnormal woman it was certainly far less. Finally, if we take the present time, we shall find that, while full recognition is given in theory to all four factors, in practice they are either erroneously interpreted or overlooked, and that the resulting mortality in both types of case is probably very similar to what it was 50 years before. In fact, I am afraid that an unprejudiced investigator, with all the facts before him, would be driven to the conclusion that the basis of modern midwifery practice was as unstable as it had ever been, and that the edifice reared on it was so shaky as to be unsafe.

The Present System of Maternal Care.

What is this edifice? Broadly I may put it something like this. A woman discovers she is pregnant. She discusses the matter with her friends, who advise her to do diverse things. After an interval of some months she interviews a medical practitioner and engages him for her confinement. It is the only part of the whole procedure with which she thinks he is concerned. He writes down her name and the probable date of her confinement. He perhaps recommends a nurse, only to find that she has already engaged one. Patient and doctor mutually forget each other's existence until about the onset of the second stage of labour, or, in a primipara, perhaps later. The doctor is then summoned. If immediate delivery is not imminent, he is expected to produce it by the usual means, and often does so. He visits the patient during the puerperium and then leaves her. Finally, he is paid a fee which, while it may have some relation to the services rendered, has no relation whatever to services which ought to have been rendered.

There are a few more details to be added. The education of the practitioner in obstetrical matters may have been sound and thorough. On the other hand, it is likely to have been so cramped by the exigencies of the other parts of his medical curriculum as to bear no relation to the responsibilities he has got to discharge. Similarly, the education of the nurse may have been sufficient. On the other hand, it may have been so incomplete as to make it unsafe to trust her even with the sterilisation of the practitioner's instruments. The environment of the patient during labour, by which I mean the various conditions which render the carrying out of asepsis and the prompt treatment of obstetrical emergencies possible or impossible, may be as good as those surrounding a minor surgical operation, or so bad that no one with a surgical conscience would care to attempt one.

Everyone—patient, relations, nurse, and doctor—may be in haste, and the chance of a normal labour reaching a normal termination be very small. Further, the practitioner, through no fault of his, may have been obliged to come directly to his patient from a case of a septic nature. The puerperium follows, and the patient lies in bed for perhaps 8, 10, 14 days, or even for longer. Her active movements are often discouraged, and the idea of her leaving bed is sometimes viewed with horror. Finally, there is no effective postnatal examination or care.

Is my description exaggerated? Let me put the matter in the form of question and answer.

What is the chief essential in the management of normal pregnancy and in the prevention of abnormal pregnancy?—I answer—antenatal care.

What are the chief essentials in the management of normal labour?—Absence of haste and asepsis.

What is the chief essential in the prevention of abnormal labour?—Antenatal diagnosis.

What are the chief essentials in the treatment of abnormal labour?—Asepsis and operative facilities.

Are these essentials usually present in the average case of maternity as conducted in the present time?—I do not think they are.

Hence my opinion that the cardinal factors which control maternal mortality are erroneously interpreted, and that, this being so, the present system of caring for the puerperal woman is wrong.

A Comparison of Results.

I want to bring to your notice certain statistics which show the relative rates of maternal mortality in different parts of the world, and in one section of these parts. In each case the figures cover a period of six years ending 1927.

Countries.	Number of live births.	Total deaths.	Death-rate per 1000 live births.
Great Britain, Ireland, Australia, New Zealand	6,060,532	26,506	4·22
Australia	676,599	3,522	5·21
New Zealand	169,494	821	4·87
Holland and the Scandinavian countries ..	2,064,620	5,220	2·53
Holland alone	1,081,096	2,809	2·59
Queen Victoria's Jubilee Institute •	317,758 (labour)	524	1·41

It will be seen at a glance that these figures fall into two groups. There is first a group in which the death-rate is relatively high, and which includes both all that area of the British Empire which I am considering, and also its component parts. Secondly, there is a group in which the death-rate is markedly lower. It includes Holland and the Scandinavian countries. As a connecting link between the two, and as a proof that the cause of the difference is not racial, I add the statistics of a sub-group of the British Empire, which shows a very low mortality. If the views I have expressed above are correct, we should find that the practice of obstetrics in Holland and the Scandinavian countries rests on a wholly different basis to that on which it rests in the British Empire.

ANALYSIS OF THE FOUR FACTORS.

I now propose to analyse the differences which exist between the two groups in respect of the four cardinal factors that control maternal mortality.

1. *The Nature of the Midwifery Attendant.*

I think I am right in saying that, in the British Empire, as I have limited it, the majority of women are attended in labour by medical practitioners. In Holland and the Scandinavian countries, and under the care of the Queen Victoria's Jubilee Institute, all normal cases of labour are attended by midwives. Here, then, is a very marked difference. Is it a vital one? Personally I think that it is, and I will go into my reasons for so thinking. There are three types of midwifery attendant to whom the care of the normal lying-in woman can be entrusted—the obstetrical specialist, the general practitioner, and the midwife. If I am right in thinking that the chief essentials of the management of normal labour are asepsis and the avoidance of interference, the specialists and the midwife are in a better position than is the general practitioner. Both can give, or ought to be able to give, the necessary time and need not to be driven by the exigencies of general practice to shorten the labour to the injury of the patient. For the midwife it is, or ought to be, a matter of one patient at a time. For the specialist his fee is, or ought to be, sufficient to enable him to give all the time that is wanted.

The position of the general practitioner is different. In the day-time the demands of general practice press on him, as well as those of midwifery. At night he must get some sleep if he is to carry out his work. The natural and practically *unavoidable result is that* he comes to a case of midwifery in a hurry, and that the two essentials of midwifery—asepsis and the avoidance of interference—are crowded out. Again, he is in constant contact with infection of different kinds, and no matter how carefully he may try to remove its effects it is not always possible for him to do so. If the specialist comes into contact with infection in the course of gynæcological practice he can find a substitute to replace him temporarily. The specialist, however, we may put aside. The real issue is between the general practitioner and the midwife, and the *midwife has neither the need nor the right to come* into contact with outside infection, nor having done so, to attend another patient until she is again safe. The septic death-rate amongst over 300,000 patients of the Queen Victoria's Jubilee Institute was 0·33 per 1000, and in Holland it was 0·77 per 1000. During the same period in England and Wales it was 1·40 per 1000. In Australia it was 1·7. In Ireland it was 1·79. In New Zealand and in Scotland it was 1·82. That is to say, the septic death-rate amongst women mostly attended by the medical profession was from something more than four to something less than six *times greater than* amongst women attended wholly by nurses. This being so, it would seem to be apparent that on the grounds of freedom from sepsis alone the care of the normal woman by the midwife, as opposed to the practitioner, is clearly indicated. Further, it is obvious that the other dangers of pregnancy and of normal labour are not increased thereby, seeing that in Holland they account for 1·82 of the total mortality, and amongst the patients of the Queen Victoria's Jubilee Institute for 1·07, while in England and Wales they account for 2·5, and in Australia for 3·51.

Here, then, is a very marked difference between low mortality and high mortality countries in regard to my first cardinal factor—the nature of the medical attendant. Accordingly, I am going to suggest that the midwife is the proper person to conduct normal labours. To support this suggestion I give from the point of view of the patient the statistics I have already quoted. From the point of view of the medical profession I advance the further suggestion that, to comply with the legitimate demands of present-day midwifery and to accept its customary remuneration, means that the medical practitioner must be a philanthropist—not by wish but by compulsion, and not on occasions but all the time. Whether such an occupation is compatible with the financial and domestic necessities of a professional individual is for each individual to answer for himself. My own view is that, when the time comes that all normal cases are handed over to midwives, the medical practitioner will wonder how he stood for so long a servitude under which his night was converted into day, his work into toil, and his obste[illegible] into a nightmare.

2. *The Degree of Skill and Knowledge Possessed by the Attendant.*

Here, again, we find the most striking differences between the practice of the British Empire and of Holland in regard to the education of both the student and the midwife. I will select for contrast the training of the medical student which prevailed at Otago University, New Zealand, up to the end of 1927 and the similar training at Utrecht University. In each case the total length of the medical course is six years.

In the *Otago* University the course is as follows:—Fifth year: Attendance on a course of 50 theoretical lectures. Fifth and sixth years: Attendance on at least 20 midwifery cases, of which at least four shall have been attended under proper supervision at a maternity hospital. Twelve attendances at the antenatal clinic. Attendance at the University Maternity Hospital, which has 10 beds, when called on for practical instruction in cases of difficult labour. Each student attends approximately six abnormal labours. Attendance on 12 clinical lectures delivered by the University tutor.

In the *Utrecht* University the course is as follows:—Second year: Two hours weekly of theoretical instruction in midwifery and demonstrations on the phantom. Third year: Three hours weekly of similar instruction. Fourth year: Ten hours weekly of similar instruction. The student then passes an examination in theoretical midwifery. Fifth and sixth years the work is as follows: Eight hours weekly of special instruction in practical obstetrics. Six-week dressership in the University Midwifery Hospital, of which two are spent in residence. One month as extern accoucheur working on the district. The standard of practical work is 50 antenatal examinations and 40 conductions (not attendances).

In the training of midwives a similar difference is apparent though it is not so marked. In New Zealand the course for women without general training is 10 months. In Holland it is three years. I select New Zealand for comparison because the facts are before me, and not because it serves to emphasise the differences. As a matter of fact its course for medical students was at that time, and probably still is, inferior to the corresponding course in Great Britain, owing to circumstances which are at present difficult to control. On the other hand, its training of midwives is considerably better than the average training of midwives as laid down by the Central Midwives Board of England and Wales. A similar remark applies to the nurses of the Queen Victoria's Jubilee Institute who, so far as I understand, have all received a general training and who have received their midwifery training in recognised maternity hospitals.

The essential duties of the medical practitioner in maternity work are to be found in the prevention and treatment of obstetrical disease and anomaly. If his education does not fit him to discharge them, then his services towards the prevention of maternal mortality are very small. Further, if the management of normal cases is to be given to midwives, it is obvious that the present system which prevails in Great Britain, whereby one midwife can be almost wholly trained by another midwife, must become a thing of the past, and that even the more advanced training given in New Zealand is not sufficient.

3. *Antenatal Care and Diagnosis.*

This, again, is a factor of vital importance, and one which in regard to antenatal care is partly, and in regard to antenatal diagnosis is wholly, an essential duty of the medical profession. To emphasise this importance in the case of antenatal care it is only necessary to refer to its effect on the incidence of eclampsia. The patients of the Queen Victoria's Jubilee Institute receive antenatal care, and the mortality of eclampsia amongst them was 0·10 per 1000 deliveries. In New Zealand during the same period the mortality was 1·10 per 1000 live births.

Statistics of the work of a maternity hospital collected by Ray and laid before a Conference on Maternal Mortality and Morbidity in 1928 show that, before antenatal work was systematised, there were ten deaths from eclampsia amongst 10,505 patients. After it was systematised there was one death from eclampsia amongst 13,067 patients. At the East End Maternity Home amongst 4173 patients there was not a single case of eclampsia. On the other hand, the attendances at the antenatal clinic numbered 11,881.

The only positive figures which I can place before you to show the effect of antenatal diagnosis on the prevention and prognosis of difficult labour are as follows. In England and Wales the death-rate from the "other accidents of labour" and from hæmorrhage was in the statistics from which I have already quoted 0·96 per 1000 live births, in Australia it was 1·22, in New Zealand it was 0·98. The corresponding death-rate amongst the patients of the Queen Victoria's Jubilee Institute was 0·33 per 1000 labours. That is to say, it was approximately a third of that of England and Wales and of New Zealand, and slightly more than a fourth that of Australia. I think that if you will recall the appalling consequences of undiagnosed and improperly treated contracted pelvis and particularly of the minor degrees of contraction, with its sequelæ failed forceps, failed craniotomy, delayed Cæsarean section, and septic infection, you will be able to estimate the effect of careful antenatal diagnosis yourself.

I have already suggested that the medical profession should give up the care of normal labour to midwives. I now suggest that they should replace this irksome and in every sense of the word unprofitable task by careful antenatal care and diagnosis, effective assistance in abnormal labour, and sufficient postnatal care. I quite recognise that many practitioners are trying and have tried for some years to give such care, in spite of the fact that the considerably increased demand it makes on their time goes unrewarded. Still the fact remains that, whereas in Holland every mother comes under the care of a medical practitioner during labour, in the British Empire it is only the minority who do so. Antenatal care and diagnosis is capable of removing almost completely the graver dangers of eclampsia and of obstructed labour by preventing the occurrence of the one and by the anticipation of the other. If it did nothing more than this it would probably reduce the maternal mortality-rate by something between 1 and 1·5 per 1000 births.

4. *Suitable Environment.*

I have explained what I intend to convey by this term—namely, everything which tends to promote the practice of asepsis, and which makes necessary intervention in obstetrical emergencies easily accomplished. I have no means of judging whether the environment of labour is better in Holland than in the British Empire, and so I will assume that it is the sole cardinal factor in which the practice of the two countries does not materially differ. Still its importance is such that I must discuss it. The value of suitable environment varies theoretically according to the circumstances and nature of the case. Thus, in a normal confinement normally managed in a private house, environment is possibly of small importance. Intervention is, and even vaginal examination may be, unnecessary. Consequently the risk of infection is small. In hospitals, public or private, environment is all-important on account of the increased risk of infection due to the presence of other patients. In abnormal cases, whether in private houses or in hospitals, environment is again all-important. So much in theory is probably right. In practice, however, seeing that unexpected complications may occur and necessitate intervention, suitable environment is always necessary.

The details of a suitable environment are all-important, but it is impossible to do more than touch on them. The aseptic environment must be such as to enable the labour to be carried out with the same degree of asepsis as is a surgical operation. It is strange that the truth of the fact is still unrecognised, and even contested, by so many people, and that it is possible to find a medical man removing tonsils in the morning with the strictest aseptic ritual and a placenta in the evening with none. Yet the removal of a placenta is possibly the operation most fraught with septic possibilities of any in the whole field of medicine. I am sure that the defence to this will be that the surroundings of an average case of labour make asepsis impossible. My reply is that we, as a profession, have had some 50 years at least in which to teach nurses and the public that these surroundings must be changed, and that we have not done so. Even at the present time, when a technique, which makes asepsis possible amidst bad surroundings, has been worked out in a satisfactory manner, medical practitioners are to be found who decry it as a useless and unnecessary expense and complication. Consequently environment does not improve, and the responsibility rests with us.

A very similar remark may be made regarding the environment which makes the treatment of obstetrical emergencies easy and safe. How many practitioners insist that the patient's room shall be so arranged that if, for example, postpartum hæmorrhage should occur, its treatment can be immediate and effective? I am almost afraid to ask the next question. How many practitioners carry with them the necessary appliances for its treatment, and prepare them beforehand so that they may be ready for an emergency? And yet the sole excuse for the presence of a medical practitioner during normal labour is that he is available for the treatment of the unforseen complication. Otherwise he is only an additional source of danger.

Again, the environment in private maternity hospitals is often no better than in a private home. And yet it is generally recognised that such hospitals are a danger rather than a benefit unless improved asepsis and general facilities more than compensate for the increased danger caused by the aggregation of patients.

CIRCUMSTANCES HAVE MADE LABOUR PATHOLOGICAL.

Someone may suggest, as has been so often suggested before, that it is absurd to worry about environment, and to treat as pathological what is a normal physiological function. This is a confusion of ideas, and one which in the past has helped to increase maternal mortality. It is true that the process of labour under normal circumstances is a physiological one, but the circumstances which surround it in civilisation are so far from normal that it has become pathological. I ask the question in all seriousness. Is there a single incident in the management of normal labour which is not opposed to the physiological process of labour? Candidly I cannot discern one which is not opposed to it in some manner. Let me compare the course which I think Nature will prompt a woman to follow during labour with the cause which civilisation has imposed on her. I fancy that a cave-dweller's labour was somewhat as follows.

The Cave-dweller's Labour.

The woman washes herself at a nearby spring or stream, and she walks about and does some of her daily work during the first stage. There is no hip-bath in which she sits, there are no examinations or other interferences. The second stage comes on. She squats during the pains in an attitude of defæcation, thus enlarging her pelvic outlet, and gaining the help of gravitation on the descent of the child, and effectively using her abdominal muscles. The child is born, and the cord is either divided or left while the woman, still in a squatty position, expels the placenta. There is no question here of vaginal retention. If there is any delay, she hugs tightly a large stone, using it, together with her voluntary efforts, as a means of increasing intra-abdominal pressure. Then she probably lies down for a time, shortly to get up again to make the cave equivalent of a cup of tea. During the puerperium she is mostly on her feet. There is free drainage from the vagina, and, when she suckles her child, uterine action expels the lochia from the uterus. Her posture during labour and the puerperium causes a flow from the uterus to the vagina and thence externally. There is no opportunity for its reversal, and the aspiration of fluids from the vulva and the vagina cannot occur.

Civilised Labour.

The labour of her sister in civilisation is a very different matter. She enters a nursing home for her confinement, and begins her opportunities of infection by sitting in water in a bath which has just been used by another patient. Her vaginal orifice is somewhat patulous and water enters freely. She is then examined vaginally to see that all is normal, and later, perhaps a second or third time, to see if the doctor must be sent for. She has been sent to bed early in the first stage, and her position and mental anxiety make labour tedious. The nurse thinks it is getting too slow, so she presses on the fundus to try to hasten the expulsion of the child. The uterus is pressed down into the pelvis, and, when the pressure is relaxed, it rises again, and there is some vaginal aspiration which sucks into the vagina any fluid lying near the orifice. Such fluid has been infected by an unsterilised "wipe," and so more bacteria gain entrance.

The first stage continues, the patient is crying from nervousness and unrelieved pain, and so the medical attendant is summoned. He examines again and finds nothing wrong, so he is wise enough to give her a sedative and to wait. The patient, however, she comes into the second stage the forceps is applied. In a way she is a lucky woman, because it might have been applied during the first stage.

Where does the physiological process of labour come into this radical mismanagement? To begin with, civilisation forced the woman to have her baby in an abnormal attitude and in the confined circumstances of a nursing home, instead of in a normal attitude in an open space. Then her nurse sent her to bed when Nature wanted her to walk about. Then her doctor extracted her baby with forceps, when she would have delivered it herself if she had been allowed. Lastly, he extracted the placenta when Nature would have expelled it if the patient's attitude had not prevented her. Then civilisation again made her lie on her back or side in bed, while the normal discharges of the puerperium collected in the upper part of the vagina, and the septic organisms which had entered found both a medium in which to develop and an incubator to help development.

I submit that when a natural process has been diverted from the normal, to the extent that the labour of civilisation has been diverted from the labour of nature, it becomes to all intents and purposes a pathological process for which it is necessary to try continually to find new remedies, of which a perfect environment is one.

It is thus evident that current practice in regard to three out of the four cardinal factors I have mentioned differs markedly in the British Empire and in the group of low mortality countries. It is also clear that so far as the Queen Victoria's Jubilee Institute is concerned, the recognition of these factors is followed by an even greater drop in maternal mortality than occurs in Holland.

APPARENT EVERYDAY CAUSES OF MATERNAL MORTALITY.

I have certain definite ideas in regard both to the causes of maternal mortality and the ways by which it can be prevented. They are the result of my experience during the last five years or so as obstetrical consultant to the Health Department of New Zealand, and of the study of the writings of others on the subject both in Great Britain and in Australia. I express my indebtedness for both information and suggestion to Dame Janet Campbell and Dr. J. S. Fairbairn at home, to Dr. Marshall Allan and Dr. Sydney Morris in Australia, and to Dr. Sydney Allen in New Zealand. I believe that the practical causes of an unduly high maternal mortality, that is to say, the causes which are removable and whose removal will effect a marked reduction in such mortality, are as follows:

1. The conduction of normal labour by medical practitioners, because the latter of necessity bring to the case the dangerous elements of haste, of unnecessary interference, and of sepsis.

2. The insufficient medical education of both medical practitioners and midwives. In the case of the former the consequence is an insufficient skill to deal with the obstetrical diseases and difficulties which are their special province. In the case of the latter the consequences are an insufficient knowledge to enable them to appreciate the importance of and to practise a rigid aseptic technique, and, to a less degree, to make the general management of their patients inadequate.

3. The lack of due attention to antenatal care and antenatal diagnosis. The failure of the former results in unnecessary deaths from toxæmia, from pre-existing septic infection and from antepartum hæmorrhage. The failure of the latter results in unnecessary deaths from difficult labour and its sequelæ.

4. Unsuitable environment leading in maternity hospitals to deaths from septic infection acquired from other patients, and in private houses to deaths due to inability properly to treat obstetrical emergencies and to a less extent septic infection.

I trust no one will suggest that in expressing these opinions I am attacking the medical profession. If anyone should do so, my best answer is that, if so, I am attacking myself too. I am sure that, when I was Master of the Rotunda, the only one of the four causes which I have given above, and to which I attached sufficient importance, was the second—namely, adequate obstetrical education, and possibly also the fourth—suitable environment. The other aspects of the matter had not occurred to me, although they should have been obvious. I can only hope that soon they will represent the collective opinion of the medical profession.

The remedy suggests itself. Free the medical profession from what I have called the servitude of normal midwifery. Give the medical student sound and practical instruction in midwifery, and imbue him with the belief that one of his duties in life is to keep on adding to her knowledge. Teach the practitioner that his part in midwifery is antenatal care and diagnosis, the management of abnormal labour and of the abnormal puerperium, and postnatal care. Teach him, too, that amongst his patients he is an obstetrical parson, and that his text is the necessity for early medical advice and for suitable environment. Lastly, reform private maternity hospitals so that their environment may be that of a true hospital rather than of a lodging-house, or even of a private hotel.

I have quoted the statistics of the Queen Victoria's Jubilee Institute a number of times, and I will quote them once again. The total death-rate amongst its patients during a period of six years was two-fifths that of the obstetrical death-rate of the British Empire during the same period. If these figures are adjusted to make them more strictly comparable with official statistics, the death-rate per 1000 live births amongst the patients of the Institute was approximately one-third that of the Empire figures, while the unadjusted septic death-rate is less than one-third. Surely if an institution working amongst the poorer classes can attain this standard, the united efforts of the medical profession can do the same.

SUMMARY OF THE AUTHOR'S VIEWS.

I propose to vary the usual procedure, and to allow someone else to write the summary for me. In 1925 Dr. Sydney Morris, senior medical officer of health for New South Wales, wrote in a prize essay as follows:

1. "What public opinion has not yet realised is that the civilised woman requires attention not only at the actual confinement, but also some considerable time antecedent to the latter. Provided that the woman can obtain the services of a competent midwife for the actual confinement and the puerperium, together with the advice and supervision of a careful practitioner during the later months of pregnancy and in any emergency during the actual labour,

eclampsia amongst 13,067 patients. At the East End Maternity Home amongst 4173 patients there was not a single case of eclampsia. On the other hand, the attendances at the antenatal clinic numbered 11,881.

The only positive figures which I can place before you to show the effect of antenatal diagnosis on the prevention and prognosis of difficult labour are as follows. In England and Wales the death-rate from the "other accidents of labour" and from hæmorrhage was in the statistics from which I have already quoted 0·96 per 1000 live births, in Australia it was 1·22, in New Zealand it was 0·98. The corresponding death-rate amongst the patients of the Queen Victoria's Jubilee Institute was 0·33 per 1000 labours. That is to say, it was approximately a third of that of England and Wales and of New Zealand, and slightly more than a fourth that of Australia. I think that if you will recall the appalling consequences of undiagnosed and improperly treated contracted pelvis and particularly of the minor degrees of contraction, with its sequelæ failed forceps, failed craniotomy, delayed Cæsarean section, and septic infection, you will be able to estimate the effect of careful antenatal diagnosis yourself.

I have already suggested that the medical profession should give up the care of normal labour to midwives. I now suggest that they should replace this irksome and in every sense of the word unprofitable task by careful antenatal care and diagnosis, effective assistance in abnormal labour, and sufficient postnatal care. I quite recognise that many practitioners are trying and have tried for some years to give such care, in spite of the fact that the considerably increased demand it makes on their time goes unrewarded. Still the fact remains that, whereas in Holland every mother comes under the care of a medical practitioner during labour, in the British Empire it is only the minority who do so. Antenatal care and diagnosis is capable of removing almost completely the graver dangers of eclampsia and of obstructed labour by preventing the occurrence of the one and by the anticipation of the other. If it did nothing more than this it would probably reduce the maternal mortality-rate by something between 1 and 1·5 per 1000 births.

4. *Suitable Environment.*

I have explained what I intend to convey by this term—namely, everything which tends to promote the practice of asepsis, and which makes necessary intervention in obstetrical emergencies easily accomplished. I have no means of judging whether the environment of labour is better in Holland than in the British Empire, and so I will assume that it is the sole cardinal factor in which the practice of the two countries does not materially differ. Still its importance is such that I must discuss it. The value of suitable environment varies theoretically according to the circumstances and nature of the case. Thus, in a normal confinement normally managed in a private house, environment is possibly of small importance. Intervention is, and even vaginal examination may be, unnecessary. Consequently the risk of infection is small. In hospitals, public or private, environment is all-important on account of the increased risk of infection due to the presence of other patients. In abnormal cases, whether in private houses or in hospitals, environment is again all-important. So much in theory is probably right. In practice, however, seeing that unexpected complications may occur and necessitate intervention, suitable environment is always necessary.

The details of a suitable environment are all-important, but it is impossible to do more than touch on them. The aseptic environment must be such as to enable the labour to be carried out with the same degree of asepsis as is a surgical operation. It is strange that the truth of the fact is still unrecognised, and even contested, by so many people, and that it is possible to find a medical man removing tonsils in the morning with the strictest aseptic ritual and a placenta in the evening with none. Yet the removal of a placenta is possibly the operation most fraught with septic possibilities of any in the whole field of medicine. I am sure that the defence to this will be that the surroundings of an average case of labour make asepsis impossible. My reply is that we, as a profession, have had some 50 years at least in which to teach nurses and the public that these surroundings must be changed, and that we have not done so. Even at the present time, when a technique, which makes asepsis possible amidst bad surroundings, has been worked out in a satisfactory manner, medical practitioners are to be found who decry it as a useless and unnecessary expense and complication. Consequently environment does not improve, and the responsibility rests with us.

A very similar remark may be made regarding the environment which makes the treatment of obstetrical emergencies easy and safe. How many practitioners insist that the patient's room shall be so arranged that if, for example, postpartum hæmorrhage should occur, its treatment can be immediate and effective? I am almost afraid to ask the next question. How many practitioners carry with them the necessary appliances for its treatment, and prepare them beforehand so that they may be ready for an emergency? And yet the sole excuse for the presence of a medical practitioner during normal labour is that he is available for the treatment of the unforseen complication. Otherwise he is only an additional source of danger.

Again, the environment in private maternity hospitals is often no better than in a private home. And yet it is generally recognised that such hospitals are a danger rather than a benefit unless improved asepsis and general facilities more than compensate for the increased danger caused by the aggregation of patients.

CIRCUMSTANCES HAVE MADE LABOUR PATHOLOGICAL.

Someone may suggest, as has been so often suggested before, that it is absurd to worry about environment, and to treat as pathological what is a normal physiological function. This is a confusion of ideas, and one which in the past has helped to increase maternal mortality. It is true that the process of labour under normal circumstances is a physiological one, but the circumstances which surround it in civilisation are so far from normal that it has become pathological. I ask the question in all seriousness. Is there a single incident in the management of normal labour which is not opposed to the physiological process of labour? Candidly I cannot discern one which is not opposed to it in some manner. Let me compare the course which I think Nature will prompt a woman to follow during labour with the cause which civilisation has imposed on her. I fancy that a cave-dweller's labour was somewhat as follows.

The Cave-dweller's Labour.

The woman washes herself at a nearby spring or stream, and she walks about and does some of her daily work during the first stage. There is no hip-bath in which she sits, there are no examinations or other interferences. The second stage comes on. She squats during the pains in an attitude of defæcation, thus enlarging her pelvic outlet, and gaining the help of gravitation on the descent of the child, and effectively using her abdominal muscles. The child is born, and the cord is either divided or left while the woman, still in a squatty position, expels the placenta. There is no question here of vaginal retention. If there is any delay, she hugs tightly a large stone, using it, together with her voluntary efforts, as a means of increasing intra-abdominal pressure. Then she probably lies down for a time, shortly to get up again to make the cave equivalent of a cup of tea. During the puerperium she is mostly on her feet. There is free drainage from the vagina, and, when she suckles her child, uterine action expels the lochia from the uterus. Her posture during labour and the puerperium causes a flow from the uterus to

Vestibular examination on Feb. 24th gave the following results with cold water:—Right ear: nystagmus began at 51″ and lasted 54″. Left ear: nystagmus began at 49″ and lasted 120″.

The following report was made following radiographic examination of the skull on Feb. 24th: "Frontal and sphenoidal sinuses undeveloped. The sella turcica is small. There is a thick bony wall with well-marked anterior and posterior clinoid processes. There is no evidence of erosion. No abnormality of the skull is evident."

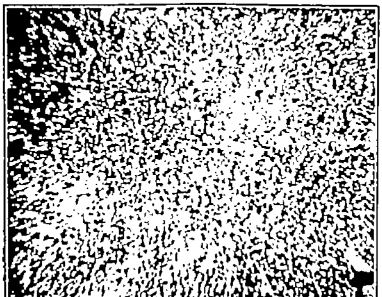
Summary and Commentary.

A previously healthy child of 8 years suffers from a progressive illness lasting between five and six months. Failure of hearing and spastic paraplegia are the first symptoms. Then there is rapidly increasing speech defect leading to complete dumbness. Sight is more gradually lost, and spastic paralysis increases in the lower limbs and extends to the upper. Finally, death occurs rather suddenly a few hours after the onset of acute symptoms of cerebral inflammatory type.

Post-mortem examination showed no abnormality except in the brain. The results of the pathological study of this organ are described by Prof. Woollard.

During life the recognition of the condition presented some difficulty. The diagnosis seemed to lie between a rapidly growing tumour of the brain and Schilder's disease. The chief arguments against the former were as follows: The signs and symptoms showed a very extensive and rapidly progressive lesion, but in spite of this there was none of the general signs of tumour. Headache, vomiting, and choked disc were absent, as were all other signs of increased intracranial pressure. The symmetry of distribution was in accord with recorded cases of Schilder's disease. The failure of hearing before that of sight had already been noted in a case recorded by Grainger Stewart, Greenfield, and Blandy[1] also, strangely enough, in a boy of 8 years. The subsequent blindness, unaccompanied by changes in the fundi, seemed to confirm the diagnosis.

FIG. 2.



Preparation stained by the Weigert-Pal method showing the demyelinisation of the fibres so that the white matter no longer takes the stain.

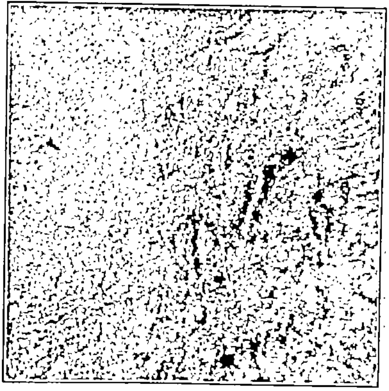
A good résumé of this disease appears in "Recent Advances in Neurology" by W. Russell Brain and E. B. Strauss[2] which includes a bibliography.

Pathological Notes by Prof. H. H. WOOLLARD.

It appears that 23 or more examples of this disease have now been collected. Of these the macroscopic examination of the brain has given a very similar picture in some 17. Microscopic analysis has been carried out in about six or seven, but this has naturally enough shown some divergence in detail though agreeing in essentials.

The present case of Dr. de Crespigny's was shown at a clinical meeting in Adelaide as a case of Schilder's disease, and it represents the first case discovered in Australia.

FIG. 3.



A high power view of the periphery of the demyelinised area. Weigert-Pal stain. Short irregular beaded fibres are seen.

Macroscopic Features.

The brain presented no external evidence of disease. There was no vascular injection of the pia mater, the convolutions were neither engorged nor flattened, and there was no hydrocephalus or sign of increased intracranial pressure. When the brain was sectioned there was disclosed an alteration in the white matter of both hemispheres (see Fig. 1), including the posterior part of the corpus callosum. The change gave to the white matter a fused gelatinous appearance easily distinguished from the normal, the transition between the two being abrupt.

The affected area of white matter was situated for the most part above the level of a horizontal section that would have passed through the genu and splenium of the corpus callosum. This is in agreement with other cases described. The fused gelatinous appearance of the white matter extended symmetrically in both hemispheres and the corpus callosum in its posterior fourth presented a similar appearance. This involvement of the corpus callosum has not been mentioned in the cases whose descriptions are available to us. The areas of white matter involved are those of the occipital and temporal regions. After fixation the changed areas of white matter became brownish and friable. The crumbling of the material made section cutting difficult.

It is a striking feature that the cortex immediately adjacent to the gelatinous white matter appears to be normal and is separated from the diseased area by a thin band of normal white substance. In the occipital lobe it is easy to discern the stria of Gennari with the unaided eye.

All descriptions of the affected white substance agree on the following points. The disease is limited to the occipital and temporal regions of the cerebrum, the area affected is large and continuous and extends symmetrically in both hemispheres. The grey matter immediately adjacent to the affected white matter appears normal, and the passage from affected white matter to normal areas is abrupt.

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[1] Brain, 1927, l., 1.

[2] London 1929, p. 328 et seq.

of appetite, and insomnia. Mental retardation may be experienced, and often presents itself to the patient as a feeling that "the brain won't work," but in mild cases hallucinations and delusions are exceptional. There is often a history of previous attacks, followed by complete recovery, and sometimes a family history of more serious mental trouble. The relief of the insomnia is an important part of the treatment. Luminal is also effective in the treatment of insomnia associated with mental excitement, but larger doses, up to grs. 5, may then be required.

It is rash to say of any drug that it never gives rise to addiction, but it is very exceptional for luminal to do so. The risk of habit formation may be diminished in the neurotic patient with insomnia by letting him put the tablet by his bedside and take it only if he is not asleep half an hour after going to bed. After he has secured a few nights' sleep by means of the drug he will often fall asleep without its aid if he feels that it is readily available.

(3) *Aural vertigo* is a complex subject, upon which I can only touch lightly now. It is convenient to distinguish clinically two types of aural vertigo: (1) An acute type associated with an acute lesion of the internal ear, an acute labyrinthitis, sometimes secondary to middle-ear infection, acute or chronic, sometimes of undiscovered ætiology. (2) The second and commoner type is found in the patient who suffers from recurrent attacks of vertigo of varying severity associated usually with deafness and tinnitus. This is a heterogeneous group. Most cases have not had purulent otitis media, but the condition is usually secondary to blockage of the Eustachian canal, with deflected nasal septum, polyps, infected air sinuses, chronic catarrh, or dental infections.

In this second group luminal is an exceedingly valuable drug. I cannot remember a patient who was not greatly relieved by it, and in mild cases complete freedom from vertigo is often produced in a few days. I give ½-gr. doses three times a day at first, and later reduce the dose. Luminal, of course, does not remove the cause of the vertigo, which must be sought and treated by otological methods.

Luminal is an excellent vestibular sedative in conditions of acute labyrinthitis, and I have used it also for vertigo due to lesions of the vestibular tracts and centres—for example, in encephalitis lethargica and disseminated sclerosis. It is useful as a preventive of sea-sickness.

(4) *Pruritus.*—I owe my acquaintance with the antipruritic effects of luminal to Dr. W. J. O'Donovan. It is especially valuable in cutaneous affections in which a large neurotic factor plays a part, such as pruritus ani. Used in gr. ½ doses and combined with appropriate local treatment it greatly diminishes the pruritus and so helps to break the vicious circle in which scratching keeps up an abnormal and irritating state of the skin.

(5) *Miscellaneous Disorders.*—Luminal is also useful as a sedative in chorea, whooping-cough, and exophthalmic goitre, and other uses for it will, no doubt, suggest themselves.

ABOLITION OF LETTERS OF RECOMMENDATION.—The governors of the Norfolk and Norwich Hospital have abolished the use of letters of recommendation on the ground that 75 per cent. of the patients are members of the contributory scheme, and that others can be admitted almost automatically on the advice of their medical men.

A BANKERS' HOSPITAL TRUSTEE.—The original trustees of the Yorkshire Home for Chronic and Incurable Diseases at Harrogate, which was established in 1881, have long been dead, the trust deed has been lost, and no new trustees have been appointed. The resulting difficulty has now been removed by the appointment of the National Provincial Bank as trustee for an honorarium of 10*s.* per cent. The rules have, at the same time, been amended by substituting the word "resident" for "patient." The word "hospital" has been deleted at the request of the inmates, on the ground that, as the National Health Insurance does not pay benefits to patients in hospitals, they are in danger of being denied their rights.

TWO CASES OF
HUMAN INFECTION BY THE AMERICAN HOG-CHOLERA BACILLUS.

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WITHIN the salmonella series of types the porcine strains referred to as *Bacillus suipestifer* (*B. choleræ suis*, or hog-cholera bacilli) and the human strains to which—in flagrant disregard of its original usage—the term *B. paratyphosus* C has of recent years been variously applied, form a cluster of species with specially close serological affinities. The composition of this cluster has been the subject of numerous studies, and one of us (White, 1926), piecing together and extending the work of others, concluded that these strains were divisible into four sharply-defined types: (1) Eastern or Hirschfeld, (2) American *suipestifer*, (3) European *suipestifer*, and (4) Glässer-Voldagsen or Ferkeltyphus.

The main differential characters of these types are set out in Table I.

TABLE I.—*Differential Characters of Four Types.*

—	Fermentation of—				Production of H_2S.	Serological relations.	
	Mannite.	Dulcite.	Arabinose.	Rhamnose.		Specific phase.	Non-specific phase.
Eastern or Hirschfeld type	AG	AG	AG	—*	+ +	Closely similar.	(See below).
American *suipestifer* type..	AG	—	—	AG *or* —	—		
Ferkel typhus type—							
Glässer strains	—	—*	A(g)	A(g)	+		
Voldagsen ,,	—	—*	A(g)	A(g)	+	None.	
European *suipestifer* type..	AG	—*	—	AG	+ +		

Non-specific phases of American and Glässer strains are to all intents identical; European and Voldagsen strains differ therefrom only by lack of any trace of specific phase antigen. The non-specific phase of the Hirschfeld type differs definitely from all the above by its deficiency in certain antigenic components.

A = acid; G = gas; (g) indicates that small amounts of gas are produced by some strains; — = No fermentation or no H_2S produced; —* indicates regular or occasional late fermentation; + = H_2S formed.

While the Hirschfeld type is known only from typho-septic disease in man, and while the European *suipestifer* type has been repeatedly encountered as a cause of food-poisoning outbreaks and of isolated cases of paratyphoid, there appear to be only two records of isolation of the American *suipestifer* bacillus from human sources; these are due to Krumwiede, Provost, and Cooper (1922), who describe a small outbreak of food poisoning due to this form, and to Hicks (1927), who isolated the organism in Shanghai from the blood of a paratyphoid sufferer. Furthermore, up to the present time the American *suipestifer* bacillus has not been shown to occur in Europe; it did not appear among 37 porcine strains collected by one of us (P. B. W.) from England and the continent; its known strongholds are America and Japan.

It is therefore of interest to record two cases in which the organism was isolated in this country and as an apparent cause of disease in man.

NABARRO AND WHITE'S CASE.

V. R., a girl aged 8 months, was brought to the Hospital for Sick Children, Great Ormond-street, on Dec. 2nd, 1926, with the history of having been ailing for the past two months and of having lost the use of the arms from the shoulder to the elbow, especially the right.

On examination the child was well developed, but rather pale. Both upper arms were held rigidly at the side of the chest, and there was generalised swelling of the shoulder region on both sides. The shoulders were tender to palpation, although gentle, passive movements did not seem to cause pain. Radiographic examination showed periosteal thickening at the outer side of the upper arm, and of both humeri, also a small area of rarefaction at the upper end of the left diaphysis, and doubtful erosion at the upper end of the right diaphysis. No other joints were swollen, and the child had no fever. The right shoulder-joint was aspirated and about 1 c.cm. of thin, turbid fluid removed. This was investigated and an organism of the salmonella group was isolated.

Agglutination Tests with the Patient's Serum.

Samples of blood were taken on the eighth and thirteenth days after admission to hospital and were tested for salmonella agglutinins. Oxford standard suspensions of *B. paratyphosus* B and *B. paratyphosus* C (presumably Hirschfeld's bacillus), and a suspension of the organism from the joint fluid were clumped on both occasions up to serum dilutions between 1000 and 2500; Oxford suspensions of paratyphoid A, Gaertner and "Mutton" (Aertrycke) type bacilli were not agglutinated at dilutions 25 and above. An absorption test showed that saturation of the serum with paratyphoid B bacilli did not appreciably reduce its titre for Hirschfeld's bacillus or for the patient's own organism; another suggested that Hirschfeld's bacillus was unable to exhaust the serum of agglutinins for the patient's strain.

Two years later (Dec. 17th, 1928), when the child was called up for examination, its serum still clumped paratyphoid C-*suipestifer* bacilli up to dilutions between 125 and 250.

Widal tests, made in March, 1927, with samples of blood from the parents of V. R. revealed no agglutinins for any salmonella tested.

Cultural and Serological Features of the Organism Isolated.

In morphology, in motility, in failure to produce indol, to liquefy gelatin, to clot milk, to attack lactose, saccharose, and salicin, and in its gaseous fermentation of glucose and mannite the organism presented the usual characters of the salmonella group. Arabinose and inosite were unfermented; acidity did not appear in dulcite peptone water till the third week of incubation; lead acetate added to broth cultures remained undarkened during 14 days. These peculiarities are together characteristic of the American *suipestifer* or hog-cholera type.

The organism was found to be a typical diphasic form, and agglutination tests performed with its specific and non-specific phases and the phase antisera of various salmonella types grouped the strain unequivocally with the bacilli of the paratyphoid C-*suipestifer* series of types.

A number of comparative absorption tests were carried out. The essential results may be summarised as follows:—

1. The specific phase of strain V. R. completely exhausted the specific phase antisera of two America *suipestifer* strains (titre reduced from 10,000 and 20,000 resp. to <100); it almost exhausted a specific phase Hirschfeld type serum (20,000 to 200).

2. The non-specific phase of strain V. R. completely exhausted the non-specific phase antisera of the same two American *suipestifer* strains (25,000 and 50,000 resp. to <100) and equally exhausted the high titre sera of two European *suipestifer* strains. Similarly applied to these sera the non-specific phase of Hirschfeld's bacillus left considerable agglutinins (1000–5000). Acting on a non-specific phase Hirschfeld type serum the non-specific phase of V. R. was almost as effective in removing agglutinins as the homologous Hirschfeld strain.

3. A mixed phase serum prepared against strain V. R. showed an homologous specific phase titre of 25,000. This was reduced to <100 by treatment of the serum with specific phase American *suipestifer* bacilli, to 250 by treatment with specific phase Hirschfeld bacilli, and was unaffected by saturation with European *suipestifer* bacilli. The non-specific phase titre of the same serum was 100,000. Heavy doses of non-specific phase American *suipestifer* and of European *suipestifer* bacilli reduced this titre to <200, but the corresponding phase of Hirschfeld's bacillus left well-marked non-specific phase agglutinins (titre 10,000).

In fine the strain V. R. was found to correspond exactly and exclusively with typical *suipestifer* strains from the United States. Incidentally it may be noted that another strain, "Cole," also isolated by one of us (D. N.) from a case of joint abscess in a child, was identified as a typical European *suipestifer* strain, adding yet another instance of human infection by this organism. It would seem that the European *suipestifer* bacillus is particularly apt to attack young children and occurs as frequently in localised disease as in generalised febrile infections and gastro-enteritic poisoning.

DYKE AND SCOTT'S CASE.

The patient, aged 20, a labourer, was admitted to the Wolverhampton and Staffordshire Hospital on June 20th, 1927, having been ill for four days.

The onset of his illness was said to have been sudden with generalised indefinite pain and deafness. There was no diarrhœa and no vomiting. Delirium appeared in 48 hours, at first intermittent, but on admission persistent. It was of a violent character, the patient crying aloud, struggling, and continually attempting to get out of bed. The temperature on admission was 103° F., pulse 110, and respirations 28. The abdomen was distended but soft; the spleen could not be felt. Except some crepitations at the apex of the right lung there were no abnormal physical signs.

The patient died in hospital five days after admission, the duration of the illness thus being nine days. Delirium persisted during the whole of his stay in hospital until the final coma; the temperature ranged between 103.5° and 101° F. except for a brief period on the fourth day when it fell to normal; the pulse ranged from 116 to 140 most of the time and rose to 160 shortly before death. The bowels were opened normally about once daily; stools were firm and well formed. The urine showed no albumin and no deposit on centrifugalisation. On the fourth day after admission a large purpuric area about the size of the palm of the hand appeared on the left flank.

Autopsy.

The morbid changes found were those characterising an acute infection. The heart muscle was soft and friable; there were no abnormalities of the valves. The serous cavities showed no free fluid, but small purpuric flecks were present on both parietal and visceral pleura and on the surface of the heart. The intestines appeared normal; the liver was pale and fatty; the kidney showed a most intense cloudy swelling, the capsule stripping readily; the spleen was moderately enlarged, dark red, and soft; the lungs showed congestion, but no consolidation; the tracheal mucous membrane was moderately inflamed; there were no macroscopic abnormalities in the brain.

Bacteriology.

A blood specimen was taken for culture on the third day after admission. This showed in 48 hours an abundant growth of a small Gram-negative motile bacillus which grew readily on all the ordinary laboratory media. Cultures from the heart blood and spleen post mortem yielded a similar micro-organism. Mice inoculated with cultures of this bacillus died in one to four days with septicæmia.

In view of the obscure nature of the illness the case was reported to the Ministry of Health, and the circumstances were then investigated locally by Dr. E. Wilkinson, one of the medical officers of the Ministry. Inquiry showed that there had been no cases of similar illness in the family of the patient nor in the neighbourhood, and no possible source of infection has since been discovered.

Identification of B. suipestifer, Group I.—A culture of the bacillus isolated post mortem was received at the laboratory of the Ministry of Health on June 30th, 1927. In colony and culture it resembled a salmonella; it fermented glucose and mannite with production of acid and gas and left unattacked lactose, saccharose, and dulcite; it failed to produce blackening of lead acetate even after ten days' growth. Colonies were tested for agglutination with the sera prepared with various salmonella types. It was found that 80 per cent. of the colonies agglutinated with the "specific phase" sera of *B. paratyphosus* Hirschfeld and *B. suipestifer* Indiana 49, but not with the sera of other types. With various "group phase" sera 20 per cent. of the colonies agglutinated, such colonies giving no agglutination with "specific phase" salmonella sera. It was thus possible by direct serological examination of the colonies to report within 24 hours that the infection was due to a diphasic salmonella belonging to the *suipestifer*-paratyphosus C series. Since such a salmonella had not at that time been described as indigenous in England further serological work was undertaken to determine to which of the sub-types of the *suipestifer*-paratyphosus C series it belonged and especially to see if it was of the American sub-type not hitherto found in human infections. The matter was mentioned to Bruce White, who proposed that our Wolverhampton case should be published jointly with the similar case in London already investigated by Nabarro and himself.

Specific and group phase cultures of the Wolverhampton strain were used to produce agglutinating sera in rabbits (intravenous doses of 0·1 c.cm., 0·25 c.cm., 0·5 c.cm., and 1 c.cm. of chloroformed broth culture) and absorption experiments set up as shown in Table II.

TABLE II.—*Absorption Experiments:* (A) *Group Phase Antigen.* (B) *Specific Phase Antigen.*

Serum.	Absorbed by—	(A) Titre (group phase).	(B) Titre (specific (phase).
Para-C Hirschfeld	Wolverhampton	<100	200
	B. suipestifer Indiana 49	<100	200
	Unabsorbed	25,000	6,000
Wolverhampton	Para-C Hirschfeld ..	3,000	800
	B. suipestifer Indiana 49	<100	<100
	Unabsorbed	25,000	6,000

These absorption experiments were performed by emulsifying about 100 mg. of the moist growth from agar plates in 2 c.cm. of a 1 in 50 dilution of agglutinating serum. This quantity sufficed in each case to remove all the agglutinin when the homologous strain was used.

The experiments show that the group-phase of the Wolverhampton strain and of the American *B. suipestifer* Indiana 49 removes all the group-agglutinin from the Hirschfeld serum. The group-phase of the *B. paratyphosus* C strain (Hirschfeld) leaves a considerable proportion of the agglutinin in the Wolverhampton group-phase serum, whereas from the latter serum the American *suipestifer* removes the agglutinin entirely. The specific phase of both Wolverhampton and Indiana 49 removes a large proportion of the specific agglutinin in the paratyphosus C serum, but leaves a small fraction unaffected, and the specific phase of *B. paratyphosus* C, while absorbing a considerable amount of the specific agglutinin from the Wolverhampton serum, leaves a fair proportion uncombined, although the American *suipestifer* removes it completely. Other absorption experiments show: (1) that the specific agglutinin for the American *suipestifer* Indiana 49 can be completely removed by the specific phase of the Wolverhampton strain; and (2) that a group II, "European;" *suipestifer* leaves uncombined only the small proportion of specific agglutinin in a group phase Wolverhampton serum. This was shown by Bruce White (1926) to be characteristic of the relationship between group I. and group II. *suipestifers*. (The European *suipestifer* employed was that obtained in the outbreak of gastro-enteritis at Offenbach in 1926 and described by Braun and Mündel (1927).

It is interesting to note that the conclusion arrived at by serological analysis—namely, that the Wolverhampton bacillus is a group I. or American *suipestifer*, is in agreement with the cultural indications, the absence of dulcite fermentation, and the failure to blacken lead acetate being characteristic of the American strains of *suipestifer* as contrasted with *B. paratyphosus* C of oriental origin.

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THE TREATMENT OF PURULENT PLEURISY BY PLEUROTOMY AND BALNEOTHERAPY.*

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THE evacuation of pus from the pleural cavity is best attained by making a complete opening under local anæsthesia in an intercostal space along the posterior axillary line of the side affected. The superficial incision can be made anywhere, but the patient is transferred to a bath for the purpose of deepening the incision under water, the temperature of the bath being 104°–108·6° F.

Technique of Treatment.

The bath is flamed and filled to a convenient level, and the patient is washed down with soap and water. He sits in the bath so that the water covers the superficial incision, which is then deepened until pus is found. The edges of the wound are held apart by large forceps like sinus forceps. This brings about an interchange of pus and water, and greatly favours the expulsion of fibrinous exudations by respiratory impulse. The greatest possible quietness is maintained, and when the pleural lavage is considered sufficient the patient is lain down outside the bath; this brings about the expulsion of almost all the remaining fluid under respiratory impulse. A pad of sterilised cotton-wool is then placed over the wound and makes it a closed cavity. Under these conditions the surgical diaeresis performs the function of a valve which, by excess pressure, allows the intrapleural air to escape without admitting an equal amount; this promotes expansion of the lung.

Later treatment consists in repeating the bath after washing down, opening the wound fully by large forceps, and thereby promoting lavage of the pleural cavity. The duration, frequency, and temperature of the baths should be governed by the general condition. In serious toxic cases I advise two baths per diem, of five minutes' duration; in cases of medium intensity a daily bath of ten minutes suffices. According to his condition and stamina, the patient should get up and gain strength. The diet should be as nourishing as possible.

While the patient is in the bath it is interesting and very easy to discover if the empyema communicates with a bronchus. An adult is told to place his hands over his mouth and blow through them as if warming his hands on a cold day, then to close his lips tightly, press firmly against them with his hands, and keep up the pressure of air in his respiratory passages. Should there be communication with a bronchus this air will escape from the wound and bubble into the water as often as the test is repeated—that is to say, to an indefinite extent. This repetition differentiates the air from gas which may have been formed by organisms or air which may have entered accidentally. The bubbling is exactly the same as if air were injected under water through a small tube. Infants cry, and so produce the same result. This manifestation, first observed by Dr. Enrique Foster while applying the treatment experimentally in his clinic for unweaned infants, is very important in prognosis. It indicates: (1) that the empyema springs from broncho-pneumonia, and (2) that it opposes the principle of treatment which endeavours to obtain a closed cavity. When the empyema communicates with a bronchial tube, the beneficial principle of a pneumothorax closed by a valve, such as is obtained in other forms of pleurisy, is not possible or is much impeded, inasmuch as the communicating bronchial tube, in all those efforts of the patient which are so useful for expanding the lung, injects air into the pleural cavity, counteracting the favourable results of the effort. Pleurisy with bronchial involvement is more intractable to treat and of longer duration than closed pleurisy.

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* Translated from a paper read before the Surgical Congress at Buenos Aires, 1928.

Underlying Principles.

The hot bath has a very important effect on the general condition, for it brings about elimination of toxins by profuse perspiration and diuresis, and also by the neuro-nutritive stimulus of the bath; it improves appetite and makes the patients more active, thereby increasing their recuperative powers.

The advantage of this method is shown by the reduced period of treatment, which varies between 15 days in the most successful cases and two months. The work performed by Drs. Enrique Foster and Fernando Arancibia in the Children's Hospital shows that better results have been obtained with the bath than with other methods of treatment of empyema in unweaned infants. The peculiar gravity of empyema in unweaned children was taken as a test of the treatment.

The chief difficulty which the treatment has to overcome is the prejudice of the surgeons who, in accordance with the inflexibility of the teaching of asepsis, are antagonised by the lack of respect which this method shows for suppurating cavities, even when the rules of surgical cleanliness are meticulously observed. Nevertheless I venture to state that, no matter how much surprise the method may cause on account of its mode of operation, fundamentally it has not infringed any principle. What is obtained by asepsis in these cases is only relatively valuable compared with the process on which it acts. Taking as example a case of simple pneumococcic empyema, the standard procedure cannot avoid microbic contamination, to which the cavities are inevitably exposed by prolonged drainage. Asepsis can only prevent the penetration of germs of great virulence, which are kept remote from the wound more easily than the common germs living in immediate contact with it. It may be objected that the bath cure allows the common cutaneous germs to reach the suppurating cavity, but in fact it illustrates the benefit of hot water upon the general and local condition, and, at the expense of a certain concession in surgical conventions, gives the great advantages of operating with efficacy, simplicity, and ease.

Statistical Data.

My cases include the following:—

(1) Ten patients treated by me in the clinic of Dr. Marini: of *eight adults, one died of pneumococcic meningitis, after* being clinically cured of a fœtid pleurisy on the left side with bronchial involvement, which developed in two months; the other seven were cured. Of two children, one aged 4 years and the other aged 18 months, both were cured.

(2) Four cases treated by Dr. Nicasio Cuneo: two adults were cured, and two children, one aged 3 years and the other aged 6 years, with double pleurisy (the second occurring eight days after the operation for the first), were both cured.

(3) Thirty-nine cases treated in the Children's Hospital: of 15 over two years of age, 12 were cured and 3 died; of 24 under two years of age, 9 were cured and 15 died.

(4) One case treated by Dr. Foster in private practice, a child of 22 months, was cured.

Summarised, these figures are:—

Adults.—10: 9 cured, 1 died.

Children over two years.—16: 13 cured, 3 died.

Children under two years.—26: 11 cured, 15 died.

Statistics given by Drs. Foster and Arancibia on 72 cases of pleurisy in unweaned infants in the Children's Hospital, treated by different methods, show a percentage mortality as follows:—

	Mortality.
By minimum pleurotomy and drainage	90
By costal resection and drainage..	85
By puncture	65
By pleurotomy and bath cure	36

Conclusions.

(1) Unless a more extensive statistical study shows different results, it appears that purulent pleurisy is cured in greater proportion, in a shorter period, and with less difficulty by the bath than by any other method.

(2) When appreciating results we must remember that the great majority of cases of purulent pleurisy are complications of developing pulmonary affections.

PRINCIPLES IN THE TREATMENT OF COMMON DEFORMITIES.*

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ORTHOPÆDIC surgery is so closely associated with function that the patient is in an exceptionally good position to judge of the practical success or failure of what is done for him. Often perfect restoration of function is impossible, and it is therefore important that, before treatment is begun, the patient and parents should understand clearly how much improvement is to be expected; otherwise what we may consider a brilliant surgical success will to them be a disappointment.

Deformities are associated with changes in bones, joints or muscles, and their causes must be understood before the possibilities of cure can be assessed.

Causes of Deformity.

In *rickets* there is a deficiency of lime in the bone, and the softened bone readily adapts itself to posture; deformity is thus influenced by the incidence of body-weight. In *arthritis* the instinctive effort to prevent pain causes spasm of all muscles controlling the joint, and the stronger muscle groups determine the position in which the joint is fixed. The position of deformity in arthritis of any joint is therefore almost constant; it is adduction of the shoulder, flexion of the elbow and wrist, flexion and adduction of the hip, flexion of the knee and equinus deformity of the foot. So in *infantile paralysis* the deformity is determined by two factors: (1) persistent posture, and (2) the deflection of the joint towards the stronger group of muscles. These deformities once established will, as a rule, be aggravated by the incidence of body-weight. Early treatment by splintage would prevent their onset, but *as a rule* we see the patient when deformity is established, and the problem is the one of restoring function. The methods commonly adopted for this are: (1) gradual correction of the deformity; (2) forcible correction of the deformity; (3) surgical exposure with division of tight structures; and (4) operations on bone. In cases in which the loss of function is not associated with deformity, the possibilities of improvement by operations on joints or tendons must still be considered.

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* Being a lecture delivered before the Chartered Society of Massage and Medical Gymnastics on Oct. 16th, 1929.

Restoration of Function.

Gradual correction of deformity is a method which was successfully employed before many of the operations at present practised were surgically safe, and we can assess the value of modern operative methods only if we have experienced the possibilities of correction of deformity by gradual splintage. It has been my good fortune to be trained in a school in which success in the application of the principles of gradual correction of deformity has been very striking. I have learned that nature resents tension and allows relaxation of structures to which it is constantly applied.

It is generally agreed that division or elongation of muscles reduce their power, so that methods of gradual correction of deformity have a definite advantage in dealing with ischæmic palsies and infantile paralysis where muscle power is already deficient. Again in deformities resulting from rickets there is seldom any indication for operation while the disease is active. In practically all children under the age of 4 the deformities can be corrected by splintage, while the necessary general treatment to harden the bones is being applied. Gradual correction is the method which can be applied in cases of arthritis of joints before the stage of true ankylosis. It is also the method of choice for the early treatment of congenital club-foot.

Forcible correction of deformity is mainly utilised for the correction of claw-foot in children and young adolescents. Considerable force is also necessary for the reduction of congenital dislocation of the hip-joints, and also in cases of club-foot in which treatment has been delayed.

Surgical division or elongation of tight structures, as a preliminary to correction of deformity, is usually necessary in cases of torticollis, and to weaken muscle groups which are causing deformity in cases of spastic paraplegia.

Operations on bones or joints may be required to correct alignment in cases of established deformity, or to improve function by arthrodesis—i.e., by promoting sound bony union of certain joints. These operations are perhaps the simplest and most satisfying both to the patient and surgeon. Those commonly practised are: osteotomy of the upper or lower end of the femur in cases of established rickety deformity; operation for malunion of fractures, or deformity resulting from arthritis; and arthrodesis. This last operation is of special value in certain cases of loss of function resulting from paralysis, for instance, in cases of loss of power in the deltoid with active scapular muscles a very useful range of controlled movement of the limb is possible if the humerus is arthrodesed to the scapula in a position of moderate abduction. The controlled movement of the scapula is then transmitted to the limb, and in young patients with good scapular muscles the range of movement is so good that it is often difficult to detect the original disability.

In cases of paralytic deformity of the foot removal of bone and arthodesis of joints has proved very valuable. On examining a paralytic deformity of the foot, clinically or by X rays, it will be noticed that deformity has taken place mainly at the mid-tarsal and subastragaloid joints, and that there is little alteration of the relation of the astragalus to the bones of the leg. The to-and-fro movement at the ankle-joint is the important one for locomotion.

In infantile paralysis we cannot restore power to the atrophied muscles, but by reducing the number of joints which depend on them for stability we not only prevent recurrence of deformity, but leave such muscle power as is present for control of flexion and extension of the ankle-joint. This operation is known as stabilisation of the foot, and it consists essentially of correction of deformity by removal of bone at the mid-tarsal and subastragaloid joints, with after-treatment which ensures that the os calcis, astragalus, and fore part of the foot become united as one bone in a good weight-bearing position. Subsequent deformity at the mid-tarsal and subastragaloid joints is not then possible. This operation may be utilised in other types of fixed deformity of the foot, such as old-standing club-foot, or to relieve pain in cases of tarsal arthritis.

Tendon Transplantation and Tenodesis.

The late war gave many of us an extensive experience of tendon transplantation in the restoration of function. The causes of failure in many operations previously practised were understood, and certain procedures are now recognised as essential for success. These are: (1) That before operation correction of deformity should be complete. (2) That the transplanted muscle should run in a direct line from its origin to its new insertion. (3) That the muscle should be of sufficient power to meet the strain which would be imposed on it. (4) That in the lower extremity a tendon should only be used to replace one of its own group—i.e., one normally in action with it. (5) That the tendon should be sutured under considerable tension.

The re-education of an individual tendon to act apart from its group appears to be more practicable in the upper extremity, where the action of individual muscles is more specialised than in the leg. The movements employed in locomotion are simple and controlled by groups of muscles, so that it is difficult to re-educate a muscle to act apart from its own group. In cases of paralysis of the quadriceps muscle transplantation of the sartorius or tensor fascia femoris to the patella is found effective. In the foot there are for practical purposes only two groups of muscles—viz., the anterior tibial, in action in dorsiflexion of the foot, and the peroneal and posterior tibial associated in action with the tendo Achillis in plantar flexion. Any of the anterior muscles may successfully replace one another—e.g., the tibialis anticus may be successfully transplanted to the outer side of the dorsum of the foot in paralytic varus, or the extensor longus hallucis may be transposed to the tibialis anticus. On the other hand, no tendon transplanted from the peroneal or posterior tibial group will be effective in replacing the loss of active dorsiflexion. The posterior tibial and peroneal muscles form one group. All are in action in extension of the ankle, so that they may be used to replace one another with certainty of success. The successful use of these muscles to replace a paralysed tendo Achillis is a striking illustration of the group action of muscles in the control of the foot.

In the upper extremity certain tendon transplantations have proved most valuable in the restoration of function; thus in musculo-spiral paralysis we find that loss of extension of the wrist, fingers, and thumb can be surely replaced by transference of the pronator radii teres, flexor carpi radialis, and flexor carpi ulnaris to the extensors of the wrist, fingers, and thumb.

Tenodesis is a method of utilising paralysed tendons as ligaments so as to limit movement of joints. It consists of embedding the proximal portion of the tendon in bone, and its use may be illustrated by the anchoring of a portion of the tendo Achillis to the lower third of the tibia to prevent calcaneus deformity in cases of paralysis of this muscle.

Although I have dealt mainly with the correction of established deformity, it must be recognised that many of these can be prevented by early treatment. For this a knowledge of simple splintage is essential. Whether we are dealing with fractures, arthritis, rickets, or paralysis the type of deformity is almost constant and its cause must be understood. Its prevention or correction will then present little difficulty.

Clinical and Laboratory Notes.

IMPLANTATION OF EPITHELIOMA IN THE ALVEOLI OF THE MAXILLA FROM PRIMARY GROWTH IN TONGUE.

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THE *following case seems to suggest that the* extraction of diseased teeth as a preliminary to operation for epithelioma of the tongue may have unfortunate results.

A man, aged 50, came to the Northern Hospital complaining of an ulcer and soreness of the tongue. He gave a history of excessive smoking and of syphilis 23 years ago. He stated that six months before he had noticed a white patch, presumably leucoplakia, on his tongue. About three months ago the tongue became sore on the right side, and a month later an ulcer formed. Lately he had noticed that he was salivating excessively, especially at night, and that he had pain now and then at the angle of the jaw. During the last month he had difficulty in speech, and deglutition had caused pain at the angle of the right jaw.

Examination.—The man was well built and apparently healthy. The right side of the dorsum of the tongue was almost completely occupied by an ulcer, which extended from the right edge to near the middle line; it came forward almost to the tip of the tongue, and extended back and just on to the anterior pillar of the fauces. The edge was irregular and heaped up, and the base sloughy and friable. The left half of the tongue showed many patches of leucoplakia. Movement of the tongue was restricted, and on attempting to protrude the tongue it deviated to the right. Salivation was very marked, and was streaked with blood. The teeth were all deficient, except for the two upper right molars, which were jagged. Pyorrhœa was marked. The submaxillary glands were enlarged and hard on the right side; they were not attached to the jaw. Speech was a little indistinct.

Operation.—Pending operation, the man was transferred to the dental surgeon, who removed the two molar teeth. He was admitted on June 10th, 1927, about one week after the teeth had been removed. Owing to the sloughy condition of the tongue, it was decided to excise the tongue before removing the cervical glands. On June 17th I tied the right external carotid artery, and then with the diathermy excised the right half of the tongue, both pillars of the fauces, and the tonsil. Under anæsthesia it was found that the tongue was indurated very far back, well on to its base, so that the excision was a formidable task. The late Prof. E. E. Glynn reported: Typical squamous-celled carcinoma with many cell nests.

Sequel.—Convalescence was uneventful, in spite of the size of the raw area. The temperature never rose above 99° F., nor the pulse-rate above 90. During the first two weeks the submaxillary glands showed some inflammatory enlargement. On July 2nd he was allowed to go home on the understanding that he would return for removal of the cervical glands. For some reason he did not return till August 31st, when it was found that the glands had become slightly larger and harder. On examining the mouth it was found that the right side of the mouth had healed up completely, and there was no evidence of any local recurrence. On the left tonsil there was a small ulcer, half an inch in diameter, irregular, friable, and obviously malignant. It spread on to the soft palate, but did not involve the tongue or the anterior pillar of the fauces. The two sockets of the right upper molars which had been removed were filled with fungating masses which projected almost half an inch from the alveolar margin. Although touching, the two masses were quite distinct.

As the removal of the right half of the tongue had been so successful, it was decided to try to remove the recurrences. On Sept. 2nd I excised with the diathermy the masses in the tooth sockets, and diathermised the surrounding tissues. I then excised the left tonsil and fauces, the left half of the soft palate, and that part of the tongue in proximity to the tonsil. The pathologist's report on tonsillar and alveolar fragments was: squamous-celled carcinoma exactly similar to lingual growth.

As before, the man showed little after-effects from the operation, but the area took a long time to clean up. In the meantime the glands showed so much inflammatory reaction that it was considered inadvisable to attempt an immediate excision. About a month after operation the mouth was clean, but the glands were now so enlarged, and the toxic absorption had so devitalised the man that he was allowed to go home on Oct. 15th. His private doctor kindly kept me informed of his progress. The mouth improved steadily, and there was never any sign of recurrence, either in the scar or remotely, but the glandular condition went rapidly from bad to worse, and the man died in December.

SOME OBSERVATIONS ON GAS AND OXYGEN IN GENERAL SURGERY.

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IN November, 1928, gas and oxygen, administered through a McKesson machine, was instituted in this hospital. Since that date I have observed its effects on a series of 165 cases, from careful examination of which certain deductions can be drawn. I have been struck by the following points in all patients who have had gas and oxygen: (*a*) the comparative rarity of post-anæsthetic sickness; (*b*) the early demand for food; (*c*) the complete absence of post-operative chest complications except in two cases.

No matter what the type of case—a big abdominal or a simple appendix—the ruling-out of any tendency to post-anæsthetic sickness and chest trouble is a most important argument in favour of gas and oxygen in general surgery. I have had frequent opportunities of observing the condition of patients who have had gas and oxygen and those who have had chloroform and ether mixture or ether, and in all cases I found a most striking contrast in the immediate post-operative period. The climax of the contrast was in every case on the day following operation, and despite precisely similar surgical treatment the gas and oxygen case showed the following points:—

1. Appearance of well-being with no undue discomfort. The chloroform and ether or ether patient showed much more collapse with pale facies.

2. The blood pressure and pulse-rate readings of the gas and oxygen patient were identical with the readings taken before operation, whereas in the others the blood pressure in every case had decreased by 10 to 20 mm. Hg, while the pulse-rate was higher by as much as 25 to 30 beats per minute.

3. The gas and oxygen patients showed little tendency to vomit and in many cases vomiting was conspicuous by its absence, whereas the other patients had considerable trouble from frequent retching.

Two Cases with Lung Complications.

Only two patients had distressful vomiting, and these were the cases which showed signs of lung complications. Both were women who had had frequent attacks of biliary colic before being admitted to hospital.

CASE 1.—A woman, aged 69, was admitted as an emergency case with acute cholecystitis. She was much collapsed and was having frequent spasms of biliary colic which were relieved by morphia. At the end of a week her symptoms had partially disappeared, while after four weeks' interval the acute condition had practically subsided and it was decided to perform a laparotomy. A cholecystogram three days previously had revealed the presence of two large stones in the gall-bladder. Under gas and oxygen the abdomen was opened by a right paramedian incision and a cholecystostomy was performed with removal of the stones; the operation took 85 minutes. She vomited at frequent intervals for four days after the operation, during which time the drainage was maintained. On the fifth day she developed a temperature of 103·5° F. with signs of congestion in the right base. On the eighth day, however, the temperature became normal and the signs in the lung had cleared up. She died on the tenth day and autopsy revealed a deep-seated subphrenic abscess with manifestations of what had been massive collapse of the right base.

CASE 2.—A woman, aged 48, had had several attacks of acute cholecystitis and was admitted in one of them. She was somewhat "chesty" and had a dilated irregularly-irregular heart. Four days later a cholecystectomy and appendicectomy were performed under gas and oxygen, the total time being 1 hour 20 minutes. Almost as soon as she returned to the ward she vomited, and this persisted at irregular intervals for three days. The day after operation her temperature was 102° F., her respiration-rate 32, and her pulse-rate 120. There were well-marked signs of a broncho-pneumonia of the right lung, from which she died at the end of the fourth day. At autopsy the right heart contained much blood clot, while the right lung showed definite patches of consolidation.

These two cases have been described because they were the only two, in a series of 165, which had any lung complications. They were both particularly adipose women; the former did not really die of a lung complication and the latter had a very bad family history. In this series there have been ten cholecystectomies, all the other cases running an uninterrupted course.

The Other 163 Inductions.

For herniæ, hydroceles, and empyemata gas and oxygen gave every satisfaction, both from the anæsthetic point of view and in the after-results, for these patients were discharged sooner than those who had had a chloroform and ether mixture or ether. In rib-resection for empyema a further advantage of gas and oxygen is that after the parietal pleura has been incised drainage is facilitated by giving oxygen under pressure.

This series includes 11 panhysterectomies performed under gas and oxygen with a good result in every case. Two cases of resection of large intestine for scirrhous stricture did particularly well, one case being discharged five weeks after operation. One particularly pleasing operation under gas and oxygen was a Cæsarean section for contracted pelvis in a woman aged 33 of particularly small build. As soon as the fœtus was delivered outside the abdominal wound the uterus almost immediately began to contract and retract, with the result that there was very little hæmorrhage. This was due to the fact that the uterus was not paralysed as it would have been under a deep chloroform and ether mixture or ether.

The only serious difficulties I have observed whilst operating with gas and oxygen are: (*a*) controlling the bowel which is apt to balloon out through the wound; (*b*) stitching the peritoneum.

The first factor is especially apparent while working in the upper abdomen or attempting to get a good field for examination of the uterus and appendages. This difficulty, however, can easily be overcome by carefully packing off the bowel with three or four abdominal towels. If this has been done methodically the bowel will give no further trouble, either in a cholecystectomy or a hysterectomy.

In stitching the peritoneum there may be difficulty in getting the peritoneum to come together, especially in an upper abdominal wound. This is greatly facilitated if, before the abdomen is entered, the skin, recti, and peritoneum are injected with 20–30 c.cm. of 0·5 per cent. solution of novocain. In most cases this is quite sufficient to give the necessary relaxation for stitching the peritoneum. Another factor which has been found to facilitate relaxation is placing a pillow under the patient's knees when he or she is put on the table, so that the hip- and knee-joints are slightly flexed.

In the clamp and ligature treatment of hæmorrhoids the previous injection of 15–20 c.cm. of a 0·5 per cent. solution of novocain into the external sphincter ani gives a beautiful relaxation under gas and oxygen and also assists in overcoming much of the discomfort from painful spasms that the patient is apt to experience in the first 8–12 hours after operation.

In all cases opoidine was given three-quarters of an hour or an hour before operation. In the majority of cases one-third of a grain only was given, but in a few cases, especially in alcoholics and heavy cigarette-smokers, two-thirds of a grain were required.

It is now agreed that, although the method requires a little extra care and patience on the part of the surgeon, such operations as a cholecystectomy or hysterectomy are not only possible under gas and oxygen, but are in the best interests of the patients.

I am indebted to Dr. E. J. Chambers (Doncaster) the honorary anæsthetist, for permitting me to publish these observations, and to the honorary surgeons for the cases.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF OBSTETRICS AND COMPARATIVE MEDICINE.

A JOINT meeting of these Sections was held on Oct. 18th, with Dr. ARTHUR GILES, President of the Section of Obstetrics, in the chair, to discuss the

CAUSES OF EARLY ABORTION AND STERILITY.

The Chairman began by speaking of the need for clear definitions. Sterility, he said, meant incapacity to conceive, and abortion should not be spoken of as a cause of sterility. A woman who had conceived at all—whether she had miscarried or not—was not a sterile woman.

Prof. ARTHUR ROBINSON (Edinburgh), in opening the discussion, said he could not accept the Chairman's definition. To speak of a man or a woman as sterile was not in accordance with the biological view of sterility. The object of fertilisation was to carry on the race, and sterility must be the opposite of fertility. He would define sterility as lack of the power of a pair to produce living young which could in its turn become fertile.

Varieties and Causes of Sterility.

Sterility might be due to injury, malformation, or disease of the genital organs. An interesting group of cases were those in which one or other of a pair was incapable of producing mature germ cells (gametes). In the male such a defect might be recognised and verified, but in the female he did not know of any way in which this could be done. In human beings menstruation was no criterion, nor was "heat" in animals necessarily so. Parkes had said that all the symptoms and signs of heat could be present in the absence of any ovarian follicles. By feeding a young animal on actual anterior lobe of pituitary it could be made precociously fertile. By feeding an adult animal with the same substance it could be prevented from producing either ova or spermatozoa. Thus by the same means one could hurry up something and also destroy the capacity to do something. This latter process might conceivably occur under ordinary conditions. If an animal could not produce germ cells there would be no abortion, but there was another group of cases in which the germ cells were mature but abnormal. In Canada Savage and Williams had tried to detect this abnormality in the spermatozoa of bulls. They had found that the heads of the spermatozoa varied in size, and that if this variation was beyond certain narrow limits the particular bull was not a good sire. Following service by such bulls there were many abortions and the progeny were, in general, poor.

Recently a good deal had been written about vitamin E, which was said to be necessary to fertility. It had been found that if female rats were fed on food deficient in vitamin E and then placed with a male, the embryos died on the eighth day of pregnancy. That was, from the point of view of the observer, the effect on the embryo or the uterus. But it might be that this E-deficient food had so affected the chromatic quality of the ovum that, although it was capable of uniting with the germ of the other sex to form a zygote, the latter was unable to live.

Another group of cases was that in which neither member of the pair was unfertile with other mates, but the two were unfertile together. He had conducted observations on a series of horses; 3040 ova were shed by thoroughbred mares, and over 58 per cent. of them failed to produce young, though the matings were carried out under the control of the Scottish Agricultural Board, and all the stallions concerned were proved to be healthy. The inquiry extended over five years. Clydesdales were also investigated, this time over a period of six years. In these, 48 per cent. of the ova produced no result, though insemination had taken place in the ordinary way, under fairly skilled observation. How could this non-fertilisation be accounted for? Commonly it was thought that under ordinary circumstances every ovum would be fertilised and so help to form a zygote which would form a new individual, but, even under favourable circumstances, only half did so. In the case of the mare, abortion might occur without being noticed. There was no close attachment of the chorion to the uterine mucosa. In Scotland no records of abortion were kept.

To experiment it was desirable to use an animal which produced several at a birth, and which was not too large. He chose the ferret. He obtained 105 which were useful for the purpose, and they produced 1040 ova; 39 per cent. of these ova failed to form living young—i.e., the results of union with living spermatozoa were dead. All the animals were kept in good condition. Animals were killed at varying stages to see what had happened. An average of 24 per cent. died in the earlier stages of gestation, 47 per cent. in the later. Very few of the spoilt ova were found dead in the peritoneal cavity. Some ova were left unfertilised, while their neighbours were fertilised. There was a uniform style of living for all the animals, and the males used were the same. Examining the ovaries of animals which did not go to term, before the rupture of the ovarian follicles, the same number of follicles was found as in other animals, and the ova were apparently the same. The only explanation he could think of was that in the chromatic arrangement of the nuclei the paired arrangement of the so-called "genes" had become disturbed, and lethal combinations of chromosomes would cause the zygotes to die after fertilisation had occurred. In some cases, however, the spermatozoa might not be able to unite with the ovum. But there was one complication which he could not quite explain. Two people married and might have no children, but if one died and the survivor remarried, that survivor might have children; and the same thing might, of course, happen after divorce. Yet he had never heard of a case in which the pair had no children but after divorce both had children by their subsequent partners. In some places it was usual for marriage not to take place until after a child had resulted from cohabitation, and if no child was to be born, the parties tried again elsewhere. As in the case of horses the spermatozoa of one male might not fertilise the ovum of a particular female. When this happened he suggested that there was an incompatibility between the germ cells of opposite sexes, so that they did not fertilise, or if they did so the arrangement of the chromatic particles was such that the zygote might die at any stage after fertilisation. The period during which it might die did not end with birth. An abortion was Nature's way of removing a failure so that the parents could quickly have another chance of mature reproduction.

Mr. J. B. BARKER preferred not to attempt definitions of abortion and sterility. In cattle the two conditions gradually merged into each other. Early abortion in these animals, showing a macroscopical abort, was rare, though early abortion was probably common. Sterility was an everyday state. A bovine abort at 31 days, with unruptured membranes, was a mass of about 20 oz. Early abortion in cattle might be due to any of a number of causes. The morula might lack power to absorb nutrient materials, or such nutrient materials might be lacking, or deleterious materials might be present. Two other possible factors were the absence of placental areas and definite disease of the endometrium. Mr. Barker regarded sterility in cattle as only a previous state to an early abortion, both being due to the same disease-causing agencies. For purposes of discussion he submitted the following causes of sterility: (1) Failure of the male to produce perfectly functioning spermatozoa (orchitis). (2) Failure of a functioning spermatozoon to reach the ovum because of vaginitis, cervicitis, endometritis, or salpingitis. (3) Failure of the ovary to produce a perfectly functioning ovum because of oöphoritis. (4) Failure of any ovum to reach a favourable position for fertilisation in the Fallopian tube owing to the presence of salpingitis.

Abortion in Man.

Prof. H. BECKWITH WHITEHOUSE said that in Germany the number of abortions each year was said to be between 500,000 and 875,000, while in 1919 one abortion for every two births took place in Hamburg. In this country investigations based on 3000 patients admitted to a gynæcological clinic showed an incidence of one abortion to every 4·7 births. The proportion of women who aborted at some time in their sexual life was about 35 per cent. The attempt to arrive at the frequency of natural abortion was vitiated by the criminal termination of pregnancies.

For gestation to proceed in the natural way it was necessary (1) that the germ plasm of the oöcyte and the spermatozoon should have sufficient initial vitality; (2) that the zygote should be implanted in a position favouring its subsequent development; (3) that the nutrition of the ovum should be maintained. The natural site of attachment of the zygote was the decidua of the upper uterine segment. Many abortions after the twelfth week seemed to be associated with a low placentation in the region of the os internum. It was difficult to get direct evidence to show that defective vitality of germ cells led to premature death of the fertilised ovum. Of 1233 women 336 were childless, 71 of them having aborted. Of 158 women who had one child 64 aborted. A number of factors might be operative.

A woman, aged 33, was married for five years and was delivered of a dead child at the seventh month of her first gestation, though no cause was apparent. The Wassermann reaction in both husband and wife was negative. She was a small woman, a seven-months child, and was the last of a family of 13. Her mother also was a premature child, and was the last of 16 children; also all her immediate brothers and sisters had been premature. These people showed a succession of lack of reproductive vitality. An abnormal implantation of ovum in the uterus nearly always led to disaster. Implantation in the decidua was commonly followed by death of the ovum. When abortion took place at the twelfth week it was commonly attributed to a low deposition in the os internum.

The development and function of the decidua called for special consideration. Its growth depended on a hormone which was elaborated in the corpus luteum; hence lesions in the ovaries might account for many of the early abortions which were associated with uterine fibroids, displacements, &c. The Graafian follicle and corpus luteum were liberally supplied with nerve elements, and so inhibition of the latter might be the cause of the "reflex abortion" which followed mental or physical shock. Half the ova aborting during the first three months of gestation appeared to be pathological, and the view of embryologists was that pathological ova were the result of an abnormal environment, and not of any inherent factor in the germ cells. In the case of the eggs of certain fishes, sea-urchins, frogs, &c., it was possible, by using certain solutions, to produce from normal cells every form of anomaly occurring in man, such as spina bifida and anencephalus. Hence it was likely that abnormal food factors and various toxins might form an important element in causing obscure early abortions. In the raising of animal stock and in egg production the importance of iodine was receiving ever-widening recognition. An adequate supply of calcium was equally important. The work of Evans and Burr on a specific antisterility food factor, vitamin E, promised a new field of investigation concerning the causes and treatment of repeated abortion. In a series of 300 cases investigated, said Prof. Whitehouse, in 58 (19 per cent.) the cause of the abortion was not known, 30 were due to prolapse, 21 to fibroids, 23 to metritis, 29 to salpingitis, 14 to retroversion, 10 to ectropion, 5 to cystomata, 9 to toxæmia, and 9 were criminally induced.

Contagious Abortion.

Mr. O. STINSON did not doubt that in cattle abortion was mostly due to the bacillus of Bang. In nearly every case this organism found its way into the alimentary tract and was not conveyed by the act of coitus. It caused a very serious state of things. At present 50 farms were affected by it in his province, and in some it had been active three or four years. Gradually, on any particular farm, the activity of the bacillus became reduced. On farms where abortion was rife many cows proceeded to full term, but never fully held again; they did not abort, but afterwards were sterile, though duly served by the male. Early abortion occurred among cattle with fair frequency. The later the abortion the greater was the liability to sterility. In some regions, said Mr. Stinson, there was a deficiency of calcium and iodine in the food, and the cows only conceived in July, August, and September. During the last two years he had been doing work on calcium deficiency and sugar deficiency, and he had arrived at the conclusion that there was a definite association between abortion and sterility on one hand, and calcium, iodine, and sugar deficiency on the other. Much had been said about giving insulin in diabetes, but little was said of the possibility of too much insulin being present in the organism. In cases of abortion he thought there was usually an upset of basal metabolism, or of the secretion of the endocrine glands.

Captain S. R. DOUGLAS, F.R.S., pointed out that in human abortion infection was seldom mentioned as a cause. A Copenhagen authority reported that there was an outbreak of *B. abortus* fever among women in Denmark—500 cases in the year. Among the cases were eight pregnant women, seven of whom aborted. It must have been passed on from the cow to man. He asked whether there might not be other organisms which had the same effect in the human —possibly including Malta fever. If material were taken from the uterus immediately after abortion and examined, some bacterial cause for the mishap might be discovered.

Mr. LESLIE PUGH said that of the cows affected with contagious abortion, about 30 per cent. passed the bacillus out into their milk. He therefore supported Captain Douglas's plea for bacterial search in these cases. The Bang bacillus affected only sexually mature animals. If young animals responded to it, it would probably lead to the end of the disease, because of the immunity to it which would be set up.

Dr. S. FORSDIKE said that on expressing the contents of the corpus luteum by squeezing the ovary, the cow was enabled to become pregnant at the next service.

Mr. A. L. SHEATHER, D.Sc., confirmed Dr. Forsdike's statement. He had done that operation a hundred times; it was easily done by manipulation per rectum. Abortion δ-12 hourse four days later, and the cow couldr all cases opoidiF served afterwards. Surgical hour or an hour befos of the cow. In many cases of cases one-third of aver he felt that the infection ses, especially in aF handling by physician or rs, two-thirds of a gus had been there all the time; such autogenous infection was found in bitches and cows which had not been handled at all.

The CHAIRMAN suggested that when a woman aborted at a stage when she already had mammary secretion it might be worth while to make a careful examination of her milk.

SECTION OF MEDICINE.

AT a meeting of this Section, held on Oct. 22nd, the chair was taken by the President, Dr. R. A. YOUNG, and Dr. W. J. ADIE opened a discussion on

DISEASES OF THE PITUITARY BODY.

The common tumours, the adenomas of the anterior lobe, were classified, he said, according to the staining of their cells, but much confusion had arisen around the terms used. He would therefore employ the names "acidophile" and "basophile" for the cells with granules that stained red or blue with, for instance, Mallory's acid fuchsin anilin-blue, and "indifferent" for the agranular principal cells, the Hauptzellen, that hardly stained at all, and he would speak of the tumours as granular or agranular. The tumour associated with acromegaly was usually a simple granular adenoma of the anterior lobe with acidophile cells; sometimes, however, the cells were basophile or mixed. The cells seemed to be more often basophile in acromegalics who had become obese or cachectic, but no rigid formula could be used for associating the character of the cells with the symptoms. The signs of acromegaly appeared before the tumour was large enough to deform the sella and were almost always very obvious before it began to cause visual or other pressure symptoms. This fact had given rise to a dangerous and erroneous impression that a tumour of the pituitary body was necessarily accompanied by endocrine signs; the commonest form of tumour might actually be very large and cause failure of vision with no glandular signs or with very slight ones. Persistent glycosuria occurred with granular adenomata only—i.e., in giants and acromegalics. In many ways it resembled pancreatic diabetes but ran a variable course. Acromegaly might remain stationary for years, or the headaches and malaise might cease although the body continued to grow. In these cases operation could not be recommended, although delay increased the danger. Should operation be performed in the earliest stages in order to prevent deformities? At present it was only done to relieve headache and conserve vision; early operation might hasten the inevitable cachexia. At present it did not seem justifiable to operate for glandular disturbances only. X ray treatment should always be tried in acromegaly, though it was little use in other forms of tumour. Radium had not given good results.

Adenoma of the anterior lobe without acromegaly was the commonest and most important tumour. It was almost exclusively confined to adults and was agranular. The cardinal sign was loss of vision; there might be nothing else. This condition provided one of the few opportunities of saving sight by prompt operation, but it was often lost through failure of early diagnosis. In most cases there was a tendency to adiposity with smooth, pale, soft skin, scanty hair, amenorrhœa or diminished potency, pale optic nerves, bitemporal defects, headaches, and enlargement of the sella turcica, but endocrine disorders might be absent and the sella might be normal. Pituitary tumour should be suspected in every case of failing vision, even when some other cause seemed to be present; toxic amblyopia was diagnosed too readily. A pituitary tumour might cause loss of tendon reflexes and pains in the legs, so that every apparent tabetic optic atrophy should be scrutinised very carefully; the Argyll Robertson pupil confirmed a diagnosis of tabes.

Tumours arising from the remains of Rathke's pouch were third in order of frequency, and were the only tumours to produce symptoms before the age of 15. The patient would be an intelligent and cheerful child with gross signs of endocrine disorder, suffering from headaches and failing vision, swollen discs, bitemporal defect, and a deformed sella with shadows above it. Failing vision, however, might appear at any age in patients free from endocrine symptoms, and in adults the typical picture might be absent. The ultimate prognosis was bad.

The symptoms in these cases fell into two groups: those due to intracranial pressure and those due to dysfunction of an endocrine gland. A typical symptom was diabetes insipidus, about which there had been much controversy. Polyuria might occur when the lesion was confined either to the posterior lobe of the pituitary body or to the hypothalamus. The gland and the adjacent centres acted together as a neuro-endocrine mechanism, and this was probably true for all the symptoms associated with disease of this region. How the mechanism acted, whether it was nervous or hormonal, we did not know. Since injury to the tuber could produce polyuria although the gland was intact, the nervous centres seemed to be predominant. Moreover, injury to the tuber produced polyuria when the gland had been removed and the kidneys completely denervated; apparently a lack of the nervous impulses conveyed from the periventricular nuclei to the medulla and by the splanchnic nerves caused metabolic disturbances in the tissues. The diabetes insipidus of pituitary disease was milder and associated with less desiccation and emaciation than that of midbrain disease. Polyuria was certainly not a simple symptom but the complex sum of a number of disturbances of simpler functions of vegetative centres. Until we knew more of the metabolism of water we could not solve the problems of growth and metabolism.

Mr. NORMAN DOTT reviewed a number of cases which illustrated the types of disorder, the nature of treatment, and the results. These included examples of simple hyperpituitarism in the child and in the adult, eosinophile hyperpituitarism associated with acromegaly, pure visual disturbance, and a combination of visual with other symptoms. There seemed to be some evidence, he said, that the eosinophile cells were connected with growth and the basophile cells with sexual ability.

Pathological Examinations.

Prof. E. C. DODDS called attention to some methods of investigating pituitary disease. Giant animals could be produced by injecting extracts of the posterior lobe of the pituitary into the peritoneal cavity. The extract of the anterior lobe stimulated the ovary to produce œstrin and, if it were injected into an immature female mouse, puberty would occur in 50–60 hours—i.e., the vagina would open and œstrus appear. In the mature animal the effect was to produce continuous œstrus for a few days, after which the ovary became exhausted and œstrus would be inhibited as long as the anterior lobe extract was continued. This might explain the amenorrhœa associated with pituitary tumour. In the very early stages of pregnancy there was a sudden discharge of anterior lobe hormone into the urine. If the urine of a pregnant woman were injected into mice the ovaries would be found studded with corpora hæmorrhagica, which was a definite sign of pregnancy. Anterior lobe transplants into an immature male produced puberty with descent of the testes and spermatogenesis.

Dr. O. LEYTON described experiments with various proprietary preparations of pituitary which were found to have very different effects on diabetes insipidus, although all contained a standard number of units of oxytocic substance. The best results were obtained from freshly killed animals; delay for even an hour weakened the action, as did also filtration. The work had led on to the separation of the vasopressor from the oxytocic substance. He believed that many cases were due to an increase of sugar in the blood without any great alteration [illegible] the power of utilising sugar.

Epithelial Tumours in the Pituitary Region.

Dr. MACDONALD CRITCHLEY reviewed the embryology of the pituitary and said that epithelial tumours were of two kinds: those growing from primitive remains in Rathke's pouch, and those growing from relics of the old cranio-pharyngeal duct, which were found in 80 per cent. of adult brains. The first were rare and simple, situated in or just above the pituitary. They were described as having a ciliated or columnar lining, but in his experience it was exceptional to find ciliated or columnar epithelium either in Rathke's pouch or in the tumours. The second group were of three kinds: (1) the rather rare simple papillary cysts which might show cuboidal or transitional epithelium several layers thick; (2) the common adamantinomata, characterised by a single peripheral layer of columnar cells in palisade formation bounding epithelial masses rather like the prickle cells of the skin. The sections resembled those of adamantinomata of the jaw, and commonly showed secondary keratinisation, calcification, or even ossification, which caused suprasellar shadows in the X ray; (3) spinal-celled carcinomata which were malignant and very rare, only five cases being on record. It was just possible that there was another type, arising from the infundibular recess and not derived from epithelium.

The Surgical Differential Diagnosis.

Mr. HUGH CAIRNS reviewed the conditions which might resemble pituitary tumour. While the physical changes of acromegaly were usually unmistakable, he said, he had known one case of hypertrophic pulmonary osteo-arthropathy mistaken for pituitary tumour. In acromegaly the overgrowth was not limited to the extremities; the tongue and vocal cords were also involved. Occasionally an acromegalic might have a normal sella turcica as the adenoma grew up into the diaphragma sellæ; this produced a scotomatous type of hemianopia, liable to sudden and rapid failure of vision. Fröhlich's syndrome was often mistaken for pituitary disorder. Cysts of Rathke's pouch were more often confused with tumours of the fourth and hinder end of the third ventricle; X rays showed typical calcification in 75 per cent. of cases. There was usually no calcification in suprasellar endothelioma or meningeoma, but the symptoms were bitemporal hemianopia and optic atrophy without endocrine disorder or distortion of the sella. Glioma of the optic chiasma led to optic atrophy and occasionally to defects in the visual fields, obesity, polyuria, and polydipsia; there was a pear-shaped prolongation of the sella into the optic foramina, which might also be enlarged, and the visual disturbance was out of all proportion to the changes in the discs. The patients were young and often showed brown spots on their skin. Glioma of the third ventricle caused obesity, polyuria, and polydipsia, but papillœdema appeared early. Cerebral aneurysm might cause difficulty in diagnosis and a tumour in the fourth ventricle might cause a dilatation in the third, which pressed on the sella and caused symptoms such as amenorrhœa, purely as a result of pressure.

Pituitary Dysfunction and Mental Disorder.

Dr. F. A. PICKWORTH described work on the relationship of infection of the sphenoidal sinus to disorders of the pituitary and brain substance. Organisms had been demonstrated within the pituitary in these cases. Resistance to the spread of infection from a septic sinus was offered by the sinus membrane and the capsule of the gland much more than by the intervening bone. A large deposit of colloid in the gland indicated previous adjacent sepsis, the normal amount of colloid averaging about 1·2 per cent. Endocrine disturbances were a marked feature among mental hospital patients, and Dr. Pickworth suggested that they were due to endocrine imbalance following pituitary disturbance after infections of low-virulence, which spread very slowly along ly.

or thrombosed vessels. The symptoms varied according to the age and the stability of the other endocrine glands of the body.

Dr. T. C. **GRAVES** described two typical cases of pituitary disorder associated with sphenoidal sinus sepsis. The usual symptoms were general loss of muscle tone; disturbance of the peripheral circulation, causing extreme pallor and cyanosis of the extremities; disturbance of nutrition, with striking emaciation which might be followed by obesity; and disturbance of the reproductive mechanism, with amenorrhœa. An interesting feature was complete absence of pyrexial response to the injection of vaccines such as TAB, although the pulse-rate went up in the usual way. A large number of such cases had been collected and had improved after suitable rhinological treatment.

Dr. **BERNARD MYERS** referred to the importance of blood pressure, and Dr. **ADIE** briefly replied.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(*Continued from p. 826.*)

SECTION OF RADIOLOGY AND RADIOTHERAPEUTICS.

DEMONSTRATIONS.

FOUR demonstrations were arranged in connexion with this Section.

Cinematography of the Living Cell.

Dr. R. G. **CANTI** preceded this demonstration by a brief explanation of the technique employed in making the films. It was found that the study of growing tissues under the microscope by ordinary methods entailed an enormous number of personal observations. Not only was the work very fatiguing, but, since only fairly well-marked cell changes were sufficiently striking to excite attention during the comparatively slow progress of growth in tissue culture, the events leading up to the change were not noted. Cinematography provided a means of recording changes too small to be appreciated by the eye directly. Also, by securing cinema pictures at intervals varying from 3 to 60 seconds and projecting them at the normal rate of 16 per second, the processes which occupied many hours in occurring could be "speeded up" and shown as if they occurred in a few minutes. The actual "speeding-up" effect varied between 50, 120, 480, and 960 times. Elaborate precautions were taken to prevent vibration affecting the apparatus. The cultures photographed consisted of periosteum of chick embryo of 6–8 days' incubation, and of portions of tumour of Jensen's rat sarcoma, each in a suitable medium. Three reels of film were shown.

Reel 1.—After preliminary views of the explant upon its microscopic slide, to give an idea of the size of the fragment used, a cinema film of the edge of the living culture was shown on which the events of 27 hours were "speeded up" 960 times. Fibroblasts, wandering out at the culture-edge, rapidly gave it a fluffy appearance, whilst ahead of the fibroblasts a zone of rapidly moving wandering cells was strikingly shown. Following this, a picture at higher magnification clearly showed the stages of cell division, the daughter cells moving away in opposite directions. Next a hand was shown drawing a diagram of a vegetable fibroblast, to be replaced by an actual photograph at high magnification of the cell itself, in which the nucleus, nucleoli, and fat globules were clearly visible. Similar pictures showed amœboid movements in a wandering cell, with its fine pseudopodia. High magnification views of cell division followed, in which the details of mitosis were seen.

Reel 2 showed the effects of irradiation upon the same cells, the source of irradiation being radium emanation contained in small glass tubes. After a period during which normal cell activity was proceeding, the commencement of irradiation was marked by a "black-out" of the picture. The first pictures showed irradiation of chick embryo periosteum, and was "speeded up" 480 times. Cell mitosis and the spreading of the growing edge appeared to cease instantaneously. Very soon the wandering cells assumed a spherical form, and after a moment the fibroblasts contracted down into irregular spheres and showed the "bubbling" characteristic of breaking-down cells. Several records of similar experiments at different speed and magnifications were shown. The remaining pictures recorded the effects of irradiating Jensen's rat sarcoma, in which the same arrest of movement and cell division, assumption of spherical shape, and commencing breaking-down were demonstrated. The action of irradiation of the intensity used showed the following points. Fibroblasts of normal periosteum, though rendered immobile, showed very little structural change after exposure. Very few became rounded or broke down. Wandering cells all showed a marked effect after 20 minutes' exposure; movement ceased, and the cells became rounded, and their outline blurred. If a cell was dividing the process ceased at once. When the cells of Jensen's rat sarcoma were irradiated, all types appeared to be affected, whether mobile or fibroblastic in type. These experiments of direct observation appeared to substantiate the hypothesis of selective action upon malignant cells.

Reel 3 showed direct cinematographic film of living cells under dark-ground illumination. The cells shown were the vegetative fibroblasts of the choroid of the chick embryo in 2–3 days' culture. Cell structure and movement were shown with extraordinary clearness. Only cells which are flattened out between coverslips and radium, and which remain in one optical plane, are suitable for this method.

Living Cells in Tissue Culture.

A demonstration of living cells in tissue culture was given in the Manchester Royal Infirmary by Miss S. F. Cox and Dr. F. G. Spear. They showed living cells as seen with dark-ground illumination and cell division in living cultures. They also gave a demonstration of stained specimens and charts showing the effect of various physical agents on cells cultivated in vitro. These agents included hard beam X rays, soft beam X rays, radium, radium emanation, and cold.

Cases Treated by Radium.

A demonstration was given in the out-patient department of the Manchester Royal Infirmary consisting of 103 patients who had previously been treated with radium by the Manchester and District Radium Institute. The patients were demonstrated by Dr. G. E. Birkett, Mr. W. R. Douglas, Mr. A. Graham Bryce, Dr. O. Chance, Mr. A. H. Baker, and Mr. K. H. Watkins. They included 73 cases of carcinoma of the buccal cavity, mostly treated between 1925 and 1928; it was noticeable that there is practically no impairment of function following radium treatment. As the result of the experience gained during the last few years, the technique is now almost standardised, and consists of implantation of needles of low linear intensity (0·66 mg. radium element), screened by 0·6 mm. platinum for 8 to 12 days. The importance of an adequate active length (10–20 mm.) was emphasised. The treatment of the lymphatic drainage area in these cases by radium alone is not yet on a satisfactory basis, and where glands are palpable block dissections had been performed. These involve the removal of the sterno-mastoid muscle and internal jugular vein. As a rule implantation is carried out in the neck at the same time.

Eight cases of carcinoma of the breast, treated by implantation of a large number of separate foci into the primary growth and the lymphatic drainage area, were also shown. In such cases the axilla is exposed, so that the implanted units can be placed in position accurately. The remaining 22 patients had had cancer of various types, but chiefly epitheliomata and rodent ulcers of the skin. Some of them showed clearly that rodent ulcers involving the eyelids can be successfully treated without damage to the globe and with a perfect cosmetic and functional result. The implanted units in these cases, and the cases of carcinoma of the breast, were of the same linear intensity as are used for the treatment of buccal carcinoma.

Functional Studies of the Tracheo-bronchial Tree.

The "cin-ex-camera" is the term applied to a new apparatus designed by Dr. William A. Hudson and Dr. Hans A. Jarre (Detroit, U.S.A.). It is designed for the purpose of making successive X ray pictures on film bands at short enough intervals to permit of the interpretation of the functional changes occurring in the organ being studied. The apparatus will make up to five records per second, and will handle a film band up to 80 ft. in length. The width of the film band can be varied. The method of procedure in the studies of the tracheo-bronchial tree which was demonstrated was the passage of a small soft rubber catheter, with the aid of a direct laryngoscope through the glottis into the bronchus, under cocaine anæsthesia of the glottis. Through the catheter lipiodol was allowed to flow into the bronchi. Records were made at the rate of from one to four exposures per second. Studies were reported on five individuals:—

1.—A healthy young female, in whom there were noted: (*a*) Regularly occurring narrowings of the bronchi, which seem to originate in the peripheral bronchi, and seem to be associated with the propulsion of the oil toward the main stem bronchi. These narrowings occur regularly during expiration. (*b*) The fact that the angles at diverging bronchi are greater during expiration than during inspiration. (*c*) Evidence of rotation of the lung field is seen. (*d*) A measurable shifting of the bronchial tree downwards during inspiration is present. (*e*) A shifting of the bronchi closely simulating the opening and closing of a fan. (*f*) The fact that a suppressed cough can force material into the alveoli, but during quiet breathing no oil enters the alveoli.

2.—A male, aged 58, with a moderate degree of emphysema revealed definite narrowings of the bronchial tree, which definitely progress toward the main stem bronchus. This phenomenon is very similar to a peristaltic wave. The other observations made in case 1 were also noticeable. In addition it was noted that in an emphysematous lung the lipiodol flows into the alveoli very readily, this being attributed to an enlarged atrial opening.

3.—In a case of long-standing bronchiectasis no evidence of motor activity in the involved bronchi could be seen.

4 and 5.—In two cases of asthma the bronchi were found to be in a continual state of bronchial spasm, in fact the lipiodol did not enter the terminal bronchioli. In addition, areas of temporary spasm were observed.

The authors believe that there is a definite motor phenomenon in the tracheo-bronchial tree. This phenomenon is inhibited in cases of long-standing infection of the bronchial tree, but is hyperactive in cases of an asthmatic nature.

SECTION OF MEDICAL SOCIOLOGY.

VALUE OF HEALTH PROPAGANDA.

THREE papers written (1) from the point of view of the administrator by Prof. F. E. Wynne (Sheffield), (2) from that of the practitioner by Dr. H. C. Jonas (Barnstaple), and (3) from that of the press by Mr. H. A. Gwynne (President of the Institute of Journalists) had been circulated beforehand amongst the speakers invited to join in this discussion.

Prof. WYNNE adopted the rôle of *advocatus diaboli* as regards the claims to canonisation of propagandists other than workers in the statutory health services, and thereby gave zest to the discussion. Propaganda, he said, was a horrible word, and one of the unpleasant things popularised by the war, during which it came to mean "a competitive effort, in misleading the public of the particular nation concerned." It was, he said, essentially associated with the vulgarity which is an integral part of all successful advertisement. Public health propaganda and education had become the latest duty imposed upon local authorities, though much work of this kind had been done by voluntary organisations, the multiplication and overlapping of which had become, in his opinion, almost a public scandal. He thought the Minister of Health might be empowered to register these associations, to reduce their number from about 800 to 8, and to refuse registration to new competitors in this field. Whatever methods of propaganda were adopted, nothing should be done or said to accentuate that morbid absorption in his, or her, own health on the part of individuals, which is one of the worst vices of our time. The available methods were—public lectures, instruction in the schools, the distribution of special literature, and the judicious use of the public press. "Health weeks" could be organised so as to have an educational value, but might degenerate into mere stunts, without any lasting effect. Teaching of hygiene in schools ought to be valuable, but at present he was afraid it was not. In his experience the teaching given was, with few exceptions, perfunctory and in the wrong hands. Public lectures in large halls were of doubtful value, but lectures to small audiences, followed by questions and developing into discussions, were really educational. Most of the special literature which was submitted to him found its way to the waste paper basket, but he had found the magazine *Better Health* useful, and it was the only publication, apart from local leaflets, distributed by his department. As regards the use of the press, medical men were restrained by the rules very properly laid down by the General Medical Council, but could contribute articles on matters which they believed to be of public importance as from "a medical correspondent." He thought it was most important that the public should be kept in touch with the progress of medical science by wise and well-informed contributions to the press. Dr. Wynne concluded that the most important work done in the propagation of knowledge about health matters was that which was being done daily and persistently by our public health departments, their sanitary services, their maternity and child welfare services, their school medical services, tuberculosis services, and other sections of their activities; of these the public knew little, but they derived more benefit from them than they ever would from any much-advertised "propaganda."

Lord LEVERHULME said that he was intimately concerned with advertisement, but that he did not agree with Dr. Wynne that in order to be successful it must be vulgar. Industry was becoming increasingly interested in health matters. The periodical medical examination of employees had been suggested but was, at present, negatived, partly owing to the expense and partly owing to suspicion as to its object. The medical profession were unable to supply the signed articles which the press would prefer, and the profession could not help to advertise proprietary articles, although this would be useful to the public.

Dr. JONAS began by stating that he had taken some trouble to ascertain that the views expressed in his paper were generally approved by his brother practitioners. He went on to criticise the flimsiness of the evidence on which our population was alleged to be C3. The most promising sign about the present health campaign was the stress laid on the education of the young. To teach healthy habits to the young was valuable, but to make the young think about their health implied failure. Dr. Jonas singled out for unqualified praise the Boy Scout and Girl Guide movements and the National Association for the Provision of Playing Fields. The method of propaganda adopted must not manufacture valetudinarians, or make people introspective. The search for health was not an aim in itself but only a means to a useful life. He was opposed to the circulation of cancer leaflets. Much good health propagandism was accomplished daily by the great body of general practitioners, especially by engendering in their patients a cheery optimism.

Mr. GWYNNE said the press was only too anxious to march side by side with medicine in the fight for public health. They were up against the strict rules and regulations of the medical profession. They were able to obtain an article from the best specialist on a particular subject, but it had to be published as "from a distinguished Harley-street specialist." He suggested that the British Medical Association might well examine this matter and see whether it could not evolve a solution of the difficulty and thus bridge the gulf between publicity and reticence.

Propaganda from the Public Health Services.

Mrs. E. D. SIMON (chairman of the School Inspection Subcommittee, Manchester) referred to the work of the school medical services, not only in caring for the children, but also in educating the parents. The general practitioner only saw his clients when they were ill, but the school medical officer saw them when they were well and the beginnings of illness. There was now very little opposition among the parents in Manchester to the recommendations of the service. The dislike to dental treatment was being gradually overcome. As a preliminary to immunisation they must first explain the scheme to the teachers and subsequently to the parents. Propaganda by the school medical service was continuous, not spasmodic. It reached the bad and careless parents as well as the interested parents. It did not preach only to the converted like many public lectures and meetings.

Councillor WRIGHT ROBINSON (Manchester) thought the reports of medical officers of health were powerful agents for good, although they might be read only by influential people.

Lieut.-Colonel F. E. FREMANTLE, M.P., spoke in high praise of the voluntary associations, and pointed out that much coördination of these bodies had already been effected.

Dr. VEITCH CLARK (M.O.H., Manchester) thought the day by day work of the public health services, especially with the mothers and children, was the best form of propaganda. The lectures which brought the best results were those which were given at boys' clubs and similar places, sandwiched in among other items of a programme. Posters, he thought, were frequently indiscreet and lacking in earnestness or dignity.

The Press and the Medical Profession.

Mr. H. D. NICHOLS (President of the National Union of Journalists) thought this discussion under the auspices of the B.M.A. was a sign of the times. He believed that personal hygiene would become more important in the future. The only effective help given by the medical profession to the press at present was through the medical officers of health. It was high time that the medical profession as a whole should improve its publicity organisation, with a view to supplying orthodox and authoritative information.

Dr. H. B. BRACKENBURY admitted that he had been responsible for the wish that the hundred voluntary health societies should be scrapped and a single organisation formed. He caused some amusement by suggesting that Dr. Wynne might take upon his shoulders the unifying process. Dr. Brackenbury considered that the teaching of personal and domestic hygiene in the schools was one of the best methods of propaganda and that the general practitioner also had great opportunities.

Dr. WHEELER HART (Stretford) deprecated the alarming methods of propaganda adopted with regard to cancer tuberculosis and childbirth mortality. He had been 30 years in practice and welcomed education of the public in health matters but they must be careful not to make hypochondriacs.

Miss NORAH MARCH pointed out that the voluntary workers and associations had given the lead, which was subsequently followed by the Ministry of Health and the medical officers of health, and that in the penal clause of the Local Government Act, 1929, the status of these associations was given recognition.

Dr. EUSTACE HILL (Durham County) spoke very emphatically as to the value of the work accomplished by voluntary organisations and well-organised "health weeks." He was confident that the press could help much more and on better lines than at present.

Replies.

Lord LEVERHULME said they must have propaganda on health matters. The public could be led but could not be driven. The Daylight Saving Bill was an example of subtle persuasion.

Dr. JONAS thought the problem of coöperation between the medical profession and the press was almost insoluble, while Mr. Gwynne was slightly less pessimistic.

Reviews and Notices of Books.

COLLAPSE THERAPY IN PULMONARY TUBERCULOSIS.

La Collassoterapia nella Tubercolosi Polmonare e nelle Lesioni Distruttive del Polmone. By Prof. UMBERTO CARPI, Senior Physician to the Ospedale Maggiore, and Professor of Clinical Medicine at the Royal University of Milan. Ed. Cooperativa Farmaceutica. 1929. Pp. 268. L.40.

Prof. Carpi is an ardent disciple of Carlo Forlanini, who in 1880 brought to the notice of the medical world a method of treating phthisis by artificial pneumothorax. In a foreword on the historical side of the question he claims for his master absolute priority, although admitting James Carson, who wrote in 1820 "On the Elasticity of the Lungs," as one of the precursors. Prof. Carpi is also a supporter of M. Ascoli, who with Parry Morgan in this country has explored the use of partial bilateral pneumothorax when lesions are present on both sides of the chest. Indication for this form of therapy has been extended from phthisis to various forms of pleuro-pulmonary diseases, including hæmoptysis, pleural effusions, dry pleurisy, bronchiectasis, gangrene, and bullet wounds of the thorax. After an extensive explanation of these indications, the various forms of apparatus for artificial pneumothorax are described and illustrated, including the original instrument of Forlanini and that of Prof. Carpi himself. The advantages claimed for this instrument are that it acts by air displacement, has a working capacity of 100 c.cm., while its potential capacity is unlimited. It is very sensitive; a cylinder and piston act as an index of decompression or over-pressure in the pleural cavity. It accurately measures the amount of gas injected, and the quantity injected with each respiration can also be measured. The volumetric capacity of the pleural cavity can be ascertained by the measurement of the quantity of gas spontaneously aspirated, and it acts as well in the first production of pneumothorax as in the refillings carried out at a negative pressure. The instrument is easily sterilised, every part being detachable and capable of being washed in alcohol and ether. In a chapter on the physical signs found in artificial pneumothorax, Prof. Carpi draws attention to the area of hyper-resonance found in the opposite paravertebral region, which he attempts to explain. Just as happens in effusions, when the pleural sac, distended by fluid, is displaced towards the healthy side, so in pneumothorax the mediastinal pleura, owing to the tension of the gas, becomes a sac, which is pushed in front of the vertebral column and easily overlaps the middle line. The zone of hyper-resonance thus corresponds to the shape of the pleural cavity, and is more pronounced where the mediastinal pleura yields most—i.e., in the postero-inferior section, the so-called *recessus pleuræ*. In a chapter on the clinical practice of artificial pneumothorax some importance is attached to hypotensive pneumothorax as a therapeutic means of election. The efficacy of a pneumothorax at low pressure is subject to the condition that the lung is free from adhesions at the site of the focus. In such conditions the gas introduced even in lessened amount into the pleural cavity exerts its action on the lung in a measure proportionate to the elastic tension at the surface. Now the elastic tension is naturally diminished, if not abolished, at the site of destructive pulmonary foci, and on them the gas introduced exercises an almost selective action, even if it does not do so en masse on the whole lung.

Prof. Carpi notes that bilateral localisations in the region of the apex and hilus are those which best lend themselves effectually to this method, provided that with a moderate hypotensive pneumothorax there is sufficient expansion left in the free pulmonary bases. The force of the pulmonary elastic tension is at its minimum in the region of the hilus, weak at the apices, and greatest in the bases and edges. Small amounts, therefore, at a low tension, are sufficient to neutralise those foci which are situated in the apex and hilus, and hence recent caseous lesions with a progressive tendency, and free from pleural complications, lend themselves best to the method of bilateral pneumothorax. There is much interesting and practical material in Prof. Carpi's book which will well repay the serious attention of those who are experts in collapse therapy.

FRACTURES AND DISLOCATIONS.

Treatment of Fractures and Dislocations in General Practice. Third edition. By C. MAX PAGE, D.S.O., M.S. Lond., F.R.C.S., Surgeon to St. Thomas's Hospital; and W. ROWLEY BRISTOW, M.B., B.S. Lond., F.R.C.S., Surgeon to the Orthopædic Department, St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1929. Pp. 284. 14s.

THIS book deals with the treatment of fractures and dislocations in clear and simple language. It is well illustrated, and provides just the kind of work that those who have to deal with fractures in general practice need for ready reference. No attempt is made to discuss a variety of ways of treatment for any individual fracture, but the methods selected are sound. The comparatively small size of the book is one of its chief attractions, and we hesitate to make any suggestion which, if adopted, might increase its bulk. It is necessary to say, however, that in future editions fractures of the ankle should be allotted more space; a classification based on the mechanism of their causation is more likely to give the reader a clear conception of these injuries and to enable him to follow the mechanical principles of their treatment.

This book should be in the possession of every medical student and general practitioner in the country.

SURGICAL PATHOLOGY.

Second edition. By WILLIAM BOYD, M.D., M.R.C.P., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital. London and Philadelphia: W. B. Saunders Company. 1929. Pp. 933. 48s.

THE second edition of Prof. Boyd's Surgical Pathology has been generally revised and in parts rewritten. The chief changes are to be found in the chapters dealing with the stomach, the thyroid gland, and with malignant disease, especially in relation to tumours of bone, the testicle and the kidney, and the gliomata and melanomata. Many other sections have been recast so as to include new matter which has emerged since the first edition was published four years ago. All these changes have been carried out with judgment. Prof. Boyd's attitude towards disputed points is sane and critical; his discussions of the ætiology of malignant disease and the relation of gastric carcinoma to ulceration, for example, are admirably balanced; and the book as a whole may be recommended as a sound presentation of surgical pathology. There are 130 new illustrations, including a number of radiological ones, and several of the older figures have been replaced by others.

COMMUNITY HYGIENE.

By DEAN FRANKLIN SMILEY, A.B., M.D., Medical Adviser and Assistant Professor of Hygiene in Cornell University; and ADRIAN GORDON GOULD, Ph.B., M.D., Assistant Medical Adviser and Assistant Professor of Hygiene in Cornell University. New York: The Macmillan Company. 1929. Pp. 350. 8s. 6d.

THIS is not a text-book, neither can it be classified with the popular books on health, since it is primarily intended for those preparing to fill a position in society which will involve responsibility for the life and health of others. Beginning with a short section on the history and development of modern public health work the author proceeds in simple terms to discuss the common sources of infection in man, and how best they may be avoided. The effects of the weather, the air, and sun on health, and the sanitary significance of the soil, good water, clean food, and adequate housing are next dealt with. Sections follow on such important community problems as mental hygiene, sex hygiene, tuberculosis, heart disease, and cancer. A strongly-worded warning on the need for guarding against quack remedies for cancer is included.

As an example of the improvements brought about in recent years in the health of the public by means of well-conducted schemes of hygiene, the sections on maternity and child welfare and on school medical work make interesting reading. The authors rightly emphasise the importance of the educative side of this work and the need for closer coöperation between health authorities and the community. Technical terms are avoided throughout and the work provides a general survey rather than a detailed study. Those wishing to make a deeper study of health problems will find an excellent guide in the numerous references supplied.

College students of all classes, teachers, and large numbers of the public interested in the welfare of the community will like this book. The medical student entering on his public health course would do well to read it, for it puts before him from the popular standpoint those problems which health authorities throughout the world are intent on solving.

SQUINT.

Its Causes, Pathology, and Treatment. Sixth edition. By CLAUD WORTH, F.R.C.S., Consulting Surgeon to the Royal London Ophthalmic Hospital (Moorfields). London: Baillière, Tindall and Cox. 1929. Pp. 240. 10s. 6d.

MR. WORTH's book on squint, first published in 1903, deals with the ordinary concomitant squint of children, not with the paralytic variety. In the preface to this new edition the author contrasts the treatment received 30 years ago by the average case of convergent squint with that received by a similar case to-day. There can be no doubt that the modern treatment of forcing the squinting eye to function by occluding or atropinising the good eye has great advantages over the older practice. Formerly when correcting glasses had been prescribed, the ophthalmologist took no further steps to prevent the good eye from continuing to do all the work. Thus the habit of suppressing the image in the squinting eye became so firmly established as to be permanent and incapable of alteration. The author claims to have proved that the amblyopia of a squinting eye is nearly always acquired from disuse, and it is the realisation of this fact that has been the cause of improved modern treatment. The younger the child when a squint becomes constant the greater the danger of amblyopia ex anopsia, and it is for children between the ages of 3 and 6 that efficient supervision can be most beneficial. The essential cause of squint is a defect in the cerebral function of fusing the two slightly differing images that fall on the retinæ of the two eyes. This power of fusion is a late development in children, and is usually not complete till about the age of 6; often it is absent altogether, but in many cases it is capable of being strengthened by practice—for instance, by Worth's amblyoscope, an instrument which can be adjusted to any angle. As a test for the different grades of binocular vision this instrument is of great service; as a means of education it requires much time and patience on the part either of the surgeon or of someone trained by him.

The theory of squint and the non-operative treatment are the main subjects of the book. Details of the operation for advancement vary in the hands of different surgeons; in describing his own method Mr. Worth lays special stress on the importance of getting a sufficient grip of the sclera with the sutures without going through. He has devised a special cutting needle for this purpose. Uncontrolled tenotomy he condemns, as do nearly all ophthalmic surgeons nowadays, unless for exceptional cases.

and the partial tenotomies practised in America he considers useless. For control he trusts to the lateral expansions of the muscle which should never be divided. He does not mention the plan, now often adopted, of reattaching the end of the divided tendon to the sclera further back than its original insertion.

The Analysis of Drugs and Chemicals.

By Norman Evers, B.Sc., F.I.C., and G. D. Elsdon, B.Sc., F.I.C. London: Charles Griffin and Co., Ltd. 1929. Pp. 372. 25*s*.

The collaboration of a works chemist and a public analyst has resulted in the production of a concise and accurate book of reference. A works chemist is constantly receiving from his firm's customers samples of drugs and chemicals which are reported to have shown deviations from their normal characters; and in the investigation of these many fertile ideas originate. A public analyst, again, usually has a considerable accumulation of disconnected notes arising out of his routine tests which should not be lost to his less-practised colleagues. The reader of this joint work must have some acquaintance with analytical processes, for it is greatly condensed. Of the seven parts into which it is divided, Part V. (Galenicals) is of particular importance, and the appendix is invaluable. Here will be found information on the preparation of reagents, the specific gravity of alcohol solutions (with correction for temperature), the refraction of alcohols, sugar analysis, and the densities of various solutions. The methods described have been well tested, and can be followed with confidence.

Dairy Bacteriology.

By Bernard W. Hammer, Ph.D., Professor of Dairy Bacteriology, Iowa State College; Chief in Dairy Bacteriology, Iowa Agricultural Experimental Station. London: Chapman and Hall, Ltd. 1928. Pp. 473. 25*s*.

Text-books dealing with dairy bacteriology are rare, though in recent years there has been a great extension of our knowledge of the bacteriology of milk and milk products. A comprehensive treatise by Prof. Hammer, whose investigations have contributed so largely to the development of the science of dairy bacteriology, is thus welcome. Its purpose is clearly defined—to supply a practical knowledge of dairy bacteriology to the technical dairyman. The subject is dealt with primarily from the economic standpoint, and the work provides a very complete survey of dairying problems dependent on bacteriology. A clear description of the normal lactic fermentation of milk is given, and of the causes of abnormal fermentations, with classification and characters of the organisms concerned. The chapters dealing with the bacteriology of butter and cheese include a detailed study of the bacterial, chemical, and enzymatic factors concerned in the production of ripeness, flavour, and aroma, and also in deterioration. The bacteriology of other milk products—i.e., condensed and dried milks, fermented milks, and ice-cream—is adequately summarised. Processes of milk preservation are fully described, the advantages and disadvantages of pasteurisation being discussed.

The book should appeal to public health officers as well as to dairymen, for the chapters dealing with contamination of milk and cream, and the precautions necessary for the production of clean dairy products are instructive. Valuable data, of which the tables on page 123 are a type, are given which serve to emphasise the influence of sanitary methods upon the bacterial content of milk. Of special interest to the health officer is the chapter dealing with diseases which may originate from milk and its derivatives or may be conveyed by them. The epidemiologist will appreciate the detailed accounts of recent milk-borne epidemics occurring in the United States. The references to infections by bovine tuberculosis and *Br. abortus* are quite up to date. In this section a summary of the present state of knowledge concerning food poisoning outbreaks due to milk and ice-cream would have been acceptable. An appendix, containing descriptions of the special media for the study of dairy organisms, would also have added to the value of the work, since these are not included in text-books of general bacteriology. The author has wisely embodied results of his own research amongst the valuable data supplied in each section, but he is not dogmatic. Recognition is given to the work of European authorities, such as Orla Jensen, W. G. Savage, and others, although we noticed no reference to the pioneer work of the Institute of Research in Dairying at Reading.

The Art of Anæsthesia.

Fourth edition. By P. J. Flagg, M.D. London and Philadelphia: J. B. Lippincott Company. Pp. 384. 21*s*.

This well-known text-book has been brought up to date, but has not altered much from its original form. As then, the distinguishing feature of the book, which is meant largely for the nurse anæsthetists of America, is the clear explanation of the way in which the phenomena of anæsthesia are produced and of their significance. The language is as plain as the excellent type. A quaint printer's error leads to "the anal sphincter of primiporous cervix" (p. 28). The least satisfactory section of the book is that dealing with chloroform. Here there are but scanty practical instructions, and a still less adequate physiological explanation of the peculiar dangers of the drug; nor is its use in midwifery given the consideration which that important side of chloroform administration certainly demands. The author's division of anæsthesia into two stages of induction, maintenance and recovery, simple and sensible in itself, is so complicated by the numerous subdivisions that we cannot give it preference over the classical four stages which we owe to Snow.

A Book of Crimes.

By A. Salusbury MacNalty. London: Elkin Mathews and Marrot, Ltd. 1929. Pp. 328. 12*s*. 6*d*.

The contents of this volume are ranged under the four headings Murders, Mysteries, Poisonings, and Thefts and Impostures. Of the 12 stories many like those of Madeleine Smith, Mrs. Bravo, Mary Blandy, Lord Ferrers, and Courvoisier are extremely well known, and several of them have appeared in the Notable Trials Series, or have formed the contents of other chronicles of similar character; but in each instance the author has attempted to obtain new information, and in some he advances further speculations towards the solution of remaining problems. Among the stories which will be unfamiliar to many English readers is that of the murder of the Marquise de Ganges, wife of the Sieur de Lande, a young French nobleman who was in attendance at the court of Louis XIV. when the Roi Soleil was at the top of his magnificence. The story of how the Marchioness met her death is elaborated frankly by some imaginative writing, and the fate of the Abbé de Ganges, the youngest brother and leader in the crime, is a sequel rounding off the story too symmetrically for credence, as the author suggests. The last story is that of Jenny Diver, the "dear artful hypocrite" of the "Beggars' Opera," and gives an amusing description of the methods of a beautiful and larcenous young prostitute in the reign of George II.

Dr. MacNalty may be congratulated on his ability to tell complicated stories vividly, and his medical knowledge enables him to lay proper stress on toxicological findings. But in two celebrated poison mysteries the process of unravelling gains nothing from the lapse of time, or the collocation of many theories. We are not helped to any decision as to the guilt of Madeleine Smith or the part played by the wife and the companion in the death of Charles Bravo.

THE LANCET.

LONDON: SATURDAY, OCTOBER 26, 1929.

THE HARVEIAN ORATION.

THE Harveian Oration of the Royal College of Physicians of London was delivered in the College on Friday, Oct. 18th, by Sir WILMOT HERRINGHAM to a full audience. The orator kept that audience deeply interested throughout a narration which, though related so easily, was replete with dated facts and quotations from contemporary sources—that is, contemporary with HARVEY. It will be increasingly difficult for distinguished persons, selected as official mouth-pieces, to find a new way of presenting their pious estimates of certain of our historic heroes, especially HARVEY and HUNTER. One method has been employed with great eloquence by different speakers in relation to HARVEY, and many will remember beautiful discourses, delivered within the walls of the College of Physicians, setting out the way in which HARVEY's fundamental discovery transformed, as soon as its bearings and implications became known, the whole of medicine. But so thoroughly has this line of argument been pursued, that such reflections must, in the future, largely take the shape of showing how modern developments in pathology, as they occur, owe their clinical value to foundation upon the basis supplied by HARVEY. A second approach to the subject has suggested itself to many other orators who have, often with grace and erudition, expounded the text of HARVEY's writings, and borne testimony to the analytical powers which he displayed in what Sir ARTHUR KEITH, from the anatomical point of view, has described as an unerring piece of detective work. A third method of keeping alive in grateful hearts HARVEY's memory would naturally have been to draw a personal picture of the man and make him live before us in biographical shape; this has been done, as far as possible, by several orators, notably Sir GEORGE PAGET, and a fuller carrying out of the design can hardly be attempted for the excellent reason that material for doing it does not exist.

This fact was placed before his audience by Sir WILMOT HERRINGHAM in his first sentences when he described the extraordinary absence of general interest which followed HARVEY's announcement of the true story of the circulation of the blood. Search in contemporary literature and memoirs has brought to light no mention by the leaders of thought in HARVEY's day that the sun of medical truth had risen through the mists of ancient and mediæval speculation; and while the work of HARVEY went unnoticed by those among whom he moved, and who might have brought the news to the public attention, details of his private life are similarly scanty. At considerable intervals Sir D'ARCY POWER and Sir THOMAS BARLOW have resumed for us all that could be ascertained, and, since their researches, Sir WILMOT found that nothing of any consequence had come to light; but he was none the less able, by visualising for his hearers the social milieu in which HARVEY lived, to make "the little man," as he later affectionately called him, a real and intelligible character. As the personal medical attendant of CHARLES I. during that King's long struggle with the Parliamentary Party, HARVEY was in relation with both sides. He accompanied the King to Scotland, and after the detention of CHARLES by the Scottish Army, and during his period of imprisonment, HARVEY received passes through the belligerent lines, enabling him to continue his ministrations. And we get from what HARVEY did not do a suggestive picture of his absorption in what he considered it his duty to do. For practically he never said anything at all about what he either saw or thought. In his writings he mentions the King and Queen but once, and then in the usual terms of respect, while he mentions the Parliamentary Party once also, a little critically in respect of his own professional relations. Thus HARVEY was obviously a doctor and a physiologist, and obviously not either a courtier or a politician. In this connexion Sir WILMOT's researches into HARVEY's family, as represented by his several brothers, became pertinent, and the result of these researches made up much of his narration. All HARVEY's brothers were engaged in trade. They were merchant adventurers, with London as the basis of their operations, while London was from the early days of the revolution the centre of the Parliamentary Party. The probability is, therefore, that as a doctor HARVEY stood by his patient, but that, as far as family tendency or environment went, he was prepared to see eye to eye on many points with Parliament.

And yet the closing passages of the Oration suggested that the mental capacities of the unfortunate King may have appealed to HARVEY's philosophic mind in favourable contrast to the impressions of the intellectual abilities of the protagonists of the revolt. For Sir WILMOT found the leaders of the revolution, though temporarily successful, lamentably wanting in statesmanship, and the results to be not at all commensurate with the drastic nature of their objects or the manner in which they strove to obtain them. In a striking historical survey he drew a picture of the chaos into which the political and social life of the country had fallen by the close of the Protectorate, and, in so doing, he supplied, perhaps, the chief reason why the significance of HARVEY's discovery escaped in an incredible fashion all popular notice. The people were too distraught to be able to respond to anything outside the pressing constitutional and practical needs of the country. Sir WILMOT HERRINGHAM's Oration will long be remembered for its style and the manner of its delivery; it was a happy compound of dignity and simplicity.

THE PURPOSE OF THE BLOOD.

ONE purpose of the blood is well known; it is to carry oxygen and other foods to the tissues, to take away their excreta, and to keep them in such communications with one another as they effect by chemical substances. To serve these ends it is obviously essential that the blood should go round the body; bakers' vans and dust-carts are no use if they stand still. But the blood is something more than a nimble servant of the body; it is a tissue or organ whose chief business it is to be itself, to conserve its own individuality, and to take its place as a sovereign state in the commonwealth of the organism; for these purposes motion is not primarily necessary. It was to this aspect of the blood that Prof. A. E. BOYCOTT devoted his presidential address to the Section of Pathology of the Royal Society of Medicine on Oct. 15th (briefly summarised in our last issue), and he also have a visiting staff of physicians and surgeons who would be paid for their services while retaining the right to private practice. The general practitioner in the neighbourhood of such hospitals would keep in close touch with them and share the sessional work at the clinics. This is the solution of "group medicine," as distinct from that of "State medicine," which was advocated by Mr. T. Swann Harding in the previous number of the *Forum*.

FILTRABLE TUMOURS OF FOWLS.

In casual references nowadays the term "Rous sarcoma" is often used loosely to indicate filtrable fowl tumours in general. This error is an injustice to the fine researches of the staff of the Rockefeller Institute, and, by the implied inference that only one filtrable fowl tumour has been discovered, obscures a problem of cardinal importance. It ought always to be remembered that Peyton Rous and his colleagues described and studied five filtrable tumours, comprising three distinct structural and biological types. No. 1 and No. 43 were simple spindle cell sarcomata; No. 18 and No. 38 sarcomata with a characteristic structure, and No. 7 an osteochondro-sarcoma. These tumours retained their characters during continued transplantation. When loose references to the "Rous sarcoma" are made it is usually tumour No. 1 which is meant, but it is seldom realised that this type is a relatively rare form of avian neoplasm. Since the first publications from the Rockefeller Institute on this subject observers in Germany, Japan, France, and Italy have added other examples of filtrable new growths of the common fowl. In this country two such tumours have been discovered and propagated by Dr. A. M. Begg, the first an endothelioma[1] and the second a fibrosarcoma.[2] During the first three years of its propagation by cell grafts the fibrosarcoma grew slowly—sometimes a year or more elapsed between two transplantations—and formed a hard fibrous mass with the structure typical of a fibroma. In the current number of the *British Journal of Experimental Pathology* Begg describes the subsequent behaviour of the tumour. It has quickened in its rate of growth and become softer and more cellular. Consequently it has now become possible to make filtrates from it, and these have proved to be potent; dried tissue is likewise active. The tumours engendered by both cell-free filtrate and dried tissue reproduce the structure of the parent growth. This change in malignancy calls to mind a relatively common and well-recognised property of the recurrent fibroma of man. The resemblance to a common typical human tumour is thus not confined to gross and microscopic anatomy, but includes also a well-known and serious biological character.

Each addition to the number and histological types of filtrable tumours forces the problem they represent into the foreground of cancer research. The work of Peyton Rous, J. B. Murphy, and their collaborators was buried for years in the obscurity of technical journals, partly because of the overwhelming pre-occupations of the Great War, and partly because filtrable tumours run counter to opinions which had come to be regarded as finally established. Representing a concrete challenge to the biological conceptions of the origin of cancer they demand vigorous investigation. What is the nature of the causative agents present in potent filtrates? Are they viruses of extrinsic origin, or enzymes or other inanimate catalysts, manufactured in, and by, the tumour cell itself? Rous, in his pioneer work on this subject, gave some support to the virus theory, which has been espoused in this country by W. E. Gye. The opposite view that these agents are of intrinsic origin is, for the moment, in the ascendant, but opinion fluctuates as adherents of one or another school are vocal. Prof. A. E. Boycott has argued,[3] by analogy and on theoretical grounds, in favour of the intrinsic non-living catalyst theory. Evidence from experiment must decide this issue, but it is slow to accumulate. So far as the catalyst theory is concerned, almost the only evidence as yet brought forward in its favour is found in the work of Carrel and Brebner and that of Murphy and Leitch on the production of tumours with materials which cannot conceivably contain a virus. Tumour formation can be induced both in fowls and mammals by the application of dead chemical substances—e.g., coal-tar—but by this method the tumours appear only after repeated trauma over a long period of time. In the experiments of Carrel, Murphy, and Leitch the time of tumour formation after one injection was so short as to suggest the action of a specific agent. Carrel and Brebner used normal chick embryo and various chemicals, including arsenious oxide and indol; Leitch, in a solitary experiment, observed a tumour to follow the inoculation of normal fowl pancreas; whilst Murphy achieved the same result by injecting derivatives of normal fowl testis. The experiments of Carrel and Brebner have not been repeated; Leitch has already announced his inability to repeat his single observation, and Murphy's results remain unconfirmed.

It is true that a positive result is of more value than many negatives, and is not to be rejected as accidental until renewed efforts to bring it off again have failed. If it cannot be repeated either the conditions under which it had been obtained have not been completely reproduced or it is due to unnoticed errors which can only be eliminated by repetition of experiments. In the issue of THE LANCET of Oct. 5th (p. 697) Dr. Begg and Dr. Cramer related an experience of their own in which the inoculation of fowls with a simple extract of a mouse carcinoma was followed by the formation of the Rous tumour No. 1 at the site of inoculation. This was an experimental error, and Begg and Cramer were fortunate in being able to trace the sequence of technical operations which led to such a remarkable result. It was found to be due to the accidental use of a mortar, which was contaminated with tumour tissue derived from a No. 1 sarcoma. Such a simple explanation may not suffice to account for any of the unconfirmed observations of Carrel, Brebner, and Murphy—Prof. Leitch has already shown in THE LANCET of Oct. 12th that his observation cannot be explained in this way—but it does indicate the ease with which simple errors can creep unnoticed into biological experiments.

ARE ACCIDENTS A DISEASE?

The study of industrial accidents continues to yield results of practical interest. First, examination of records disclosed that less than 20 per cent. of accidents were associated in any way with those dangerous power-driven machines to which thought naturally turned, while the great bulk originated from circumstances, such as persons falling or articles falling on persons, directly under human control—a control also largely concerned in machinery accidents, as motor-car accidents exemplify. Next, accidents were observed not to be chance occurrences, but to be so distributed that a small group of workers monopolised far more than their due share, according to the laws of chance. Further, clever statistical research established that individuals possess different innate liabilities for sustaining accidents, just as individuals vary in their tendency to succumb to infectious diseases, and that, given knowledge of the accidents experienced in the past by any group of workers, an accurate estimate can be made of the accidents they will experience in the future. Not only so, but those who experienced most accidents were found to suffer most sickness, and—a matter of no small economic import—to be the least efficient workers. Accident causation has been further linked up with the reaction of the worker to his surroundings by finding that there is an optimum temperature, about 67° F., at which the incidence of accidents is least, but above or below which the incidence steadily rises. In fact, if the traumatic origin of the records were unknown, the morbidity and mortality under investigation would certainly be attributed to organic disease. The truth being that organic disease and accidents are end-results of the reaction of the living organism to its environment. Now these investigations of the Industrial Health Research Board have been carried a stage onward by new work[1] wherein tests were sought for by which those inherently predisposed to accidents might be detected. Probably few more unlikely searches have been undertaken; nevertheless no small measure of success has been achieved. It was undertaken by testing 1304 Royal Air Force apprentices, 387 Royal Dockyard apprentices, and 143 naval ratings, concerning whom information was available as to entrance examination results and subsequent accidents experienced. Tests were selected to bring out various characteristics, such as intelligence, stereoscopic vision, power and æstheto-kinetic capacity. The last somewhat cumbrously named tests included (1) responses to visual, auditory, and tactual stimuli; (2) skill at dotting a series of small circles passing by at an increasing speed; and (3) capacity to follow irregular movements of a mechanically controlled pointer. This set of tests enabled a group comprising 25 per cent. of the apprentices to be isolated; this group showed up worst at the tests, and were found to have an accident rate approximately twice that of the remaining 75 per cent. On the other hand, those who did well in these same tests tended to be more proficient in their occupations. Skill at æstheto-kinetic tests was not closely correlated with intelligence indicating that some types of mentality do not go with special sense muscular reactions; and those failing at the tests may include the class naturally fitted for scholastic and sedentary occupations. The capable authors of this report point out how they are breaking new ground with pioneer work, which must be advanced further before its full value can be obtained in practice.

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[1] THE LANCET, 1927, i., 912.

[2] Brit. Jour. of Exp. Path., 1927, viii., 147.

[3] See THE LANCET, 1928, ii., 817.

BCG VACCINATION OF PIRQUET-NEGATIVE ADULTS.

In a lecture published in *Tidens Tegn* for Sept. 20th under the alluring title: Will Norway be Free from Tuberculosis in Ten to Twenty Years? Dr. J. Heimbeck, to whose experiments with BCG on Pirquet-negative nurses reference has already been made in these columns, produced some remarkable figures and evolved a new scheme for the campaign against tuberculosis in Norway. His scheme is, in fact, a deliberate challenge to the present order of things in the administrative world of tuberculosis. The three chief headings of his lecture concerned: (1) the Pirquet tests performed by different doctors in various parts of Norway; (2) his own experiments with the subcutaneous administration of BCG to Pirquet-negative nurses, medical students, and others; and (3) a vigorous criticism of the conduct of the present official campaign against tuberculosis in Norway. With regard to the first heading, he showed how recent Pirquet tests had, apparently, upset the teaching that the overwhelming majority of human beings living in civilised communities are infected by the tubercle bacillus before adult life is reached. In Norway less than 50 per cent. of the population become Pirquet-positive during childhood. This observation is of far more than academic importance in view of the possibilities put forward by Dr. Heimbeck with such confident optimism of rendering the Pirquet-negative element of the country immune to tuberculosis by vaccination with BCG. With regard to the second heading, Dr. Heimbeck illustrated the accompanying diagrams with the following observations: In 1924 the communal hospital of Oslo at Ullevaal accepted 109 young women as probationer nurses, of whom 58 were Pirquet-positive, while 51 were Pirquet-positive when they first joined the hospital. As will be seen from the shaded portions of the two columns representing these two lots of probationers, only one of the originally Pirquet-positive probationers developed clinical signs of tuberculosis during her career as a nurse in the hospital, whereas this misfortune befell 17 of the 51 originally Pirquet-negative probationers. As amazingly great a proportion as 28 per cent. of the nurses who were Pirquet-negative on joining the hospital in the years 1924, 1925, and 1926 subsequently developed signs of tuberculosis. In January, 1927, Dr. Heimbeck began to inject BCG hypodermically into those probationers who, on joining the staff of the hospital, were Pirquet-negative, and who were willing to make the venture. As the diagram shows, there were 56 Pirquet-negative probationers joining the hospital this year, and of the 44 who were vaccinated only one subsequently developed clinical signs of tuberculosis, whereas five of the 12 Pirquet-negative probationers, who dispensed with BCG, subsequently fell ill with clinical manifestations of tuberculosis. The very striking difference between the fate of those Pirquet-negative probationers who were vaccinated in 1928 and those who were not vaccinated is indicated in the diagram. Of a total of 136 vaccinated nurses, only three subsequently developed tuberculosis, whereas 14 of the 34 control Pirquet-negative nurses, who were not vaccinated, developed tuberculosis. Dr. Heimbeck and his disciples have begun to give injections of BCG to Pirquet-negative persons outside the hospital, and in one district, Sollien, where this measure was begun two years ago, nearly all the Pirquet-negative inhabitants of this community, to a total of 150, were vaccinated. During this two-year period no new case of tuberculosis has occurred, whereas in the two preceding years there were five such new cases. These carefully controlled hospital experiments have reached a stage when their sponsors consider the time is ripe for advocating this measure beyond the confines of hospitals.

With regard to Dr. Heimbeck's third heading, his criticism of the present order of things is focused on the building of large and costly sanatoriums, where infectious cases are isolated only for a short period, and the provision of special homes for children threatened with tuberculosis, where an attempt is made to defer the date of infection—"a delay, the value of which is doubtful though costly." Dr. Heimbeck would stamp tuberculosis as "the most infectious disease we have," and would act according to this opinion. He recommends the earliest possible isolation of infectious cases, and to this end he advocates tuberculosis homes in which the patients can receive treatment, live and work. As matters stand at present, it is impossible altogether to avoid infection, and BCG vaccination must, therefore, be practised, preference being given in point of time to those who are most exposed to infection—i.e., children in tuberculous surroundings, and such young persons as probationers and medical students who must come in contact with infectious cases. Dr. Heimbeck would like to see the special homes for children threatened with tuberculosis radically converted into vaccination stations, to which these children would be admitted for examination (as to whether they were already infected or not) and for vaccination. Here they would remain, isolated from infectious cases, for the month or two necessary for the establishment of immunity following the vaccination. They would then be sent home, not only well, but also immune to the virulent infections to which they might subsequently be exposed. This system would enable many more children than heretofore to obtain admission to these special homes. Pending the accumulation of further experiences of the results of BCG vaccination, and the education of the community thereto, Dr. Heimbeck advocates a systematic tuberculin survey of the whole of the community, in order that exact information may be available as to

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[1] A Study of Personal Qualities in Accident Proneness and Proficiency. By Eric Farmer and E. G. Chambers. Report No. 55 Industrial Health Research Board. H.M. Stationery Office. 3s.

THE SALE OF ARSENIC TO MINORS.

THE general secretary of the Horticultural Trades Association has questioned a statement in a recent annotation (THE LANCET, Oct. 12th, p. 780) on the sale of arsenic to the effect that arsenical weed-killers can be sold to boys of 16. He refers us to Section 2 of the Arsenic Act of 1851, the purport of which was stated in our article, to the effect that "no person shall sell arsenic to any person other than a person of full age." So far as there is any certainty in the interpretation of statutes, it would seem that this prohibition still stands. Section 17 of the Pharmacy Act of 1868 makes it clear that nothing in that Act is to repeal or affect any provision of the Arsenic Act of 1851. Similarly Section 2 of the Poisons and Pharmacy Act of 1908—the section which authorises the sale of arsenical or nicotine weed-killers by duly licensed persons—expressly saves the requirements of the Act of 1851. One would therefore be disposed to agree that the concessions as to the sale of weed-killers by general dealers have in no way negatived the prohibition in the 1851 Act against the sale of arsenic to persons under age, were it not that our learned contemporary, the *Solicitors' Journal*, whose opinion we quoted, appears to take a different view. Our contemporary's article was written by Mr. Marshall Freeman, the recorder of Stamford, a barrister with special knowledge of matters pharmaceutical. It may be that his observations were intended to emphasise the fact that, so far as the rules governing the sale of weed-killers are concerned, there is nothing to warn the distributor that he must not sell to a minor. His opinion, however, certainly seemed to justify the statement that such sales were legal. The doubt thus disclosed is a fresh indication of the unsatisfactory state of the law.

WE regret to announce the death of Dr. William Bevan-Lewis at the age of 82 years. Director for more than 25 years of the West Riding Asylum at Wakefield, and sometime Professor of Mental Diseases at the University of Leeds, he had long been living in retirement at Cardigan, his old home and birthplace.

OUR Medical Diary this week contains an abridged programme of the Conference on Mental Health to be held next week at the Central Hall, Westminster, under the auspices of the National Council for Mental Hygiene and the Tavistock-square Clinic, in association with many other organisations. Applications for tickets and other correspondence should be addressed to the Secretary of the National Council, 78, Chandos House, Palmer-street, London, S.W. 1.

As already announced, an informal "At Home" was held on Wednesday evening last, Oct. 16th, at 7, Adam-street, Adelphi, to inaugurate the removal of THE LANCET to its new home. The house being still empty the rooms were able to accommodate the large number of guests who responded to the Editor's invitation. The removal is now complete and the editing and publishing of the paper takes place from 7, Adam-street, Adelphi.

The number of students entered for the D.P.H. course at the London School of Hygiene and Tropical Medicine already greatly exceeds the earlier expectations of the director and the School Council. The special lectures for the Michaelmas term are all arranged for Mondays at 5 P.M. On Oct. 28th and Nov. 4th two lectures on Atmospheric Pollution will be given by Dr. J. S. Owens and Dr. Leonard Hill, F.R.S., respectively; on Nov. 11th and 18th Dr. Hill will speak on Sunlight and Health, and Clothing and Climate; and on Nov. 25th and Dec. 2nd Mr. J. C. Dawes will deliver three lectures on Disposal of Refuse. All these lectures are open to the public and we hope to publish in due course the programmes for the other terms of the academic year.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XLIX.

URETHRAL AND VAGINAL DISCHARGES.

ALTHOUGH the trained clinician can usually diagnose with some accuracy the cause of a urethral or vaginal discharge, and foretell within limits what the bacteriological findings are likely to be, the assistance of an expert bacteriologist is of definite value. Without laboratory methods gonorrhœa cannot be definitely established nor excluded as the cause of the discharge. Microscopical examination of the urethral and cervical smears is, moreover, helpful as a means of assessing the effects of treatment and of judging improvement in this disease.

Technique of Collecting Samples.

For the examination to be of value to the clinician, it is essential that the material for examination should be taken correctly; much waste of time is incurred by submitting indifferently or carelessly taken specimens for investigation. The gonococcus is seldom found in large numbers in the female genito-urinary tract, and it is an organism which possesses little tenacity of life when removed from its normal habitat. These two facts form the basis of the technique of film and culture taking in modern venereal clinics. In chronic cases positive results are more likely to be obtained immediately after cessation of the menstrual flow. If cultures are desired it is important to avoid delay in transferring the culture tubes to the incubator. Not more than one hour should elapse between the collection of the sample and the introduction of the tube into the incubator.

For the collection of the pus the patient is placed, for preference, in the lithotomy position, and a beam of light from a head lamp or from other suitable source is focused on the vulva.

The *urethral sample* should be taken as long as possible after the patient has last passed urine. The ideal is five hours and upwards after micturition, but this time cannot always be allowed to elapse since frequency of micturition is a feature of some cases in which bacteriological examination is required.

The labia being held apart, the vulva is swabbed from before backwards, in order to remove the possibility of contamination with vulval organisms. Since the favourite resting-place of the gonococcus is in the higher reaches of the urethra that channel should be milked from above downwards through the anterior vaginal wall by means of a gloved finger. The sterilised platinum loop is then introduced into the urethra and subsequently smeared on to a glass slide, or on to the hydrocele-fluid agar, or other suitable medium, if a culture is desired.

Vaginal films, or cultures, are of little value in the adult, except possibly in virginal vaginæ; indeed it is of the utmost importance to avoid contamination of the cervical smear by vaginal organisms, which are apt to lead to confusing results. It is most unlikely that the gonococcus will be found in the vaginal pus of adults, while there exist in this situation other organisms which may be mistaken for it.

Cervical films.—In all cases of purulent vaginal discharge, except in young children, the material to be examined must be taken from the interior of the cervical canal. The cervix is exposed with a bivalve or other speculum which will ensure exclusion of the vagina. The fornices and the vaginal cervix are then mopped dry with gauze swabs on holders, the sterile loop is introduced into the canal of the cervix, and the material thus collected is smeared on to a glass slide or culture medium. If preferred, the ordinary cotton-wool throat swab on a stilette may be used in place of the platinum loop; but if this is used there must be no delay in smearing the slide or culture medium.

Bacteriology.

The *gonococcus.* The finding of an *intracellular*, reniform, Gram-negative diplococcus in this situation is positive evidence that the patient is suffering from gonorrhœa. The finding of *extracellular* characteristic diplococci is, in the overwhelmingly large majority of cases, positive clinical proof that the gonococcus is the infecting organism. It is worthy of note that a positive urethral result is of more value than a positive cervical film. For medico-legal purposes both the meningococcus and the *Micrococcus catarrhalis* should be excluded by their different fermentative reactions. The gonococcus can often be identified by culture, although the smears have failed to yield a positive result.

The *staphylococcus* is commonly found. Occasionally cases of profuse purulent vaginal and urethral discharges are met in which this organism is found alone or in association with diphtheroid bacilli. If repeated examinations fail to reveal the presence of the gonococcus, a diagnosis of staphylococcal urethritis or cervicitis can be made. Such infection is apparently not communicable to the male and rapidly responds to treatment. But the chief importance of the staphylococcus lies in the fact that in its degenerate forms, which have lost the capability of taking Gram's stain, it is sometimes confused with extracellular gonococci. These degenerate, Gram-negative staphylococci are to be distinguished from gonococci by being members of a group, the majority of which are Gram-positive. Their morphology when dividing is, moreover, characteristic.

The *colon bacillus.* Like the staphylococcus, this organism is frequently found in films, particularly in those made from the urethra. It may be the cause of urethritis, the infection being of hæmatogenous origin, and arising as a primary infection in the pelvis of the kidney, or in the bladder as the result of the passage of an infected catheter. In its atypical coccoid forms it may be mistaken for the gonococcus; but in such cases typical bacteria will be seen as well and all gradations in size exist, from the Gram-negative bacillus to the atypical coccoid types. The coccus, moreover, is of larger size than the gonoccocus, and does not possess the typical reniform shape.

The *streptococcus*, in various forms, is found with considerable frequency, especially as a secondary invader, in cases of gonorrhœa, and, of course, in primary streptococcal vaginitis, cervicitis, and urethritis. If the lesion is a *vaginitis* as distinct from a *cervicitis*, the causative organism is almost always the streptococcus. When the urethra is affected the urethritis is associated with cystitis or pyelitis, while in cervicitis streptococci are frequently found in the presence of post-parturitional cervical lacerations. There is little clinical difficulty in differentiating between the infected cervical laceration and the gonococcal erosion of the cervix. The short-chained variety of streptococcus is the commonest. The identification of the hæmolytic streptococcus during pregnancy is of great importance. Its association with puerperal septicæmia is well recognised, and has recently been stressed by H. Burt-White.

The *bacillus of Döderlein* is a large Gram-positive bacillus, often present in the vagina. It does not grow on the ordinary culture media, and it has no pathogenic properties.

Other organisms.—In cases of tuberculosis of the genital tract, excluding primary tuberculous salpingitis, the *Bacillus tuberculosis* may be present in the cervical smears, while, in cases of tuberculosis of the urinary tract, this organism may be found in those from the urethra. In either case it must be distinguished by its acid-fast properties from the smegma bacillus. The *Klebs-Löffler bacillus* is found in the rare cases of aphthous vaginitis. *Diphtheroid bacilli* are relatively common in the vagina, and possess no pathological significance. The *thrush* infection is again rare, but may be surmised in those cases possessing the well-known appearance of oral thrush. Films will show the presence of oidium albicans. The *pneumococcus* is uncommon. It is an occasional cause of hæmatogenous or descending urethritis. In children between the ages of three and ten years the alkaline vaginal reaction and the increased size of the lumen of the vagina make this passage the *via portialis* in cases of primary pneumococcal salpingitis, which, as McCartney and Fraser have shown, is the almost invariable antecedent of pneumococcal peritonitis.

Cytology.

Normally shreds of mucus and squamous epithelial cells are found. The only cellular elements other than these result from inflammation, from ulceration, and from tumour formation.

Inflammation produces excessive desquamation, with increase in the squamous epithelial cell content and the presence of pus cells. In the absence of a *positive gonococcal culture, the presence of a preponderance* of pus cells over epithelial cells, taken in conjunction with suggestive clinical findings, is sufficient to warrant the institution of the treatment for chronic gonorrhœa.

Ulceration.—The findings in this case are pus, blood, and epithelial debris, which may be in clumps. The causative organism will also be found.

Tumour formation.—The malignant growths of the cervix—carcinoma and sarcoma—produce a blood-stained vaginal discharge in which epithelial and connective tissue elements respectively may be found in conjunction with pus and blood cells. By the time carcinomatous or sarcomatous cells make their appearance in the discharge the growth is almost invariably of such dimensions and of such characteristic nature that it can be diagnosed by ordinary clinical methods. The growth at this stage is always secondarily infected. In patients over 50 years of age the possibility of a discharge being due to carcinoma of the body of the uterus must not be overlooked. The findings are similar to those in carcinoma of the cervix, but the secondary infection is usually not so heavy.

Discharges in Children.

In adults the causative lesions, in the majority of cases in which the patient complains of a discharge are urethritis and cervicitis, occasionally vaginitis. In children, on the other hand, the lesion is vulvo-vaginitis. Any of the organisms previously mentioned may be found, particularly the pyogenic bacteria in cases owing their origin to uncleanliness or to the presence of foreign bodies. Parasites and thread-worms are sometimes found, while the disease occasionally occurs as a complication of one of the acute specific fevers. The only place in which the gonococcus is likely to be found is in the vaginal or vulval discharge, whereas in adults the urethra and the cervix are the most likely sites. A determined search must be made and if the bacillus is found a real effort should be instituted to examine all the other members of the family.

The mode of infection in children is sometimes, but not always, by rape. Vulvo-vaginitis spreads rapidly in a family of poor children, and occasionally in a school. Infection in such cases is probably conveyed by the use in common of washing utensils, towels, sponges and lavatories, or by several members of a family sleeping in the same bed.

Discharges during Pregnancy.

It is well known that during pregnancy there is an increase in the physiological secretions; similarly, all pathological discharges become accentuated. The two important organisms for which repeated search should be made are the gonococcus and the hæmolytic streptococcus; the former on account of the danger of ophthalmia neonatorum, the latter because of its relationship to puerperal septicæmia. Primary staphylococcal infections are not uncommon during pregnancy, and give rise to a very profuse discharge which, as has been mentioned, is of relatively little importance.

Criteria of Cure.

A patient can be judged cured of gonorrhœa when, in the absence of all clinical evidence, notably vaginal discharge, the bacteriologist fails to find gonococci in films and cultures from the urethra and cervix on three successive occasions at monthly intervals. It is advisable to conduct a fourth examination two to four months later. Judged on this basis the treatment of gonorrhœa in the female yields very promising results, but the criteria can only be fairly applied to those patients who attend regularly, not to say enthusiastically, for treatment, and who obey to the letter the instructions they receive concerning, for example, marital relations, alcohol, and other excesses. Pessimism is only justified if it takes these factors into account. The reputation of every clinic suffers from the patient who, finding her daily visit irksome, begins to attend less and less frequently, and finally ceases to attend at all. Some patients find it impossible, for fear of detection, to carry out advice. Others are married to husbands who refuse treatment. And so on. There are a hundred and one reasons why a woman cannot do as she is bid. The same reasons explain, and to some extent justify, pessimism.

The complement-fixation test is unreliable, and all authorities are agreed that provocative vaccines are valueless as a means of assessing cure in the female.

From the point of view of cure cases fall into three groups:—

(*a*) Cases in which, clinical manifestations being absent, three successive bacteriological examinations fail to reveal the presence of the gonococcus. Clearly nothing requires to be said of this group.

(*b*) Cases in which repeated bacteriological examinations fail to demonstrate the presence of gonococci, but in which a chronic discharge persists. Secondary invaders, streptococci or staphylococci, are frequently found in considerable numbers, while the discharge contains a high percentage of pus cells. Patients in this group cannot be taken as cured, and the discharge must continue to be regarded as gonococcal, provided the gonococcus was found in the films or cultures at some past examination, however long ago. Repeated search by a skilled clinician working in conjunction with a skilled bacteriologist will, in the large majority of cases, be rewarded with success, and the gonococcus will be found even after a long series of negative examinations. The power of secondary invaders to maintain or to cause a recrudescence of the discharge is extremely dubious. If treatment has effectively eradicated the gonococcus the secondary organisms will have perished. Failure to find the gonococcus usually is due to the fact that the organism lies buried in the deeper crypts and so eludes detection, unless the utmost care and patience are observed in taking the material for examination and in the examination of that material.

(*c*) Cases in which clinical manifestations cease and in which bacteriological examination is negative on three successive occasions, but in which the discharge, with or without other symptoms and signs, reappears at intermittent intervals. Such cases are very similar to those described in the previous paragraph. The gonococcus, if carefully sought, should be found. When not due to reinfection, such a discharge is, as in the male, usually due to some exciting excess, alcohol, chill, intercourse, and the like.

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Special Articles.

THE BROWN v. WHITE BREAD CONTROVERSY.

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So far the brown versus white bread controversy has engendered more heat than light. The upholders of brown bread maintain that brown bread is better than white because it contains more protein of a higher biological value,[1] more vitamin B 1[2]—the antineuritic vitamin—more mineral matter,[3] and more roughage.[4] The protagonists of white bread, while admitting all these points, maintain that an ordinary mixed diet contains so much of these commodities that the deficiencies of white bread are amply compensated[5] and point to the overwhelming instinct of the working classes (which, of course, may be mere prejudice) in favour of white bread as mute and inarticulate evidence of its dietetic value.

The controversy has been complicated by the advent of patent germ breads which have relatively large proportions of the germ of wheat (obtained from the milling of white flour) added to the white flour from which they are made. Such breads contain still more protein of higher biological value, more antineuritic vitamin (B 1)[6] and more toxamins,[7] the poisonous substances discovered in cereal germs by Edward Mellanby. Such toxamins necessitate the addition of more fat-soluble vitamins to counteract their poisonous influence—i.e., demand more milk and butter in the diet, things which the working classes are wont to deny themselves. A still further complication has been introduced by the recent separation of vitamin B[8] into two moieties, B 1 (the antineuritic vitamin) and B 2 (the antipellagric vitamin), and our consequent lack of knowledge of the distribution of these in foodstuffs other than wheat germ and yeast in which their presence has been fully investigated. The adumbration of still further moieties[9] of vitamin B renders the problem still more involved.

At the present it may be taken as certain that brown—i.e., wholemeal—bread contains more protein of good biological value, more vitamin B 1, more mineral matter, more toxamins, and more roughage than white bread, while it contains approximately the same amount of vitamin B 2.

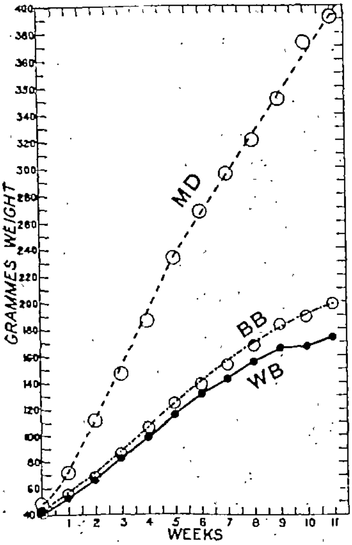
It is very difficult arguing from these data to assay the value of these three types of bread in human nutrition; in fact it may be said at once that nothing but experiments made directly upon human beings will be satisfactory or acceptable to either group of protagonists—long and costly experiments on the lines of those made under the auspices of the Medical Research Council and the Ministry of Health by Dr. Corry Mann[10] upon the value in nutrition of milk. We venture, however, to report an experiment made upon the respective values of brown and white breads incorporated in a mixed diet based upon the analyses of the diet of agricultural labourers in Essex[11] when fed to the laboratory rat.

Experimental Diets.

The diet in question comprised meat, potatoes, vegetables such as beetroot, cabbage, carrot, cucumber (raw), lettuce (raw), green peas, tomato (raw), turnip, sugar, bread, cheese, margarine, lard, milk, bacon, and eggs. The proportions were chosen so that they tallied as nearly as possible with the amounts of these foods used by agricultural labourers. The interpretation of "other vegetables"[11] was left to the discretion of the assistant who was in charge of the animals. The amounts used were in the proportion of meat 10 parts, potatoes 59, vegetables 16, sugar 11, bread 95, cheese 2·5, margarine 4·5, lard 2, milk 20 (by volume), 170 (by volume) of water. Streaky bacon was given twice a week instead of meat and one-quarter of an egg per week beaten in a known portion of the milk and pipetted off. The vegetables were cooked with salt as is usual, the potatoes being cooked separately. The raw vegetables were chopped finely, the tomatoes being skinned first by pouring boiling water over them.

As the food was served ad lib. in the special feeding dishes devised by one of us (G. A. H.) it had to be prepared in the form of a finely divided pulp so that there was no chance of the animals, taking more of one thing than another. The method adopted was as follows: the weighed meat and cheese together with five parts of water to one of meat, and a pinch of salt, were heated in the inner compartment of a double saucepan, with rapidly boiling water in the outer, till the meat turned colour (i.e., it was very lightly cooked). During this short period the mixture was rapidly and constantly stirred. This breaks up the meat into tiny fragments. Into the mixture the fat was stirred. Then the bread was added. The sugar was dissolved in 120 parts of water and poured rapidly over the bread. The mixture was well beaten. The vegetables, which had been previously cooked and thoroughly disintegrated, were added and the whole again beaten together. Last of all the milk, with or without the portion of egg, was added with further beating. When raw vegetables were given they were incorporated with the mixture at the end.

FIG. 1.

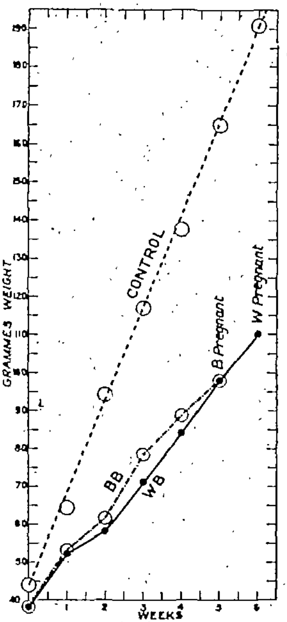


The growth curves of male rats upon the brown bread (B.B.) and white bread (W.B.) diets respectively, with a control curve of the rate of growth of normal male laboratory animals (M.D.) at the same period of the year.

The total amount of mixed food was adjusted to the appetites of the animals, enough being given to leave a small surplus each day.

Twelve animals were used in each experiment, six bucks and six does. One group of 12 were fed on a diet with white bread and the other with brown bread in the mixture. Each buck on the white bread diet was matched against a litter brother of the same weight on brown, and each doe with a litter sister. The average weight was therefore identical, and the litter control complete. The animals were three weeks old at the beginning of the experiment and weighed 40·7 g. (bucks) on the average and 38·3 g. (does) respectively. The experiment ran for 77 days for the bucks and until 10 of the 12 does had produced a litter. The animals were weighed and carefully inspected every day and the growth curves of the males and females are given separately in Figs. 1 and 2. As a control in each case the average growth rates of the stock laboratory animals, male and female respectively, on a mixed middle-class diet are also given.

FIG. 2.



The growth curves of female rats upon the brown bread (B.B.) and white bread (W.B.) diets respectively, with a control curve of the rate of growth of normal female rats at the same period of the year.

Inspection of the curves shows that the males receiving the brown bread diet grew somewhat more rapidly than those on white, though both sets are far behind the normal growth rate on a middle-class mixed diet. This slight advantage in favour of the brown bread diet for males tallies with the results of earlier work.[12 13] Between the females on the brown bread diet and those on the white there is little to choose. When the experiment closed the weights were almost identical in each set, but at intermediate points there had been a slight advantage in favour of the brown bread diet. Moreover, those on the latter diet littered a week earlier than those on the white bread diet.

Condition and Habits of Dieted Rats.

The most that can be claimed for these growth curves is that the substitution of brown for white bread appeared to improve this diet though it brought it by no means near the value of a middle-class diet. This improvement may easily have been due to the coprophagy which developed in those on brown bread (vide infra), for other criteria counterbalanced this increased growth rate.

The routine inspection of the animals showed as regards their physical state the usual signs of defective nutrition, especially the slow growth, the loss of hair (later partly regained), and the lightening in tint of the black patches to grey or fawn previously described.[11] At the end of the second week the hair had begun to fall and this was more noticeable in those on the brown bread diet than those on the white. At the end of the fifth week the lack of colour of hair was seen, and again the brown bread animals suffered more than the white. The hair was normal in quantity in neither set of animals at the end of the experiment. Nine animals on the brown bread diet and two on the white showed incipient xerophthalmia. The teeth were poor, dull, and opaque in appearance, and worse in those on the brown bread diet. Both sets of animals had the prematurely aged appearance of rats on a poor diet.[15]

A striking difference in habits between the two sets was also observed. Those on the brown bread were highly nervous, refused to come at call, and threatened to bite. They needed the more careful handling. Moreover, they showed a desire to consume both the liquid and solid excreta of their fellows, and in time developed an extraordinary cleverness in obtaining such excreta in spite of the usual technique of the use of screens. They waited for the excreta, even removing solid matter from the anal canals of the others before it had time to be voided and fall out of reach. This curious phenomenon appeared at the end of the sixth week in those on brown bread. Three weeks later signs of it, though to a much smaller extent, were seen in those on the white bread diet. Such nervous and gustatory habits have never been seen before in this laboratory in an experience extending over 3300 litters with about half that number of feeding experiments. They lead to the suspicion of a lack of, or more probably an imbalance between, food factors in the brown bread diet.[16]

Summary.

The substitution of brown bread for white in a diet made up to approximate to that of the Essex agricultural labourer, when fed, in carefully controlled experiments, to the laboratory rat, resulted in but small increase in growth and was accompanied by physical and nervous symptoms and by habits pointing towards a lack of, or imbalance between, food factors in the brown bread diet. The experiments give but little support to the propaganda for brown bread in the diet of the working classes.

The cost of these experiments was defrayed by a grant from the Medical Research Council.

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THE LONDON MEDICAL EXHIBITION.

THIS exhibition, which for many years has been held at the Central Hall, Westminster, has so grown both in regard to the number of exhibitors and in attendance that the organisers have been compelled to move to larger premises—namely, to the New Hall of the Royal Horticultural Society in Greycoat-street, Westminster. The exhibition closed at the end of last week after a record attendance of medical men both from this country and from overseas, who were enabled thus to measure the progress which has been made in the production of drugs and in the improved excellence of British-made surgical instruments. In the space at our disposal it is possible to mention a part only of some 170 stands, while drugs, foods, and surgical instruments so overlapped—some of the exhibitors catering for several branches of medicine and surgery—that only a general classification can be made.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

BURROUGHS WELLCOME AND CO. (Snow Hill-buildings, London, E.C.), in an attractive exhibit, prominently displayed "Tabloid" Alkaline Compound Effervescent, a therapeutic agent which may be used (1) as an antacid draught, (2) to correct hypo-alkalinity associated with gastric disturbance of various kinds, or (3) to restore the alkaline balance and assist remineralisation in the condition now known as acidosis; "Kepler" Malt Extract, an *important source of vitamin B, and* "Kepler" Cod-liver Oil with Malt Extract presenting vitamins A, B, and D in their natural form and association; and "Tabloid" Brand Hypodermic Bulbocapnine Phosphate, an adjunct to the treatment of certain phases of epidemic encephalitis. A mortality chart recorded the results of insulin treatment on 1310 patients and indicated how case-fatality has decreased as a result of improved technique.—**MAY AND BAKER, LTD.** (Battersea, London, S.W.), had a large display of drugs, including Novarsenobillon ("914") for all stages of syphilis and valuable also in yaws, malaria, rat-bite fever, and anthrax; Metarsenobillon, a water-soluble arsenobenzene derivative specially recommended for use by intramuscular or subcutaneous injection; Mercurochrome-220 Soluble, a powerful antiseptic of great penetrative power and low toxicity; and Arthrytin Ammonium ortho-iodoxy-benzoate in capsules for oral administration, and powder for intravenous and rectal injection in the treatment of chronic arthritis.—**THE BRITISH DRUG HOUSES, LTD.** (Graham-street, London, N.), exhibited a number of their interesting products, new additions being Acetylcholine for the treatment of arterial hypertension and Iodised Tincture of Guaiacol. Attention was particularly drawn to Radiostoleum which is used as a substitute for cod-liver oil and which, it is claimed, has *anti-infective properties*. Radiostol and Radio-Malt were also shown.—**PARKE DAVIS AND CO.** (50-54, Beak-street, London, W., and Hounslow) had a display of drugs which attracted much attention. Their exhibit included a new preparation called Citronin for the treatment of asthma and catarrhal conditions; Estrogen, a hormone-containing substance for the stimulation of the female reproductive organs; Immunogens, a series of antigens including "catarrhalis," "gonococcus," "pertussis," "pneumococcus," "staphylococcus," and "streptococcus"; drugs for the injection treatment of internal hæmorrhoids, and panteric tablets for use in conditions associated with pancreatic deficiency.—**BAYER PRODUCTS, LTD.** (19, St. Dunstan's-hill, London, E.C.). A selection of the well-known Bayer products including Avertin, a basal narcotic administered per rectum which maintains a state of basal anæsthesia through dosage calculated on the body-weight; Compral, a recently introduced analgesic; Phanodorm, an hypnotic; and Theominal, for reducing high blood pressure in arterio-sclerosis, were shown.—**H. R. NAPP, LTD.** (3 and 4, Clement's-inn, Kingsway, London), among other preparations showed Anzypan, a new product intended for the treatment of dyspepsia, embodying both gastric and intestinal enzymes in a form which ensures the release of the gastric enzymes in the stomach and of the intestinal enzymes in the bowel. Put up in the form of "a tablet within a tablet," the interior tablet contains intestinal ferments and is surrounded by a coating which is only soluble when in contact with the alkaline medium of the bowel; Normacol, an intestinal evacuant of vegetable character which gives both bulk and emollience, and thus ensures regular function; Ephetonin, a synthetic ephedrine for the oral treatment of bronchial asthma, hay-fever, and allergic conditions; and Bulbocapnine, an alkaloid of *Corydalis cava* for the treatment of hyperkinetic conditions (paralysis agitans, chorea, &c.). It has also been found of value in the treatment of behaviour disorders of children in post-encephalitic conditions (vide an article in THE LANCET, May 11th, by Dr. T. R. Hill).—THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD. (51, Bowes-road, London, N.), showed a series of preparations including Allonal allyl-isopropyl-barbiturate of dimethyl-amino-antipyrine, a synthetic, non-habit-forming hypnotic and analgesic, which relieves pain and gives sleep, not only in nervous insomnia but in pain insomnia. It contains no morphine, heroin, or opium derivatives; Omnopon, an opium derivative in which the whole of the opium alkaloids are presented in the form of soluble hydrochlorides; and Sedobrol, sedative bouillon in tablet form.

ALLEN AND HANBURYS, LTD. (Bethnal Green, London, E.), had an imposing display of their various drugs and foods including the well-known "Byno" series of tonics: Pitibulin, pituitary (posterior lobe) extract; Crismol, a pure medicinal paraffin; liver products for the treatment of pernicious anæmia; and Cremor Alkalinus for the intensive alkaline treatment of gastric and duodenal ulcer. It is prepared in two forms: (*a*) sod. bicarb. 2 parts; mag. carb., 4 parts; calcium carb., 4 parts; bismuth carb., 1 part; and (*b*) sod. bicarb., 2 parts; mag. carb., 3 parts; calcium carb., 4 parts; bismuth carb., 2 parts; where formula (*a*) proves to be too laxative in effect, the proportion of magnesium carbonate being decreased and that of bismuth carbonate increased.—VITAMINS, LTD. (38, Danemere-street, London, S.W.), exhibited their vitamin food Bemax, which is prepared from the embryo of cereals and possesses a high concentration of B-vitamin as well as a large amount of E-vitamin, and is indicated in constipation, rheumatism, depression, and gastric and duodenal ulcers. It can be taken in milk or in any breakfast food, or eaten with soup or stewed fruit. —PROMONTA CO., LTD. (127, Regent-street, London, W.), showed New-Promonta intended to stimulate the general metabolism and increase the calcium and phosphorus content of the blood. The preparation contains the lipoids of the central nervous system with vitamins A, B, D, and E, lime, iron, hæmoglobin, and soluble lacto-albumins and carbohydrates. It is indicated in neurasthenia, fatigue, insomnia, malnutrition, and conditions of functional insufficiency. FASSETT AND JOHNSON, LTD. (86, Clerkenwell-road, London, E.C.), presented a wide selection of medical and pharmaceutical products including Phyllosan, pharmacological chlorophyll for use in anæmia, debility, convalescence, and all forms of wasting diseases and cardiac affections. Medicinal plasters, dressings, and surgical requisites were also displayed, and attention was particularly drawn to Mead's rubber adhesive plaster which is wound in various widths on a common spool.—PEARSON'S ANTISEPTIC CO., LTD. (61, Mark-lane, London, E.C.), exhibited Hycol, a strong germicidal disinfectant with low toxicity prepared from coal-tar oils, which has a Rideal-Walker coefficient for *B. typhosus* 18–20. It is suitable for dental, medicinal, and surgical uses. Iodine-Medol, a non-toxic and non-irritant antiseptic ointment, was also shown.—SCHERING, LTD. (3, Lloyd's-avenue, London, E.C.), made prominent Veramon, an analgesic whose pain-relieving effects, especially post-operative pain, were emphasised; Atophan, a remedy for gouty and rheumatic conditions; and Medinal, a hypnotic and sedative with absence of cumulative effect; and Vasano, for the prophylaxis and cure of train-, air-, car-, and sea-sickness, also received attention.—HOWARDS AND SONS, LTD. (Ilford, near London), made a special feature of their standard Ether manufactured from duty-free rectified spirit, which is sold at the same price as was formerly charged for ether made from rectified spirit. Agotan Ointment was also prominently displayed, and many fine chemicals such as quinines and quinine derivatives, aspirin, calomel, calcium lactate, and so forth.

(*To be continued.*)

THE OLYMPIA MOTOR SHOW, 1929.

(FROM A CORRESPONDENT.)

THE 1929 Motor Exhibition at Olympia provides striking evidence of the efforts of the manufacturers:

(1) To allow for the average man's dislike of giving his car periodic attention. Maintenance jobs, such as "greasing-round," have in the past been a much shirked duty and are now being largely eliminated or at least simplified.

(2) To make the sensation of motoring more luxurious. This he does by providing smoother running engines and improving the springing.

(3) To take discomfort out of motoring, by better seating accommodation and by efforts to prevent the entry of engine fumes into the saloon body, and so to abolish the saloon headache.

(4) To provide the motorist, as standard fittings, with devices which have until recently been considered accessories to a car, notably radiator shutters, bumpers, and safety glass.

These tendencies are of special interest to the doctor, who has less opportunity than most other professional men to set aside regular occasions to give his car attention; if he neglects the rite of the grease-gun, he is showing the average man's dislike of a thoroughly disgusting job with much more excuse. When the doctor is an owner-driver his car is liable to be neglected, and any action of the motor-car designer to eliminate the penalties of that neglect is therefore acceptable. Certain labour-saving developments are recorded below.

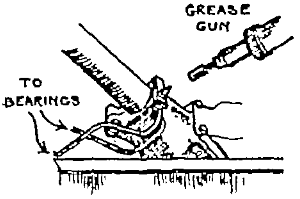
The general refinement of performance in the 1929–30 models is noteworthy. The outstanding characteristic of the Show is the increased use of the six-cylinder engine, and this is a distinct advance towards sweeter running. A year ago the number of makes of car on the market compared as follows: 34·0 per cent. with four-cylinder engines, as against 40·6 per cent. with six-cylinder engines. To-day the difference is: 20·8 per cent. "fours" and 52·5 per cent. "sixes." Six-cylinder cars can now be obtained at prices from £190 and with a horse-power of from 12 upwards. Improvements in suspension are also noticeable and are due to detail alterations to springs and shock absorbers.

Less Noise and Better Ventilation.

Further, to lessen the fatigue of one who has to spend many hours daily in a car, efforts are being made to reduce the noise which frequently emanates from the gear-box. Four-speed gear-boxes are becoming more popular than three-speed boxes, and on some of the cars at Olympia four-speed boxes are provided in which the third speed is claimed to be as quiet as the top gear. These include Graham-Paige and (which were so equipped last year) Humber, Chrysler, Delage, Darracq, Riley, and the new M.G. Advance in gear-box design is also bringing about easier gear changing. The 12 h.p. Austin, for example, is now much easier to change between third and top gears. The admirable "self-changing" gear-box is again shown by the Armstrong Siddeley Company. This is fitted as an extra on the 20 h.p. and 30 h.p. models, but eventually, when factory arrangements permit, this box will be available for all the models. This company is now making only six-cylinder cars, the smallest of the range being the 12 h.p. model, the saloon price of which is £285.

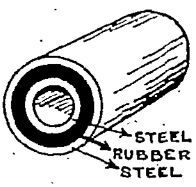
It is extraordinary that in an age when the importance of abundant fresh air and sunshine is receiving unprecedented public recognition, the open motor-car body should be apparently on the verge of extinction. At Olympia this year there are fewer open bodies on view than ever, and most of those displayed are on sports types. Few saloons, however, are adequately ventilated, and on a long journey the choice is frequently between a draught and a headache. The fumes from the engine, which tend to percolate into the body, appear to affect different people in different degrees, but to some a journey of 50 or 100 miles in a saloon car (unless it be in one of the rare well-ventilated types) causes general malaise. If some designer would seriously turn his talent to producing a really leak-proof, non-rattle, inexpensive and rapidly erected hood, possibly open cars would come back into general favour. Meanwhile, on the new 16 h.p. six-cylinder Singer (which takes the place of the previous Senior model, and is the lowest price British six-cylinder car, at £275 for the saloon) glass ventilator panels are provided over the windows. The 2/3 seater (Fig. 6) is £240. An ambitious effort to improve the atmosphere inside a saloon car is to be found on the new 15 h.p. Morris Oxford Six (saloon £285). The engine of this car is equipped with a device enabling it to consume its own fumes.

FIG. 1.



Nipple on the steering column of the Swift, for greasing ten points simultaneously.

FIG. 2.



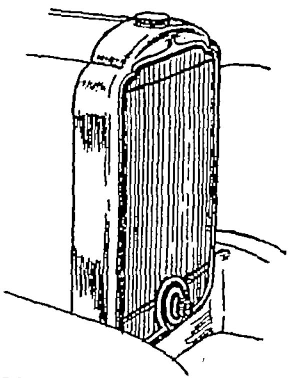
A Silentbloc bearing.

The sunshine roof, if carefully designed, is a useful compromise between the saloon body and the advantages of the open car. Its popularity continues. The Singer design has dropped out, but other makers have improved their designs.

Easy Starting.

The gradual tendency to provide radiator shutters as a standard fitting is welcome. For a doctor who makes journeys involving frequent stops the provision of radiator shutters is essential. The function of these shutters is to keep the temperature of the engine at the most efficient point as nearly as possible, and so to ensure easy starting in winter time. Radiator muffs may be used for this purpose, but they are not nearly so satisfactory as shutters which are either automatic or controlled by hand from inside the car. Automatic shutters, which are to be preferred, are operated by a thermostat which causes them to open in proportion to the increasing heat of the engine and to close the shutters as the engine cools down.

FIG. 3.



The new Buick radiator, with automatic shutters.

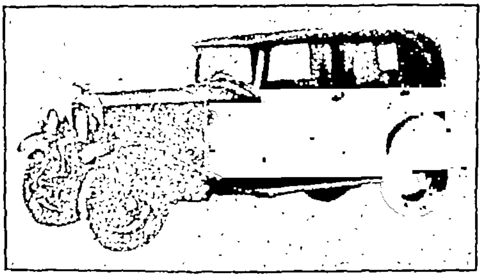
Easy starting is essential to the doctor, and the vogue of coil ignition is therefore important. The magneto system is rapidly losing its popularity, and 60 per cent. of the cars now on the British market employ coil ignition. This is reverting to the system of many years ago, and because motorists in those days had a great amount of trouble with their coil ignition this system is having to overcome a good deal of prejudice. Coil ignition to-day, however, is greatly improved. Its early defects have been cured, and the fear of being stranded owing to failure of the car battery (on which the ignition system depends) need not be entertained with modern batteries, so long as they receive reasonable attention. Coil ignition gives some slight improvement in easy starting and slow running compared with the magneto system.

Easy Greasing.

The 12 h.p. and 16 h.p. Austins employ one of the systems to simplify chassis greasing. The shackles of the road springs are fitted with Silentbloc bushes (Fig. 2), in which hard rubber is sandwiched between the fixed and moving elements of each bearing, so that no lubrication is required between them. The rubber has to take the stress of the constant flexing of the bearing, but according to the makers this torsion has not had any deleterious effect on the rubber during the two or three years that these bearings have been on the market. This year Silentbloc bushes have jumped into popularity, and they are now fitted to A.C., Austin, Alvis, Ascot, Citroen, H.E., Hillman, Humber, Riley, Rover, Standard, Talbot, Trojan, and Triumph cars. They do not, of course, eliminate the job of "greasing round," but they greatly reduce the number of greasing points.

Another and more complete method of tackling the greasing problem is illustrated, among others, on the Singer Super Six. This car has a larger engine than the new six-cylinder model, but the tax is the same (£16). One-shot chassis lubrication is fitted; in this system all the greasing points on the chassis (hitherto lubricated by hand with a grease gun) are connected by piping to a central oil reservoir. By depressing a pedal which operates a plunger in this reservoir, oil is forced to all the points. The price of this saloon is £350.

FIG. 4.



The Vauxhall 20/60 Velox Fabric Saloon.

On the interesting redesigned 40/50 h.p. Rolls-Royce one-shot lubrication is provided to all the chassis bearings except those on the two axles, which are connected by piping to a single accessible grease-gun nipple. This decentralised system has been used in order not to involve the use of flexible tubing between the chassis and the axles.

The redesigned Swift shows how, on a lower price type of car, some of the benefits of one-shot lubrication may be obtained without going to the expense of the complete system. On this much improved car the ten most inaccessible bearings are connected to one central greasing nipple at the foot of the steering column (Fig. 1). The grease gun has to be applied to this nipple, while the more accessible points are greased with the gun in the usual way. The saloon is £260.

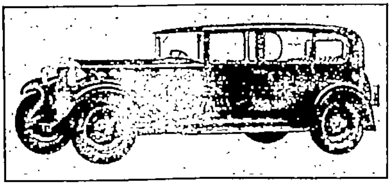
The Buick represents another method. On this car the greasing is by grease gun, but the nipples are grouped together in a small number of accessible places, each nipple being connected to its bearing by piping. The 1930 Buicks have a number of improvements. Automatic radiator shutters are included in the specification (Fig. 3). These cars are big and powerful, the six-cylinder engine being rated at 28·4 h.p. The sportsman's coupé displayed at Olympia is an attractive car in which the doors are not too wide (£535). The saloon is £485.

One-shot lubrication is fitted on the six-cylinder 20/60 h.p. Vauxhalls. These are dignified-looking cars with a fine road performance. The prices range from £495, the fabric saloon shown in Fig. 4 being £565.

On the Wolseley the radiator shutters (hand controlled) are chromium plated. The very smart black 16 h.p. six-cylinder Wolseley is good value at £450. The 21/60 h.p. eight-cylinder saloon is £515. Standard are exhibiting a new car, styled the "Envoy." This version of the 15 h.p. Standard is more roomy and has a slightly larger engine. The saloon is £340, with sliding roof.

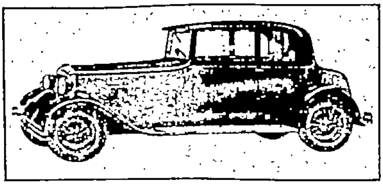
Most of the old-established makers are avoiding extravagant body designs and garish colours. A typical example of the dignified motor-car, such as the doctor requires, is the 14/45 h.p. Talbot. The prices range from £395; an attractive sliding roof coupé is £425. The Sunbeam stand provides another lesson in up-to-date but restrained coachwork. The same applies to the eight-cylinder Hillman (Fig. 5), which also includes Silentblocs and automatic radiator shutters in its specification. This is the least expensive British "eight." As compared with a six-cylinder car, an "eight" gives even smoother running, but the difference is not so marked as between a six- and a four-cylinder engine. The saloon is £445 and there is a drop-head coupé at £510. The four-cylinder Hillman cars have no radiator shutters. Automatic shutters are provided on the new Humber "Snipe" six-cylinder model, and on the new six-cylinder Morris Oxford, the fabric saloon of which is £285. A coupé (not shown at Olympia) is £295. On the adjoining stand at Olympia is the Essex. With an 18·2 h.p. six-cylinder engine this car is fine value for money. Radiator shutters (hand controlled) are fitted. Chassis lubrication (as with the Morris) is by grease gun. Saloon prices range from £250. The convertible coupé (£295) has a big rear compartment which locks.

FIG. 5.



Hillman "Straight Eight" Saloon.

FIG. 6.



The new Singer Six 2/3 Seater.

The Chryslers also have plenty of locker room and are improved in performance and more dignified in appearance. The "66" saloon is £395, and the open two-seater "70" model is £450. On these cars the radiator shutters are imitation, but on the "77" automatic shutters are provided. The "77" (this figure refers to maximum speed) is £625 for the saloon.

The "Babies."

Some doctors favour a "baby" car for short journeys as a second car. The 7 h.p. Austin and the 8 h.p. Morris Minor have established a fine reputation, and now have safety glass and chromium plating. A handsome new coachbuilt saloon Minor with opening head is displayed at £149, and there is an addition to the 8 h.p. M.G. Midget range: a sportsman's coupé with four glass panels set in the sliding roof. This car is well finished at £245, but it is surprising to find the battery box lid uncovered on the floor. The finest show of "baby" car coachwork is on the 7 h.p. Triumph stand, the new saloon landaulet (£197 10s.) being very smart in a black finish, with a folding head, and a trunk at the rear which locks.

Conclusion.

There are some most interesting new cars at Olympia, which are fully described in the current number of the *Autocar*, but the doctor who wants a car for immediate daily and reliable service will be wise to buy a type which has been well tried out. In some cases, doubtless, the designs have been so perfected that they will give little or no trouble, but it frequently happens that, no matter how many thousands of miles a new car has been tested by the makers, some fault is discovered during the first year when thousands of people drive it for thousands of miles.

The equipment of practically every closed car now includes door locks. In some towns, however, the police require car doors to be left unlocked when the car is parked, and in such circumstances the doctor motorist will need a dickey, or some other locking compartment. For this reason the two-seater or coupé type of body has a special appeal to the doctor. The sportsman's coupé type is very popular, but on some of them the doors are too wide for convenient access in a busy street or in the garage.

Chromium plating for the bright parts is now standardised by almost all manufacturers. This also means less trouble in keeping a car in good condition, since chromium plating is non-tarnishable and requires only an occasional rub with a rag.

The doctor who has, or buys, a car not equipped with radiator shutters can, of course, obtain these as an extra fitment. A number of the accessory makers whose exhibits are displayed in the galleries at Olympia are showing shutters and muffs, and in this part of the exhibition there are to be seen a great number of other accessories, some, such as fog lights, of special interest to those motorists whose business or profession takes them out in all weathers.

THE MEDICAL INSURANCE AGENCY.—On Tuesday, Oct. 15th, the annual general meeting of the agency was held at the house of the British Medical Association, and the report covering the twenty-second year of its work was received. This showed that great expansion had occurred. The approved balance-sheet showed that the life assurance now dealt with through the agency approximates very closely to a total of one and three-quarter million pounds, and increases were shown in the sections of sickness and accident, motor-car insurance, and comprehensive household policies. The total premiums for insurance business debited to the agency by the various companies with which its business is transacted amounted to £80,948. The rebates to the doctors insuring through the medium of the agency amounted to £1187.

The following grants were made to medical charities for the year 1929:—

	£	s.	d.
Royal Medical Benevolent Fund	630	0	0
Royal Medical Benevolent Fund Guild ..	630	0	0
Epsom College:			
Dawson Williams Presentation Scholarship Votes	860	0	0
Girls' Education Subcommittee	250	0	0
Royal Home for Incurables, Putney	52	10	0
Sir Charles Hastings Fund	52	10	0
Total	£2,475	0	0

As a result of this distribution the total sum devoted to medical charities by the Medical Insurance Agency since 1910 amounts to nearly £23,000.

Sir Robert Bolam, Lady Barrett, Dr. J. D'Ewart, Lieut.-Colonel R. H. Elliot, and Dr. J. W. Bone were re-elected as directors.

Correspondence.

"Audi alteram partem."

ELECTROCARDIOGRAPH LEADS.

To the Editor of THE LANCET.

SIR,—A false idea about the significance of electrocardiograph leads is widely diffused among students, possibly also among their teachers, and is periodically given further leases of life in successive editions of at least one reputable text-book of medicine.

The heresy is that lead I. chiefly indicates the activity of the auricles, lead II. that of the right auricle and ventricle, and lead III. that of the left auricle and ventricle. That this is untrue can be readily proved, with regard to the auricles, in lead I. by taking any unselected series of tracings, when it will be manifest that it is lead II. which best shows up the P or auricular waves. The inaccuracy of the statement with regard to the other two leads is similarly evident. The truth is that, as Sir Thomas Lewis states (The Mechanism and Graphic Representation of the Heart Beat, third edition, p. 55):—

> "A lead from the right arm to left leg in human electrocardiography is not equivalent to a lead from electrodes placed in experiment on the actual base and apex of the heart. In human work the contacts with the heart are in reality large, they are constituted by the tissue surrounding the heart on all sides. . . . The resultant curves are composite and represent, more in their due proportions, the activity of the heart muscle as a whole."

I trust that this protest may induce editors, and those responsible for the subject in text-books, to search their pages and their consciences with a view to repentance.—I am, Sir, yours faithfully,

London, W., Oct. 22nd, 1929. GEOFFREY BOURNE.

THE DIAGNOSIS OF LARYNGEAL CANCER.

To the Editor of THE LANCET.

SIR,—At a recent meeting of the Section of Laryngology of the Royal Society of Medicine Dr. Jobson Horne read a most instructive and inspiring paper describing cases, culled from the Proceedings, in illustration of difficulties in the diagnosis of cancer of the vocal cords with resulting fallacies in statistics. A common error was the mistaking of tuberculosis for cancer, and if the diagnosis had to be made on laryngoscopical appearances alone it was often excusable. I urged the practice of submitting a fragment removed to microscopical examination before deciding to perform laryngo-fissure or a fortiori laryngectomy—life-saving resorts in cancer and life-endangering in tubercle.

In illustration I exhibited a few lantern slides of such sections from cases in which the previous diagnosis had been incorrect, or in which immediate confirmation of a disputed diagnosis was essential. In one, for instance, the case was supposed to be one of tuberculosis, but the microscope revealed unmistakable epithelioma. This was found on laryngofissure to be so extensive that laryngectomy had to be at once performed, and the patient after five years is now well and hearty. In another, a gentleman of mature years, and of a rather obstinate disposition, refused to accept the diagnosis of cancer until the microscope enabled us to insist on its correctness, when early removal by pharyngotomy resulted in complete and lasting cure. It is not too much to claim that several of these patients would soon have reached the incurable stage, and have lost their lives, if appropriate treatment had not been promptly carried out with the thoroughness that only an exact diagnosis could inspire and justify. The competence of the pathologists, on whose reports the diagnosis in each case was finally established, is beyond question. My friend, Mr. Layton, somehow considered that these slides "afforded a strong argument against biopsies" (see Proceedings of the Section, p. 72). I am sure that my respect for his technical opinion is shared by many of your readers, but I hope they will not allow themselves to be deterred from resorting to this invaluable method for the clinching of the diagnosis, and avoiding the difficulties described by Dr. Jobson Horne.

I am, Sir, yours faithfully,

London, Oct. 21st, 1929. JAMES DUNDAS-GRANT.

SPINOCAIN: THE CONTROLLABLE ANÆSTHETIC.

To the Editor of THE LANCET.

SIR,—You published last week an abstract of the papers read by Dr. G. P. Pitkin and Dr. F. A. Kelly to the Section of Anæsthetics at the recent annual meeting of the British Medical Association, describing their new solution "spinocain" and the technique which they employ. These papers seem to have met so far with very little comment. Those, however, who are interested in the subject of spinal anæsthesia cannot but be struck by the surprising amount of stress they lay on the question of the fall of blood pressure, due to the ordinary methods of spinal anæsthesia, which is a point they advance as one of the chief arguments in favour of this new solution. Dr. Pitkin's quotation from a "well-known American author," that "the radial pulse cannot be felt by the fingers, nor can it be detected by the ear when the arm is subjected to the pressure of the cuff of the sphygmomanometer" is hardly the experience of English observers, so that possibly his insistence on the technique which he has elaborated is as much responsible for the improved results obtained in America as his new solution.

During a term as temporary assistant R.M.O. at St. Luke's Hospital, Chelsea, last year, I took blood-pressure readings at five-minute intervals in a series of 25 cases considered suitable for this type of anæsthesia, stovaine being used; only in four of these cases was there any appreciable fall in blood pressure. In two of these latter cases the fall was directly attributable to surgical interference—i.e., clamping the meso-appendix in one case and pulling on an adhesion of the omentum to an old hernial sac in the other.

Stovaine and novocain have their disadvantages and without doubt Dr. Pitkin's method is fairly safe and superior to many others; but his No. 1 spinocain solution contains 1 per cent. of strychnine and his No. 2 solution 3 per cent. of ephedrine. Many authorities maintain that the use of ephedrine temporarily inhibits the action of adrenalin. If a patient should suffer vaso-motor collapse during a spinal anæsthetic, disaster might follow if a preoperative vaso-motor stimulant had been used, which in any way tended to inhibit the use of adrenalin—the only drug that can be used intravenously with the assurance that a rise in blood pressure will almost immediately follow. Moreover, the method at present most widely used in this country that does not require a measured degree of Trendelenburg position and permits of the drug being injected low down in the dural sac has at least the merit of simplicity, and appears to be equally safe.

In any case, far more than in other methods of anæsthesia, success depends much more upon the anæsthetist than upon the particular solution used, and failures are generally due to faults of technique. Correctly administered, within the limits of the indication for its application, spinal anæsthesia is the most satisfactory of anæsthetics, and it is to be hoped that the place given to the discussion on this subject this year will stimulate in this country the greater interest which it deserves.

I am, Sir, yours faithfully,

Norwich, Oct. 17th, 1929. L. SHILLITO.

CURES AND PREVENTION.

To the Editor of THE LANCET.

SIR,—In his letter appearing in your issue of Oct. 12th (p. 793) Dr. W. M. Crofton states that "there is only one efficient intravital *germicide* in the Pharmacopœia, and that is antidiphtheritic serum" (italics mine). It would be illuminating to workers in serology if Dr. Crofton would communicate the evidence on which he bases his theory of the germicidal action of a serum usually regarded as more or less purely antitoxic in therapeutic action. The tissues themselves appear to be an efficient germicide for the diphtheria bacillus, if its toxic products are adequately neutralised.

I am, Sir, yours faithfully,
E. W. AINLEY WALKER.

University College, Oxford, Oct. 16th, 1929.

SUBCUTANEOUS NODULES IN THE SCALP.

To the Editor of THE LANCET.

SIR,—In their paper under the above heading in your issue of Oct. 19th (p. 812) Dr. F. J. Poynton and Dr. Alan Moncrieff refer to the case of a child, which they regard as analogous to their own cases, and which was demonstrated by Dr. Hugh Thursfield, at the Royal Society of Medicine (Section of Disease in Children) on May 22nd, 1925. They say that a subsequent speaker suggested the term "leukæmic lymphadenosis." I was the speaker in question, but I suggested *aleukæmic* (not leukæmic) lymphadenosis. In the printed account the *a* comes at the end of a line, and the hyphen has been omitted, but the context makes the meaning clear. I venture to suggest that both the cases now described by Drs. Poynton and Moncrieff belong to the class of lymphatic leukæmia, of which hypoleukæmic and aleukæmic (including actually leucopenic) lymphadenoses are mere varieties, or sometimes only temporary phases. The blood-counts in the second case are inconsistent with a diagnosis of lymphadenoma (in the sense of lymphogranulomatosis maligna). The frequency of infections in subacute leukæmic cases of all kinds has been long established, and the occasional occurrence of subcutaneous or cutaneous nodules has been recognised. but much less is known of associated bone-changes—see, however, cases recorded by Haenisch and Guerner (*Zeit. f. Klin. Med.*, 1919, lxxxviii., 28), and H. K. Taylor (*Radiology*, 1926, vi., 523), which may have some bearing on the subject.

I am, Sir, yours faithfully,
London, W., Oct. 19th, 1929. F. PARKES WEBER.

*** In describing Dr. Thursfield's case, Dr. Poynton and Dr. Moncrieff refer to "curious nodular swellings in the scalp." We regret that in our last issue the word "curious" was printed as "carious."—ED. L.

MALIGNANT TUMOURS IN THE FOWL.

To the Editor of THE LANCET.

SIR,—The contention upheld by Prof. A. Leitch that it is possible to induce malignancy in fowls by the injection of normal tissues of the fowl or of material obtained from them is of such importance, not only from the pathological but also the biological point of view, that we may be excused for reverting once more to the subject.

In our paper on the Alleged Experimental Production of Tumours in Fowls, published in THE LANCET of Oct. 5th, we emphasised the significance of the similarity of the tumours obtained by Prof. Leitch and Dr. Murphy with the Rous sarcoma No. 1. We pointed out that this similarity is an argument against their contention that they had induced malignancy by the normal tissues which they had injected, and supports our view that their results were due to an accidental contamination with the "agent" of the Rous sarcoma, which can sometimes exhibit an extraordinary virulence. To this Prof. Leitch replies in your issue of Oct. 12th that his tumour was "at first histologically distinguishable from the ordinary Rous sarcoma," and that "one at least of Dr. Murphy's tumours produced by testicular extract was quite distinct."

Our argument was based on the information supplied by Prof. Leitch and Dr. Murphy in their respective papers, published in the official report of the International Conference on Cancer, London, 1928. For the information of your readers we append the relevant *quotation from these two papers. Dr. Leitch writes:*—

> "A year ago in a series of experiments in which normal fowl pancreas was injected into the pectoral muscles, we succeeded in obtaining a tumour of the Rous type, a tumour transmissible by filtrates and desiccates. This tumour had a more solid structure than chicken tumour I. as we know it now. Histologically, it differed in that it had areas of fairly compact spindle cells, and it contained much more mucoid material, rendering filtration difficult. In subsequent generations it has approximated more and more to the classic type until now it is quite indistinguishable from it."

Dr Murphy writes:—

> "We have isolated from such normal tissues as the testicles of normal fowls, not in contact with any tumour-bearing animals, a similar agent with which we have produced the typical tumour, transplantable in over 90 per cent. of fowls."

Neither of the two authors published any figures.

We are, Sir, yours faithfuly, A. M. BEGG.
W. CRAMER.

Imperial Cancer Research Fund, Queen-square, W.C.,
Oct. 16th 1929.

A POINT IN CERTIFICATION.

To the Editor of THE LANCET.

SIR,—In your issue of Oct. 19th under the heading of Medicine and the Law you deal with the case brought against a colleague and myself for failure to keep a proper register under the Dangerous Drugs Acts. It has been pointed out to me that to the casual observer it would appear that I might have signed a blank piece of paper, and allowed my patient to fill in whatever he or she thought fit. As this same wording has appeared elsewhere, particularly in the lay press, I should like to trespass on your space to state categorically that such was never the case. Every order, &c., signed by me whereof the body was written by someone else has been written under my personal supervision and checked over by me before signature. Although this matter is quite irrelevant to a charge of failing to keep a register, nevertheless since the matter has been raised it is only justice that this fact should be made plain, as also the fact that the magistrate specifically said: "One thing was clear; there was no suggestion against either of these medical men that the regulations were infringed for the purpose of any malpractice in administering the drugs."

I am, Sir, yours faithfully,
REGINALD KARN, *M.C.*, M.R.C.S., L.R.C.P.

Beaumont-street, Portland-place, W.,
Oct. 23rd, 1929.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. J. M. Sloan, late R.A.M.C., retires on retd. pay.

Col. H. E. M. Douglas, V.C., late R.A.M.C., to be Maj.-Gen.

Lt.-Col. W. L. Steele, from R.A.M.C., to be Col.

Maj.-Gen. W. R. Blackwell, late R.A.M.C., to be Dep. Dir.-Gen., Army Med. Servs., War Office.

Maj. W. J. Weston to be Lt.-Col.

ARMY DENTAL CORPS.

G. A. Ballantyne, D.F.C., late Capt., the A.D. Corps, to be Capt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. J. G. Churton and Capt. D. J. F. O'Donoghue, having attained the age limit of liability to recall, cease to belong to the Reserve of Officers.

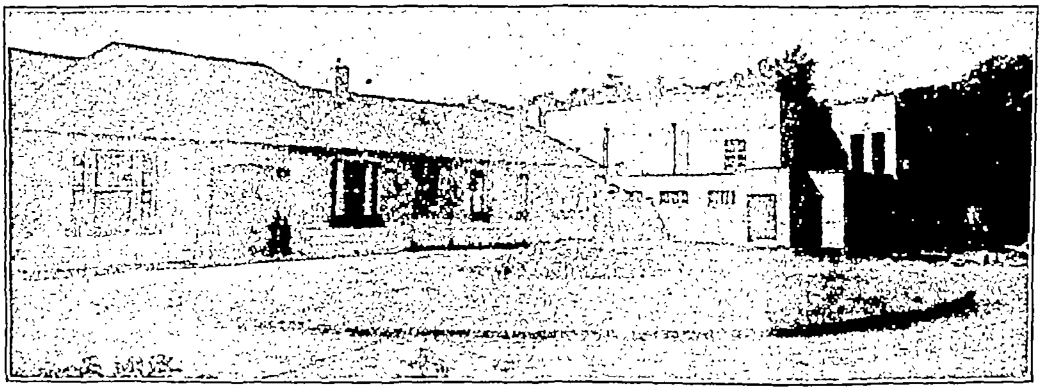
The King has approved of Lt.-Col. E. C. Hodgson, D.S.O., I.M.S., and Lt.-Col. R. B. Ainsworth, D.S.O., O.B.E., R.A.M.C., being appointed Hon. Physicians to the King, and to being promoted to the brevet rank of Colonel.

JORDANBURN PSYCHOLOGICAL INSTITUTE.

(FROM OUR EDINBURGH CORRESPONDENT.)

OPENING OF THE NEW LECTURE THEATRE.

ON Oct. 14th Mr. William Adamson, Secretary of State for Scotland, opened the new lecture theatre of the Jordanburn Nerve Hospital and Psychological Institute at Morningside. This is claimed to be the most complete theatre for medical purposes to be found anywhere. In other respects, too, the occasion was exceptional. It brought together the University, which was represented by the new Principal, Sir Thomas Holland, who here made his first public speech in Edinburgh, the City and the Royal College of Physicians. The three Maces emphasised the official nature of the meeting. Mr. Adamson noted the rapid rise of the nerve hospital and its continuous development as a vital centre for teaching and research. It was, he said, the beginning of a movement to make hospital provision for conserving the mental health of the Scottish people and raising it to a higher level. The old fears which had enslaved the public mind in facing the problems of mental disorder must be robbed of their power; the theatre in which they were met was designed as a deliberate challenge to the exclusiveness of former methods of dealing with disorder of the nervous system. The work of the institution would reach deep down into the life of the nation; the individual sufferers, the difficult and backward children, handicapped for life in many cases, and those who were mentally and morally weak and doomed to become derelict would be helped. There was hardly one branch of the social service in which the coöperation of the medical profession could be safely dispensed with. He understood that some £20,000 was still required to provide the laboratories that were the vital centre from which the whole of the research activities must radiate.



Jordanburn Psychological Institute. On the right is the new Lecture Theatre, on the left the out-patient department of the Nerve Hospital.

Sir Thomas Holland expressed his pleasure that his first public ceremony in Edinburgh should be the dedication of a lecture theatre to a work which would supplement the activities of the University. It was very significant that they had got over the old difficulty of regarding physical disabilities as due to providential intervention. Those who had followed the history of the medical profession would realise what a revolution had occurred since Pasteur discovered that diseases were due to a germ and infection; yet they still went on imagining that mental aberrations were something beyond the reach of research. The Institute would increase the facilities for lectures to students, but it would go much further in undertaking research into the causes of mental disturbances. Here was another opportunity for Edinburgh, largely due to the irresistible enthusiasm of Prof. G. M. Robertson, to lead the medical schools of the world in opening up new ground.

Prof. Lorrain Smith, Dean of the Faculty of Medicine, said that since the days of Laycock the study of mental disorders had been prominent in Edinburgh. He doubted if ever before in this country there had been opened on the same day a hospital which was also an institute for research. Every hospital was moving in that direction, but Jordanburn had done it first. They were introducing there an application of psychology which had never been reached in this country before. This was the day of psychology; so extensive indeed was its application that they could live from a happy childhood to a green old age in the light of pure reason.

Dr. R. A. Fleming, President of the Royal College of Physicians, who agreed that the hospital was unique in Great Britain, suggested to Mr. Adamson that they had in Borstal institutions problems which would be greatly helped by psychological investigation.

Construction of the Theatre.

The lecture theatre has been designed to make it suitable for academic purposes and for semi-popular lectures of an educational character. It is seated for over 250 persons, each of whom will have a perfect view of the platform, which is 34 × 12 feet. Echo has been avoided by covering walls and ceiling with a porous material known as celotex. The backs of the seats have been padded with corduroy, so that if the audience is small there is no echo from wooden benches. The passages are covered with matting. There is thus no hard or smooth surface from which the sound of the voice can recoil, with the exception of the wall at the back of the lecturer, which acts as a sounding board; but its echo follows the voice so quickly that it accentuates the sound of the words without distorting them. The theatre has a cinema, an epidiascope, and a separate complete out-patient department to which admission is obtained from the outer hall. The stage is in a line with the broad corridor of the hospital so that patients in bed can easily be brought along; there is a large anteroom from which admission to the platform is gained, and patients may be held there in reserve.

Staff and Curriculum of the Hospital.

A feature of the hospital is a department for psychology under the directorship of Mr. J. Drever, D.Phil., reader in psychology at the University, and his two assistants, Miss Mary Collins, Ph.D., and Dr. W. R. D. Fairbairn. Pure psychology is now a compulsory subject for the student in the medical curriculum of Edinburgh University, and is taught on alternate days with the subjects of psychiatry and psychopathology during the whole of the spring term.

A few days before the opening an anonymous donor gave a sum of £10,000 as an endowment fund for the working expenses of the lecture theatre and the out-patient department.

LONDON HOSPITAL POST-GRADUATE COURSE.

THIS year for the first time a post-graduate course was held at the London Hospital in connexion with the reunion of the annual dinner. A considerable number of old students attended lectures and demonstrations from Wednesday to Saturday of last week, and the experiment was adjudged a great success, to be repeated, if possible, on a larger scale a year hence. On p. 867 of our present issue will be found the opening paper of the course by Dr. Russell Brain; in a later issue we hope to publish Dr. S. P. Bedson's observations on vaccination, whilst reports of a few of the other addresses appear below.

In the course of some observations on the

Present Position of General Light Therapy

Sir Robert Stanton Woods referred first of all to the two schools of thought which favoured the use of long light rays (luminous) and short rays (wavelength 2900 to 2500) respectively. The theoretical grounds for treatment by light were, he said, by no means well established. One fact, and one fact only, was clear—namely, that exposure of the skin to ultra-violet rays would prevent and cure rickets. But these rays had other probable—indeed, highly probable—effects. In the first place they were bactericidal. This property, however, was of little use in practice, since as bactericides they could not penetrate one bacterial spore to reach another. What was likely to be more important was that it had been pretty definitely shown that exposure of the skin to ultra-violet rays would increase the bactericidal power of the blood. Probably the process here was local and comparable to protein shock—that is to say, it might produce a non-specific immunity reaction. The difference of opinion between exponents of long ray therapy and short ray therapy was conspicuous in the treatment of tubercle, a disease in which light was almost certainly useful, at any rate in the surgical forms. There was reason to suppose that ultra-violet therapy was beneficial also in certain circumstances in frank septicæmia. It would do no good here if the resistance of the body against infection was exhausted, but it might help a patient in whom there still existed the possibility of antibody stimulation. The use of light in other general conditions, and especially in debility, was on even less certain ground; no incontrovertible evidence had been brought forward to show that exposure of the so-called debilitated person to ultra-violet rays had any tonic effect. His own experience had been confined to its employment for definite diseases, and especially inflammatory conditions of joints. He had no doubt that radiation did have some profound good effect in certain forms of subacute and chronic arthritis. In one case, indeed, complete cure had followed such treatment applied after other measures had failed over a period of two years, and though complete success of this kind was exceptional, he had noticed that the general health usually improved under light treatment, and that in the majority the pain and stiffness were greatly alleviated, although he had not yet been able to show that (with the exception mentioned) the pathological joint changes were affected. As for the other effects attributed to ultra-violet rays, there was very little evidence of their utility in medicine. Nor had any means yet been devised for measuring dosage scientifically. Of the two principal methods in use one depended on the measurement of erythema after exposure to the rays, whilst the other was frankly empirical. In treatment some authorities, such as Rollier, began by exposing a small area of skin to light and increased this area gradually; others preferred short exposures of the whole body from the first. The dosage technique depended mainly on the nature of the source employed. It would be seen, said the speaker in conclusion, that the experimental evidence in favour of light treatment was meagre, and that conclusive clinical evidence, which would be much more useful, had yet to be collected.

Mr. Alan Perry gave a lecture demonstration on the

Injection Treatment of Varicose Veins.

Three solutions had, he said, been tried at the London Hospital—namely, 20 per cent. sodium chloride (which had not proved very satisfactory), 30 and 40 per cent. sodium salicylate, and quinine and urethane (1·0 g. quinine plus 2·0 g. urethane in 15 c.cm. sterile water). Special syringes had been used, but any 5 c.cm. syringe would do perfectly well. The ordinary hypodermic needle was too sharply pointed for this work, but could be ground down to a small bevel. Injections might be given with the patient standing up, sitting, or lying down. Preliminary bandaging of the leg was unnecessary. It had been shown that the flow of blood in varicose veins was downwards, and even if the solution injected was not actually carried distally, its flow towards the heart was at any rate very slow. The solution acted by causing swelling and disappearance of the endothelium of the vein. The blood did not simply coagulate, as in thrombophlebitis. A special name had been coined for the inflammatory condition produced—namely, venitis. The consequences of injection were: (1) thickening of the walls of the veins; (2) obliterative sclerosis; (3) obliterative sclerosis and periventitis. When salicylates were used intense cramp might be felt in the leg after injection, lasting perhaps 30 seconds; with quinine and urethane, on the other hand, the treatment was painless at the time. In either case injection was followed in two or three days by thickening along the vein, perhaps with discoloration, and rarely more acute inflammation developed. As a rule, patients noticed improvement after the first injection. Embolism had never occurred in the London Hospital cases, and there was no record in the literature of embolism after injection of salicylates. Sloughing of the skin was an occasional complication but became more infrequent as the operator became more skilled. It was probably due to leakage of solution outside the vein, and although troublesome was not dangerous. The slough took a long time to separate and healing was slow. Fomentations should be used to remove the slough; then a bland ointment could be applied. Patients occasionally fainted, and with quinine they sometimes complained of buzzing in the ears and a taste of quinine in the mouth. In every case a full medical examination should precede treatment, and albuminuria or glycosuria should deter the surgeon from undertaking it. It should be remembered that all pains in the foot and leg were not necessarily due to varicose veins. The treatment was suitable for any tortuous varicose vein up to the saphenous opening, provided that the general medical condition was sound and that there was no generalised œdema of the leg with lymphatic obstruction. Pregnancy was a further contra-indication. Injection should not be attempted for minute superficial varices or when the condition was secondary to deep thrombosis, as in phlegmasia alba dolens. Recent thrombophlebitis also contra-indicated injection treatment.

Modern Treatment of Lead Poisoning.

Dr. Donald Hunter said he knew his audience would agree that so far as industrial plumbism was concerned the treatment was first and foremost preventive. Those who were certifying surgeons under the Factory Acts would appreciate, too, that the Home Office regulations as applied in this country controlled the situation better than any other scheme elsewhere in force. But new sources of poisoning were constantly arising, the most productive at present being the manufacture of electric accumulators. Clinical observation and the evidence of experimental pathology provided abundant evidence that inhalation of dusts and fumes was far more dangerous than ingestion. Extensive chemical analyses after prolonged exposure had shown that lead was stored in the skeleton, probably in the form of tertiary phosphate. Of the total amount in the body 90 per cent. might be immobilised in the bones and while it stayed there it was harmless. A study of the factors causing its elimination and storage had been made the basis of modern therapy. The metabolism of calcium and of lead were very similar so that a low calcium diet favoured the excretion of calcium and of lead, whereas a high calcium diet and calcium therapy favoured their retention in the bones. Therapeutic measures which greatly disturbed the acid-base balance of the blood promoted elimination of lead, probably by mobilising it as secondary phosphate, which was a hundred times more soluble than the tertiary salt. Among agents used for this purpose were phosphoric and hydrochloric acids and their ammonium salts, and sodium bicarbonate; the mode of action of potassium iodide was unknown. The practical conclusions to be drawn from these observations were:—

1. The patient poisoned in industry has shown himself to be susceptible. He must never work in lead again.

2. In the treatment of toxic episodes (colic, palsy, encephalopathy) the patient should have a high calcium diet (milk, eggs, butter, custards, ice-cream, green vegetables, nuts, raisins) plus calcium lactate 3·0 g. daily. Constipation should be combated by enemata and by magnesium sulphate. Colic might be treated with local heat, amyl nitrite, nitroglycerine, and atropine. In bad cases 20·0 c.cm. of a 5 per cent. solution of calcium chloride should be injected *very slowly* into a vein. In palsy (while developing) the general treatment should be as above, together with splints and massage. In encephalopathy, besides treating convulsions and mania symptomatically, calcium therapy was required and intravenous calcium chloride might be necessary.

3. *Elimination* should be attempted only in the absence of toxic episodes. A constant watch must be kept for their occurrence, and if they did occur it was necessary to revert to a high calcium diet and calcium therapy. In all cases a high calcium diet must be resumed after three weeks' treatment. For a low calcium diet the patient might have meat, liver, potato, rice, tomato, banana, apple, butter fat, bread without milk, tea and coffee without milk, sugar, salt, pepper. Dilute phosphoric acid, 20·0 c.cm. (in half a pint of water flavoured with sugar and gin), should be taken through a straw hourly for eight doses a day if tolerated; also ammonium chloride, 1·0 g., in half a pint of water, hourly (eight times daily), if tolerated. The symptoms of acid intolerance were loss of appetite, headache, and nausea; but most patients never developed these. Elimination might be continued for three weeks. It was very much more effective than treatment by potassium iodide. When the patient had nephritis elimination was assisted by sodium bicarbonate, 40·0 g. a day; acids must never be used.

Causes of Sudden Death.

Dr. W. W. WOODS spoke of sudden death in the light of his experience as assistant director of the Institute of Pathology. He subdivided the causes according to the organ affected:—

1. *Heart.*—(*a*) Coronary atheroma and thrombosis. This constitutes the largest of all groups. There is infarction of the myocardium, the anterior descending coronary artery being that most commonly affected. (*b*) Coronary atheroma with stenosis of coronary trunk but no thrombosis. (*c*) Syphilitic aortitis with stenosis of the coronary orifices, the coronary trunks being normal. (*d*) Hæmopericardium either from rupture of the infarcted heart or from rupture of aneurysm of the ascending aorta into the pericardium. (*e*) Aortic incompetence, due to old rheumatic involvement or due to syphilitic aortitis. (*f*) Atheromatous stenosis of the aortic valve.

2. *Cardiovascular.*—(*a*) Cardiovascular hypertrophy either primary or secondary to chronic interstitial nephritis. (*b*) Rupture of aortic aneurysm into œsophagus. (*c*) Spontaneous rupture of the aorta usually presenting a ragged tear about an inch long. (*d*) Perforation of aorta by sharp foreign body impacted in œsophagus.

3. *Lung and Air Passages.*—(*a*) Chronic pulmonary tuberculosis with hæmoptysis and suffocation. (*b*) Foreign body in air passages (pharynx, larynx, trachea, bronchi). (*c*) Pulmonary embolism, large enough to be fatal, occurs only in people just out of bed after an illness. Death occupies several minutes.

4. *Brain.*—(*a*) In cerebral hæmorrhage sudden death only occurs in a very extensive lesion. The patient usually survives several hours. (*b*) Rupture of congenital aneurysm of the circle of Willis. (*c*) Hæmorrhage into a soft glioma. (*d*) Cerebral embolism rarely causes sudden death.

5. *Stomach.*—Perforated gastric ulcer is an occasional cause.

6. *In Infants*, the post-mortem diagnosis presents great difficulty. The condition may be due to: (*a*) Inhalation of vomit—usually white curdy stomach content. (*b*) Overlaying—the exact circumstances leading to the fatality are very important. The lips and nails are blue and petechial hæmorrhages are found in pleura, pericardium, thymus, and testis. (*c*) Convulsions. (*d*) Hæmorrhage into the suprarenals—rare. (*e*) Bilateral thrombosis of renal veins causing hæmorrhagic infarction of the kidneys.

Mr. ROBERT MILNE delivered a lecture on

Pain in the Fore Part of the Foot.

In the causation of such pain he distinguished six main factors: (1) Tight socks and shoes. (2) Tinea or cheiropompholyx affecting the toes. (3) General diseases, such as tuberculosis, syphilis, and gout, affecting the bones and joints of the foot. In these three groups the treatment must obviously be directed to the underlying cause. (4) In a fourth group he placed cases of hallux rigidus and hallux valgus with or without bunion, flat-foot, and hammer-toe. The relative importance of the various factors in the production of the pain must be carefully weighed. In treatment attention to shoes and socks must come first, and might be all that was necessary. If operative measures were deemed advisable they should be as conservative as possible. (5) In another group he placed those cases with a tendency to claw-foot, with or without shortening of the tendo Achillis. Such a tendency would invariably throw too much weight on the fore part of the foot, with consequent pain, chiefly in the region of the head of the first metatarsal. If on examination it was found that the metatarso-phalangeal joint of the great toe could still be straightened, transplantation of the tendon of extensor hallucis longus was justifiable. If the condition was more advanced tenotomy of the tendo Achillis would also be necessary. In many cases nothing further was required than the fitting of a transverse bar of leather to the sole of the boot at a level just posterior to the heads of the metatarsals. (6) Incompetence of the first metatarsal owing to its being either too short or atavistic—i.e., possessing abnormal mobility at its tarsal joint—threw excessive strain on the second metatarsal, and might produce considerable pain in the fore part of the foot. Evidence of this condition might be found in actual osseous hypertrophy of the second metatarsal, callosity of the skin beneath its head, a point of tenderness at its base, and relative thinness of the skin beneath the head of the first metatarsal. In young people actual infraction of the head of the second metatarsal might be demonstrable by X rays. Also apparently spontaneous fractures of the shafts of the second or third metatarsals were not uncommonly found, especially in young adults subjected to excessive or sudden strain on the feet—e.g., route marching. Without radiographic examination such fractures were easily missed. The metatarsal bar was again a great help in treating this group, but in cases where fracture was present rest for the foot for three to four weeks was essential if chronic pain was to be avoided. (7) Mr. Milne mentioned Köhler's disease (a condition allied to Schlatter's and Osgood's diseases) as another cause of pain in fore part of the foot requiring rest. (8) He pointed out that fracture of the fifth metatarsal occurred almost invariably at its base and must be distinguished in X rays from a small accessory bone (bone of Vesalius) which was occasionally present in this region.

Dyspepsias of Childhood.

Dr. ROBERT HUTCHISON began an address on this subject by comparing the dyspepsias of childhood and adult life, referring especially to the relative rarity of organic forms, and the greater importance of the intestine, in childhood. In the child dyspepsia might simulate other things; in the adult other things might simulate dyspepsia. The dyspepsias of childhood could be classified as gastric (acute and chronic), hepatic, and intestinal. In acute *gastritis* the child not infrequently had symptoms of considerable severity—high temperature, repeated vomiting, convulsions, and even coma. These must be distinguished from the symptoms of "acute abdomen" and acute infective diseases, including meningitis. The treatment could be summarised as bed, starvation, and sodium bicarbonate. Chronic gastric dyspepsia of the catarrhal form might follow acute gastritis, or might be due to some source of chronic irritation such as the too free use of roughage in the diet. Chill (from inadequate clothing, &c.) was also an ætiological factor. The child had a diminished appetite, nausea (rarely vomiting), and occasionally attacks of pain in the mornings; it was often constipated and had a coated tongue. Treatment consisted in removing the irritating forms of food from the diet; in seeing that the child had ample time for its meals and masticated efficiently, and in ensuring that the clothing was warm. Rhubarb and soda were the most useful drugs. The functional form of chronic gastric dyspepsia was uncommon in childhood. An atonic variety might be encountered at puberty. *Hepatic dyspepsia* was often seen in children under school age. They were "unsatisfactory" children with capricious appetites, bad tempers, and bad breath; they were pallid and slept badly. Their stools were usually pale and often constipated. They suffered from bouts of vomiting and acidosis, fever, and migraine which might be called "the hepatic episodes." The factors in the production of this form of dyspepsia were an inborn hepatic inadequacy (often hereditary) and over-use of the liver foods such as milk, cream, eggs, chocolate, and oranges. The quantity of these in the diet should be cut down (especially milk). The most useful drugs were rhubarb and mercury, and paraffin was best avoided. *Intestinal dyspepsia*—the so-called mucous disease—was found usually in children of school age (6–12 years). These also were "unsatisfactory" children; they were languid, and dark under the eyes; they had disturbed nights with terrors or sleep-walking; they had attacks of pallor or fainting, and of night sweating. They had poor appetites with occasional voracious hunger, they passed jelly in the stools, and they were not often constipated. They also suffered from "episodes," which include bouts of lienteric diarrhœa, umbilical colic (in which the pain might be severe, but was always short-lived, and might recur several times a day). They were subject to fainting and worms. These cases must be distinguished from chronic appendicitis and abdominal tuberculosis. The important factor in their production was the over-use of carbohydrate in the diet, which induced an excessive secretion of mucus in both stomach and intestine. The supply of carbohydrate should therefore be cut down. Useful drugs were alkalis, rhubarb, nux vomica, bitters, and such laxatives as aloes and senna. Paraffin again was best avoided; iron was unnecessary and cod-liver oil and malt should not be employed at the outset of treatment. For diarrhœa and colic a few drops of tincture of opium (with or without belladonna) could be given before meals and a laxative at night. In the treatment of worms in these cases it was essential to recognise the underlying dietetic error. In all these forms of dyspepsia general regulation of life and change of surroundings (people and place) were of great importance.

Mr. A. J. WALTON gave a short lecture on the

Place of Surgery in Lesions of the Upper Abdomen.

Dealing first with lesions of the stomach and duodenum, he distinguished four pathological groups: (1) The first was congestion of the mucosa, sometimes with small superficial erosions. This condition was seen, for example, in connexion with purpura, with heart failure and back pressure, and with burns or general sepsis, in all of which conditions the history might be one of acute onset with severe gastric symptoms. These cases obviously did not require surgical treatment. (2) The small multiple erosions of the stomach found in the dyspepsias of young women should also be treated medically; except in cases with severe or repeated hæmatemesis, when a rapid gastro-jejunostomy might be needed to save life. (3) In a separate group he placed gastric and duodenal ulcers of moderate size, giving a short but typically periodic history of dyspepsia, usually with a raised gastric acidity and some radiographic evidence of abnormality. Medical treatment was being widely advocated in such cases, but Mr. Walton said that he himself was not yet convinced of its success and that he still advocated surgical measures. (4) Large chronic penetrating ulcers giving a long history should, in his opinion, always be treated surgically, especially in view of the gravity of the complications—i.e., severe and occasionally fatal hæmorrhage, perforation, stenosis, and carcinoma—all of which might occur despite careful medical treatment. The danger that gastro-jejunal ulcer and lesser curve ulcer might follow gastro-jejunostomy for duodenal ulcer was often mentioned in argument against surgical treatment, but both these sequelæ were usually associated with a failure to reduce gastric acidity and this could almost certainly be avoided by correct and careful technique. It was extremely rare for carcinoma to develop in cases treated by gastro-jejunostomy. Quoting from his own figures, Mr. Walton said that from 80–92 per cent. of cases of gastric and duodenal ulcer treated surgically were free from symptoms five years after operation, and maintained that at present no figures of the results of medical treatment could compare with these. Going on to speak of disease of the gall-bladder, he advocated surgical treatment in certain cases of gall-bladder dyspepsia even when the pressure of stones could not be proved. He showed several gall-bladders removed from such cases in which extensive deposits of lipoid and, in some, small concretions, were present in the walls; which conditions, he contended, were very unlikely to be touched by medical treatment. In undoubted cases of cholelithiasis surgical treatment must be advised, and cases of acute cholecystitis should be operated upon as soon as diagnosed.

FEDERATION OF THE HEALTH RESORTS OF FRANCE.—A medical tour has been arranged by the Société Médicale du Littoral Méditerranéen to take place from Dec. 26th to Jan. 8th. It will include a visit to Marseilles, Toulon, Hyères, St. Raphael, Cannes, Le Cannet, Grasse, Juan-les-Pins, Nice, Menton, Monaco, Monte Carlo, Beaulieu, San Remo, Bordighera. Full particulars can be obtained from Madame Juppé-Blaise, Federation of the Health Resorts of France, 1, Gordon-square, W.C. 1.

ALMONERS UNDER THE LOCAL GOVERNMENT ACT.—A meeting of the Hospital Almoners' Institute has been held at the Leeds General Infirmary at which the position of almoners under the Local Government Act, 1920, was discussed. It was pointed out that the local authorities who take over poor-law hospitals will greatly need the help of trained almoners for follow-up work, since beds can only be emptied reasonably quickly by ensuring that the patients upon leaving go home to suitable conditions.

They had been well in the running for nearly all events, being beaten by 3 points in the Rugger final, and finishing in the semi-finals of the cricket and hockey. They had won the rifle cup, and (incidentally) the tug-of-war for the third year in succession. For old students of the hospital a post-graduate course was now in successful progress, and he welcomed this new departure because it would help to prevent London men from feeling themselves dissociated from their hospital. It was wrong that those who had spent five years there should come back as strangers, and he wished that they would more often return and introduce themselves to members of the staff on rounds in the wards or in the out-patient department, when they would be sure of a warm welcome. After referring to the work of Lord Dawson, Sir Hugh Rigby, and Sir Robert Stanton Woods during the King's illness, Mr. Lett went on to speak of senior members of the company present. These included Rampley, long in charge of the single operating theatre of the hospital, now in his eighty-sixth year, and the guide and friend of many generations of students; Sir Alfred Rice-Oxley; and Sir James Clark, son of Sir Andrew Clark. Their names recalled to Mr. Lett the days when general surgeons operated on everything; when there were no rubber gloves and sterilisation of the hands was carried so far that one surgeon used to snip off bits of his assistants' fingers and make cultures to see that they were sterile; when information about cases had to be sent up to Harley-street in a cab; when "compulsory anæsthetic" was an apt description of a process which often needed the coöperation of a member of the Rugger XV.; when the routine was that patients with fractures should be treated preventively for delirium tremens; and when the staff were met by their house surgeons in pomp and circumstance and morning coats.

Mr. George Neligan proposed the health of the chairman. "You will find him," he said, "in every walk of the life of the hospital, doing his work quietly; and if he gets what he wants then the thing is a success." Mr. Neligan believed that nowhere would be found a happier staff than that of the hospital at the present day, and so long as it contained men like Mr. Lett he failed to see how any Act of Parliament could do it down. After the chairman's health had been drunk to appropriate music, Mr. E. C. Lindsay said a few words as joint secretary of the dinner, and Dr. Russell Andrews told only one story—his meagre answer to a demand which has to be satisfied before any London Hospital dinner can be called complete.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Oct. 28th.—8 P.M., ODONTOLOGY. Presidential Address. Mr. J. McK. Ackland: Oral Sepsis in its Relation to General Disease. Casual Communication. Mr. F. N. Doubleday: Two Cases of Hypertrophy of the Jaw.
FRIDAY, Nov. 1st.—10.30 A.M., OTOLOGY (Cases at 9.30 A.M.). Presidential Address. Mr. W. M. Mollison: Triumphs and Failures of the Mastoid Operation. Papers have been promised by Mr. G. J. Jenkins, Mr. L. Graham Brown, and Mr. J. P. Stewart. Cases will be shown by Mr. Mills, Mr. L. Graham Brown, and others. 5 P.M., LARYNGOLOGY (Cases at 4 P.M.). Cases will be shown by Mr. W. S. T. Neville, Dr. Dan McKenzie, Mr. V. E. Negus, Mr. H. A. Kisch, Mr. T. B. Layton, and others. 8.30 P.M., ANÆSTHETICS. Discussion on Avertin Anæsthesia. Openers: Dr. J. Blomfield and Sir Francis Shipway.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Oct. 28th.—8.30 P.M., Discussion on Radium Therapy, to be introduced by Mr. A. E. Hayward Pinch and Prof. Sydney Russ.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Oct. 28th.—5 P.M., Mr. C. P. Wakeley: Specimens of Calculi.
FRIDAY, Nov. 1st.—Sir Arthur Keith: Spinal Deformities in the Sacro-iliac Region.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Oct. 28th, to SATURDAY, Nov. 2nd.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture by Dr. Maurice Davidson: Coughs. No fee. Tues., 8.30 P.M., Lecture by Dr. A. F. Hurst: Recent Work on Disorders of the Stomach. Fri., 8.30 P.M., Lecture by Dr. J. W. McNee: Recent Views on Diseases of the Liver and Biliary Tract. Specially suitable for M.R.C.P. candidates.—ST. BARTHOLOMEW'S HOSPITAL, City-road, E.C. Thurs., 1.30 P.M., Demonstration of Cases in the Wards by Sir Thomas Horder. No fee.—SAMARITAN HOSPITAL FOR WOMEN, Marylebone-road, N.W. Thurs., 10 to 12.30 P.M., Gynæcological demonstration by Mr. McKim McCullagh. No fee.—METROPOLITAN HOSPITAL, Kingsland-road, E. Special post-graduate course in Medicine, Surgery, and Special Branches. Daily, 10.30 A.M. to 5.30 P.M., demonstrations, operations and lectures.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Fri., 5 P.M., First of four weekly demonstrations in Antenatal Treatment by Prof. Dame Louise McIlroy.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Third week of course of Clinical, Ear, Nose and Throat work. All day.—Further particulars from the Fellowship of Medicine.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.
FRIDAY, Nov. 1st.—4 P.M., Dr. W. J. O'Donovan: Skin Diseases Common to Animals and Man.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Oct. 30th.—4.30 P.M., Mr. Stanford Cade: The Limitations of Radium Therapy on Genito-urinary Diseases.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Oct. 29th.—5 P.M., Dr. K. Sibley: Principles of Treatment. Local.
THURSDAY.—5 P.M., Dr. H. G. Burford: Pathology Demonstration.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Oct. 28th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.
FRIDAY, Nov. 1st.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.
MONDAY, Oct. 28th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. 4.30 P.M., Dr. Carter Braine: X Ray Therapy.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

NATIONAL HOSPITAL, Queen-square.
MONDAY, Oct. 28th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Syphilis of Nervous System.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: Disorders of Memory.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Nervous Symptoms in Sinusitis.
FRIDAY, Nov. 1st.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Some Infectious Diseases of Nervous System.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, Oct. 30th.—3.30 P.M., Dr. T. J. Hoskin: Heart Affections: Cause and Prevention.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Oct. 30th.—4 P.M., Dr. A. F. Hurst: The Asthma Problem.
FRIDAY, Nov. 1st.—5 P.M., Prof. R. A. Peters: Coördinative Biochemistry of the Cell and Tissues. (Third Harben Lecture).

ROYAL ANTHROPOLOGICAL INSTITUTE.
FRIDAY, Nov. 1st.—5.30 P.M. (in the Polytechnic Hall, Great Titchfield-street, W.), Dr. G. Elliot Smith: The Evolution of Man (Public Lecture).

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.
MONDAY, Oct. 28th.—5 P.M., Dr. J. S. Owens: Atmospheric Pollution.

CHADWICK PUBLIC LECTURES.
TUESDAY, Oct. 29th.—5.15 P.M. (at the House of the British Medical Association, Tavistock-square, W.C.), Prof. J. Boeke (Utrecht): The Tissues of Youth and Age.
FRIDAY, Nov. 1st.—5.15 P.M., The Nervous System in Relation to Health.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL, Albert Embankment, S.E.
TUESDAY, Oct. 29th.—5 P.M., Dr. A. St. G. Huggett: Physiology of the Fœtus. (Fourth lecture.)

CONFERENCE ON MENTAL HEALTH, Central Hall, Westminster, S.W.

Wednesday, Oct. 30th.—8.30 P.M., Inaugural Meeting. Sir Maurice Craig, Dr. Letitia Fairfield, Sir Frederick Willis, Dr. F. E. Fremantle, M.P., and others. (Chairman: Lord Brentford.)

Thursday.—4.30 P.M., Dr. H. Crichton-Miller, and others: Sex Education. 6 P.M., Working of the Juvenile Courts. 8 P.M., Dr. Millais Culpin and Prof. Winifred Cullis: Personal Equation in Industry.

Friday, Nov. 1st.—2.15 P.M., Dr. H. P. Newsholme and others: Place of Mental Hygiene in Social and Public Health Work. (Chairman Sir George Newman.) 4.30 P.M., The Child and the Parent. 8 P.M., Dr. J. A. Hadfield and others: Delinquency, A Problem in Mental Hygiene.

Saturday, 11 A.M., Dr. E. A. Hamilton-Pearson and others: The Problem Child at Home and in School. (Chairman: Dr. R. H. Crowley.)

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.

Friday, Nov. 1st.—5 P.M., Prof. V. H. Mottram: Human Nutrition. (Third of six lectures.)

KING'S COLLEGE, Strand, W.C.

Tuesday, Oct. 29th.—5 P.M., Mr. J. W. Pickering, D.Sc.: Blood Plasma and Platelets. (Fourth lecture.)

Thursday.—5 P.M., Mr. J. A. Hewitt, D.Sc.: Metabolism of the Carbohydrates and Fats. (Third of four lectures.

UNIVERSITY COLLEGE, Gower-street, W.C.

Monday, Oct. 28th.—5 P.M., Dr. R. J. Brocklehurst: Secretion of the Digestive Juices. (Third of four public lectures.)

Friday, Nov. 1st.—5.30 P.M., Mr. C. S. Elton: The Future of Animal Ecology. (Second of three lectures.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, Oct. 29th.—4.15 P.M., Mr. G. Jefferson: Concerning a Series of Pituitary Tumours.

Friday, Nov. 1st.—4.15 P.M., Dr. W. Sage Sutherland: Uses of Antiscarlet Fever Antitoxin.

ANCOATS HOSPITAL, Mill-street, Manchester.

Thursday, Oct. 31st.—4.15 P.M., Dr. A. Renshaw: Cystological Changes in the Blood and their Significance

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.

Friday, Nov. 1st.—3.30 P.M., Dr. Grout: Radiological Examination of the Gastro-intestinal Tract.

Appointments.

Bates, H. T., M.B., B.Ch., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Addingham District of the County of York, West Riding.

Clark, R. J., M.B., Ch.B. Aberd., D.P.H., Medical Officer of Health, Cheshire.

Potts, T. N. V., M.D., B.S. Durh., D.P.H., Medical Officer of Health to the West Riding County Council.

Sharman, Albert, M.B., Ch.B. Glasg., Extra-Surgeon, Out-patient Department, Royal Samaritan Hospital for Women, Glasgow, to a McCunn Research Scholarship in Gynæcological Surgery.

Vacancies.

For further information refer to the advertisement columns.

Adelaide University.—Elder Professor of Anatomy and Histology. £1100.

Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.

Bath, Royal United Hospital.—Asst. H.S. At rate of £100.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bethnal Green Hospital, E.—Asst. M.O. £350.

Birmingham City.—M.O. for Maternity and Child Welfare. £600.

Birmingham General Hospital.—H.P. £70.

Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £150.

Bradford Royal Infirmary.—H.P. £150.

Brighton, Sussex Maternity and Women's Hospital.—Res. H.S. £130.

Cambridge, Physiology School.—George Henry Lewes Studentship in Physiology. £250.

Cancer Hospital, Fulham-road, S.W.—Part-time Research Radiological Asst. 1 gn. each attendance. Also H.S. At rate of £100.

Cardiff, Glan Ely Tuberculosis Hospital, Fairwater.—Asst. Res. M.O. £250.

Carlisle, Cumberland Infirmary.—H.P. At rate of £155.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Asst. S.

Charing Cross Hospital, W.C.—Hon. Clin. Asst. for X Ray Dept. Also Res. M.O. £350.

Chester Royal Infirmary.—H.S. £120.

Coventry and Warwickshire Hospital.—Res. H.P. £160.

Derby, Derbyshire County Sanatorium, near Chesterfield.—Res. Asst. M.O. £350.

Dewsbury County Borough.—M.O.H. and School M.O. £900.

Dover Borough.—Asst. M.O.H. £700.

East Ham County Borough.—Deputy M.O.H., &c. £700.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.S. to Special Depts. At rate of £130.

Gloucester, Gloucestershire Royal Infirmary.—Second H.S. At rate of £100.

Gravesend and North Kent Hospital.—Jun. H.S. At rate of £80.

Great Yarmouth General Hospital.—Jun. H.S. £125.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. At rate of £250.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.P. At rate of £100.

Hull Royal Infirmary.—Hon. Ophth. S.

Italian Hospital, Queen-square, W.C.—Res. M.O. At rate o £150.

Jersey General Hospital, &c.—Res. M.O. £200.

Kingston-upon-Hull City and County.—Asst. M.O.H. £600.

Leicester, Leicestershire County Council.—Asst. County M.O.H. £650.

Liverpool, Alder Hey Children's Hospital, West Derby.—Res. Asst. M.O. £200.

Liverpool County Borough.—Jun. Asst. Sch. M.O. £600.

London Hospital, E.—Dental Anæsthetist.

London Jewish Hospital, Stepney Green, E.—Hon. Asst. Radiologist.

Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.

Middlesex Hospital and Medical School, W.—Medical and Surgical Registrar. £300.

Miller General Hospital, Greenwich-road, S.E.—Orth. H.S. At rate of £150. Hon. Surg. Also Hon. Physician to Skin Dept.

Northwood, Mount Vernon Hospital.—Asst. Pathologist. £500.

Nottingham General Hospital.—Second Cas. O. At rate of £150.

Oldham, Poor-law Institution, Rochdale-road.—Res. Asst. M.O. £200.

Plymouth City.—Asst. M.O.H. for Maternity and Child Welfare Dept. £600.

Portsmouth Royal Hospital.—Sen. H.S. At rate of £175. Also H.P. and two H.S.'s. Each at rate of £130.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Med. Reg.

Queen's Hospital for Children, Hackney-road, E.—Clin. Asst. for Orthopædic Dept. 5s. each attendance. Cas. O. £100. Also Surgeon to Ear, Nose and Throat Dept.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. At rate of £250.

Royal London Ophthalmic Hospital, City-road, E.C.—Surgeon to Ear, Nose and Throat Dept. Also Out-patient O. £100.

Royal Naval Dental Service.—Dental Officers.

Royal Society, Burlington House, W.—Foulerton Research Student. £700.

St. Mark's Hospital for Cancer, &c., City-road, E.C.—Clin. Assts.

Sheffield City Hospitals, Infectious Diseases.—Res. M.O. £350.

Sheffield University, Faculty of Medicine.—Lecturer in Pathology. Also Demonstrator in Pathology. Each £500.

Southern Rhodesia Government.—Director of Public Health and Medical Services. £1750.

Stroud General Hospital.—H.S. At rate of £125.

Swanley, Kent, Alexandra Hospital for Children with Hip Disease.—Res. Asst. M.O. At rate of £300.

Walsall General Hospital.—Sen. H.S. Also H.S. At rate of £200 and £150 respectively.

West End Hospital for Nervous Diseases, Welbeck-street, W.—Hon. Asst. Physician.

Weymouth and District General Hospital.—H.S. £180.

Windsor, King Edward VII Hospital.—Hon. Asst. S.

Worcester General Infirmary.—Sen. Res. M.O. £180. Also Jun. Res. M.O. £120.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Ammanford (Carmarthen) and Milborne Port (Somerset).

Births, Marriages, and Deaths.

BIRTHS.

Addison.—On Oct. 18th, at Wilbraham-place, S.W., the wife of Dr. G. M. Addison, of a daughter.

Farman.—On Oct. 7th, at Haverstock-Hill, N.W. the wife of Dr. Noel B. Farman, of a son.

Mathews.—On Oct. 14th at Kirkby Lonsdale, the wife of R. G. Mathews, M.B., B.Ch., of a son.

Reichwald.—On Oct. 20th, at Timber Hill, Ashtead, Surrey, the wife of Dr. M. B. Reichwald, of a son.

MARRIAGES.

Barnes—Newman.—On Oct. 16th, at St. Philip's Church, Kensington, Warren Alston Barnes, M.B., B.Ch., to Helen Newman, M.B., B.S., elder daughter of the Rev. and Mrs. Herbert Newman, of Stone, near Ashford.

DEATHS.

Bevan-Lewis.—On Oct. 14th, William Bevan-Lewis M.Sc., L.R.C.P., M.R.C.S. Eng., of Priory-street, Cardigan, aged 82 years.

Lee.—On Oct. 15th, at "Sainssoins," Little Shelford, Cambridge, Crichton Stirling Lee, M.R.C.S., L.R.C.P., aged 50.

Rouse.—On Oct. 14th, suddenly, at Monte Carlo, Rolla Edward Rouse, M.D., in his 70th year.

N.B.—A fee of 7s. 6d is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HEALTH AND CONDITIONS OF WORK OF MEDICAL STUDENTS.*

BY E. GRAHAM LITTLE, M.D., F.R.C.P., M.P.,
PHYSICIAN IN CHARGE OF THE SKIN DEPARTMENT AT ST. MARY'S HOSPITAL.

I. HEALTH.

MY choice of subject was dictated by the consideration that I gave the corresponding inaugural lecture last year upon the Health of the Doctor, and it was suggested to me that an inquiry into the health of the embryo doctor might be useful. I was filled with consternation, however, when I began to come to grips with the subject, at the nearly complete absence of any data, which had been quite abundantly present in the case of the Health of the Doctor, as there is a well-defined category of statistics concerning the health of general practitioners in the compilations of the Registrar-General's Office, but there is no category of medical students.

Sir James Paget's Analysis.

The only direct reference to the subject which I have been able to find is a very short paper by Sir James Paget, published in St. Bartholomew's Hospital *Reports* for 1869. Paget there considered the question under the heading, What Becomes of Medical Students? and his inquiry is not entirely limited to the stage of pupilage, nor is the chief attention given to the health of the persons considered so much as to their achievement. But out of a round number of a thousand of his own pupils whom he thus passes in review, 41 actually died during pupilage, 15 failed to qualify, and 96 relinquished the profession after beginning either its study or its practice. Of the 41 who died, 17 are recorded as suffering from tubercle and 2 committed suicide. It is interesting to note that 87 died after beginning practice, one of whom was hanged for murder, the notorious Palmer of Rugely, who, Paget remarks caustically, "was an idle, dissipated student, cursed with more money than he had either the wisdom or the virtue to use well." Paget began his paper with the remark that he was not aware that any attempt had been made previously to answer his question; and I have been unable, as I have said, to find any reference to the matter I am now considering since Paget wrote. I am hopeful, therefore, that the subject will not at any rate be a hackneyed one.

In the last annual report of the Ministry of Health (June, 1929) the statement is made that the sum estimated for the current year as being required to carry out the service of that Ministry is not less than £23,028,000, a sum which is nearly a million more than for the previous year. The value of these services rests almost entirely upon the fitness of medical men and women to perform the duties required, and the preparation of the army of practitioners who will be called upon to execute these functions becomes a matter of considerable public importance. When one considers the enormous increase in the complexity of the education of the medical student since Paget's time, and notably the extension of the actual duration of his training, one would perhaps surmise that the mortality of students, both as regards their relinquishing the profession as well as being invalided or dying out of it, would be materially increased.

Inquiry of Deans of Medical Schools.

Unhappily, it has been extremely difficult to get any reliable information upon these points. As a preparation for this paper I sent out a letter to the deans of all the principal medical schools in the British Isles, and I have received a large number of replies, which I shall roughly analyse. (1) A preponderant number replied that they had no data, and could not obtain them. (2) A considerable number replied that, while furnishing no actual figures, the writers were convinced that the mortality from illness amongst medical students was very small, quite a curious consensus of opinion placing it as "about 1 per cent." More definite information has been supplied by two schools, Leeds and St. Mary's Hospital. The following letter from the Dean of the Medical School of Leeds is reproduced with his permission.

Health of Medical Students at Leeds.

"I can only speak," he writes, "in general terms. Before the war I noted that the mortality or disability from tuberculosis was about 5 per cent.—*i.e., about one each year, in an entry* of 20. I do not remember any other cause of withdrawal. We lost no student by infectious disease or abdominal trouble, and certain cases of death from pneumonia occurred in students who had withdrawn for other reasons.

"Since the war there have been very few cases of tubercle, and some deaths from influenza and cerebro-spinal meningitis not to be attributed to the line of life. I have attributed the decrease of tubercular cases to the better conditions of student life, as all lodgings must be inspected and registered, and the facilities for outdoor exercise have increased vastly. Daylight saving and the decrease of monkeying about town in the evening may have had an influence, but it has to be noted that the tubercular cases pre-war occurred usually in students of very orderly lives in that respect.

"The student of the present day spends far more time out of doors, *and I note that there is much less difference in his condition* at the beginning and end of terms than there used to be. In pre-war days the student had little recreation without much trouble in transport. Now he can work in a game of tennis all the year round, or a game of golf, instead of crawling out to a pub. with a billiard table."

Withdrawal of Students at St. Mary's Hospital, London.

The following statistics have been prepared from a list of some 400 entries to St. Mary's Hospital Medical School between 1917 and 1924, the number of men and women students being approximately the same.

Number of students who, having entered upon a medical course, fail to qualify .. .. 9·3 per cent.
(Men, 13·5 per cent; women, 5·1 per cent.)

Number falling out at the various stages of the curriculum—
(*a*) Before completing the first exam. .. 4·9 per cent.
(Men, 7·6 per cent.; women 2·2 per cent.)
(*b*) Before completing the second exam. .. 1·7 per cent.
(Men, 2·5 per cent.; women, 0·9 per cent.)
(*c*) After completing the second exam., and before becoming qualified .. 2·7 per cent.
(Men, 3·4 per cent.; women, 2·00 per cent.)

Reasons for Withdrawal.

Men.—Of the 32 withdrawals dealt with during the above eight years, the following were the causes so far as can be ascertained.

(1)	Ill-health .. .. (Lung trouble, 2; shell shock, &c., 2; mental, 1.)	5
(2)	Financial difficulties	6
(3)	To take up good business openings	2
(4)	Failure to take an interest in the work	8
(5)	Suspended for misconduct	2
(6)	Uncertain (but not ill-health)	9

Women.—(12 withdrawals).

(1)	For the purpose of being married	6
(2)	Personal ill-health ("lung trouble")	1
(3)	Illness of relations	1
(4)	Suspension for unsatisfactory work	2
(5)	Uncertain (not ill-health)	2

It will be seen from these records that tubercle still seems to head the list of causes of death or withdrawal amongst medical students, and it is of some significance in this connexion to note the reply from Guy's Hospital, in which the statement is made that two house officers during the last five years were obliged to give up their appointments on account of tubercle. In only one reply has suicide been mentioned as a cause of death.

Comparison of English and American Systems.

The strenuous character of the present-day training of medical students, a training which involves very hard and continuous study for an average period of seven years between the entrance examination and qualification, marks out medical students as a class apart, and perhaps justifies my considering this question from this limited point of view. We have practically no statistics in this country of the health of students in general; but a considerable volume of literature from American sources upon this subject is now available, to which I shall refer in a few minutes. Health Education Service, as this has come to be named, forms a very important part of the administration of American universities and schools, and one cannot but regret that the subject has received no attention in this country where haphazard methods still rule. The American student nowadays is very carefully "vetted" before he is allowed to come to college, still more carefully examined for his physical fitness to undertake an industry or profession, and most severely of all for his suitability to enter upon arduous athletic exercises.

It will perhaps be contended that our system, which is lacking in all these features, succeeds by survival of the fittest, but this is surely a somewhat expensive and unscientific method of dealing with the circumstances involved. To wait, as is sometimes recommended by shortsighted observers, for treatment until the individual feels ill, which is still too much the habit with our people, is both unscientific and desperately uneconomical. Most sensible persons nowadays make a point of visiting their dentists two or three times a year, even in the absence of symptoms of toothache; and the same precautions should obviously be followed in other departments of medical practice. It is, I think rightly, contended by the advocates of the American careful methods of examination at college that the young people who have been through this mill become apostles of health and spread far and wide more scientific conceptions as to the care of mind and body than prevail amongst those not so instructed, and a still further ultimate advance in the high standard of health amongst the American population may be confidently anticipated. The American universities, where co-education is the rule, also supply some data on the relative resistance of men and women to wear and tear of training for professions generally. In our schools, where co-education is much more recent and on a very much smaller scale, no sufficient data are available.

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* An address given at the Royal Institute of Public Health on Oct. 16th, 1929.

The time is ripe, I think, for a consideration on broad lines of the health of students in general, both in secondary schools and in universities, and it is an anomalous fact that his consideration is given very meticulously in the secondary schools which are under State or municipal control but hardly at all in the great public schools of the country and in the universities, both of which categories are under voluntary management as distinguished from State or municipal management. There is no brighter outlook for the operation of preventive medicine than in this particular function of watching over the health of the adolescent and the young adult. The results obtained from the care given by the State to this function are so encouraging as to force upon us the conviction that medical watchfulness should be exercised in all departments where young people are undergoing a community education, whether at the expense of the State or of the individual. Some interesting comparisons have been made of the physique of public school boys as compared with boys attending State schools, and hitherto the comparison has been in favour of the public school boy who obviously starts with greater advantages, coming as he does from well-to-do households as compared with relatively poorer surroundings. But the later examinations are more and more proving that the State-educated adolescent is fast catching up, and even surpassing, the public school boy in this matter of physique. That some of the conditions of life at public schools require radical alteration was borne in upon me by a recent professional experience. I was consulted about an outbreak of body ringworm in an old-established house at one of the greatest and most famous of our public schools. The house contained 40 boys, all of whom were found to be infected, and the matron and housemaster, whom I interviewed, admitted that it was the rule, owing to the paucity of bath rooms in an old-fashioned house, for ten boys to use the same water one after another, and the promiscuity which such conditions inevitably engender very amply explains the overwhelming character of the epidemic in that particular house.

American Health Service.

The care taken by American colleges in sifting students before entry has no counterpart in this country, and I submit that we have much to learn from American methods. Although the American Health Service, as it is called, is of comparatively recent establishment, some valuable data have already been afforded. It is interesting to note that the principle was in the first instance initiated nearly half a century ago by the enterprise of some women investigators who were concerned to find that women students compared unfavourably in health conditions with men, and proceeded to ask why. Periodical medical examinations and careful "vetting" of women students began at once to make a difference so perceptible that the men copied the idea. Very much of the high health standard of the American people is due to the coöperation and intelligent watchfulness of women who, during the last 30 years, have learned from their college days to busy themselves as housewives, with the nutritive value and the purity of foodstuffs, and by unity of action through the agency of leagues or unions of consumers throughout the country have been able to insist upon the supply of better food. To quote one item only, the quality of American milk is immeasurably better than the quality of milk sold in this country, and I understand that probably as a result glandular tuberculosis is non-existent in the United States.

These health services have spread all over the colleges of the United States. Here are some examples of what is done. At a great industrial college in the United States inquiries are made of intending applicants for entry (1) whether the applicant should come to college at all; (2) what form of industrial occupation he may be physically fitted to undertake if admitted; (3) how he may improve his physical condition so as to make the most of his opportunities both in industry and at college; and searching inquiries upon these subjects are made through the medium of family practitioners, whose coöperation is usually readily obtained. Several interesting facts have become apparent from a study of these American statistics. In a prominent women's college, for example, the unexpected finding was that women students tended to show an actual deterioration of health during college life as compared with the men in a similar college. The figure quoted states that the women dropped 10 per cent. while the men gained 6 per cent., a contrast explained by the writer as being due to the women taking their work too seriously, and he forms the pessimistic axiom: "the higher the intellectual attainment in the subjects of health and disease, the lower seems the health intelligence. The greater the theoretical knowledge of health, the poorer seems the practice."

Another index to the value of leisure and healthy exercise is afforded by a comparison of the health of self-supporting students, that is to say, students who maintain themselves by other occupations during their study, a feature much more common in American than in British colleges. The health of students thus working overtime, as it were, compared unfavourably with the health of students who were not so handicapped, and illness in women of this class was more than twice as large as in men of the same class.

University of Minnesota.

In the University of Minnesota, with a student body of 10,000, of whom about half are stated to live at home, the health service is a very elaborate and important part of university administration. Its expenses are partly met by a compulsory fee exacted from each student, constituting about half of the actual expense of the service. The completeness of provision for overhauling disease actually provided in this University[1] is indeed remarkable. A very efficient medical service on a part-time basis has been developed and is under the direct control of the President of the University through a subordinate officer called the Director of the Health Service. The examinations conducted by this service include entrance physical examinations, periodic health examinations, and special physical examinations. Defects and abnormalities which are discovered by the entrance examinations are followed up during the school year with remarkably beneficial effects in a series of departments, such as general medicine, eye, ear, throat, &c. An improvement in defects averaging 60 per cent. was noted. Special physical examinations are exacted of students who wish to participate in athletics, and the American student is thus very thoroughly "vetted" for the particular form of athletics which he may wish to practise. An extensive out-patients' service forms part of the machinery of defence against disease, and ample provision is made for infirmary treatment, the compulsory fee covering a certain measure of infirmary treatment every year. Vaccinations, immunisations, immunity tests, are extensively used. One of the most important and typical of the measures taken in this service is the careful watch kept upon nutrition; observation is made of the student's diet, and his habits of eating, sleeping, recreation, worry, work, &c. The provision of medical services upon the spot naturally effects a great saving of time, and the accessibility of the departments may be gauged by the use which the students make of them. For example, during the year 1925–26 about 1800 students made 8772 visits to health departments, exclusive of the entrance dental examination which is one of the largest departments in the University. The number of hours per week actually given by the medical staff is comparable to the service at a great teaching London hospital.

University of Cornell.

Another valuable contribution is in a paper[2] upon the organisation of health education at Cornell University, New York, by the medical adviser, Dr. D. F. Smiley, who states that for the last three years each entering class at Cornell University has shown progressively fewer physical defects and faulty health habits than the preceding class. The means adopted at Cornell University are very fully detailed in this paper, and the sense of responsibility towards the students entertained by the University authorities is clearly very much better developed than it is with us. There can be no question also that, as Dr. Smiley remarks, these inquiries furnish the most admirable opportunities for research in the field of health-education amongst students in general, and should furnish also data for estimating the incidence, and perhaps the causes, of numerous minor disorders—colds, glycosuria, the effect of exercise upon minor abnormalities of the heart and vessels, &c.

The actual institution of these services at Cornell dates from 1919, so that they have now had ten years working of the full programme, but hygiene had been a subject of instruction at Cornell since its foundation in 1868. The department is under the control of a committee of four members appointed by the President of the University who retains a coördinating control. It is operated by physicians, and it has been found that full-time physicians are preferable to part-time physicians; that men physicians are preferable for men, and women physicians for women; that young physicians are better than old ones; and practical experience has shown that there is enough work to employ one physician for every 500 students, and it is hinted that this proportion must be soon increased. The activities of the Department of Hygiene are described under five headings: (1) health examination; (2) medical consultation; (3) communicable disease control; (4) health education; (5) research. Every undergraduate and every entering graduate is required to have annual physical examination. No athlete is permitted to represent the University on an athletic team without having qualified for and procured a certificate from the medical adviser's office. Medical services are open daily from 9 A.M. to 6 P.M., and something like 25,000 voluntary consultations are recorded per year. Each student pays $5 a term for the services, which includes the free use of the University infirmary in cases requiring bed-treatment.

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[1] Journal of Preventive Medicine, 1927, p. 377.

[2] Public Health Reports (U.S. Public Health Service), 1926, 2631.

The value of this method is demonstrated by the experience of an epidemic of influenza occurring in the year in which the report was written. Early treatment, rendered practicable by these conditions, of 658 cases of influenza resulted in keeping the incidence of pneumonia after influenza to less than 1 per cent. of the total number of cases, an incidence which compares very favourably with the usual statistics of influenza. These careful measures further allow of the compilation of extremely useful statistics. Lost time during the year amongst 3724 men students was 1·1 per cent., and amongst 1173 women it was 1·8 per cent., figures which compare favourably with an earlier inquiry at Cornell by Dr. Emerson in 1919–20, when the loss of school hours was for the men 1·5 per cent. and for the women 2·4 per cent., and this is notwithstanding the disturbance of the statistics occasioned by the very severe influenza epidemic in 1926.

The Life Extension Institute.

The actual monetary value to the State of the improvement in the health of individual citizens resulting from periodical medical inspection is demonstrated in a series of papers contributed by experts in life insurance, a subject much more carefully and scientifically studied in the States than here. A group of men prominent in American public life, including Surgeon-General Gorgas of Panama fame, ex-President Taft, Dr. Fisk, and Dr. Ley, in 1914 started a scheme of periodical health examinations conducted under the auspices of an institution founded by the group and called the Life Extension Institute. The services of this body were taken advantage of in the first instance by the great insurance company, the Metropolitan Life Insurance Company of New York, and a very significant review of the results obtained after six years' experience is contributed by Dr. Storey. During that period the company had medically examined on this system of periodical examinations about 6000 people at a cost of $60,000, and had gained, through the premiums of persons whose lives had been extended as a result of these examinations and the correction of minor defects, no less a sum than $120,000; the company had thus made 100 per cent. on its investment, and its example was speedily followed by numerous other insurance companies, so that it is stated that the Life Extension Institute has examined over half a million patients since its inception. A consideration of nine years' operation of these services showed a reduction of 18 per cent. in the death-rate of policy-holders affected, and amongst a group of impaired lives a reduction of over 50 per cent. in the death-rate. With the typical American business grasp, in another paper the capital value of this improvement in health is carefully assessed and set out. The money-equivalent of this improvement is estimated at no less a sum than 3150 million dollars in the year 1924. The figures are based on the estimate of the value of the individual to his or her family or dependents, and upon this basis the curious comparison is made that while in 1922 the material assets, other than this human capital, in the United States was 321,000 million dollars, the human capital upon the principle just described was, in 1924, nearly five times as great, and the business value of this system of health service is thus very abundantly demonstrated.

II. CONDITIONS OF WORK.

With regard to the conditions of work of medical students, which is the second title of my paper, these have changed so radically, even since the time of Paget, as to make comparisons difficult between the present-day conditions and those of earlier years. Unhappily the transcendent genius of Dickens has stamped his presentation of medical student life in the persons of Bob Sawyer and Ben Allen upon the minds of successive generations as being typical of medical student life in general. Even in Dickens's day this picture must have been a caricature, and no other picture has been drawn upon the same subject with any distinctiveness or force since he wrote the immortal "Pickwick." With the exception of some slight sketches by Conan Doyle the medical student does not seem to have figured since that date in English literature. The preparation for the profession of medicine has become so arduous and so absorbing that the medical student is kept to the grindstone very completely throughout the long seven years which form the average period of study. Nevertheless, it has become apparent from a study of the meagre statistics available that health conditions have improved very considerably, even in England. Housing of medical students, though still too little thought of, is immeasurably better, especially in the case of the big towns. As mentioned, the Dean of Leeds University regards the improvement under this heading as being largely responsible for the better general health of medical students noticeable even since the war.

The life of the medical student in the London schools differs very considerably, and must differ, from that of the fortunate student at the older residential universities. It is one of the disadvantages of the excellent training given in London that the student is restricted to intercourse with his own fellows and is not, as at a university, very easily able to mix with students of other faculties. This restriction, while mischievous in some respects, engenders in the student an extraordinarily ardent, if narrow, patriotism for the school at which he has been educated. To a member of a London school, such as Guy's or St. Bartholomew's, his hospital and all its interests acquire almost the force of a religion, and the friendships made in this narrow environment are often lifelong and abiding. Indeed, it is something of a reproach that there is so little understanding of or sympathy with other schools on the part of the students of one school. A rigid favouritism is apt thus to grow and to be reflected in the phenomenon that it is seldom that the choice of members to fill vacancies on the staff goes outside the magic circle of the school, a condition of things which is happily breaking down at present under the stress of new university appointments, now made by the University of London, with the financial help of the University Grants Committee.

Study and Relaxation.

With the drive exercised by the necessity of passing an ever-increasing number of increasingly difficult examinations the conditions of pupilage have changed very notably. It is no longer possible, as it was when I was a student, for a man to remain, as one of my fellow-students actually did, at his hospital for more than 18 years, at the end of which period he had not taken his first qualification. Much more control is exercised now upon the work of the student, and the incorrigibly idle or incompetent student is asked to leave his hospital after a certain period of probation if he should have failed to mend his ways. It is not surprising that with so persistent and so harassing a study the need for relaxation in sport and other outlets for energy is greater in the case of the medical student than perhaps in the case of any other class, and the cultivation of athletics has almost gone beyond reasonable limits in many medical schools, where the prizes of resident appointments are often given more for athletic prowess than for academic distinction. The rebound of the medical student from close application is sometimes a little exuberant, as for example in the regrettable incidents which recently attracted the notice of the London police-courts when medical students disturbed the proceedings of an antivivisection meeting. But the astonishing sobriety and restraint of medical students of the present day as a class offers indeed a sufficient contrast to the attitude of mind depicted by Dickens, and to the general conception of medical students still prevailing with a large number of people.

Medical study has become in our own generation completely transformed by the advance of medicine in its scientific outlook. With the immense increase of scientific discoveries new subjects have been continually added to the curriculum, and at the present moment the medical student has to be "signed up," as it is called, that is, certified as having attended, classes in something like 40 subjects. There seems to be no finality in this accretion, and it has long been obvious that certain changes are necessary in the preparation of the student. The period of study, which now approximates to seven years, cannot well be extended; some rearrangement of subjects must therefore come about. The present duration of the training requires so large an expenditure of time and money, both on the part of teaching schools and of students, that the profession of medicine is becoming more and more restricted to those who start with considerable private means and who enjoy an unusual degree of vigour and ability, and doubtless this latter feature accounts for the relatively small mortality; the student is a picked student from the beginning.

Numbers Seeking Entry.

It is interesting to note the variation in numbers seeking entry into the profession. Thirty years ago the average entry in the British Isles had been about 1800. It dropped during the next decade and a half to something like 1400. During the war the wastage of doctors and the demand for their services at the Front led to a somewhat unnecessary alarm on the part of the public that the profession might become dangerously depleted, so that by the end of the war the entry approximated 2250, and for two or three years after that date even exceeded this number, the peak figure being 3420 in one year (1919). During the past five years the entry has stood round these figures: 1043, 1070, 1260, 1214, 1363. With the exaggerated entry following upon the war, the number of new practitioners registering each year has greatly exceeded the pre-war figures, so that in 1928 the number of medical men upon the Register was actually 10,000 more than in 1918, and 20,000 more than in 1898. It may be said shortly that the number of registered practitioners up to the end of the first quarter of the present century was almost exactly double the number 50 years ago, but the population of Great Britain and Ireland in that period has not increased by more than about 50 per cent., so that the increase of population has been very much less than the increase of medical practitioners has been, and the ratio of doctors to population is much higher than before.

Much of the increase has been absorbed by the rapidly increased demands of public health work, and there is considerable prospect of these demands increasing and not diminishing; but it is clear that the medical profession, if not actually overstocked at the present time, runs some risk of being so. However, the prospect of obtaining work after so prolonged a preparation for it may, at the present moment, be said to be on the whole favourable. Much discussion has taken place during the past year as to the position of medical women, whose entry during the war years was disproportionately large as compared with men. Evidence is somewhat conflicting, but my personal impression, founded upon reliable data, is that a far larger number of medical women are earning a sufficient livelihood by medicine than the pessimists allow.

Prospects.

Whatever may be the future of the medical student, there can, I think, be little question that his training is now so far-reaching, so catholic, and so well selected, that the student who receives a medical training is thereby fitted for his life's struggle in any direction, more completely than any other member of the community. The success of medical students who forsake medicine and undertake other pursuits or professions corroborates this statement. Indeed it may be said that the medical man of to-day has much the best general education of any member of the community, professional or otherwise, and the rôle of the priest in the Middle Ages, when the priest was the only educated person amongst his fellows, is becoming transferred to the doctor, with repercussions both upon the doctor and upon the public which are producing some curious effects at the present moment. The desire and the search for health have become greatly extended; a much wider proportion of the people are actively interested in these questions, and at the same time woefully ignorant upon them. The function of educating this eager public has been assumed largely, not by instructed members of the medical profession, but by irresponsible and mostly anonymous newspaper writers, and there is considerable demand for an alteration of this state of affairs, a demand which is still difficult to supply; this is a problem which many leaders of the medical profession are considering at the present moment.

State Control.

All the political portents go to show that there will be an ever-widening provision of State medical service, which now absorbs more than 17,000 members of our profession, and many observers think the time is approaching when all the medical services will be State-controlled. The body entrusted with the inspiration and guidance of medical education, the General Medical Council, has been subjected to severe and usually ill-informed criticism, and in response to a certain clamour, Parliament added two or three years ago a lay member to the composition of that Council, which, by the force of circumstances and not by design, had become restricted to professional men. The admirable choice was made of Sir E. Hilton Young, M.P., who recently told me that he has been very favourably impressed, perhaps rather contrary to his expectation, by the judicial wisdom, more especially in its much criticised disciplinary function of the General Medical Council. A comparison of the status of the medical profession before and after the foundation of the General Medical Council must convince any impartial observer of the enormous value of its services in the half century during which it has been in existence. A very beneficent and recent activity of the Council has been its insistence upon better training in preventive medicine, an aspect of that art which is becoming more and more valuable. With the increased competition brought about by the large increase in members of the profession, there has been an increasing demand for the possession of university degrees as distinct from qualifications of licensing bodies not enjoying university status. There are now 11 universities in England and Wales with fully developed medical faculties, and the University of London alone comprises in its medical faculty no less than 12 distinct and competing medical schools. Some 20 years ago the medical schools were able to persuade the University Grants Committee that medical education as a technical subject was eligible for block grants from the Exchequer, and these subventions have become one of the main elements in promoting the stability of the schools. Perhaps, naturally, the grant-giving bodies at first sought to eliminate what they deemed the weaker schools, especially in London, but notwithstanding considerable pressure to this end, all the 12 schools have survived, and the competition is all to the good in ensuring an increasing effort to improve the conditions of life and opportunities of training of medical students. It may, I think, be said with confidence that the London medical schools generally enjoy a higher reputation at the present time than in any other within living memory.

Littré's Definition.

Fifty years ago Littré, in his great dictionary, gave a definition of medicine which showed an uncanny foresight of its present developments. He described medicine as "the art which has for its purpose the preservation of health and the cure of disease, and which rests upon the study of the science of disease, or pathology." The preservation of health, which Littré thus placed first, rather than the cure of disease, has become the absorbing motive of medicine within the last few years, and the function of the doctor in promoting the preservation of health has made him perhaps the most valuable artificer of the fortunes of our present-day civilisation.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 12TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 131 (last week 97); scarlet fever, 3060; diphtheria, 1582; enteric fever, 104; *pneumonia*, 809; puerperal fever, 50; puerperal pyrexia, 115; cerebro-spinal fever, 7; acute poliomyelitis, 20; encephalitis lethargica, 18; dysentery, 7; ophthalmia neonatorum, 100. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 15th–16th was as follows:—Small-pox, 166 under treatment, 8 under observation (last week 141 and 4 respectively); scarlet fever, 2263; diphtheria, 2069; enteric fever, 30; measles, 166; whooping-cough, 157; puerperal fever 30 (plus 14 babies), encephalitis lethargica, 125; poliomyelitis, 6; "other diseases," 20. At St. Margaret's Hospital there were 23 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 6 (1) from enteric fever, 11 (2) from measles, 4 (1) from scarlet fever, 21 (3) from whooping-cough, 41 (3) from diphtheria, 186 (49) from diarrhœa and enteritis under two years, and 29 (3) from influenza. The figures in parentheses are those for London itself.

The deaths from diarrhœa are on the wane, the highest figures being reported from Birmingham and Liverpool, each 14, Hull 13, Sunderland 8, Middlesbrough 6, while Glasgow, Dublin, and Belfast reported 0, 9, and 4 respectively. The deaths from enteric fever were reported from Brentford and Chiswick, Portsmouth, Huddersfield, Halifax, and Newcastle-on-Tyne, each 1.

The number of stillbirths notified during the week was 274 (corresponding to a rate of 42 per 1000 births), including 54 in London.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—On Monday, Nov. 4th, Princess Louise will lay the foundation-stone of the first block of the new Queen Charlotte's Hospital in Hammersmith.

Harveian Oration

ENTITLED

CIRCUMSTANCES IN THE LIFE AND TIMES OF WILLIAM HARVEY.

Delivered before the Royal College of Physicians of London on Oct. 18th, 1929,

BY SIR WILMOT HERRINGHAM, K.C.M.G., C.B.,
M.D. OXF., HON. M.D. TRIN. COLL., DUB.,
FELLOW AND SOMETIME CENSOR OF THE COLLEGE; CONSULTING PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL; LATE VICE-CHANCELLOR, UNIVERSITY OF LONDON.

IN such a quest we look first into a man's own writings. Of Harvey's Discourses you have heard enough. They shed a certain light on his character, but hardly any on the events of his life. Such as it is, all is well known to you already. From private letters we expect more. But of the few of Harvey's letters which are preserved, several refer merely to anatomy and add nothing we did not know. One, *it is true, that to Dorchester, better known as* Sir Dudley Carleton, shows that, however careless Harvey may have been about business, he, at any rate, took care not to lose a good position when he had got it.

Lastly, there remain the letters to Lord Feilding, later the Earl of Denbigh, and a rather incompetent Parliamentary General. They are priceless, for they show Harvey in a new character as the discontented British tourist. He is perfectly true to the type. He is detained in quarantine at Treviso, and he is furious with the wooden stupidity of the officials who will not let him through, he is furious at the quarters in which they have housed him, and he is more furious still at their daring so to molest an English gentleman of no small importance.

The chief passages in Harvey's Life are well known. They have been collected by Sir D'Arcy Power, and Sir Thomas Barlow added an account of his University years. I may, however, give you a few which I do not remember to have seen mentioned.

In 1625 the Duke of Buckingham was accused of poisoning King James by a plaster applied to his arm. Harvey was examined before the House of Commons. He had been in attendance during the King's last illness, had been present when the plaster was applied, and did not know what it was made of, but he saw no ill-effects from it. He was one of a committee of this College which, in 1627, reported on some alum works in the parish of St. Botolph and *condemned* them as a nuisance.

In 1633, on June 23rd, when he was with King Charles for the coronation in Holyrood, he received the freedom of Edinburgh and was made a Guild brother at the banquet given to the King by the city.

In 1641 he went to Aberdeen, and on August 28th received the freedom of that city. This was the year in which Charles tried unsuccessfully to raise a Scotch force against Parliament. It was not, I think, known before that Harvey accompanied him on this occasion, as well as in 1630 and 1640.

In 1644 the King sent the Duke of Richmond and Lennox and the Earl of Southampton as Commissioners to treat for peace at Uxbridge with the Parliament. Harvey went in the suite of the Duke of Richmond and Lennox, with whom he had travelled in France 14 years before, and his friend Edmund Smith went thither also in the suite of the Earl of Southampton.

In November, 1646, he was given a pass from Oxford to Newcastle to attend the King as his physician. But he did not follow the King to Holmby House, nor do we find that he was ever again in attendance. Charles was never out of health, as we know from Sir Thomas Herbert, during the remainder of his life, and no physician was among the few servants who were allowed him.

In 1650 Harvey was given a pass to go to London to attend his old patient, Lady Thynne. She had to guarantee that he would take no steps prejudicial to the Commonwealth, but that was merely the usual precaution observed with anyone who had been with the late King.

David Lloyd, in his Memorials of certain persons who suffered during the Rebellion, published in 1668, states that Harvey was fined £2000 by Parliament.

THE FAMILY.

Harvey's next brother, John, was Sergeant or head of one of the departments in the Household, became on his resignation Receiver of Crown Lands in Lincolnshire, and died in 1645 Member for Sandwich. His executor was the younger Harbottle Grimston, one of the most respected of the Parliamentary party.

The five remaining brothers were all in trade. Two of them, and apparently only two, were in the Grocers' Company. Daniel was elected in 1611, when he was only 24, and was given a loan of £50 out of a benevolent fund founded by the Company to start young members in trade, and Eliab, was elected in 1616. Both held office, and Daniel was elected Sheriff and Warden, but paid the fine to escape service. Foreign trade was then in the hands of chartered *companies. The chief exports were cloth, a trade as* old as Charlemagne, lead and tin. The oldest was the Merchant Adventurers Company, which had the monopoly of the trade with the North Coast of Europe from the Elbe to the Scheldt. Their books are lost and we cannot therefore tell if the Harveys were in it. But there was a smaller company of Merchant Adventurers trading with France, of which Daniel and Matthew were certainly members.

In 1627 Charles, in one of the vagaries of his senseless foreign policy, confiscated some French ships. The French retaliated by confiscating British goods in France. This led to litigation, and Daniel and Matthew were accused before the Privy Council by their fellow Adventurers of acting in collusion with the French merchants. The matter seems to have dropped as no subsequent proceedings are recorded. The other two great companies were the Levant Company and the East India Company. The Harveys were in both.

It seems to have been a family characteristic to refuse to pay entrance fees. In 1616, Thomas and Daniel, partners and "Farmers of the pre-emption of Tynne," were admitted to the Levant Company. Thomas paid his "fine," as it was called, of £25, and this admitted the firm. Daniel was abroad. But when Thomas died in 1623, aged 38, Daniel, by the rules of the Company, became liable for a fine. *Nothing* would induce him to pay it, and the Company did not get it out of him till December, 1625. Eliab and Michael did not join till 1637, when the fine was £50. They also refused to pay, and haggled for months with the Company until they obtained an abatement. They repeated the process in the East India Company. Daniel was already a member in 1624. Eliab, Michael, and Matthew were elected in 1628. "The fine was left to their discretion though it was considered that they could not give less than £10 to the poor-box." They not only could, but did. At the next meeting "they took the accustomed oath, the court expecting from them some reasonable fine in that respect, but they presenting to the Court but £6, which, howbeit, they refused not, yet they wished that Daniel Harvey would acquaint his brothers that the Court expected they would have enlarged themselves in a more bountiful manner, for the favour conferred upon them is not usually permitted to any under £20 a man."

In 1633 there is a delicious bit of sharp practice by Daniel. When a ship came home the members bid for the cargo, and the payment was due some months later. The usual rate of interest was then 7 per cent., and Daniel moved that the Treasurer should be ordered to receive such moneys as he should bring in upon discount for pepper at 8 per cent., on the grounds that it was much better for the Company to

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receive its own money at 8 per cent. than to borrow outside at 7 per cent. The Treasurer, however, took a different view and threatened to resign. It is not surprising to find that the Company supported him.

Clarendon, in his "Life," states that Daniel had the reputation of knowing more about trade than any man in England, and that Archbishop Laud, when he was made Commissioner of the Treasury in 1636 on the death of Weston, consulted him frequently. They were near neighbours, as the Archbishop had a house at Croydon and Daniel lived at Combe near by.

There is further evidence on the reluctance of the Harveys to part with money. When the Civil War broke out both Parliament and the King found themselves in great straits for money. Both, at first, raised it by voluntary contributions and the King never had much from any other source. Parliament, very early, began to exact contributions and their first essay was by the methods in vogue in former reigns. The levy of one-twentieth was ordered on all goods and movables. Under this Daniel Harvey was assessed in Dowgate ward. In April, 1643, he was ordered to pay £1500, but in November this was raised to £5000. The money was extracted from him with great difficulty. In May, 1644, he was imprisoned at Lambeth House. In August they threatened to deport him to Plymouth. By Dec. 20th he had paid £3000. In February, 1645, he is ordered to pay £500 more within a fortnight, and in July he was brought up before the Commissioners to answer objections against him. In 1650 he died, and in 1652 Eliab, his executor, made an affidavit that he had paid £4000, whereas his rightful share was only £1360, and his estate was thereupon credited with £3000 on the Public Faith—corresponding to our funds. Eliab was assessed at £2500. He absconded for a time. His goods at Roehampton were distrained but were bought up by his brother-in-law, Colonel Francis West, afterwards Lieutenant of the Tower for Parliament. Eventually he was brought up in custody and forced to pay up. The brothers were not alone. Many citizens behaved, and were dealt with, in the same way. Later, Parliament raised money by assessment on counties, also an old method, and great difficulty was always experienced in collecting it. The continual arrears in pay were what gave the Army its power, as it refused to be disbanded unless payment was made and no money was available for the purpose.

But the Harveys did not confine their operations to pepper and currants. In later life they dealt largely in land. Land was then easy to buy. All the royal lands, all the episcopal lands, and all the cathedral lands were up for sale. Parliament also dealt very hardly with the Royalists and only admitted them to composition for their property under heavy fines. A man with a rent roll of £1000 was usually fined £2000. As he had already spent all he had, and melted his plate for the king, and as there were then no other ways of investing money than in land, he could not pay his fine without selling some of his property. To sharp business men like the Harveys it was a great opportunity. They evidently acted together, for the brother who becomes the owner is often not the ostensible purchaser.

By the end of the first generation, therefore, the Harveys, including William, had become large landowners. Matthew, who died in 1642, owned land in Kent and Surrey, Michael's sons had a Dorsetshire estate worth £21,000, Daniel had Combe and property in the Midlands and elsewhere, and left his widow £1200 a year besides, and Eliab had Roehampton and Chigwell and a house in Broad-street, besides other properties, and left also £1500 a year to his widow.

Only two of the branches lasted long. William, John, and Matthew had no children. The Michael branch died out in 1712. Thomas's only son, known as John Harvey of Antwerp, I have been unable to trace.

Young Daniel married into the Montagu family which took a leading part in bringing back Charles II. He obtained with his wife Combe Neville, an estate adjoining Richmond Park, was a member of the Convention Parliament of 1660 which voted the Restoration, was knighted by Charles the first day he landed, along with young Eliab, his cousin, and obtained a grant of arms which, up to that time, the family did not possess. He was a courtier, was made Ranger of Richmond Park, was a friend of the notorious Castlemaines, and died as Ambassador at Constantinople in 1672. His son Edward, of Combe Neville, was a Jacobite and wasted his fortune. In 1750 Edward's surviving son sold the property. Daniel's sisters married well. Elizabeth married Heneage Finch, an honest man and an excellent lawyer, who became Lord Chancellor and Earl of Nottingham. Mary married Sir Edward Dering, of Surrenden Dering, and Sarah married an Irish peer, Lord Bulkley.

Young Eliab remained in business, and in 1672 was proposed, though not elected, for Governor of the Levant Company. He had a great house in Broad-street which just escaped the Great Fire, and was made keeper of the King's game in Epping Forest, where one of his properties, Chigwell, was.

He was succeeded by a long line of Williams and Eliabs, who were country gentlemen and M.P.'s—in the Parliament of 1678 there were no less than four members of the family—with occasional soldiers. The last of the line was a distinguished sailor, Sir Eliab, who, when a midshipman, nearly lost the property at the gaming table, commanded the *Temeraire* at Trafalgar, and in 1800 was cashiered for insulting his admiral, Lord Gambier, who had promoted Cochrane over his head. He was restored, however, the following year and died in 1830, G.C.B. and Admiral of the Blue. He left no son and, through one of his daughters, Rolls Park at Chigwell descended to the late Sir Francis Lloyd, whose widow still lives there.

THE TIMES—SCHOOL AND UNIVERSITY.

Let us now consider some of the conditions of Harvey's own life. He was brought up at the Cathedral School of Canterbury, one of the best in the country. At that date Latin was the universal language. It was the language of learned men, the language of diplomacy and of travel. Every bachelor of divinity had to preach in Latin, the young barristers used it in their moots in the Inns of Court, the accounts of the Royal household and even some of the merchants' accounts were kept in it. Accordingly it was the aim of every good school to make its boys not only able to read, but able to speak Latin, and in the statutes of Canterbury dated 1541 it is ordered that the boys, whether at work or play, should speak nothing but Latin and Greek, but Greek was rarely taught in schools. You may remember that Montaigne, who lived about that time, was not allowed to speak any language but Latin until he was six. Greek was brought into the schools by the Calvinists who returned to England on the accession of Elizabeth. For them Greek and Hebrew were the two sacred languages, and for the study of the Bible Greek became common in the schools and even Hebrew was sometimes taught.

We may therefore confidently suppose that Harvey went to Cambridge able not only to read, but also to speak Latin after a fashion, and with some knowledge of Greek. The old free University had given place to a system of Colleges and Halls founded to train priests by pious benefactors, of whom the greatest, though not the first, was my own founder, William of Wykeham. The life was hard and the teaching narrow. Into these ecclesiastical seminaries the classic revival of the fifteenth century in Italy, patronised by Humphrey, Duke of Gloucester, and other great men, brought a fresh inspiration. At Oxford, Linacre and Grocyn were as good Grecians as any in Europe. Wolsey and Fox and Henry VIII. all encouraged and endowed Classical studies. But the Classics, and especially Greek, were attacked for their Paganism both by the old religion and the new. In Oxford, Greek soon fell into contempt. At Cambridge, under Cheke and Smith, it held better. By Harvey's time it was re-established. Spenser, who went up in 1570, was a Platonist, and Harvey was devoted to Aristotle.

But meanwhile the universities had fallen on evil times. The Church had been plundered by the Crown and also by its own patrons, both lay and ecclesiastic. Spenser, in Mother Hubberd's Tale, describes the lay patron bargaining with an unfortunate clergyman, before he would present him to a £40 living, that he should resign half the income to the squire's son. The case of Wokingham was reported to the Long Parliament. It was in the gift of Salisbury. The Dean and Chapter had leased the rectory and tithes to a layman, there was no vicarage, and the parishioners had, for many years, to pay a preacher out of their own pockets. The upper clergy were Pluralists. One man might hold several benefices. The lower clergy were accordingly half starved, and as a natural consequence were grossly ignorant, careless of their duties, and sometimes drunken and corrupt. Scandalous benefices beget scandalous ministers. It was this state of things that gave the Calvinist attack such strength. The Church fell as much by its own faults as by the virtues of the Calvinists.

The absence of decent prospects in the ministry led to a great falling off in the number of students. Added to this the destruction of the monasteries had deprived the universities *of* the large numbers of scholars whom they sent up with exhibitions. In the middle of the sixteenth century the numbers had fallen to a few hundreds, nearly all the halls were closed, and the colleges were half empty. Further, the ecclesiastical character of the universities laid them open to interference by the Head of the Church, now the Monarch. By voting for the divorce they had placated Henry VIII. But under Edward VI. all the heads and professors who sympathised with the old religion were expelled. Under Mary the process was renewed in the opposite direction. Eleven heads were expelled in Cambridge alone. Under Elizabeth the Act of Supremacy was enforced, with a similar expulsion of all Romanists, and the universities became violently Calvinist.

In 1578 the Vice-Chancellor of Cambridge and two other leading Dons broke into Caius College and destroyed all the decorations with which Caius, who was a High Churchman, if not a Papist, had beautified the Chapel. In 1595 Whitgift, the Archbishop of Canterbury, and a synod of bishops drew up the Lambeth Articles, of which the following are specimens:—

> 1. God, from all Eternity, hath predestined certain men unto life: certain men He hath reprobated.
> 2. The moving cause of Predestination unto Life is not Faith or Good Works or "anything that is in the person predestinated," but only the Goodwill and Pleasure of God.
> 3. There is predetermined a certain number of the Predestinate, which can neither be augmented nor diminished.
> 4. Those who are not predestinated to salvation shall be necessarily damned for their sins.
>
> * * * *
>
> 7. Saving Grace is not given . . . . to all men by which they may be saved if they will.
> 8. No man can come unto Christ unless the Father shall draw him; and all men are not drawn by the Father.
> 9. It is not in the will or power of everyone to be saved.

This cheerful view of the future was, however, too much for Elizabeth. She sent for her little black husband, as she called Whitgift, and, after giving him what, in those days, was called a rattling, told him to withdraw the Articles altogether, which he had to do. James, who loathed the Scotch Calvinists, threw all his weight on the same side. In 1011 Laud, who, in spite of the violent opposition of the two Abbots, George the Archbishop and Robert, Master of Balliol, had led a growing High Church party in Oxford, was elected President of St. John's, and by 1022 Oxford had become anti-Calvinist. Cambridge followed suit, though considerably later.

Meanwhile, however, a great change had taken place in the material circumstances of the universities. Elizabeth, who loved to air her accomplishments, began the system of Royal visits to the universities with all their solemn puerilities, which was continued by James and Charles. She made the universities fashionable. Donations were made by her courtiers, and the numbers rose, at the end of her reign, to 2500 at Oxford and nearly as many at Cambridge. Venn says that 1590 to 1640 was the zenith of the universities until quite recent times. The result was not an unmixed blessing. The rich youth who now flocked in brought with them the manners of the Court, and for many years the Statute books are full of decrees against extravagance in dress, drunkenness, gambling, insubordination, and such unseemly sports as football. An undergraduate twice convicted was to be whipped. Simmons D'Ewes could find no fit associates in 1018 but a few Dons.

All this had, however, little effect upon the poorer students. Their life continued as hard and scanty as it was before. Harvey went to Caius with a Matthew Parker scholarship. The capital endowment of it was £61 13*s.* 4*d.* Elizabeth, in 1559, made an injunction that all clergy whose benefices were worth £100 or more should, for every £100 of their income, contribute £3 0*s.* 8*d.* as an exhibition for a scholar at the universities. Under James existing professorships received additional revenue, among which the Chair of Physic at Oxford was augmented by the Mastership of Ewelme Hospital, and fresh chairs were set up in Mathematics, in Natural and in Moral Philosophy, and in Anatomy. All these at Oxford. Similar improvements, no doubt, took place at Cambridge.

During the Rebellion both Universities were at first Royalist, for Cambridge was preparing to send its plate when it was prevented by Cromwell, but Scarborough was expelled from Caius for his loyalty, and the University had by this time been overpowered by the Parliament. Oxford was loyalist throughout, and after the King's death refused to take the oath prescribed by Parliament, for which it was punished by a visitation under Philip, Earl of Montgomery and Pembroke, the Chancellor who succeeded Hertford. On his death in 1050 Cromwell became Chancellor, and under his tolerant rule Oxford had comparative rest.

Of Harvey's feeling to Cambridge we know nothing. He is not known to have returned there after taking his degree, though, as he was at Newmarket in 1030 attending the young Elector, it is possible he was present at some ceremony.

THE SCIENCES: MEDICINE.

To understand the England of Harvey we must imagine a society to which science was unknown. To us the growth of knowledge by observation and experiment is a common-place. Every morning we read the discussions of some scientific conference or are informed of a new discovery. In Harvey's time the few sciences that existed were little removed from magic, and the great majority, including all the biological sciences from botany to sociology, did not exist at all. Alone in the great mind of Bacon had the real meaning of science been grasped, and the immensity of its future conceived. Men still ascribed the action of the brain and liver to spirits, and the causes of disease to disordered humours. Not only had they not yet comprehended that such operations could be examined by physical methods, but they resented as heresy little less than criminal all attempts to correct the mistakes and supplement the deficiencies of great predecessors such as Galen, which would have been welcomed by no one more warmly than by Galen himself.

Chaucer does not give a very good character to his Doctour of Physicke.

"In all the world ne was ther non him lyk
To speak of physik and of surgerye
For he was grounded in astronomye,"

and therefore could tell his patients' prospects by the stars.

> "He knew the cause of every maladye
> Were it of cold or hete or moist or drye
> And where they engendrid, and of what humour;
> He was a very parfight practisour."

Then he describes his understanding with his apothecaries.

> "For eche of hem made other for to wynne
> Here friendship was not newe to beginne."

Then he describes a list of the old authors that he knew, and goes on to describe his rich dress.

> "And yit he was not esy in dispence,
> He kepte that he won in pestilence,
> For gold in phisik is a cordial
> Therefore he lovede gold in special."

Bacon, in his "Advancement of Learning," published in 1604, the year that Harvey took his degree, describes with great shrewdness the difficulties of medical practice, and sums up:—

> "So then the subject being so variable hath made the art by consequence more conjectural, and the art being conjectural hath made so much the more place to be left for imposture.
>
> "And therefore I cannot much blame physicians that they use commonly to intend some other art or practice which they fancy more than their profession. For you shall have of them antiquaries, poets, humanists, statesmen, merchants, divines, and in every of these better seen than in their profession; and no doubt upon this ground, that they find mediocrity and excellence in their art maketh no difference in profit or reputation towards their fortunes.
>
> "Medicine is a science which hath been, as we said, more professed than laboured, and yet more laboured than advanced,"

and the reasons that he gives are "the discontinuance of the ancient and serious diligence of Hippocrates" in taking notes of cases, the neglect of morbid anatomy, and the absence of exact inquiry into the effect of drugs.

In Bacon's own lifetime two men, Mayerne and Harvey, partly, we may think, owing to Bacon's criticism, and partly, no doubt, because they shared in the scientific spirit that was just beginning to awake, worked exactly as Bacon advised. We have Mayerne's clinical and post mortem notes in his own beautiful handwriting here in the Library. Harvey's, to which he himself alludes, are unfortunately lost, but he had them in 1648 when the letters to Riolan were published, and it is possible they may yet be found. They revived the old Hippocratic tradition, and they were followed, after the Restoration, by Willis, Lower, Glisson, and Sydenham.

It is difficult to judge exactly what Harvey's position was in the general estimation. He attended Bacon himself, and also his successor, Lord Keeper Williams, Bishop of Lincoln, and the latter's biographer, Bishop Hacket, tells how "that great secretary of nature, Dr. William Harvey," saved William's life in what seems to have been a dangerous attack of enteric in 1624. We know the names of other patients, Sir Thomas Thynne and Sir Thomas Sandys, from certificates that he gives of their unfitness to travel. He also attended the Lord Treasurer Weston who was laid up with an attack of the stone at York during Charles' expedition to Scotland in 1633. He says he lost practice by publishing the De Motu, but he must have regained it when he was made Physician to the Household. He practised medicine, surgery, and, it seems by his notes in the De Generatione, diseases of women especially.

The title of Medicus Regius, meaning Physician to either James or Charles or their Queens, was held by no less than 16 men besides Harvey. Five of them were knighted, which Harvey was not. Sir Matthew Lister was Physician to Henrietta Maria, and when she was confined at Exeter in 1644, he and Mayerne went down to see her. But the great man of the time was Sir Theodore Turquet de Mayerne. In 1644, the Queen, writing to him, signs herself "votre bien bonne maitresse et amie," and Charles writes "Mayerne, Pour l'amour de Dieu, allez trouver ma femme."

On May 19th, 1645, he was paid the greatest compliment that Parliament has ever, I suppose, paid to a medical man. The Lords sent down a message to the Commons:—

> "The Lords desire that the House of Commons would join with them in expressing their esteem of a man whose extraordinary abilities would make him welcome in any part of Christendom: and as he is singular for his knowledge in his profession, so he may be singular in being by the favour of the House exempted from all payments which others are subject unto: it being but a continuation of that favour which he hath enjoyed for about 30 years without interruption."

The House of Commons agreed by 69 to 66.

OTHER SCIENCES.

The other sciences in Harvey's time were as little advanced as medicine. Chemistry was first studied seriously by Robert Boyle at the end of Harvey's life; physics had produced in 1600 the book of Gilbert, President of the College that year, on the Lodestone, a work of the first class of which parts are still standard. Napier had in 1614 invented logarithms. But the science which advanced most rapidly in Harvey's life was astronomy. Galileo was lecturing in Padua when he was there, Kepler died in 1630, and in 1637 a poor Lancashire clergyman named Horrocks with borrowed lenses observed for the first time the transit of Venus. It has been questioned whether Harvey attended Galileo's lectures. As Galileo drew enormous audiences it is almost certain that he did, but if so they seem to have made but small impression for his references to astronomy are merely to disparage its methods in comparison with the direct observation of anatomy.

There was, however, a good deal of amateur experiment and invention. Prince Rupert dabbled in chemistry, the Marquis of Worcester had set up at Raglan Castle hydraulic machinery which frightened the Parliamentary Commissioners out of their wits, and Petty patented his first invention in 1647. There was also a small group of men who sought relief from the troubles of the times in the study of natural philosophy. They met in London up to 1648 and latterly at Gresham College, which Hobbes says had absorbed the natural sciences from the universities, but as in that year it was used as a barracks they transferred their meetings to Oxford. Harvey was at Oxford when they met in London, and when they met at Oxford he had already left it. He never therefore formed one of the group, which was the nucleus of the Royal Society. Even so it is rather curious that Sprat's "History of the Royal Society" (published in 1667) makes no mention of Harvey as a precursor.

In striking contrast to the infantile condition of science was the maturity of art and literature.

THE ARTS.

In Harvey's time there was a great enthusiasm for painting and sculpture. Charles is said to have had the finest collection of pictures in Europe. Arundel was second only to the King. Denbigh also collected. But they were not alone. Buckingham and many others were collectors, and it was not confined to court circles. Colonel Hutchinson was a good judge and Mrs. Cromwell had a collection of portraits. There was no native school, though Dobson painted good portraits, but the seventeenth century was the age of the Dutch, Flemish, and Spanish schools, and collectors can seldom have had such chances. Vandyck lived for several years at different times in England and Rubens was sent over as ambassador.

Harvey was undoubtedly interested in painting, for Arundel gave him a commission to buy for the King in Italy, and when he escaped from quarantine he travelled to Florence and Rome under the guidance of Mr. Petty, a clergyman who collected in Italy and the Near East for Arundel. By his introductions he was very courteously treated by the Grand Duke of Tuscany, who was a scientific man, and by Cardinal

Barberini at Rome, but he was an amateur at buying and failed to get anything of value.

Another art that was universally cultivated then was music. From 1590 to 1640 English music was at its zenith. The Puritans stopped ecclesiastical music, but rather because it was favoured by the bishops than that they themselves objected to it. There was a good deal of destruction of organs and church instruments at the hands of the soldiers. But it was not widespread, and the Puritans themselves sang psalms. Secular music was never thought wrong by anyone, and it is quite untrue to say that the Puritans set their faces against it. Bunyan, Milton, Cromwell, and Colonel Hutchinson were all devoted to music, and Colonel Hutchinson to dancing also, yet no one was a stricter Puritan than he. Cromwell was the first man who provided a Court Concert as an entertainment for his friends. His Ambassador to Sweden, Whitelock, took musicians with him, and was himself a performer. In fact in those days it was a regular part of a gentleman's education, whatever his religion or his politics. One of the best composers of song music was Henry Lawes, to whom Milton writes an Ode, and he, in 1655, published a collection of Ayres, dedicated to Lady Dering, who composed three of the pieces in it. This is Daniel Harvey's daughter. Mrs. Hutchinson also composed. In the ten years 1650 to 1659 there are 34 publications of musical works.

But of course nothing equals in significance the fact that Harvey's life was practically conterminous with what we term Elizabethan literature, the greatest outburst of literary genius that the world has ever seen. The first three books of the "Faerie Queene" were published when Harvey was 11 years old, and Herrick's "Hesperides" in 1648, when he was 70, and between those dates lie all the greatest names in English literature.

I have wondered whether, in their early married life, Dr. and Mrs. Harvey took a boat across to Bankside, where Shakespeare's plays were being given at the Globe up to 1613. I have wondered, too, what Harvey thought of the "Religio Medici" which was circulating in MS. in 1636 and what he would have said to Browne if they had met. We know Browne's opinion of the "De Motu." In recommending it to his son Edward and another doctor called Power, he speaks of it as a greater discovery than that of Columbus.

Harvey quotes Virgil and Terence, but he gives no sign that he had ever read or heard of the great writers of his own day. But a writer on scientific subjects can hardly be expected to quote contemporary poetry. Tennyson's "In Memoriam" shows that Tennyson had read Darwin, but I do not remember that Darwin quotes Tennyson. It does not seem a habit of great men of science to quote poetry. We need not, therefore, suppose that Harvey's silence means that he was without knowledge of the wonderful art around him; on the contrary, we know that he mixed with men who held it in the highest honour. Charles kept a Shakespeare in his bedroom. But in the first half of the seventeenth century the interest of most men was turned not to literature, nor to painting, nor to science, but to two subjects, which of all others are the most inimical to the cultivation of science or of art, politics and religion.

POLITICS.

The chief social change in the sixteenth century was the rise in wealth and influence of the upper middle class, including the squires in the country and the merchants in the towns. Both were of the same stock, for younger sons went into trade, and merchants who succeeded bought land. Some families combined both. The Barnardistons were an old Suffolk family in 1600, and are there still. The head of the family in Charles's reign, Sir Nathaniel, was Governor of the Levant Company and a prominent Member of the Long Parliament. The squires profited by the ruin, in the Wars of the Roses, of the old nobility whose estates they bought, and also by grants and cheap leases of the Abbey lands under Henry VIII.; both they and the merchants, by the great increase of the cloth trade which began under Edward IV., increased under Henry VII., and continued with fluctuations throughout the century. It led to a great demand for sheep pasture, and this in turn to a fourfold rise in rents, as related by Latimer, and to a large reduction of arable land to pasture, as described in the Utopia. But this again threw so many labourers out of work that Elizabeth was obliged to pass a new poor-law to save them from starvation. The House of Commons was practically filled by the squires, the merchants, and the lawyers who sprang from both.

The Tudors, the ablest and the only native dynasty we have ever had, knew the House of Commons thoroughly, and except in matters of religion, managed them with great tact. But Elizabeth, with all her prestige and popularity, so clearly recognised their reluctance to grant money that she practised the most sordid parsimony, suffered her great public servants to die in poverty, and poisoned the soldiers and sailors who saved England with bad victuals sooner than ask for supplies.

James, coming as a foreigner from a country where the middle classes had no power, and ignorant of our great political struggles in past centuries, was as entirely unable to recognise the position of the Commons as he was personally incapable of dealing with them. His silly profusion brought him rapidly to poverty, and he presented the ironic spectacle of a King blustering about his sovereign power and in the same breath begging for money to pay his tradesmen. No wonder that the Commons lost their loyalty to the Crown. In 1621 James tore out of the Commons' Journals the dignified declaration in which they stated their rights and liberties, and in 1625 he died at the end of the negotiations for the Spanish match, an enterprise begun with the usual Stuart disregard of the national feeling, pursued with the usual Stuart duplicity, and ending in the usual Stuart ill-success.

For Charles there was less excuse. He had taken a prominent part in politics for some years before his accession and had abundant opportunity to learn. But if a man cannot learn by experience, wherewithal can he be instructed? He was, in his first years, dominated by his evil genius, Buckingham, and though the Commons undoubtedly treated him very badly at that time, yet surely no man could have treated them with less tact than Charles. A Venetian wrote of him: "This King is so framed by Constitution that he can never oblige any man by word or deed." When he finally decided to govern without Parliament, his arbitrary measures, if not against the letter of the law—and it must be remembered that he had the warrant of most of his judges for what he did—were so completely against the spirit both of the Constitution and of the Petition of Right, which he had recently signed, that he irretrievably alienated both Parliament and the country.

Moreover, both parties, the King and the Commons, were equally justified in distrusting each other. If the Commons had good cause to distrust Charles, and they certainly had, Charles had equally good grounds to distrust them. Faction ran high; what was voted on Monday was rescinded on Tuesday, and at the end the majority who wished to continue negotiations were expelled from the House by the Minority and the Army.

In my young days small boys were occasionally puzzled by the question "What happens when an irresistible force comes against an immovable post?" It not inaptly represents the positions of the Parliament and the King.

RELIGION.

But the desire for political liberty had small influence compared to the violence of religious fanaticism. Religious grievances were invariably placed first in all the transactions of the House of

Commons. Henry VIII., to gratify his own passions, had led the nation to revolt from the Pope. But beyond a change of supremacy the religious practice of England was, for many years, little altered. Gradually, however, and more rapidly after the Marian persecution, Calvinism spread over the whole of England and Scotland. The City of London and the universities were its chief strongholds.

It is difficult for us to understand its appeal. Probably few Fellows of the College have laboured under the conviction of original sin and the certainty of damnation which clouded Cromwell's early manhood, or have experienced the assurance of saving grace which was his comfort and support in later life. But we can imagine how men, accustomed to the lax religion of the time, administered by an ignorant and careless clergy, for such they were, must have been affected by the greatest Revival that has ever taken place, to which Wesley and the Salvation Army are but ripples on a pond to a storm in the ocean, and what, to men living under the formalism of Rome, must have seemed the splendour of Calvin's great announcement that the creature could commune with the Creator, that the individual soul could approach the Divinity, that there was no barrier between God and man. Men's minds are naturally fascinated by horrors. Gloomy creeds have created the fiercest enthusiasm, and the Independents, the logical sons of Calvin, though he would have been the first to disown them, formed the most remarkable army that England has ever raised.

But if we find it hard to understand the acceptance of Calvinism, still harder is it to comprehend a society in which toleration was not only not approved, but was even abhorred as treachery to God. The Puritans were mocked as saints, but they spoke of themselves by the same term, and it was not always undeserved. Some of them were as truly saints as any that religion ever had. But even such men hated their opponents with a violence we can hardly believe, and had no thought of allowing them any kind of toleration. Calvinist, Arminian, Anglican, Independent and Papist, each was convinced that his own opinion was the true, and each was determined that it should be enforced on every man, woman, and child in the country.

Posterity has undoubtedly approved the political aims of the Long Parliament and looks upon it rightly as the preserver of English liberty. We are, therefore, the more astonished to observe the complete dearth of constructive political ability which marks their ranks. They pulled down everything; they built nothing. The Calvinists destroyed the Church, the Independents destroyed the Commons, the Lords and the Monarchy, and they themselves, when they turned out the Rump and set up the Protectorate, were attacked by the Republicans and Fifth Monarchy men, who plotted the assassination of Cromwell.

Compare what Cromwell, honestly anxious to restore good Government, could do for England in the years of his power, with the complete system of administration, religious, educational, judicial, municipal and financial, which Napoleon established between 1800 and 1811; or if you like a modern instance, with the system of government established in Italy since the war. It may be that when Mussolini dies the edifice will fall, but see what force and what creative imagination he has displayed.

The Government under the Commonwealth is, in England, a long series of failures, and in Ireland one of the greatest political crimes on record. Charles lost his cause, luckily for us. But in the personal struggle he was the victor. He had more foresight than any of them. He always believed that the rebellion would break down and the monarchy be restored, if not in his time, then in his son's. Accordingly he resisted to the utmost, and by so doing forced his foes into such violent and illegal courses as completely lost them the sympathy of the nation. After his execution they never dared to summon a freely elected [illegible] it, they were driven to acts of great [illegible] despotism, and when the strong hand of Cromwell was removed, they perished by their own dissensions and by the universal detestation that their tyranny had evoked.

But if posterity has approved the political aims of the Long Parliament, it has condemned their religious purposes no less emphatically. The views which Laud held about the Anglican Church are those now held by its members, the clergy now are as Laud would have had them, and the services are such as Laud wished and would have aroused Elliot to fury. But these are small matters.

The great vice of the age was its intolerance, and the religious mania, for we can call it nothing else, which overran England between 1560 and 1660 like an epidemic, did not even, like bodily epidemics, leave a population behind it immune to its particular poison. Never was religious hatred more bitter than after the Restoration, and in its graver forms it persisted for over a century and a half. Catholic emancipation was not carried till 1829, Oxford and Cambridge were not thrown open till 1871, and mutual respect and goodwill between the Free and the Established Churches is a growth of the last 30 or 40 years.

It has been claimed that the Puritans preserved the family life of England from the corruption and the licentiousness of Court manners. Such statements assume, on the one hand, that the Court society of the day was something exceptional, and on the other that the manners of the capital were the manners of the country. Neither is true. The fashionable London society of that day, as of this, was composed of people in affluent circumstances, occupied chiefly with their own pleasures and their own selfish interests, with leisure and without, for the most part, serious occupation. Can you suppose that such a society could exist, have you ever known such a society to exist either in London or any other capital against which the accusation of vice and folly could not be brought? There was nothing exceptionally wicked in society then. There were some scandals—the Somerset and the Purbeck stories, for instance, there were drunkards and profligates, there were family quarrels—when Lady Hatton asked James to dinner he suggested it might be a good occasion to make up her quarrel with her second husband, Sir Edward Coke; she said if her husband came in at one door she would go out at the other. But in all these points was society then very different from the present, and could we not from the law reports parallel every one of them over and over again at the present day?

Charles himself was too uxorious, and at a time when old Lady Arundel and young Lady Derby, when the elder Lady Verney, whom her husband always called "Good Puss," and the younger Lady Verney, whom the whole family nicknamed "Mischief," when Mrs. Hutchinson and Lady Wandesford and Lady Fanshawe, and, above all, Dorothy Osborne, were alive, and when the stage was trodden by those exquisite types of English girlhood, whom we could match to-day, Portia, Rosalind, and Celia, Beatrice, Imogen, and Miranda—do you think that there can have been much amiss with the position of women?

It is said too that to the Puritans we owe that sturdiness which has kept and increased the liberty they won. Neither is this to be accepted. Lived there no brave men before Agamemnon? Did not the men of that day expressly proclaim themselves followers in their fathers' footsteps, guardians of what they had obtained by peril of their lives? The temper of a great nation is a thing too firmly set to change under every blast of new doctrine, and its history is the consequence of its character, not the cause of it.

The Puritans were the guardians of spiritual fervour at a season when religion had become cold and dead. Such seasons of decay occur from time to time, and the Puritans are neither the first nor the last of the Revivalists. Whenever need arises such men have a great part cast for them on the world's theatre, and none of us should criticise them.

so harshly as to refuse them their due praise. But we owe to them the loss of half the beauty of England. They destroyed the drama, they sold the finest collection of pictures in Europe, and even ordered the religious pictures to be burnt as superstitious, there is not a village church which does not bear the marks of their barbarous hands, and three several times it was proposed in Parliament to pull down the Cathedrals and sell the materials for what they would fetch.

But, after all, our interest is not to praise or blame the actors in this great tragedy. It is to consider what was Harvey's attitude to the great struggles, political and religious, that were taking place around him. And of this we obtain from himself no evidence whatever. He mentions the King and Queen two or three times in the "De Generatione," but without any word either of affection or regret, which indeed in 1651 it might not have been prudent to print. He mentions Parliament once, complaining that the mob had destroyed his collections, though he was attending the King with the permission, and even at the command, of Parliament. There remains only the message that he is said to have sent to Scarborough, who was an ardent royalist, "Leave thy gunning and come here and I will bring thee into practice." But that may be significant.

We may well believe that he would not approve either the folly and tyranny of Charles or the violence and malice of his foes. To Harvey the war must have seemed a vast catastrophe, for which both parties were alike responsible, from which little good was gained, and by which the progress of knowledge was irreparably hindered.

And for religion. No man of serious character then doubted the fundamental beliefs of Christianity, and Harvey was of a reverent mind. But we cannot fancy his sympathising either with Laud's formal discipline or with the brutal irreverence of the Puritans. Harvey's religious feelings, we may be sure, were too sincere and too deeply felt ever to be published to the world.

Addison once asked Garth of what religion he was. Garth replied, "Wise men all hold the same religion." "What is that?" said Addison, and Garth answered, "Wise men never tell."

A STUDY OF THE EFFECT OF RADIANT HEAT ON THE PRODUCTION OF ACTINIC ERYTHEMA.

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AN investigation into the effect of radiant heat on the production of actinic erythema was started in May, 1928, and was carried out at first in the actinotherapeutic department of the Royal Free Hospital and later, when laboratory conditions became essential, in the physics department of the London School of Medicine for Women.

The possible interaction of shorter and longer wave-lengths is of some practical and clinical importance. Infra-red radiations constitute a large proportion of the energy given out by all sources of ultra-violet light, the association of radiant heat with mercury-vapour light treatment has been advocated and incandescent filaments are used as resistance units in some types of mercury-vapour lamps. Moreover, it may be presumed that clinical differences in the therapeutic value of mercury-vapour and carbon arc lamps depend partly on different percentages of the various wave-lengths in these sources of ultra-violet energy.

No attempt has been made in this preliminary investigation to estimate the therapeutic value of combining long and short wave radiation. The effect of the rays on the production of actinic erythema was alone investigated. It was hoped that a study of the skin reaction might give some indication which would prove to be of clinical value.

The following references to the more important contributions on the subject indicate the divergent opinions held by various observers. Thedering,[1] in 1916, stated that, in the treatment of one patient, red and infra-red light immediately after an erythema dose of ultra-violet light diminished the intensity and duration of the cutaneous reaction. Benoit,[2] in 1923 and 1926, stated that the addition of infra-red to ultra-violet light diminishes the cutaneous reaction. Infra-red preceding ultra-violet irradiation will increase the reaction, and following it will produce a local clearing of the erythema. Peemoller[3] quotes a case where erythema was obtained after three minutes exposure to mercury-vapour light and radiant heat, and after four minutes to mercury vapour alone. He considers that all hyperæmia-producing skin irritation is capable of increasing the action of the erythema-producing ultra-violet rays. Stahl and Simsch[4] state that skin hyperæmia caused by the heat of a summer's day increases erythema and pigmentation; friction of the skin after a cold bath has the same result. Anæmia of the skin produced by a short cold bath decreases erythema and increases pigmentation. The same action is produced by a cool wind. This view is commonly found in German publications, where the reinforcing action of infra-red rays is generally taken for granted. Poch[5] insists on the antagonistic action of infra-red and ultra-violet radiation. He states that the addition of infra-red rays to ultra-violet light will necessitate a longer exposure for the production of an actinic erythema. *Dufestel*[6] *considers that in practical actinotherapy* the weak antagonistic action of infra-red rays can be neglected. Radiant heat in small doses increases the reaction, whereas radiant heat in larger doses, given for an hour to an hour and a half after mercury-vapour irradiation, decreases the reaction. Hill and Eidinow,[7] using a mercury-vapour lamp, obtained an erythema after ten minutes irradiation at ordinary room temperatures; this was intensified if the exposure was made in a hot room and reduced to almost nothing if made in a cold room at freezing temperature. They consider that cold retards, but cannot stop, the biological action of ultra-violet rays.

Fuller lists of references can be found in A. C. Guillaume's "Les Radiations Lumineuses," Paris, 1927, and Dufestel's "Ultra-violets et chaleur radiante," but the above quotations may suffice *to show how various are the views of different* observers.

We consider that experiments with the data and precautions mentioned below are necessary for obtaining reliable results.

Experimental Details.

The aim of our experiments was to ascertain whether the addition of "radiant heat" rays had any appreciable effect, either synergic or antagonistic, on the production of actinic erythema, and whether, if any such effect be noted, it can be attributed to some "physiological" action or "physical" cause.

The lamps used as sources of ultra-violet radiation were: a Finsen-Reyn carbon arc (15–18 A, 70–80 V) lamp, a vertical carbon arc (15–18 A, 55–60 V), a smaller vertical carbon arc (7 A, 35–40 V), a Kromayer mercury-vapour lamp (3 A type), and a mercury-vapour lamp of the Hanovia type, without reflector (2 A, 145 V). For convenience in the text we use the term "ultra-violet" light for the radiation given out by these lamps, recognising that visible and infra-red rays are also present.

The source of "infra-red" or "heat" or "long-wave" radiation used was the resistance element from a "bowl-type" electric heater at red heat. The radiation given out is mainly in the infra-red region (maximum energy in the third octave of the infra-red, about 36,000 A.U.).

The filters used were two cells, 1 and 4 cm. deep respectively, with flat quartz faces. Through these cells fresh distilled water circulated; water absorbs rays beyond the first octave of the infra-red, thus cutting off a great portion of the longer rays.

We considered it necessary to make exposures on a part of the body not usually exposed to light—the thigh or abdomen—and each reaction was tested against a control, made on a corresponding symmetrical area of skin on the other side of the body. Re-exposure of the same areas during later experiments was carefully avoided.

Statements comparing erythema are usually based on the differences observed on the following day—i.e., about 24 hours after exposure. From previous clinical observations the impression had already been gained that two erythemas of varying depth may, after 24 hours, be indistinguishable; that the rate of fading of symmetrical parts does not always run a parallel course, and that the illumination (natural or artificial) in which the erythema is viewed plays a rôle in the appreciation of its intensity. Other accidental factors, such as baths, friction from clothes, and warming or cooling also make the comparison of fading erythemas difficult, as the effect on two observed parts is not always identical. Hence frequent observations during the first few hours were considered essential. It is also desirable when comparing the relative intensity of two reactions to observe them when they are at their maximum. With the depths of erythema obtained, pigment formation was not sufficiently marked to be used for purposes of comparison and is therefore not recorded, though it was observed in some cases. Differences in colour of the pigment of the heated and non-heated areas were noticed, the latter being greyer and less brown.

We have recorded experiments made on medical students and ourselves, noting the latent period (time elapsing before the appearance of visible erythema), rate of increase of erythema, maximum reaction (colour and depth), duration and rate of fading. Rigid clamped screens of asbestos, with diaphragms for exposure of the skin, were employed. Two screens separated by about 1 cm. of air were used, as a single screen was liable to conduct heat through to the skin. It is of great importance to keep the distances constant, in view of the rapid falling-off of light intensity with distance. Care was taken that the light should fall normally on the skin and that there should be no undue pressure from the screen.

Constancy of Response to Equal Irradiation of Symmetrical Areas of Skin.

1. Six experiments (12 exposures) were made on six subjects by exposing corresponding areas for three minutes to a mercury-vapour lamp (2 A, 145 V), 22 in. distant; the light was filtered through a distilled water screen.

2. Six similar experiments (12 exposures) were made with an addition of infra-red radiation to the filtered mercury-vapour light. (The source of infra-red radiation was placed at an angle between the skin and the quartz cell, which was fixed in an asbestos screen.) Identical depths of erythema were obtained in corresponding couples of exposures in each of the 12 experiments, though minor differences in the rate of fading were noticed.

We wish to emphasise the necessity and reliability, as shown by these experiments, of this method of observation—i.e., of using corresponding areas on the two sides of the body.

Effect of Varying Exposures on the Depth of Erythema.

A series of six experiments on five subjects was made to determine what percentage increase of exposure will produce a perceptible difference in the depth of erythema. Exposures to a mercury-vapour lamp (1·75 A, 150 V) at 23 in., for 5, 4, 3, and 2 minutes respectively were given. The latent periods increased with decreasing exposures—e.g., in one experiment from 2 to 3½ hours, in another from 4½ to 9¼ hours. The erythemas observed showed that at least 20 to 30 per cent. increase of exposure is necessary to produce a perceptible difference of erythema, and that a careful observation of the latent periods under identical conditions of exposure is a more accurate indicator of the length of exposure than the observation of the depth of actinic erythema.

Experiments with Mercury-vapour Light to which Infra-red Rays are Added.

1. A preliminary series of ten separate experiments on five subjects was made, using a Kromayer lamp as source of filtered ultra-violet light, and the radiator described above as a source of infra-red rays. Small corresponding areas were exposed to the ultra-violet radiation, and to the ultra-violet and infra-red radiation respectively, the distances and exposures being kept constant in any one experiment. With distances from the lamp of from 10½ to 12 in., exposures of from three to five minutes, and heating to the limit of toleration (radiator 6–8 in. distant) the actinic erythema was diminished by the addition of the infra-red radiation in all the experiments, and (where a conclusion could be drawn) the latent period was definitely delayed on the side exposed to infra-red rays. The maximum difference was found in an experiment in which the latent periods were five hours and eight and a half hours respectively, while in two cases faint erythemas, with latent periods of six and seven hours respectively on the one side, were suppressed on the side exposed to infra-red rays.

2. Five experiments were made in which the tissues on one side were cooled by a draught of cold air (driven by an electric motor) during irradiation with the Kromayer lamp. The other side received a similar irradiation with the addition of infra-red radiation in two experiments, and a hot air draught in two other experiments, while in the fifth experiment the Kromayer light only was used. The erythemas were greater and the latent times less on the cooled side in four cases, while in the one case (cf. hot *v.* cold draught) no detectable differences were seen.

3. In the two series of six experiments each, devised to investigate the constancy of response of symmetrical areas, it was noticed that in the experiments in which filtered mercury-vapour light alone was used bigger reactions were obtained with shorter latent periods than in the experiments in which infra-red radiation was added to the filtered mercury-vapour light. The exposures in all 12 observations were three minutes and the distance from the lamp 22 in., so that the results were comparable.

4. Six experiments were made using a mercury-vapour lamp of the Hanovia type (without a reflector) and a water filter (depth 4 cm.), and on one side adding infra-red radiation. The addition of heat diminished the erythema in three cases, while no detectable differences were observed in three cases. In four cases the latent periods were increased, while in the other two cases they were approximately equal.

A summary of the experiments is given below.

Series.	No. of expts.	Erythema.		Latent periods.	
		Diminished by heat.	Visually equal.	Increased.	Decreased.
1.	10	10	0	6	0
2.	5	4	1	4	0
3.	6	3	3	6	0
4.	6	3	3	4	0
Total ..	27	20	7	20	0

In no case was the erythema increased by the addition of infra-red rays, and the visually equal erythemas are neutral evidence, since quite considerable differences of exposure are necessary to give visual differences in the depth of the erythema. The latent periods observed varied from about one to ten hours in different experiments; in no case were these diminished by the radiant heat. A difference of colour was always noted between two areas, one of which had been heated by the addition of infra-red rays or by conduction. The addition of heat causes a scarlet or vermilion erythema as compared with the more crimson or carmine colour of the usual mercury-vapour erythema. The same differences in colour were observed when comparing the actinic erythema following carbon arc light irradiation with that following irradiation with the same light filtered through water.

Experiments with Water-filtered Carbon Arc Light.

In this series a carbon arc was used because of the large amount of heat which it emits. Any small fluctuations of light intensity due to the flickering of the arc are immaterial when the two areas are irradiated simultaneously. Comparative observations of the erythema produced by the unfiltered and filtered rays were made in three ways.

1. Exposures to the Finsen-Reyn lamp through the quartz applicator empty, and subsequently through the quartz applicator filled with distilled water. Four experiments (one subject) were made. On account of the fluctuations of light intensity, experiments of this type are of little value and the experimental results were variable and contradictory.

2. Exposures of a larger area of skin, part of which only was covered with the quartz cell filled with distilled water. Three experiments were made, but they are of doubtful value, for the diminution of erythema observed is probably due, as was shown by photography, to a diminution of light after passage through the cell. Two similar experiments using a mercury-vapour arc gave similar actinic and photographic results.

Experiments of this type are quoted by some investigators as proving that an increased erythema is produced by screening through water. In our observations the screened side gave consistently smaller reactions. These experiments differ from those described in the other sections in that the control area does not receive the same, but a larger dose of ultra-violet light. Some of the loss of light was thought to be due to reflection at the surface of the cell.

3. Exposures through a circular quartz container, half filled with distilled water, so that the lower half only of the exposed skin received filtered light. Fourteen experiments on two subjects were made. Here again difficulties were encountered, sometimes due to the formation of water vapour in the upper part of the cell, a difficulty which was overcome by adjusting a stream of distilled water through the lower half of the cell from a Marriotte's bottle. Increased erythema in the lower half of the field was obtained in 5 of the 14 experiments; the other 9 showed equality. The lower field was noticed to be more brightly illuminated; the matter was investigated photographically by substituting a piece of Seltona P.O.P. paper for the skin, and exposing it to the radiation. Total reflection at the surface of the water actually increased the illumination in the lower half.

We have described this method carefully because erroneous conclusions have been based on experiments of this apparently accurate type. We wish to emphasise the difficulties inherent in the use of filters and to compare the inconclusive results obtained in the experiments described in this section with those in which heat is added during, before, or after the exposures to ultra-violet light.

P.O.P. paper was found to be a convenient method for comparing varying amounts of radiation from any one given U.V. lamp. From 5 per cent. to 10 per cent. (according to the depth of colour) increase of exposure to a given source of light is detectable—i.e., the paper is about four times more sensitive to variations in length of exposure than actinic erythema. Screening the paper with glass (absorption to 3300 A.U.) almost completely prevents darkening of the paper with the same lengths of exposure. The paper provides, therefore, a simple and sufficiently accurate method of examining the filters used in experiments of this type. Examination with a Beck ultra-violet spectroscope was a further check on the filters.

Effect of Heat following or preceding Irradiation with a Mercury-vapour Lamp.

These experiments were undertaken to determine whether heat, either in the form of "long-wave" radiation or from a hot water bottle applied to the skin, affects the erythema produced by the unscreened light of a mercury-vapour lamp, when the heat (1) follows, (2) precedes the ultra-violet radiation.

Sixteen experiments were performed on five subjects, placed 33 in. from the lamp. The current and voltage in any particular experiment were kept constant. The exposures given were three or four minutes, these being sufficient to give actinic erythemas in two to five hours, lasting from one to several days. Immediately before or immediately after irradiation the skin was heated from five to ten minutes by radiant heat or by a large corked test-tube of hot water, until a good diffuse primary erythema was obtained lasting half an hour or longer.

1. *Heat following irradiation.*—Eight separate experiments on three subjects were made; in four the skin was heated by means of the radiator and in four by means of the hot water test-tube. In six cases heat diminished the reaction; in one case heated by the radiator and in one case heated by the hot water no perceptible differences in the depths of erythema were seen. The usual differences in colour were observed. The latent periods were always increased. The duration of erythema was definitely shortened in five cases.

It was noticed that the part previously irradiated with mercury-vapour light was found to be very sensitive to heat. A painful sensation as compared with ordinary "warming" was experienced over this area when the tissues were warmed by either method.

2. *Heat preceding irradiation.*—Eight experiments on four subjects, in five of which the skin was heated by the radiator and in three of which the hot water bottle was employed, gave increased reaction on the heated side in six cases, while in two cases the reactions were apparently equal in depth. The usual differences of colour were noticed. There was slight delay (about 10 mins.) in three cases, otherwise the latent periods were not appreciably altered.

We conclude that when heat precedes irradiation there is a slight increase in actinic erythema. This effect is opposite and less than the diminished erythema which is obtained when heat either follows the irradiation or is applied simultaneously with the irradiation.

Conclusions.

1. Heating tissues by radiation or by conduction (radiator, hot water in vessel) after exposure to ultra-violet radiation diminishes—or suppresses—the actinic erythema and delays its appearance.

2. Heating of tissues by radiation of conduction before exposure to ultra-violet radiation increases the actinic erythema. The time of appearance of the actinic erythema is not appreciably influenced.

3. Heat (radiant heat or hot air draught) applied simultaneously with ultra-violet irradiation diminishes—or suppresses—the actinic erythema and delays its appearance.

4. Differences in colour as well as differences in depth of reaction are noticeable. The actinic erythema of the heated skin is more scarlet or vermilion (similar in colour to the primary erythema), as compared with the actinic erythema produced by the mercury-vapour or water-filtered carbon arc light, which is more crimson or carmine.

5. Differences of 20 to 30 per cent. of exposure to ultra-violet light are necessary to produce visual differences in the erythema. Smaller percentage differences of exposure to a given source of radiation will give appreciable differences in the latent period—i.e., the time elapsing before the appearance of erythema.

6. The diminution of actinic erythema by heating the tissues, either with radiant heat or by conduction, during ultra-violet irradiation, suggests a "physiological" rather than a "physical" cause for the diminution observed. The fact that at least equally satisfactory diminution of erythema can be obtained by heating after irradiation with ultra-violet light cannot be explained by physical interference or antagonism of the rays.

The observed action of ultra-violet light on the sensitiveness of the skin to thermal stimulation appears to be immediate and requires further investigation. It is suggested tentatively that this action may be a factor in determining the degree of actinic erythema in cases heated simultaneously or after ultra-violet irradiation.

Our thanks are due to Dr. C. B. Heald for the facilities given us in the Light Department of the Royal Free Hospital, and we are grateful to the Waller Memorial Research Fund Trust for a grant in connexion with the expenses of the research.

(*References at foot of next page*).

OBSERVATIONS ON VACCINATION.*

BY S. P. BEDSON, M.D., M.Sc. DURH.,
SENIOR FREEDOM RESEARCH FELLOW, LONDON HOSPITAL.

ALTHOUGH the method of prophylactic immunisation against small-pox has undergone no fundamental change since Jenner's time, certain modifications and improvements have been made in it. Arm-to-arm vaccination has been abandoned for obvious reasons. Vaccine lymph is now produced in large quantities and under carefully controlled conditions. The calf is the animal most generally employed for this purpose, but since the virus of cow-pox tends to behave irregularly after prolonged passage in this animal, passage through other animals, such as the rabbit, has become necessary from time to time to rejuvenate the virus. Again, when fresh seed lymphs are required one now has recourse to cases of small-pox. The virus of small-pox, when established either directly in calves or after preliminary passage through monkeys or rabbits, acquires the characters of cow-pox; in fact, the two viruses are immunologically identical, and differ only in their species adaptation.

The Jennerian method of vaccination has always had its opponents. These have steadily increased in number, and it is claimed by the antivaccinators that this method of preventive inoculation is attended not infrequently by untoward consequences. These claims have been very largely discounted by the medical profession, and rightly so. Opposition has come almost entirely from those ill-qualified to pronounce on the matter, and it has been felt that the claims were the outcome of too free a use of that faulty line of reasoning, *post hoc ergo propter hoc.*

Encephalitis.

Of late years, however, a complication of vaccination has made its appearance which, though of rare occurrence, is disquieting because of its high rate of mortality. I refer, of course, to post-vaccinal encephalitis. The onset is abrupt, some 9 to 12 days after vaccination, with headache, vomiting, and drowsiness. The patient usually passes into coma, and the other signs present vary with the portion of the central nervous system involved. About half the cases end fatally; those that recover do so completely without residual symptoms. This form of encephalomyelitis closely resembles those cases which occur rarely in the course of acute infectious diseases, such as measles, small-pox, chicken-pox, and mumps, and this resemblance extends to the essential histological lesion which has been shown to be a perivascular demyelination.

Post-vaccinal encephalitis was first recognised in 1912, when a case occurred at the London Hospital. It reappeared in 1922 when, again at the London Hospital, four cases were recognised and submitted to a detailed investigation. Between 1922 and 1927, 93 cases have occurred in this country, representing an incidence of 1 in 48,823 persons vaccinated; 62, or 66·6 per cent., of these cases occurred in patients between the ages of 5 and 14 years. Apparently the unvaccinated infant and persons submitting to revaccination are not susceptible. This statement requires some slight qualification since Turnbull has described one case in an infant under three months. However, this appears to be the only case of the kind on record, and one may therefore conclude that the susceptible individual is the one submitting to primary vaccination at any age after infancy, but more particularly between the ages of 5 and 14 years. In this connexion the figures for post-vaccinal encephalitis in Holland are of interest. In that country primary vaccination has been very largely practised at school age, and for the period 1922–27, 123 cases occurred out of 495,431 vaccinated, or 1 in 4028. This gives us a clearer conception of the risk attendant on primary vaccination in those other than infants.

The ætiology of post-vaccinal encephalitis remains obscure. There are three hypotheses current. The condition may be due to the vaccinia virus; infection with the vaccinia virus may light up a dormant neurotropic virus which the patient was harbouring; or, as has been most recently claimed, the condition may be a toxic one. The last conception seems to me difficult to accept. Occasional cases of post-vaccinal encephalomyelitis have taken the form of a transverse myelitis without other involvement of the central nervous system, and these cases are not readily explained on a toxic basis. The probability is, therefore, that we are dealing with a condition produced either directly by the vaccinia virus or indirectly through the activation of an unknown latent virus by the vaccinia virus. Whichever of the two views may be correct, it appears to me necessary for the vaccinia virus to invade the body generally, and the central nervous system in particular, for post-vaccinal encephalitis to occur.

The Practitioner and Vaccination.

The question of practical importance is: What is to be the attitude of the medical practitioner towards vaccination? There are those whose reply is: Continue vaccinating as before. It is inconceivable to my mind that any one should adopt such an attitude. Were we dealing with protection against the risk of virulent small-pox there might be some excuse for this attitude. Even so, it would be a confession of ineptitude on our part. But the type of small-pox in this country at the present time is extremely mild and rarely fatal, so that to continue vaccinating as before would be to ask the individual to submit to a prophylactic measure whose risk of death equalled that of the disease against which he was being protected.

Obviously something must be done.

Diluted Lymph.

It is clear from animal experiments with vaccinia virus that the degree of invasion varies directly with the dose inoculated. It occurred to me therefore that the risk of encephalitis should be lessened if a smaller inoculum were used, and during the last three years diluted calf lymph has been in use at the London Hospital, though only in the last six months has it been used at all excessively. The dilutions have varied from 10- to 50-fold, the diluent employed being an M/50 phosphate solution, pH 7·6, though saline or sterile water could be used. The diluted lymph is used within 24, or at most 48 hours, after dilution, and it has been the practice to vaccinate in two places, using a crucial incision of ⅜ inch diameter. The Vaccination Committee of the Ministry of Health obviously had the same idea, for they recommended one insertion of the undiluted lymph by means of a ½ inch linear incision in place of the usual cross hatching.

It is not claimed that the use of diluted lymph is the solution of the problem with which we are faced. It is, however, reasonable to suppose that it considerably reduces the risk of post-vaccinal encephalitis. It certainly gives much more satisfactory takes, and

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out of some 700 patients so vaccinated no excessive reactions have been observed. The number of primary vaccinations at a susceptible age has been very small, so that, of course, it is impossible to draw any conclusions as to efficacy of this method as a means of avoiding post-vaccinal encephalitis. However, no such cases have occurred. The ideal to be aimed at is a perfectly safe method of immunisation against small-pox, and it is our hope that such a method will be evolved. It has been shown that if the virus of foot-and-mouth disease is inactivated by means of formalin in low concentration it still retains its antigenic properties, and this method has been employed in the preparation of vaccines for distemper and yellow fever. Work is in progress here to find out whether some such method could not be applied to the vaccinia virus.

These experiments, which are being carried out by my colleague, Dr. J. Bland, are as yet in their infancy, and it is impossible to say what the outcome of them will be. In the meantime, however, I would make the following suggestions: (1) When vaccinating infants, or performing revaccination, use lymph diluted 1 in 10, making one or two insertions with a crucial incision (*no cross hatching*), or vaccinate as the Ministry of Health have recommended, making one insertion with a single linear incision, using undiluted lymph. (2) When called upon to perform primary vaccination in any person other than an infant, find out first of all if it is absolutely necessary to vaccinate. The only condition rendering vaccination necessary in such a case would be the risk of exposure to *virulent* small-pox. If you *have* to vaccinate a susceptible individual, then do so with lymph diluted 1 in 50, making one insertion with crucial incision.

THE MEDICO-LEGAL SIGNIFICANCE OF BLOOD GROUPS.

By Dr. F. SCHIFF,

DIRECTOR, BACTERIOLOGICAL DEPARTMENT, MUNICIPAL HOSPITAL, FRIEDRICHSHAIN, BERLIN.

THE establishment of paternity by application of the rules governing the inheritance of the blood groups is now receiving a great deal of attention. The results obtained with this method were recently reviewed in a leading article in THE LANCET (1928, ii., 711). *I propose to make some observations on this article.*

What does the Blood Test Establish?

A case of doubtful paternity may be chosen in order to demonstrate the application of the method. Here the blood groups of the mother and the child would be established as well as that of the alleged father (possibly those of several men). The results obtained are then considered as to whether or not they are consistent with the rules governing the transmission of blood groups from parents to offspring as established by von Dungern and Hirszfeld (1911) and by Bernstein (1924). According to whether this conformity has been established or not the answer would be: (1) the man examined may be the father; (2) the man examined cannot be the father.

It is evident that the "blood test," far from being a method for diagnosing paternity, is, in certain cases, capable of merely excluding an alleged paternity. The method should, therefore, correctly be called "a test for the exclusion of paternity." The exclusion, of course, of a man who had been denounced unjustly can be established in one out of six or seven cases only.[1] This is due to the small number of blood groups existing. It often happens that a man who is not the father belongs to the same group as the actual father; in addition, there is a high incidence of cases showing such a disposition of the blood groups of mother and child as to preclude a priori any inference being drawn from the blood group of the father.

In the leading article above the position in Germany was referred to in detail; in that country the "blood test" has been systematically applied in forensic medicine since 1924.[2] It is very difficult for the outsider, and especially for the foreigner, to judge the position in Germany, owing to complicating juridical factors. It is understandable, therefore, if some misinterpretations have crept into the article in THE LANCET which I shall now try to correct.

Certain Misinterpretations.

The leading article in THE LANCET contains the following statement: "It has been laid down in Prussia that 'the impossibility of fatherhood cannot be legally regarded as being established absolutely (einwandfrei) by a blood examination.'" This quotation, it is true, reproduces the opinion of some judges, including one member of the Supreme Prussian Court of Appeal, but it does in no way represent a decree ruling out the acceptance of the results of the blood test as the basis of a verdict in the court. The sentence quoted represents only the individual opinion of a minority of jurists. Judge Leonhard is not the President of the Prussian Court of Appeal, as would be assumed according to the article in THE LANCET. He is President merely of one out of some 30 departments of this court, and his opinion has been contradicted not only by other departments of this court but also by numerous leading members of the bar and of the medical profession.[3] Leonhard[4] himself recently admitted that those who accept the blood test as a reliable means of evidence represent the dominant trend of opinion. Official decrees have been published in various States of the Reich[5] directing the attention of the courts to the new method of evidence and pointing out explicitly that it is capable, in suitable cases, of proving the impossibility of fatherhood. These decrees regulate at the same time the details of the procedure of a more administrative nature. Numerous verdicts of supreme courts of appeal have been published which have been based on the results of the blood examination.[6]

The leading article in THE LANCET contains the following quotation from an official statement made by the Supreme Medical Council of Austria: "In the majority of cases the results of blood examinations will not assist in the establishment of paternity." German lawyers and medical men, too, interpreted this statement, but mistakenly, as a criticism of the reliability of the method. To the expert, however, it appears simply as a banality, indicating the well-known fact mentioned above, that the method is capable of affording a useful result in a minority of cases only. The decisive point, however, is, what is the attitude adopted by the courts in those cases in which the constellation of blood groups contradicts the possibility of fatherhood? In THE LANCET paper it is assumed, but not correctly, that no provision whatever has been made with regard to these cases. The promulgation referred to, published in the *Official Gazette of the Austrian Administration of* Justice, Nov. 8th, 1927,[7] stated explicitly: "According to the various blood groups established in an individual case the result obtained is capable of proving the impossibility of fatherhood for a given man." In accordance with this decree in Austria numerous verdicts have been based exclusively or for the greater part on the evidence afforded by blood grouping. A number of these verdicts, including such passed by the Vienna Supreme Court of Justice, have been published as long ago as in 1927.[8]

Exact data showing the extent and scope of the blood test in Germany have become available through an inquiry made by the writer on behalf of a committee formed by the Reichsgesundheitsamt (see *Medizinische Welt*, August 24th, 1929). The fact was revealed, surprising even for those acquainted with German conditions, that more than 5000 medico-legal examinations of this kind have already been

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Encephalitis.

Of late years, however, a complication of vaccination has made its appearance which, though of rare occurrence, is disquieting because of its high rate of mortality. I refer, of course, to post-vaccinal encephalitis. The onset is abrupt, some 9 to 12 days after vaccination, with headache, vomiting, and drowsiness. The patient usually passes into coma, and the other signs present vary with the portion of the central nervous system involved. About half the cases end fatally; those that recover do so completely without residual symptoms. This form of encephalomyelitis closely resembles those cases which occur rarely in the course of acute infectious diseases, such as measles, small-pox, chicken-pox, and mumps, and this resemblance extends to the essential histological lesion which has been shown to be a perivascular demyelination.

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Clinical and Laboratory Notes.

A CASE OF ABDOMINAL AORTIC ANEURYSM,

WITH RUPTURE AND FORMATION OF FALSE ANEURYSM AND EXTENSIVE EROSION OF VERTEBRÆ.

BY JOHN K. RENNIE, M.D. GLASG.,
HON. PHYSICIAN, BRADFORD ROYAL INFIRMARY.

CASES of aneurysm of the abdominal aorta are comparatively common, and terminal rupture of the aneurysm is by no means rare. In the following case death occurred probably five months after the first rupture, and the history of the intervening period and the post-mortem findings seem worthy of record.

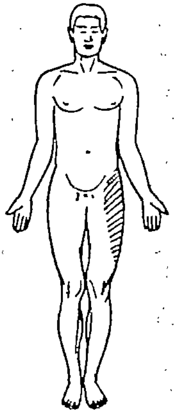
The patient, a storeman aged 43, was admitted to the Glasgow Royal Infirmary on Sept. 27th, 1927, complaining of pain in the abdomen. Four weeks before admission, while at work, he had been seized with an attack of acute pain in the right side of the abdomen. The pain had been very severe, "doubling him up," and had lasted for about 20 minutes. He had continued at work, but during the next two weeks the pain had recurred at intervals, commencing in the left upper abdomen and shooting downwards and outwards toward the left flank. On Sept. 19th he was compelled to give up his work as the attacks were occurring more frequently—three or four in the day—and the pain now radiated downward to the outer side of the left thigh. He made no complaint save of pain. His work was very hard, involving heavy lifting. He had always been a heavy drinker. He had had dysentery in Salonica in 1917 and had been in hospital for six months; but apart from occasional attacks of "influenza" he had otherwise been very healthy.

He was a small well-built man of healthy appearance. The abdomen was slightly distended, the distension being most marked in the upper part and particularly on the right side below the costal margin. Palpation in this area revealed a mass below and easily separated from the liver, slightly tender, with a rounded lower margin, and distinctly pulsatile. The pulsation was both forcible and expansile. On auscultation the cardiac sounds were heard even more distinctly than over the præcordium, and there was a loud systolic murmur. The spleen could not be felt, but there was some tenderness in the left hypochondrium. There was some general rigidity of the whole abdomen but no ascites. Posteriorly there was considerable resistance to palpation in the left lumbar region and immediately below the ribs a pulsating swelling was apparent, involving the twelfth rib in its movement. In this area also the heart sounds were heard with great distinctness. The lower dorsal and upper lumbar vertebræ were almost fixed and the spine showed a slight general kyphosis. He complained of pain in the left iliac region radiating down the outer side of the thigh. In the area of distribution of the ilio-hypogastric and external cutaneous nerves there was an anæsthesia to touch and pain (Fig. 1). The epigastric and abdominal reflexes were absent. The knee-jerks and ankle-jerks were present and equal. The plantar reflexes were equal and flexor in type. All other reflexes, including the pupillary, were normal. Movement at the hip- and knee-joints was free and painless. The heart was normal in size and position. There was a short systolic murmur at the apex and over the sternum. The lungs were normal. The liver was slightly enlarged. The urine was normal. The Wassermann reaction was + + + positive.

Radiography of the spine on Oct. 17th showed a lack of definition in the left border of the eleventh and twelfth dorsal vertebræ, and a distinct shadow on each side of the ninth, tenth, eleventh, and twelfth dorsal vertebræ.

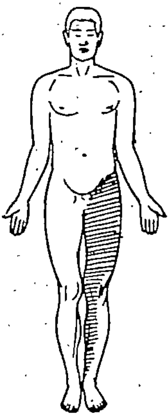
On Oct. 24th the patient complained of very severe pain in the left leg extending downwards from the buttock. He became very pale and collapsed with a weak and rapid pulse. Pulsation could still be felt in the upper abdomen and in the lumbar region, but the heart sounds were much more faintly heard. The entire left side of the abdomen became rigid but not tender. By the next morning he had rallied and appeared little changed, but the abdomen was now generally distended and rigid and there was a large area of dullness to percussion in the left flank. The left leg was held flexed at the hip and knee and any attempt to straighten the leg caused acute pain. No pulsation could now be detected in the left femoral artery. The right femoral artery was easily felt. On Oct. 26th and again on Oct. 31st similar attacks occurred, each of shorter duration, lasting about an hour. But whereas severe pain had preceded the collapse in the first attack, in the second and third attacks the collapse occurred without any pain whatsoever. From both attacks he recovered under stimulation. On Nov. 2nd a band of bluish discoloration was noted in the left flank, and the abdominal wall showed an area of induration and swelling clearly due to extravasated blood. The left knee-jerk could not now be elicited, but the left plantar reflex was present and flexor. There was complete anæsthesia over the front of the left thigh and the muscles of the thigh and leg were considerably atrophied. Gradually the discoloration disappeared and the indurated area in the abdominal wall became smaller, harder, and more defined above. Below it had spread downwards over Poupart's ligament, and the femoral artery could now be felt pulsating to its inner side. There was movement of the left foot and toes, but the leg could not be extended, probably on account of the pain, as the muscles could be felt to contract when the attempt was made.

FIG. 1.



Area of anæsthesia to touch and pain on Oct. 17th.

FIG. 2.



Area of anæsthesia to touch and pain on Nov. 29th.

On Nov. 20th œdema appeared in the left foot and leg. Bed-sores began to form over the back and legs. The general condition had greatly deteriorated and morphia became necessary on account of the discomfort. On Nov. 29th the mass on the left side had become very hard and localised. The sensory disturbance had increased in extent, involving the inner side of the left lower leg, and was clearly of root distribution (Fig. 2). The left plantar reflex remained active and flexor and vibration sense was unimpaired in the leg. On Dec. 6th incontinence of fæces commenced and on Dec. 10th the abdomen was much distended with free fluid. On Dec. 20th he had another attack of abdominal pain and collapse, from which he again recovered. Increasing œdema and weakness made accurate examination difficult, but the area of anæsthesia appeared unchanged. In spite of morphia, any attempt at movement at the left knee or hip still produced intense pain. The left knee-jerk remained absent, but the foot and toes could still be moved. On Jan. 5th an area of dullness was detected at the base of the left lung with diminished breath sounds. He became progressively weaker and died on Jan. 17th, 1928.

Post-mortem Report.

The valves of the heart appeared normal except for slight sclerosis in the aortic cusps. The myocardium showed nothing of note. A few atheromatous patches were evident in the coronary arteries. There was no evidence of syphilis in the thoracic aorta. The left lung showed collapse of its lower lobe due to a collection of about one pint of blood in the pleural cavity. The abdominal cavity contained about two pints of deeply blood-stained serous fluid. The liver was slightly atrophied; the spleen was more than twice its normal size.

Pushing forward the lesser peritoneal sac and appearing between the gall-bladder and the hepatic flexure of the colon

ant fluid remained cloudy. When examined after a large Gram-positive bacillus was found, but on tures only irregular Gram-negative forms and spores sent.

culture was made into 2 per cent. maltose broth, r 18 hours' incubation 0·5 c.cm. was injected intra- rly into the leg of a mouse and a guinea-pig. Both died after 18 hours. The muscular tissue was l down to the bone, which was visible. The liver gs were placed in a Petri dish and incubated. In 24 hey were completely liquid. Smears from the site tion showed both the large Gram-positive bacillus rminal spored organisms. The guinea-pig's heart howed morphologically only the large bacillus.

Summary of Results.

marising the results to date, it will be noted apparently a very mixed culture was grown the foreign body; that this was purified by g for ten minutes; that at least two forms were present after single colony culture; and that the blood of the dead animal showed, apparently, one. Of course, morphological appearances are tle value among anaerobes.

e guinea-pig's heart blood was next incubated in rtson's medium. Digestion both of it and of coagulated a was rapid. Gas was not formed. Forty-eight hour res had no effect on three guinea-pigs. One c.cm. of an ur culture, however, quickly produced massive œdema dquefaction of tissues in three guinea-pigs. These were d, as the lesions were obviously of the same type as those er recorded. Two c.cm. of *B. welchii* antiserum and cm. of the patient's serum failed to give any protection n injected simultaneously with 2 c.cm. of culture. c.cm. of a 12-hour culture was filtered through a Seitz injected intravenously into a rabbit; the animal ained perfectly well.

n further subculture the strain became again iously mixed. Profuse gas formation and black- ng and the medium suggested *B. sporogenes* and erminal spored form *B. cochlearius*. However, a re-bearing anaerobic motile Gram-positive bacillus, efying living tissue in early, but not in late, ures, was present. Only one known organism, rare *B. histolyticus* of Weinberg and Séguin,[2] orms with these findings. It was found by them a case of gas gangrene during the war, and has nce been found in the soil and in the fæces.[3] This organism, together with several other anaerobic forms not identified, but probably including *B. sporogenes* and *B. cochlearius*, had been present in a patient's wound, without sinus formation, for more than eleven years. Certainly no lesions resembling those found in the animals were found in him. The hæmolytic streptococcus and the staphylococcus were quite sufficient to cause his symptoms. But the results, together with former ones, indicate that the spores of anaerobic bacteria, even of pathogenic types, may persist in war wounds for many years. Whether they might ever have become pathogenic is a question on which these results throw no light. The "Medical History of the War,"[1] however, states that serious and even fatal "flares" have followed such operations as these.

My thanks are due to Mr. J. B. Harman, who assisted in the bacteriological work here described, and to Sir Cuthbert Wallace for permission to publish this case.

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[2] Weinberg, M., and Séguin, P.: Comptes rend. de l'Acad. des Sci., 1916, clxiii., 449.

[3] System of Bacteriology, Med. Res. Council, London, 1920, iii., 244.

A GUINEA SCHEME AT KING'S COLLEGE HOSPITAL.—The governors have adopted a new rule relating to guinea subscribers. Under this scheme subscribers who become private patients will be entitled to deduct the whole amount of their subscriptions from the cost of treatment.

DERBYSHIRE WOMEN'S HOSPITAL.—The Duke of Devonshire recently opened the new buildings of this hospital, which have cost about £13,000. There are over 40 beds, including a recovery ward, an X ray department, and seven sun balconies.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society, held on Oct. 28th, the chair was taken by Mr. DONALD ARMOUR, the President, and Mr. A. E. HAYWARD PINCH opened a discussion on

RADIUM THERAPY.

The early hopes of radium as a panacea for all ills, he said, had not been realised, but its subsequent derision had been equally unjustified. It was now universally recognised as a valuable and in many respects unique addition to the surgeon's armamentarium. He deprecated strongly the loose and indiscriminate use of the phrase "radium cure for cancer." Radium aided surgery but did not abolish it. Radium therapy—the treatment of disease with radium—was a very wide subject, and meant a great deal more than the treatment of malignant disease by gamma radiation. It could be divided into two main divisions: superficial, which might almost be termed beta radiation, and gamma radiation therapy with apparatus so screened as to emit only a minute portion of hard beta or pure gamma radiation. Superficial therapy was subdivided into the treatment of malignant and non-malignant conditions. It was extremely useful for a variety of disorders not very important in themselves, but sources of extreme annoyance to the patient—e.g., pruritus, corns, acute tender papillomata of the feet, and the acute tender papilloma of the ear which so effectively prevented sleep. One radium treatment was an absolute specific for these nine times out of ten. It might act as a charm occasionally in a case of lupus vulgaris which did not respond to light. It would not cure lupus erythematosus, but would improve the appearance remarkably and avert recurrence for many years. It was also extremely useful in bad keloids, such as were sometimes left by vaccination; it would at least flatten the scar. Diffuse cavernous nævus responded in an almost miraculous fashion. The malignant condition in which radium therapy was most useful was rodent ulcer. A cure could almost be guaranteed in 95 per cent. of cases with one screened treatment. Mycosis fungoides was another condition in which the outlook had been completely revolutionised by radium. Epithelioma of the cornea could not be needled, but an unscreened exposure of about an hour would practically cure every case; the growths were proliferative rather than penetrative. Sarcoma of the eye also benefited. He had treated dermatitis pigmentosa successfully.

Deep Radium Therapy: Gamma Radiation.

Of non-malignant conditions the first was menopausal hæmorrhage, in which deep gamma radiation was marvellous and an almost certain cure. Cure, however, must not be promised to a young girl with essential uterine hæmorrhage. Tuberculous adenitis, if treated before suppuration had occurred, could almost certainly be cured without disturbance of the skin or of the patient. Aspiration followed by radiation gave good results. Radium would not cure splenic leucocythæmia but would materially alleviate it and prolong life; the spleen receded from the iliac fossa to its normal impalpable position, unless there had been a good deal of fibrosis. The period of life of a patient with lymphadenoma was put in Osler at two years; after radium treatment it might be put at four or five years, and some cases had lived for six years. The glands disappeared and the patient gained in comfort and happiness.

The treatment of malignant disease by gamma radiation had been much discussed in the press.

There were only two types of case in which he would hesitate to advise radium instead of operation: when the growth occurred in a very œdematous zone, and when there was a strong syphilitic taint, which might cause intense destructive reaction. He described three typical problem cases, for all of which he would use radium: an endocervical carcinoma in a working-class mother; a mammary cancer in a society woman who feared disfigurement; and a cancer of the tongue in a man of 60. In 90 per cent. of cases radium would cause disappearance of a growth in uterus, breast, or tongue in five or six weeks. Removal of the primary growth, however, was far from constituting cure. Mr. Pinch confessed that he did not know the best method of treating the glands, whether by needles and seeds in and around, contact radiation from screened applicators, cross-fire or focal application. In some cases the result was remarkable, in other apparently identical cases nothing happened. One of the greatest problems of radium therapy was the successful treatment of secondarily infected glands. He had treated some hundreds of cases of carcinoma of the œsophagus and never cured one. One difficulty was to determine the exact extent of the disease; the bismuth meal gave length and apparent width, but no indication of the depth of penetration of the mediastinum. He had seen five cases diagnosed as cardiospasm; even a very thorough œsophagoscopy had not revealed any growth, but in four of them autopsy had shown a growth just behind the posterior wall of the stomach. Radium therapy could not be learnt in a week, however skilful the tutor or apt the pupil. In a year the pupil might possibly know enough about it not to do any mischief —but no more. There was no antidote to an overdose of radium: radium therapy must not be embarked on lightly. In Talleyrand's words "Pas trop de zèle," or—"For God's sake be careful." The Radium Institute would always be pleased to place its knowledge at the disposal of anyone who asked for it.

The Physicist's Attitude to Radium Therapy.

Prof. SIDNEY RUSS suggested that when a tube containing radium was put into the body, whether into malignant or non-malignant tissues, certain quite definite physical conditions had to be coped with. The question was how far the tube would have the desired action. Experimentally, parts of the irradiated tumour could be removed to test their viability in a susceptible animal. It was found that the cells had not been killed but would not grow. Radium did not cauterise cells, but caused some action which subsequently prevented proliferation. Doubling the dose did not double the range of lethal action, nor could the useful action of a tube be extended by leaving it in indefinitely, owing to local damage. Prof. Russ then showed diagrams illustrating how the intensity of a tube at various distances was calculated from the sine of the angle subtended by the tube. The intensity fell off very rapidly, so tubes were "staggered" in a line to supplement each other. It was astonishing how large an area could be uniformly irradiated by this method. By measuring the lethal range of a tube in animal tissues a fairly clear idea could be obtained of its effect on human tumours. It was impossible to think of the Stockholm technique as one that dealt effectually with extensions of the primary growth. An interesting feature of the development of radium therapy was the reduction of the intensity used in the tubes. Strong tubes had given very bad results. The reaction was very much more favourable when small intensities were given for a long time, because dividing cells were more vulnerable to radiation than cells in other phases. Radiation did two things: it acted on the dividing cell so that the daughter cells were abnormal and did not grow into mature cells, and it prevented growing cells from reaching the stage of division. If the radiation were not carefully planned for its purpose the malignant cells would reassert themselves in the course of time.

Discussion.

Mr. DUNCAN FITZWILLIAMS felt that curietherapy was at present in such an early experimental stage that no dogmatic statements were justified. There were three great centres, each carrying out a different but perfectly stereotyped technique, and it was difficult to get anyone to experiment with unknown possibilities. As things were, radium was more abused than used, and more was to be learned from failures than from successes. He feared a commercial exploitation of radium which would make things much worse.

Dr. J. DOUGLAS WEBSTER showed a number of slides which illustrated successful radium treatment of malignant cases and various methods of technique. He referred to the grave danger of radium burns, and said that large doses should be applied from a distance of 4–6 cm.; this gave more effect on the depth and less on the surface. He commented on the conflict of opinion about the different effects of different wave-lengths in different parts of the body, and the various techniques used to protect the areas of secondary spread in mammary cancer. In his experience failure was usually due to faulty technique in dosage. It was absolutely necessary to examine the patient every three months for five years and to treat recurrences promptly. Dr. Webster urged the necessity of further research, particularly into the technique of application, and the exploration of new methods.

Sir JAMES DUNDAS-GRANT said he had been impressed with the extraordinary relief afforded by radon to patients with cancer of the œsophagus and larynx. He said he had also been much impressed by the results of X rays in laryngeal carcinoma, describing several cases. He thought that operation followed by X rays was coming into vogue.

Mr. ARTHUR EDMUNDS said that no speaker had tackled the three problems propounded by Mr. Pinch. He would do a radical operation on the society woman and send her to a firm of corset-makers to be fitted with a suitable substitute for the lost breast. He would do a complete dissection of the glands of the neck of the tongue case and insert radium.

Mr. WILLIAM GILLIATT, speaking of Mr. Pinch's first case, said that endocervical carcinoma was seldom diagnosed in the consulting room. It always extended very much further than the manual examination would suggest. Radium was nowhere more useful than in gynæcological practice. Preoperative irradiation was nearly always beneficial; it caused disappearance of hypertrophic growths and healing of ulcerative growths, and greatly diminished the risk of the post-operative sepsis which caused the death of many Wertheim cases. There was a potent individual factor in the reaction to radium.

Dr. C. E. LAKIN preferred radium to X rays for splenomegalic leukæmia; it seldom caused constitutional disturbance, whereas prolonged deep X rays might make people really ill.

Reply.

Mr. PINCH, replying, proposed that one meeting each year should be devoted to a discussion of radium failures and mistakes; the results would be of great importance. There was no one technique in radium treatment; it was in a state of flux. Everyone must work intelligently, record successes and failures, and have the results collated and scientifically analysed after five years. He thought that personal idiosyncrasies played a larger part in gynæcological cases than in general surgery.

ABERDEEN ROYAL INFIRMARY.—By means of a special appeal, Sir Andrew Lewis, Lord Provost of Aberdeen, recently raised over £400,000 for the erection of a new infirmary. It is now stated by the board of directors of the institution that, in consequence of altered plans and increased estimates, the cost of the work will be £600,000.

ROYAL SOCIETY OF TROPICAL MEDICINE.

TROPICAL MEDICINE AT THE TURN OF LAST CENTURY.

IN his presidential address to the Fellows on Oct. 18th Dr. G. CARMICHAEL LOW passed in review the gains to tropical medicine made between 1894 and 1914. He recalled how, at the turn of the century, a brilliant company of explorers in the new world of tropical pathology opened up by Patrick Manson rapidly extended and consolidated his pioneer observations of the part played by insects in carrying disease.

Malaria and Mosquitoes.

Manson left Hong-Kong in 1889. He had retired from practice and gone to live in Scotland, but the great depreciation of the Chinese dollar in 1890 brought him back to practice again and to London. Here, four years later, Ronald Ross sought him out. In Bangalore in 1889 Ross had studied malaria, but failed to confirm Laveran's discovery of the malaria parasite. Manson now showed him the parasite and withal explained his famous mosquito-malaria hypothesis which had been born of and fostered by his pioneer work in Amoy in 1877 on the development of the embryos of *Filaria bancrofti* in the tissues of the mosquito. In 1894 the predominant opinion was that "flagellation" of the malaria parasite signified, and was the product of, the parasite's death and disintegration. Manson taught the contrary: "Since the flagella appear only when malarial blood gets outside the body," he said, "their purpose must be to continue the life of the parasite in the outer world . . . for the purpose of infecting mosquitoes which suck the blood of patients." This was a chain of reasoning from which Ross found it impossible to escape; and in the upshot, on returning to India in 1895, he, for his part, began those researches which eventually justified the hypothesis that malaria was transmitted by mosquitoes. But before this historic achievement MacCallum, in 1897, settled all controversy about the exact nature of the "flagella" by showing that they were microgametes. On August 20th and 21st, 1897, Ross, in Secunderabad, made an important discovery. In the stomach of two "spotted-winged mosquitoes," bred from larvæ and fed on a patient with malaria crescents in the blood, he found certain cells containing pigment granules indistinguishable from those seen in malaria parasites; and a month later he found like cells in another species of anopheles—also bred from larvæ and fed on malarial blood. This shining discovery Ross reported promptly to his chief in the Madras Presidency; and now, with the solution of the great problem in his grasp, he was given urgent orders to proceed at once to Rajputana where the dry cold weather put an end to mosquito work. At this juncture Manson interceded with the India Office in London, with result that in January, 1898, Ross was placed on special duty for six months to continue his malaria research. He arrived in Calcutta in the following February, but now armed with MacCallum and Opie's proof that the crescents were sexual forms and not special "sporulating" ones. Human malaria was scarce in Calcutta, so, acting on Manson's suggestion, Ross turned to the malaria of birds, and here found material in plenty. In March he had tracked down the species of mosquito [illegible]nable of carrying the malaria parasite of birds, [illegible] within a few more weeks had traced step by step [illegible] cycle of the parasite's development in this mosquito. In July, 1898, he telegraphed to Manson, who announced the discovery at the British Medical Association meeting in Edinburgh at the end of that month. But the "mugwumps" had not finished with Ross; again and quickly he was forced to discontinue malaria work. He was sent to Assam to investigate kala-azar, and thus, said Dr. Low, it fell to Grassi, Bignami, and Bastianelli, in Rome, to verify the great discovery for human malaria. This would not have been done at the time but for Ross's work—the Italian researches followed his, and were not independent of them.

Manson's Later Work.

In July, 1897, Manson was appointed Medical Adviser at the Colonial Office. His influence appeared in March, 1898, when the Secretary of State for the Colonies, Joseph Chamberlain, issued the first of his letters to the General Medical Council, the medical schools, and the governors of tropical colonies, urging the need of special instruction in tropical diseases. These letters led directly to the founding of the schools of tropical medicine in Liverpool and London before the end of the century—a lead since followed by many nations. In 1877 Manson, in Amoy, discovered the nocturnal periodicity of the embryos of *F. bancrofti* in human blood, and followed this up by showing that the embryos developed and underwent a metamorphosis in the thoracic muscles of the mosquito *Culex fatigans*. He surmised that the mosquito then died in water; the metamorphosed embryos escaped into the water, and through this medium entered man.

In 1899 Manson set Dr. Low the task of examining by serial section a number of mosquitoes which had fed on the blood of filarial human patients, and been kept alive for varying periods afterwards. They had been sent to Manson by Bancroft in Australia. In the heads of some of the mosquitoes, 12 to 20 days after feeding, metamorphosed embryos were found, and at first taken to be just aberrant wanderers. In March, 1900, a section was examined which had taken in the whole length of the proboscis—and there, lying along it, were two completely metamorphosed embryos. When it was shown to Manson he exclaimed: "If only I had known this before my mosquito-malaria theory—how it would have helped me!" The ball had been set rolling, and fast. In 1900–01, Reed, Carroll, and Lazear demonstrated in Havana that yellow fever was transmitted by the mosquito *Aëdes egypti* (*Stegomyia fasciata*). Lazear himself was bitten by one of these infected mosquitoes and died of yellow fever. The first and still the greatest triumph in practical prevention of tropical disease, the direct outcome of these discoveries, soon followed. Havana was completely rid of the secular scourge, and Gorgas was now armed with the knowledge which he expressed in the sanitary control that made possible the digging of the Panama Canal—where once malaria and yellow fever had signally defeated de Lesseps.

ROYAL SOCIETY OF MEDICINE.

SECTION OF UROLOGY.

UROLOGICAL STATISTICS.

AT a meeting held on Oct. 24th Mr. FRANK JEANS delivered his presidential address on Urological Statistics as a Criterion of Progress. He questioned the conclusions to be deduced from figures, because clinical surgery was not exact enough to be reduced to numbers. Medicine was a science, surgery an art, and general practice an inspiration. The essential to interpreting statistics was the realisation of the inconstant factors, which far outnumbered the constant factors. The constant factors were few. They were:—

1. The name of the disease, but even this was subject to differences in nomenclature.
2. The age of the patient.
3. The sex of the patient.

Beyond this the factors became more vague. They were:—

1. The duration of the disease; this figure, if given in weeks or years, ignored the fact that one man in a week may become as ill as another man in a year—the old fallacy of [illegible] fourth [illegible]dix.

2. The presence or absence of sepsis. This was difficult to measure, though in the war it had been roughly done by counting organisms in a microscopic field.
3. Concomitant diseases independent of obstructive urinary lesions.
4. The temperament of the patient; this frequently had determined the question of operation.
5. The weather. Kocher the elder said: "Never do a thyroidectomy on a foggy day."
6. The surgeon who does the operation, or in "pooled" statistics of various hospitals, a mixture of surgeons of very varying ability and skill.
7. The stage of the surgeon's career. Was it done when he was at the height of his daring, or at the height of his efficiency, or at the height of his fame? These were all peaks in the curve at different points in a surgeon's career (and in the careers of actors, violinists, and vocalists). A block of statistics from each of these three periods might or might not yield the same mathematical results as a block from the whole period of his career, but would be clinically different.

Certain factors that ought to make results better were considered by Mr. Jeans.

1. *Asepsis.*—Nothing had been added to the technique of the theatres at the Royal Infirmary, Liverpool, which was as perfect 25 years ago as is to be seen in any theatre to-day.
2. *Anæsthesia.*—It was true we had greater experience of a larger variety of methods, but it was only the increased choice that helped us to select the right method.
3. The greatest influence was increased knowledge of the *efficiency of the kidneys*, and therefore the knowledge when to operate. Many men were alive to-day because they had had preliminary drainage before prostatectomy.

There was one factor, not often mentioned, which might make the results of urologists look worse on paper, and that was the decentralisation of surgery, first from London to the big provincial cities, and later from them to smaller towns. The result of this was necessarily that the pure surgeons and the pure urologists, whether in London or in the teaching provincial schools, were getting a far higher proportion of difficult cases, the ordinary easy ones being done, selectively, by surgeons who were also general practitioners. Specialised experience therefore became qualitative as well as quantitative. Had a deep interest in one's own statistics any moral or immoral influence upon a surgeon's decision to operate upon a desperate case? Theoretically it had none; but surgeons were, after all, human. Impressions after the age of 40 were more valuable than statistics, always provided that the surgeon had not had the disease himself. Personal experience was graphic but misleading.

The results of urinary surgery had undoubtedly improved enormously, but it was difficult to prove this by figures. One should continue to aim high, but one had to choose between two poetical views—Shakespeare's "Striving to better oft we mar what's well." and William Watson's "To keep in sight perfection and adore the vision is the artist's best delight."

SECTION OF EPIDEMIOLOGY.

THIS Section met on Oct. 25th, with Dr. F. E. FREMANTLE, M.P., the President, in the chair, when a paper on

MODERN ASPECTS OF THE EPIDEMIOLOGY, PREVENTION, AND TREATMENT OF MALARIA

was read by Dr. S. P. JAMES. Malarial mortality, he observed, had decreased enormously in the last 100 years in North Europe, though chiefly because [illegible] many deaths were formerly ascribed to malaria [illegible]or. Deaths from this cause did, however, still [illegible] the [illegible]d, and in the same districts as were [illegible] the dividing [illegible]d malarial. Why were they so [illegible] and [illegible]eles were as prevalent as he had [illegible] growing [illegible]ere the feeding habits of these [illegible] the [illegible]? Great social improvements, [illegible]ose the [illegible]r housing had limited malaria, [illegible] in the cou[illegible]ces eight miles from a doctor, with bad houses, unceiled roofs, and no drainage, and to get rid of malaria in England better housing was of the first importance. Speaking of general paralysis, Dr. James mentioned a case infected with benign tertian in September but showing no reaction till a characteristic attack came on in April, a strikingly long incubation. He showed excellent photographs of a charcoal-burner's hut, a perfect mosquito trap, and of other houses in England in which mosquitoes had harboured and carried infection.

Sir MALCOLM WATSON said they had had good housing in Malaya but they had not got rid of their huge malarial death-rate till they had drained their areas. Drainage was required to destroy the larvæ of carrier species while they were together before they had turned into mosquitoes. People not living in the tropics could hardly appreciate the effects of tropical malaria which had depopulated great cities in Ceylon. Problems of malarial control were unending. He spoke of a district where the river had been embanked to avoid floods, and malaria had thereafter become worse, the floods having in the past carried away the larvæ in mass, while now these remained on the spot. —Dr. PHILIP MANSON-BAHR insisted on full use of quinine to prevent patients becoming carriers. —Dr. GORDON THOMSON said drainage and housing were both needed. People were mostly infected in their houses as Dr. James had said, and many bites were needed, for only 1 per cent. of mosquitoes were infected.—The recent reduction of malaria in the army in India through screening of barracks was mentioned with appreciation.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(*Continued from p. 880.*)

SECTION OF HISTORY OF MEDICINE.

IN a paper entitled

JOHN DALTON—EXPERIMENTAL PHYSIOLOGIST AND WOULD-BE PHYSICIAN

Dr. E. M. BROCKBANK, President of the Section, gave an account of the early life of the founder of the atomic theory as a schoolmaster at Kendal. Dalton had expressed in letters, two of which were published for the first time, the wish to become a physician. Having been discouraged by his relatives from entering the medical profession, he accepted an invitation to go to Manchester as teacher of mathematics and natural philosophy at the academy of that town. He remained there for about six years, and during that time used to discuss with the social reformer, Robert Owen, various religious and scientific topics, including his then undefined atomic theory. He soon became a member of the Manchester Literary and Philosophic Society, which was mainly composed of medical men, and took an active part in its proceedings. As the title of his papers showed, Dalton paid considerable attention to important physiological subjects to which he had been attracted by his interest in medicine. His contributions included papers on colour vision, the mind and its ideas and affections, respiration and the causes of animal heat, the effect of atmospherical pressure on the animal frame, and the quantity of food taken in health compared with the amount of the secretions during the same period. Dr. Brockbank concluded by giving some personal details relating to Dalton's dietetic habits, his colour-blindness, and his susceptibility to lead. His death, which took place in 1844, at the age of 78, was due to cerebral hæmorrhage.

Sir D'ARCY POWER read a paper entitled

Surgeons Who Were Never Surgeons.

By this he meant persons who had taken or obtained the degree of F.R.C.S. Eng., but had never practised as surgeons, and apparently had never intended to do so. He gave short biographical notices of such men. First amongst them was Richard Robert Madden, who became a Fellow in 1855. He was intimate with Lady Blessington's circle, and became a friend of Lord Byron and Count D'Orsay. He was a special correspondent in Lisbon for the *Morning Chronicle*, and was Colonial Secretary in Western Australia. William Guybon Atherstone—F.R.C.S. in 1863—was in danger of being forgotten in this country, but he did invaluable service in South Africa, where he made straight the paths for Cecil Rhodes. He advocated the Cape to Cairo railway, desired to see the telegraph carried overland, recognised the first diamond brought from Kimberley, and became a member of the Legislative Council in 1884. Robert James Stone left England for Natal as Superintendent of Education, became a meteorologist, and organised the scientific apparatus at the South Kensington Museum in 1870. George Redford—elected F.R.C.S. in 1869—was registrar of the Crystal Palace collection of sculpture, and devoted his life to the care and description of works of art. His son, George Alexander Redford, was well known as the official examiner of plays. The Bishop of Labuan—Dr. Francis Thomas McDougall—seemed to have been the only bishop of the English Church who passed the examinations and was admitted a Fellow of the Royal College of Surgeons of England. He was an eminent Churchman, a good doctor, and a first-class fighting man. Alfred Smee had the post of surgeon to the Bank of England specially made for him that the Bank might retain his scientific services. He invented "Smee's battery," a durable writing ink, a method of printing cheques and notes, and rendered it impossible any longer to split bank notes. He was, too, a physiologist interested in the electrical parts of the science, and had he still been alive would have been amongst the foremost electrical engineers. Whilst he was still a student he invented the "gum and chalk" splints, which were superseded by plaster-of-Paris, which in turn were replaced by celluloid.

Dr. T. WILSON PARRY (London) read a paper illustrated by lantern slides on

The Stimulus given by Religion to Surgery during the Third Epoch of the Neolithic Period.

He showed that during that period the operation of craniotrypesis (holing the cranium) was performed on the living human skull in order to facilitate the departure of demoniacal spirits. The dead were then buried in dolmens, so that these events could be accurately dated. Large numbers of holed skulls recovered from dolmens could be seen to-day in public and private museums in different parts of France. There were, however, only two skulls on record which could have been in any way dealt with for morbid conditions. It was clear that the religious operation for the setting free of evil spirits was performed first, and later opportunity was taken by the experience thus gained to correct pathological conditions, thus giving a start to cranial surgery, which otherwise would doubtless have been kept back for many centuries. Dr. Parry showed how a skull exhibiting evidence of the ritualistic operation could be differentiated from other holed skulls of prehistoric origin, and pointed out that it was entirely due to the spiritual conditions of that day, which necessitated a surgical procedure for the cleansing of the individual from evil spirits, that cranial surgery took its origin.

In a paper on

James Braid

Dr. GEORGE FLETCHER (Manchester) stated that details of Braid's life were scanty, and his writings were now very scarce. He was born on June 19th, 1705, at Ryelaw House, in a part of Fifeshire which was afterwards transferred to Kinross-shire by the Boundary Commissioners. He was qualified at Edinburgh in 1815, and in 1820 came to Manchester, where he died on March 25th, 1800. He had little connexion with official medicine at Manchester. He was not on the infirmary staff, nor was he a member either of the Literary and Philosophical Society or of the Medico-Ethical Association. His advocacy of hypnotism led to his being regarded as somewhat of a charlatan by his more disciplined brethren. He early specialised in the surgery of deformities, and was apparently the first in England at any rate to have performed tendon shortening in paralytic talipes. The demonstrations of a travelling mesmerist led him to investigate mesmerism, and having found something genuine in it he gave lectures in various parts of the country in order to convince the public and the profession of its safety and value. In 1842 he published a pamphlet "Satanic Agency and Mesmerism," in which he replied to the criticisms which the Rev. H. M'Neile had made in a sermon. Next year appeared Braid's chief work, "Neurypnology." In it he defined the meaning of the word "hypnotism," which he himself had coined, and described the phenomena of the hypnotic state and his mode of inducing it. He devoted a large section to the investigation of the alleged phenomena of phrenology, but his results were discordant; in a later essay he repudiated a belief in phrenology. The second part of the volume was occupied by descriptions of cases of disease which he had treated with more or less success by hypnotism. Most of Braid's writings were occasional and controversial in character. He did not live to give a final account of his researches. In his later works he laid less emphasis on fatigue as a factor in exciting the hypnotic state, and recognised the rôle of suggestion in its induction, control, and therapeutic application. He did not, of course, discover that state, nor was he the first who contended that it was wholly subjective in character. His great merit lay in the fact that he stripped mesmerism of its baseless and occult extravagances, and reissued it in the form of hypnotism for the service of the physician and the psychologist. The subsequent development of hypnotism in France and elsewhere was largely the outcome of his labours. Braid's interests were not confined to hypnotism, which he employed only in the minority of his patients. The use of arsenic in trypanosomiasis was due to a suggestion which he made to Dr. Livingstone. He performed a Cæsarean section in 1847. Sanitary matters occupied his attention, and he kept in touch with natural history during his Manchester life.

Dr. E. BOSDIN LEECH gave an account of

Charles Harrison Blackley (1820–1900).

Blackley was a pioneer in hay-fever research, who, according to Dr. Leech, had not had sufficient recognition for his researches and discoveries. He took up medicine when 35 years old, and spent the remainder of a long life experimenting on the cause and treatment of the disease from which he himself was a sufferer. His work was all the more praiseworthy since he was a general practitioner with a large practice, and a really successful experiment on himself meant that he was incapacitated from work for the day. He was the first to prove definitely that pollen was the cause of the trouble, and that though grasses were the most frequent cause, still the pollen of other plants brought it on in varying, though definite, degrees. Others had surmised; but he experimented and proved. His ingenuity in devising apparatus, both for judging the effects of pollen and preventing it reaching the nasal mucous membrane, was very great. He practised in Manchester, so that the meeting was a suitable one for recognition of his work. Up to the present his fame was chiefly in America, where his work was more appreciated than at home.

WARMINSTER COTTAGE HOSPITAL.—Last week the Marquess of Bath, who gave the site, opened a new cottage hospital at Warminster. The old building, which has been in use for 63 years, was originally a farmhouse. The wards are all on the ground floor and one of them is named after Dr. R. L. Willcox, who has for many years been associated with the hospital.

Reviews and Notices of Books.

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The first volume of the Extra Pharmacopœia is concerned chiefly with information upon the clinical use of chemicals and drugs, their characters, dosage, and methods of prescription, while the present volume sets out developments in investigations, details of experimental research, and certain machinery for diagnosis. One matter among many dealt with by laboratory investigation is mould inhibition by means of various preservatives, a complication which has constantly given practical anxiety in the preparation of pharmaceutical products and foodstuffs generally. An equally important section from the public point of view deals with the antiseptic powers of various chemicals. This chapter is particularly informatory, while it makes pleasant reading for ourselves because stress is laid upon the value of the work of the late S. A. Vasey, which was done at the instigation of THE LANCET and which, with modifications, has been employed in these investigations. Dr. Martindale points out that while there is in this country an inclination to discredit disinfectants as weapons against the germs of disease, the reason of this may be that under the Act of 1908 any useless preparation may be sold to the public without proof that it contains, for example, high germicidal power, that it makes or forms a due emulsion with water, and that it is not affected to a mischievous degree by temperature. The importance of distinguishing antiseptic action from germicidal power is pointed out, and a list of the more potent antiseptics arrived at by recent experiment is given alphabetically, with details of the researches. The information in these pages is of the first practical value.

Another section that will be immediately consulted is that dealing with milk analysis. We have here a résumé of the various Acts of Parliament, regulations, and official publications through which it is endeavoured to secure that the public obtain a milk of good quality and average chemical composition. The grading of milk is clearly dealt with, and the bacteriological standards of the various grades are given, as well as an explanation of the tuberculin tests in cattle, special reference to intradermal tests being added. The notes on the pasteurisation of milk are full, and we may commend the impartiality with which the views on a vexed subject have been collated. The author puts forward a suggestion which we believe is novel—namely, that the consumer might be supplied with milk refrigerated on the farm and delivered to him within a few hours of milking in thermo-isolated vessels. His proposal is backed by experiment, and he may be congratulated upon an idea which could be realised practically by the provision of cheap thermos flasks, which must also be strong and returnable.

The scope of the Extra Pharmacopœia, through the successful dispersal of many large editions, is familiar to all our readers; it remains to say that this addition to the series is, like its predecessors, a clear and authoritative publication, of the highest value to all medical men, and indispensable to many of us.

THE TRAUMA OF BIRTH.

By OTTO RANK. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 224. 10*s.* 6*d.*

IT is agreed by psycho-analysts that what may be either memories or fantasies of birth play a part in the genesis of pathological anxiety and commonly emerge in the process of analysis, though to anyone not analytically minded the existence of the actual memory in the unconscious is not easily credible. Otto Rank, a Viennese analyst of repute, finds that the unconscious is right "where we have dared to follow it only hesitatingly and incredulously," and that in a number of cases the patient repeats his own birth for the most part quite faithfully in all its details. From this starting-point Rank explores the worlds, of myth, religion, art, and philosophy, finding everywhere proof that the primary trauma of separation from the mother underlies their development and manifestations. Without rejecting his original observations we may doubt whether he has done more than other single-minded enthusiasts who, exploring the same worlds, have found evidence for their own theories of human development, and we turn more expectantly to the medical implications of his proposition. He shows in his early chapters a fault common in psycho-analytical writings—perhaps due to the lack of the discipline of effective criticism—for it is sometimes difficult to distinguish established observations from deductions or mere obiter dicta. A statement on page 28 is startling in its non sequitur, when we read that the fact of the newly hatched young of a Cichlid fish taking refuge at night in the throat-pouch of the mother "proves that physiological sleep throughout the animal kingdom is a temporary return to the mother's womb." The writer should not thus make more difficult the task of giving impartial consideration to views that, as psycho-analysts freely admit, inevitably arouse opposition. The fault becomes less apparent in later chapters, as if the one frankly headed "Philosophic Speculation" had enabled the author to sort out his material and prepare the way for his lucid discussion of psycho-analytical knowledge and the therapeutic aspect. He has already claimed (page 4) that his analyses are comparatively short and now he boldly presents the opponents of analysis with the admission that he considers analysis is now in a position to free itself to an extensive degree from the work of investigation (that is, we assume, in the individual case) and to sever the Gordian knot of the primal repression at one cut, thus rendering the analytical process easier and quicker. It is for his fellow workers to decide how far this departure from accepted technique will be approved; his discussion shows an appreciation of the difficulties and limitations of therapy.

From the analytical point of view the book is important inasmuch as it deposes the Œdipus motif from its central position and makes it secondary to the birth experience. Erasmus Darwin, describing the reactions of the child at birth, suggested that the sensations then experienced might serve as the prototype of fear throughout life. By those who accept their observations the possibility of this biological memory on the part of the organism will be confirmed by Rank and his colleagues, who attempt to show that the experience is actually conserved in the unconscious and is accessible to their methods of approach. The book is obviously intended only for those who have already travelled far along the same path as the author, and for them it should be full of interest.

AFTER-TREATMENT OF OPERATIONS.

Fifth edition. By P. LOCKHART-MUMMERY, F.R.C.S. Eng., M.A., M.B., B.C. Cantab., Senior Surgeon, St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum. London: Baillière, Tindall and Cox. 1929. Pp. 281. 7*s.* 6*d.*

THE appearance of a fifth edition is sufficient evidence that this book has proved of great value in the past. It has provided house surgeons and practitioners with just the kind of information about after-treatment that they need, and has given them details of the complications they may expect to meet and of the ways to deal with them when they arise. Unfortunately, in spite of the assurance in the preface that it has been brought up to date, that part of modern practice which is based on new knowledge is not given adequate prominence. For example, we can find no word about massive collapse of the lung, probably the commonest of the important pulmonary complications of operations. In the section on thyroid operations and their after-treatment iodine is not mentioned, while in that on pulmonary embolism and its treatment the word morphia does not occur. The article on surgical shock contains no account of histamine and its action; and while the statement on p. 99 of the same article that "the only form of transfusion which is permanently effective is human blood" is no doubt merely the author's somewhat dogmatic way of saying that a colloid solution remains in the vessels longer than a crystalloid one, gum solution has surely proved of sufficient value to be worthy of mention. In the discussion of the likelihood of gangrene if the main artery of the limb is ligatured for secondary hæmorrhage, no note is taken of the valuable war experience that simultaneous ligature of the vein materially lessens the risk. Finally, the insertion of a drainage-tube after the radical cure of hydrocele is not generally considered necessary.

That the radical of to-day is the conservative of to-morrow is a commonplace of politics, and although Mr. Lockhart-Mummery is justified in claiming credit for having advocated the shortening of the bed-period after the simpler abdominal operations from the three weeks of long ago to ten days, yet this period is now considered unnecessarily long by many surgeons. A few misprints need correction, such as "arthritis" on p. 54, where "arteritis" is meant, and "internal appendix" instead of "interval appendix" on p. 124. The book is written in a readable if somewhat dogmatic style, and it is only because it contains so much valuable information that it seems worth while to call attention to the need for incorporating some of the recently acquired knowledge which has been overlooked.

ANATOMY AND PHYSIOLOGY OF CAPILLARIES.

By AUGUST KROGH. Second edition. New Haven: Yale University Press; London: Humphrey Milford, Oxford University Press. 1929. 101 text figures. Pp. 422. 18*s.*

SINCE the first issue of this book in 1922 general interest in capillaries has much increased and a good deal of fresh and important work has been done, no doubt stimulated for the most part by the book itself. Specially notable are the researches of Landis on the quantitative measurement of skin permeability and of Lewis and his co-workers on the reaction of the skin to injury. Of these Prof. Krogh takes very full notice in this revised edition which in other ways as well is to a large extent rewritten. As before, it has the characteristics of its author. He is anxious everywhere to get some sort of quantitative idea of what is going on and to what extent, accurate if possible, but he shows over and over again that rough approximations are better than nothing at all. And he is not afraid of his imagination. What makes the book such good reading (which it certainly is) is not so much what he tells us as known, but his suggestive comment on what might be found out. He accepts Rouget cells as elements in the capillary wall of proved individuality, responsible for changes in calibre. And naturally a great deal of attention is given to Lewis's H-substance, though it does not seem to have occurred to Krogh that the phenomena of inflammation consequent on a clean aseptic skin wound have for many years been recognised as proving by exclusion that inflammation may be caused by the products of cell injury. Nor does he appreciate when he comments on the extreme whealing activity of the "poison" of the mosquito that this is an anaphylactic reaction which fits quite elegantly into the histamine saga.

DERMATOLOGY.

Précis de Dermatologie. Fourth edition. By J. DARIER, Médecin hon. de l'Hôpital Saint-Louis; Membre de l'Académie de Médecine. Paris: Masson et Cie. Pp. 1102. Fr.100.

FROM its first appearance in 1908 this work has occupied a distinguished position among dermatological text-books, and has been translated into four foreign languages. The collection of material and the preparation and selection of suitable illustrations for an up-to-date dermatological text-book is a task demanding not only much labour and time but also a comprehensive knowledge of current literature. Dr. Darier has given all of these freely, and has been in a position to enrich his book by accounts of his own classical contributions to the science of dermatology. The publishers have made a list of these in an appendix. This list reminds us that it is mainly to Darier that we owe the recognition and classification of the tuberculides, while his work on the sarcoids has justified the inclusion of a special type under his name (Darier-Roussy), while dermatologists all over the world speak of Darier's disease when referring to the condition which he has modestly called "psorospermose folliculaire végétante." Darier's more recent contribution to the histology of cutaneous epitheliomata goes far to explain the relative malignancy of the various types, and deserves more consideration than it has yet received from surgeons and radiotherapeutists.

In the augmented fourth edition of his text-book he has thoroughly modernised and largely expanded the sections on urticaria, eczema, parasitic and mycotic infections, &c., and has added a new chapter on diseases due to filtrable virus—e.g., herpes zoster—and another on dermatoses of autotoxic origin—e.g., prurigo and pruritus. The text throughout is brilliantly composed and arranged, and the sections on eruptions will stand as masterpieces of clinical phraseology. To read them is a relaxation rather than a labour, and so simple is the choice of words and idiom that a dictionary will seldom be required, even by those who do not read French easily. The one blot on the work is the old-fashioned method of reproducing the excellent illustrations and the absence of coloured plates.

THE MYSTERY AND ART OF THE APOTHECARY.

By C. J. S. THOMPSON, M.B.E. London: John Lane, The Bodley Head, Ltd. 1929. Pp. 287. 12*s.* 6*d.*

LAST year Mr. Thompson, who is honorary curator of the Historical Section of the Museum of the Royal College of Surgeons of England, gave us a valuable historical study of the quacks of old London. He now tells the history of the apothecary from the earliest times, tracing his subject from Assyrian, Egyptian,

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THE LANCET.

LONDON: SATURDAY, NOVEMBER 2, 1929.

THE RENAISSANCE OF GENERAL PRACTICE.

WHETHER we like it or not, the centre of gravity of medicine is shifting from the home to the hospital and clinic. The first result of this is that the profession will be unable to go on doing its hospital work for nothing and will increasingly demand payment for services rendered in institutions; the second result is a narrowing of the confines of general practice which will ultimately destroy the efficiency of all who are isolated from hospitals. The problem of payment for institutional treatment is being solved on orderly lines in the course of social evolution, but the problem of the private practitioner's isolation presents itself urgently in connexion with the Local Government Act which will come into force in April. It may not be strictly true to say, with one of the speakers at last week's Panel Conference, that this Act will provide hospitals for everybody, from duke to dustman, but it will certainly set free a very large number of beds to meet the public demand. This will have the effect of popularising hospitals still further, and if no attempt is made to bring the general practitioner into their working it will separate him yet more widely from truly general practice. If the family doctor is to look after nothing but minor complaints, if he is to surrender his patient during every illness, if he is to be kept out of the multifarious activities of the public health service, if he is to have no access to special means of investigation and treatment, then he stands little chance of being a good doctor. While very many have these facilities at cottage hospitals and elsewhere, and make good use of them, the majority of medical men are in no direct relation with hospitals. If local authorities choose the easy course and indiscriminately staff all their institutions with whole-time officers, the present opportunity of a renaissance of general practice will be lost—and such an opportunity may not occur again. It was on some such conclusion that the Panel Conference passed a resolution requiring an institutional position for the family practitioner.

But, of course, it is one thing to pass resolutions and quite another to translate them into action. What sort of hospital is the general practitioner to enter, and what is he to do when he gets there? Clearly no one would care to thrust him into the organisation of the great voluntary hospitals, and it may be asked whether he has in fact a function in anything bigger than a cottage hospital. If he has no place in the large institutions under natural conditions, ought we to provide an artificial environment in which he will thrive? Is the family doctor engaged on work of such national importance that he should be protected; or is free trade in medicine ultimately best for consumer and profession alike? These questions will have all sorts of answers in different minds, in different parts of the country, and in different circumstances. Even now we can find object-lessons in plenty if we look for them. There are already poor-law institutions which have pay-beds to which patients can be admitted under the care of their own doctor. There are others in which medical men are encouraged to follow their cases to the wards and consult with the superintendent and his assistants. Others again have coöpted local medical men as members of their consulting staffs; but here they are usually invited in some specialist capacity, and begin to lose their status as genuine general practitioners. This is the process which has given specialists to most of the big provincial towns during the past two generations, for where a man is attached to a large hospital as physician or surgeon he is apt insensibly to become a consultant—or at any rate a "consultoid." In this increasing specialisation some people see the salvation of the practitioner, but Lord MOYNIHAN (as is reported on p. 957) would have us beware of the tendency to put local doctors on the staffs of the new municipal hospitals unless they have the proper credentials. The hope of the medical profession, he says, is that the standards and ideals of the voluntary hospitals will guide and inspire the work of the old poor-law institutions under their new control, and it must be recognised that physicians and surgeons required for them do not at present exist. Lord MOYNIHAN evidently visualises a municipal hospital as developing gradually on the lines of the teaching hospitals, with no one on the staff who is not an F.R.C.S. or M.R.C.P. He agrees, however, that general practitioners should be given greater facilities for keeping in touch with their patients, and for following the practice of the hospitals so as to keep abreast of advances in medicine.

Possibly we shall have to admit that such facilities are the most that can be hoped for. Perhaps it is true that general practitioners when they demand admission to hospitals are asking for the lost opportunities of their youth, which they can never have again. We must beware of thinking that it does not matter what happens to the practitioner of to-day so long as we look after the training and chances of the practitioner of to-morrow. And we are not persuaded that it is impossible at once to bring the family doctor into much closer touch with hospital work. If the so-called salt of the profession is losing its savour, we do not believe it is beyond the wit of man to re-salt it.

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LATENT FRACTURES OF THE SPINE.

UNDER this title Médecin-Commandant M. CLAVELIN [1] writes of those minor or overlooked injuries of the vertebræ which have figured more largely in medical literature since the war. The number of violent injuries from explosions, falls of earth, and accidents to vehicles during the war, and the automobile accidents after it, have made this subject more important than it was even 20 years ago, while improvements in radiographic apparatus and technique have made early diagnosis possible where previously it was impracticable. No doubt it would be well if, as CLAVELIN suggests, we were to banish from our case-books such vague terms as contusion of the spine and muscular strain, for nearly always what is called contusion is really fracture, and muscular strain, however slight, involves rupture of muscle-fibres, which may be extensive enough to impair the muscular support of the spinal column. Not only may the bodies of the vertebræ be concerned in a crush fracture caused by excessive flexion, but any of the apophyses may suffer, and Clavelin has found that these latter lesions are accompanied by more acute and more localised pain than are compression and deformation of a vertebral body. The term "compression fracture" is perhaps not very happily chosen, for by fracture of a bone we usually understand a solution of continuity involving the division of one bone into two or more fragments, whereas a crush fracture of a vertebra consists not in a tearing apart but in a squeezing together of cancellous tissue and consequent alteration of shape of the bone affected. Any regions of the spine may be the site of a compression fracture, but the lumbar region is far more often affected than the cervical, and the dorsal least of all.

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[1] Arch. de Méd. et de Pharm. Milit., 1929, xc., 439.

Unlike the classical fractures or fracture-dislocations of the spine, with their obvious and grave clinical signs and symptoms, these minor injuries have often been overlooked, especially when other and more grave injuries of the limbs and trunk have absorbed the attention of the surgeon immediately after the injury. But when these have been successfully treated disability may still remain, together with pain referable to the spinal column, which on careful radiographic examination may be found to be due to overlooked injuries. In other cases the original accident may have been comparatively slight; the symptoms may have been attributed to sprain and treated by too short a period of rest; after which instead of disappearing they may become worse, whereupon a more careful and more skilful radiographic examination reveals a definite lesion of bone. Clavelin has confined his observations to cases which he has seen for himself or which have been recorded in France. But the subject has not been neglected elsewhere and we may direct attention of students to the work of R. B. Osgood on compression fractures and to the discussion on minor injuries of the vertebræ which took place at a combined meeting of the Surgical and War Sections of the Royal Society of Medicine last January. On that occasion Group-Captain H. V. Wells[2] described typical cases of "latent" fracture—to use Clavelin's term—in which at or soon after the time of injury radiography showed nothing wrong with the spine, but which months later developed symptoms, and radiograms subsequently showed deformity of bone. The surgeons who spoke at that meeting for the most part thought that such deformity was due to morbid processes in the nature of an osteitis—coming on after the first radiogram was taken—a view which was stoutly challenged by at least one radiologist, who refused to accept it until more exact radiographic evidence was forthcoming. Clavelin, while discussing late-coming symptoms in minor injuries, does not deal with this syndrome, although he shows among the 24 figures which illustrate his paper, two of "spondylose traumatique" which bear evidence of arthritis deformans of the spine following on injury. However divergent the views held by various clinical observers, there is an unanimous belief in the necessity of skilful radiography (always in two planes), consequent early diagnosis, and early and adequate treatment. This last may be summed up in the Hiltonian prescriptions of physiological rest; but after this rest care must be taken to secure mobility if necessary by breaking down adhesions.

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[2] The Lancet, 1929, i., 335.

THE POSITION OF PSYCHO-ANALYSIS.

An attempt to place in perspective a book on "The Trauma of Birth," reviewed elsewhere in this issue, induces some reflections on the present position of psycho-analysis. The arguments of the author, as he himself states, are only possible and intelligible on the basis of the whole body of knowledge that has been gained psycho-analytically about the construction and functioning of our own psychical instrument. The assumption involved invites a general survey of the relation of psycho-analysis and medicine, since either this body of knowledge is a delusion, and books like this are waste paper, or we are ignoring a most important advance in the pathology and therapy of some of the commonest ills of mankind.

Freud's first announcements of his discoveries, over 30 years ago, were received with blank incredulity, and years passed before his ideas began to receive attention, even from a few. Now they are being to a greater or less degree confirmed by an ever-increasing number of practical workers, and they influence our conceptions of neurotic disorders more than is generally recognised. Recently a committee of the British Medical Association was appointed to inquire whether the practice of the specialty is immoral or dangerous; the fact that propriety and usefulness of this sort had been publicly questioned justified this unique inquiry, which resulted in the acquittal of psycho-analysts of evil practice. What this new method of approach can offer to medicine is, however, a question we seem in no hurry to consider. The fact that, if confirmed, it will mark an epoch in the growth of knowledge escapes the observation of many who may thus be losing the opportunity of watching history in the making. An active psycho-analytical organisation certainly coördinates work in different countries, and has published a large mass of observations, theories, and speculations, resulting from work that is evidently laborious and painstaking; but this organisation stands aloof from the general body of medical or scientific thought, and a glance at the history of the psycho-analytic movement suggests that in this aloofness Otto Rank might see the results of a difficult delivery and a stormy childhood. As a possible bridge across the gap we find individual practitioners who make use of analytical teachings in the treatment of psychoneurotic patients, but these seem to receive little academic encouragement and are denied, or deny for themselves, the title of psycho-analyst. The situation is without precedent. In the controversies associated with the names of Darwin and Lister the opponents came to grips in the scientific arena and reached conclusions. Although the acceptance of evolutionary theory was delayed by emotional opposition, and finally became a matter of gradual absorption, yet in the stormiest times its exponents were not driven from the scientific fold. The unanswerable virulence that expressed itself in our journals some twelve years ago is happily a thing of the past. Yet in London to-day few young men on the threshold of an academic career in medicine would dare to give open adherence to psycho-analytical principles, or even to investigate them practically in a scientific spirit.

For this state of affairs it is futile to ascribe blame in any particular quarter. The historian sees in such situations the play of forces inherent to human nature, and the cases of Darwin and Freud are alike if only because in each of them the world's peace of mind was apparently in danger and man's satisfaction with himself was shaken. The intrinsic qualities of the processes revealed by analysis are held by his followers to be responsible for the determined rejection of Freud's discoveries, and they rightly plead that to make them answerable for these qualities is the negation of science. We may eventually come to acknowledge a debt to those workers who, as we have seen, are content for the present to be isolated from the general current of medical thought.

By that time we shall have answered the questions that arise from the reading of "The Trauma of Birth"—do these things happen, and if so, what is their import to medicine? The nature of the answer to these questions cannot be prophesied. The trouble of investigating psychology from this new aspect should not be minimised or attributed only to its unwelcome message; its exponents are still unable to agree on even the fundamental tenets of the faith. Few of them follow Freud in all his teachings, and it is likely that the pattern ultimately to be woven will be made from many designs which at present seem to clash with one another. Our plea is that in the medical schools some equipment should be given to the student to enable him to follow the developments of Freud's ideas, and eventually to assimilate those which will help him to understand his patients.

Annotations.

"Ne quid nimis."

PRINCIPLES OF PUBLIC HEALTH DEVELOPMENT.

An ordinary industry, as Dr. J. J. Buchan pointed out in his presidential address to the Society of Medical Officers of Health on Friday last, is constantly reviewing its organisation and making any outlay necessary to improve efficiency, maintain position, increase profits, and diminish expenses. Yet, although the only real capital of the State is the health of its people, this vigorous progressive acumen is seldom seen in the department of public health. The public health is a good business proposition, for it has done more in the past to increase capital and diminish expenses than the most successful industrial venture on record. Despite a chaos of patchwork legislation and great inherent difficulties, the rate of progress in recent years calls, as Dr. Buchan pointed out, for some satisfaction, but he laid down certain principles for the future which should ensure a continuance and amplification of the success already attained. We are still far short of making full use of the knowledge we already have and still more wanting in facilities for research. Every up-to-date industrial concern maintains a research institute; surely the State should not leave the great bulk of research work in health to the self-sacrificing labour of the few and the vicarious generosity of the well-intentioned. Dr. Buchan's first principle was that the protection and improvement of the health of the people should be regarded by the State as an end worthy in itself. Too often in the past public health has crept in behind the skirts of some other work, as, for instance, the public health services under the poor-law, which were no more than a side-line in the relief of destitution. This has been set right, but similar examples still abound, notably in factory legislation. "Despite a succession of statutes and a multitude of orders," said Dr. Buchan, "factory legislation has continuously failed to meet fully the real health needs of the whole body of the employed . . . only some six millions out of sixteen and a half millions of occupied persons come under the Factory Act." He refused, however, to regard the health of the worker as a labour problem to be solved by codification of industrial laws; the health problem is fundamental and the health of the employed must be brought under the Ministry of Health and not under the Home Office. His second principle was that the people cannot be sectionalised; evil conditions in one class, at one age, or in one set of circumstances have comparable evil conditions in very different departments. Health in pregnancy, for instance, must be viewed in relationship to the conditions before and after pregnancy, and the more deeply we inquire into the health of school-children the further do we travel from the school. The third principle was that a central unification and reorganisation of health effort is not in itself sufficient unless it is accompanied by a similar unification and reorganisation at the points of administration. Health work in this country has always suffered, he maintained, from a lack of well-ordered and well-arranged local government areas. The State should permit no consideration of local history, pride, prejudice, or precedent to stand in the way of securing competent machinery of local administration. His final principle was the complete freedom of expression of the professional health officer within his own sphere. To be of any service he must be absolutely free to express his opinion on any matter of health, whether it be lead poisoning among painters or the exclusion of school contacts in infectious disease. Any control of this expression of opinion must come from within the public health service itself, and not from administrators who have not the knowledge to control opinion on such subjects. "In no other kind of public activity," concluded Dr. Buchan, "is there such a solidarity of interest for all the people, and in none is their coöperation and help more desirable." This coöperation depends almost entirely upon the better education of the great mass of the people in matters of health, and for this education the public health officer must rely to a very large extent on the general practitioner, who has it in his power to take the knowledge of hygienic principles into the homes and hearts of the people.

PERNICIOUS ANÆMIA WHICH RESISTS LIVER TREATMENT.

Are there any cases of pernicious anæmia which will not respond to liver? The general experience both here and in America seems to be that there are not; but Dr. P. Emil-Weil now publishes[1] three cases diagnosed as pernicious anæmia which got no better under modern treatment. The patients all showed severe anæmia with a high colour-index and some leucopenia; in one the spleen is said to have been enlarged. Liver was given, both as whole gland and in the form of extracts; this treatment was supplemented by frequent transfusions of blood; yet no improvement followed, and all the patients died after illnesses of some months. The question naturally arises whether the diagnosis was correct. We have at present three criteria of pernicious anæmia—namely, achlorhydria, hæmolysis, and an increase in the mean size of the red cells. A high colour-index is indirect evidence of the last of these, and it was observed in Emil-Weil's three cases. But he gives no information about the other two signs, and failing this it would be rash to amend the aphorism that anæmia which will not respond to liver is not pernicious anæmia.

JUVENILE RHEUMATISM IN MARYLEBONE.

The St. Marylebone Children's Rheumatism Supervisory Centre was instituted at the General Dispensary in 1926, and has now published its first report with an analysis of the first 100 cases. An attempt is being made to combine into a simultaneous objective a clinical inquiry into the prevention of heart disease and a laboratory investigation into the nature of the rheumatism of childhood. The clothing was good in 71 per cent., fair in 23 per cent., and bad in 6 per cent. The family income was adequate in 79 and inadequate in 21. The housing was good in 23, overcrowded in 32, damp in 8 only, insanitary in 11, and inadequately light in 9. The clinical analysis shows the family and personal history, age, previous infections, early symptoms and state of nutrition, teeth, and blood pressure. The biochemical work includes hæmatological and chemical examination of blood, urine, and fæces, and certain abnormalities have been found with some consistency. In 75 of the children focal sepsis could be excluded, and the constitutional findings in the remaining 25 provided presumptive evidence of a rheumatic diathesis with a secondary superadded septic factor. Cardiac involvement was found in all the children (60) who exhibited a lowered alkaline reserve. Cases which showed a deviation of the acid-base balance to the alkaline side were eventually classified as non-rheumatic, both on clinical and on biochemical grounds. Phosphate and sulphate excretion was abnormal in more than half the cases, and the aromatic sulphate fraction was increased in 30. Calcium excretion was low in 65, and 70 showed an abnormal carbon-nitrogen ratio. No consistent variations from normal were found in the fæces except for an excessive loss of calcium in 40. Some of these findings are suggestive, but the director, Dr. Halls Dally, rightly declines to draw conclusions at this early stage of the work.

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[1] Le Sang, 1929, iii., 420.

DUTCH MENTAL HOSPITALS.

OF the subcommittees formed by the Royal Medico-Psychological Association there is one which organises study tours and post-graduate education in mental disorder. Just a year ago a party visited the mental hospitals of Holland, and an account of the tour has now been published in pamphlet form.[1] The Dutch Lunacy Law differs from our own in a few respects. Until 1906 a patient could only be received into a mental institution on the certificate of an independent medical practitioner, and the petition of a relative or of the Public Prosecutor in lieu. Any building where more than two insane persons were treated was legally an asylum, but in 1906 the law was amended so that patients could be received in a university clinic without labelling the building as an asylum. Thus patients can now be taken into these institutions or into separate blocks in mental hospitals, called "open wards," without the formality of certification or periodic statutory reports. The visitors last year found that 20 per cent. of the inmates of mental wards had been admitted without any kind of certification. Many of them were obviously non-volitional, and isolation, seclusion, or continuous bath treatment were ordered for them, irrespective of the basis of admission. There is no legal provision for single care or for the disposal of the income of well-to-do patients. One doctor to every 175 patients is required in new hospitals. The medical director is the chief officer, except in Roman Catholic institutions, where the Prior exercises general control. The State issues a diploma in mental nursing after three years' training and examination. The proportion of nurses to patients is about double that found in Britain, but Holland experiences the same difficulty as we do in securing suitable applicants. Assistant nurses are paid from £45 to £60, and nurses holding the diploma £146 to £160 per annum, and the working week varies from 48 to 60 hours. Female nursing of male patients is commoner there than in this country.

Perhaps the most striking feature of the Dutch mental hospital is the application of Dr. Simon's occupational therapy, which was devised with a particular view to improving the condition of restless, destructive, or filthy patients in turbulent wards. It is based on pedagogic principles. Four or five patients are put together in a little alcove, and stillness and silence are enjoined. When a new patient joins the group the atmosphere of quiet industry has a strong influence. Any patient who becomes noisy is removed to a single room for a period varying from ten minutes to an hour, as a penalty. The work on which the patients are employed includes raffia, tearing rags or coir, untying knots in string, rolling string into balls, envelope-making, cleaning letters off three-ply wood tea-chests, rudimentary knitting, rug- and mat-making, tobacco-leaf stripping, brick trimming, tile-making, and cleaning labels. The articles made by more advanced patients display much ingenuity and activity with every variety of handicraft, but even the least intelligent can produce wire paper clips or firelighters made of rolled shavings. Weekly payments are made in recognition of good behaviour and regular work, and to promote self-esteem. On July 1st, 1928—a day taken at random—1273 out of 1420 patients at Santpoort were doing some kind of work; of the remainder, 122 were too old or ill, and only 25 were unoccupied for mental reasons. Dr. van der Scheer, of Santpoort, maintains that turbulent behaviour is not a part of the psychosis, but arises secondarily from loss of educational and environmental influences; he believes that noisy wards will follow mechanical restraint and dark cells into oblivion. Padded rooms are unknown in Holland, their place being taken by continuous baths in which the patient is fixed by a wooden or canvas lid with a padded opening for the neck. Even this restraint is now very little used. A method frequently employed for controlling acutely excited or depressed patients is Kläsi's continuous sleep. Somnifen is given orally or by intramuscular injection twice a day, and the patient is kept absolutely quiet. Manic-depressives may be kept under the drug for a fortnight; dementia præcox patients for a few days. As the somnolence begins to pass off the patient is exercised by two nurses and started on manual occupation, so that by the time he is fully awake again he finds himself engaged in some quiet employment. Sometimes opium is given instead of somnifen.

There is an interesting after-care service in Rotterdam. A special practitioner living in the town is selected as outdoor service doctor; he attends the hospital weekly for a whole day, and so is well acquainted with hospital routine and problems. He gets to know the patients before they leave, and his services are offered to them for after-care and seldom refused. He inspects the environment to which they are returning, and thereafter visits as often as seems desirable. A consulting clinic has arisen out of this service but was not the primary element of it: the home visitation is stressed as the most important and illuminating part of after-care. The service is in close contact with the local welfare society. Since its inauguration three years ago the insanity figures for Rotterdam have decreased, although the population has soared, and other cities in Holland show no corresponding decrease. Thoroughness was the quality in all this work which consistently impressed the visitors; therapeutic measures and laboratory research alike are pursued in Holland with energy and application.

The committee is doing a great service to European psychiatry in linking up the work of different countries by these study tours, and it was a happy corollary of the visit to publish this account for those who were unable to take part.

SCLEROSING INJECTIONS IN THE TREATMENT OF HERNIA.

SCLEROSING injections in the treatment of varicose veins have become deservedly popular; their effective superiority to excision has been proved beyond dispute. It is not surprising therefore that investigators have sought to adapt similar methods to the treatment of other conditions, such as inguinal hernia. It is curious to what extent the sequence of events corresponds. Injections for the cure of varicose veins were employed about the middle of last century, but were discarded as dangerous largely because the fluids used were unsuitable. Now Dr. J. S. K. Hall[1] reminds us that Velpeau, in 1835, was the first to think of an injection method for the cure of hernia, and actually put his plan into practice, using an iodine solution as the fluid. Several other surgeons followed his lead and good results were recorded. For some reason, probably because the fluids used were too irritating, the method fell into disuse and, according to Dr. Hall, has only been resuscitated by the work of Dr. Pina Mestre, a Spanish physician, who published his experiences in 1927. He and his associates claim to have treated more than 8000 cases of hernia. Almost without exception the inguinal canal was obliterated in 10–15 days. The success recorded appears to be due to the discovery of a non-irritating and effective liquid. Like that used in the treatment of varicose veins, the method is an ambulatory one. The injection is composed of a mixture of the alcoholic extracts of several astringent plants, of which the most important seems to be rhatany. The hernia is first reduced and an injection made every day in the region of the external abdominal ring. An indurated mass appears in a day or two which effectively blocks the inguinal canal. Precise details of the formula are not given by Dr. Hall, nor is it clear whether the injection is made within the lumen of the sac or around it. Various objections are likely to arise in the mind of a critical surgeon reading this account. He may well ask what will happen if inadvertently the injection is made intraperitoneally, whether the coils of intestine in the neighbourhood of the internal ring become adherent in this situation, whether or not thrombosis may sometimes be caused in the pampiniform plexus, and whether, in infants, to whom the method is said to be applicable, any damage is done to the delicate vas deferens. None of these questions is touched upon, but it is scarcely likely that 8000 patients would have submitted to the treatment had complications been frequent. The method, whilst in principle it lacks precision and does not therefore attract the surgeon, appears worthy of consideration; and further investigation is desirable because any effective ambulatory treatment of this common abnormality would be a boon to countless sufferers.

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[1] An Account of a Tour of Dutch Mental Hospitals and Clinics. By A. E. Evans, M.B. Adlard and Son, Ltd., 21, Hart-street, W.C. 1929. Pp. 18. 1s.

[1] Medical Journal and Record, 1929, cxxx., 81.

LATER BREAKFASTS IN HOSPITALS.

EVERY profession has its critics amongst what it chooses to call the lay public, and close association with any profession is usually sufficient to show that there are very good reasons behind what the outsider is often inclined to consider an abuse. It has long been a matter of astonishment and indignation amongst a section of the public that the sick, when they are admitted to a hospital or nursing home, find themselves roused from their sleep many hours before the time at which they would be woken up in their own homes. Doctors and nurses know that the cleaning of the wards and the washing of many patients takes a considerable time, that enemata and douchings and dressings often have to be carried out at an early hour, that four-hourly medicines must be given by the clock, and that in fact the hours before 10 A.M. are extremely busy ones for nurses, whose duty it is to have their patients suitably prepared for the visit of the surgeon or physician. To harmonise these interests with the rest which is often the primary therapeutic need of the patient is almost an impossible task. The layman who is inclined to grumble when two nurses have to be installed into his house to look after a sick patient is often slow to comprehend that if all these morning duties were to be piled upon one nurse she would be quickly worn out. Twelve hours is the utmost a nurse can be asked to work, but in private it can be arranged for the change of duty to take place at the hour, be it 8, 9, or even 10, when an equitable distribution of hard work can be made. But in hospital such adjustments are not so easy, since the needs of individual patients vary. It is therefore a satisfaction to learn that the authorities of the Middlesex Hospital have been able to reorganise the work of the hospital on lines which will allow the patients to rest undisturbed until 7 A.M., when breakfast will be served. We understand that in order to introduce this reform—in which the matron, sisters, and nursing staff are eagerly and loyally coöperating—it has been necessary to bring the day nursing staff on duty at an earlier hour and that the visits of the resident and other medical officers and presumably of the students are to be postponed until after 10 A.M. The change is introduced at the moment when the new west wing of the hospital is being occupied, and the authorities believe that their example will be followed by hospitals throughout Great Britain. As much depends upon the interpretation of such a rule as upon its actual wording. If such urgent treatment as is required in the early hours for individual patients is administered without clatter, if ward maids are excluded till after breakfast, and the routine cleaning of floor and lockers is also postponed, the concession will result in securing an extra hour of rest to the patients, possibly even more. In many hospitals it is the custom to serve breakfast at 6 A.M., the active patients being provided with hot water only after the meal, while the helpless ones are washed before it; if there are many of these the process must be lengthy and some at least must be roused uncomfortably early. Any attempt to make the hospital more like the home deserves praise. A later breakfast is one way. Another is to sacrifice the appearance of the ward to the idiosyncrasies of the patient; to allow him to smoke and receive visitors during convalescence, and to accept from his friends fruit and other delicacies which the hospital cannot provide; and finally, to ensure that his friends can obtain not only news of his progress but messages of his wants on the telephone. The Middlesex Hospital is one of those with a reputation for consideration as well as good treatment, and has given new proof that this reputation is deserved.

CHLOROTIC ANÆMIA IN THE MIDDLE-AGED.

A LOW colour-index of the blood associated with virginity in young females used to be regarded as an indication for the administration of iron in large doses or the encouragement of early marriage, either remedy being effective. Chlorosis is now so rarely seen that there must be those among students and medical men of fairly recent standing who wonder whether the whole syndrome of green sickness was not a figment of the imagination of the earlier clinicians. No one, however, who was walking the hospitals 20 years ago will deny that the condition existed. The reasons for its disappearance afford much subject for speculation; increase in the therapeutic use of iron and changes in the dress and normal activities, customs, and pursuits of girls have both been suggested. While typical chlorosis has practically disappeared, however, it is becoming evident that there are other types of anæmia associated with a low colour-index still to be reckoned with. A well-recognised type is that associated with hypofunction of the thyroid; a further type occurring in adult females leading a normal sexual life has been closely studied by Dr. Grieg Altschuller[1] at the Medical Clinic of the University of Prague. In the particular case described by this author there was moderate diminution of the red cells with profound depression of the hæmoglobin percentage and consequently a very low colour-index. The basal metabolism rate was lowered, but the condition made no response to thyroid medication and could therefore be removed from the thyreogenic class. The exhibition of reduced iron in large doses brought about a speedy improvement in the blood picture; when the iron was dropped the anæmia returned, but was again abolished by its administration. In fact, the condition behaved like a case of chlorosis, but differed from it in occurring in a widowed woman of 45, who had borne several children, and in the absence of the peculiar aspect of chlorosis. In considering the case Altschuller points out that hæmatopoiesis may be considered under three heads—the production of the young red cells, their saturation with hæmoglobin, and their liberation into the blood stream. In cases of the sort described he sees a disturbance of the second step, which is also that affected in the chlorotic diathesis. The fact that in Altschuller's own case the subjective symptoms of headaches, lassitude, and fatigue disappeared within a few days after the exhibition of iron, before any change had become detectable in the blood picture, he takes as confirmation of the view of Morawitz that the action of iron is not confined to the blood-forming system but extends to other organs, including those of internal secretion.

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[1] Altschuller, Grieg: Sur la Pathogénie de la Anémie hypochrome, Acta Medica Scandinavica, 1929, lxx., 110–119.

SEWAGE ANALYSIS.

THE Committee appointed to discuss the question of technique in carrying out chemical analyses of sewage and sewage effluents has now brought in its report,[1] which is designed to assist those who are engaged in testing the purity of effluents and of rivers. Two sentences in the report sum up well the two points of view held by analysts on the question of standard methods :—

> "A reasonable measure of uniformity is desirable in the methods to be followed in testing the quality of sewage liquors, before and after their purification, and also in the statement of analytical results. Without this it is difficult to be assured that the same standards are being applied or that really comparable results are being obtained. Reasonable uniformity is essential if a common language is to be spoken."
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> "This search for some measure of uniformity is not intended in any way as a break on initiative, upon which progress in methods depends. It should not, however, be difficult to secure both objects, reasonable uniformity and full initiative."

When the thing to be determined is a definite chemical entity the real chemist will no doubt prefer to choose his method to suit the case; it is only the man who is afraid to exercise his judgment who will willingly let it be bound. In the case of sewage, however, some measure of standardisation, both of methods of analysis and of setting out the results obtained, is desirable. For sewage is a very complex mixture of unstable compounds, containing within itself living agents which continually work changes and modify its composition from hour to hour. Ammonia, chlorine (or rather chlor-ions), and total nitrogen are well-defined chemical individuals; yet in sewage and effluents ammonia is readily formed by the very reagents or processes used, through hydrolysis of amines and the like, while the total nitrogen content of a liquid containing 0·01 per cent. or less is not determinable with the same ease as it is in, say, a sample of bone-meal. The conception of "albuminoid ammonia" which we owe to that brilliant but erratic genius Alfred Wanklyn is another useful label—not to be dignified with the name of entity—which is only valuable if it is applied in the same rigid manner by all whose results are to be compared. This is in brief the case for standard methods of sewage analysis.

The personnel of the Committee and the fact that Dr. George McGowan was mainly responsible for details is a guarantee that the methods are sound. Criticism, if any, will be directed to a degree of precision which may be unnecessarily high and involve an undue expenditure of time. The report opens with the question of sampling, for the most careful analysis in the world would have no value, except as a laboratory exercise, unless made on a sample which really represents something definite. A consideration of the way in which sewage is produced, the daily incidence of the morning wash or bath, other matters of personal hygiene, washing-up, street watering, and the regular operations of industry, the weekly round of washing days, washing-down after brewing and similar intermittent operations, with irregularities of rainfall and secular changes due to the seasons—all these affect the composition of sewage. No shorter interval than a day can be regarded as yielding a representative sample, and this day should be one on which there is little or no rain. Samples should, whenever possible, be analysed within 24 hours of collection, the time elapsing being stated. Results of analysing the same sample one, two, three, and six days after collection are given in an appendix; although the total nitrogen remained constant, the proportion of ammonia went up at the expense of organic nitrogen—in other words, chemical simplification was going on. In the illustration given, however, the variations of solid content suggest that the samples were not at the beginning quite identical, as the non-volatile matter varied; calcium carbonate may have separated out owing to the increasing alkalinity of the liquid. The increase of oxygen immediately absorbed from permanganate showed that unstable organic matter was increasing, while a decrease of that absorbed in four hours seems to indicate that oxidation had gone on, reducing the total oxidisable matter. Turning to the methods themselves, it may be remarked that Crum's mercury-sulphuric acid process for nitrates and nitrites has the advantage of being positive and specific, although rather troublesome; *it is useful* in cases where the presence of these compounds is a priori improbable and it is desired to verify the findings of a differential method. The mysterious entity known as "X nitrogen" is given its proper significance, which is merely the difference between the real organic nitrogen and that indefinite portion of it which is yielded by the Wanklyn process as "albuminoid nitrogen." The Committee recommends that analyses should, as a rule, include estimations of suspended matter, chlorides, free saline and albuminoid ammonia, oxygen absorbed from an acid solution of permanganate, and, in addition, in the case of purified effluents, nitrates, nitrites, and the Royal Commission test for oxygen taken up from aerated tap water. It is important to distinguish between the last-named test and the permanganate test for oxygen absorbed, the results of which bear no simple relationship to the Royal Commission test.

The report should prove of value not only to analysts but to medical officers of health, engineers, managers of sewage disposal works, and other officials of local authorities on whom falls the burden of sewage disposal. What this burden amounts to is well indicated in Mr. A. J. Martin's recent Chadwick lectures which are summarised on p. 961.

INFANTILE MORTALITY IN KENSINGTON.

To people who do not live there the name of Kensington suggests the last resting-place of smug respectability, the essence of organised drapery, beautiful gardens, or dismal slums. Few envisage the borough as a whole. It is in fact a long, narrow slice of the County of London, shaped like the popular, if unfashionable, Russian boot. Its heel extends south of the old exhibition grounds at Earl's Court, to take in the West London (Brompton) cemetery. Its pointed toe touches Piccadilly at Knightsbridge, and its rucked leg includes no part of Kensington Gardens, but, on the other hand, many of the squares, such as Pembridge-square, usually associated with Bayswater. The whole of Holland Park and Campden Hill, and the more dilapidated areas of Notting Hill are included in the borough, its northern boundary at the top of the boot being another cemetery, Kensal Rise. Even a casual survey of this medley of social conditions shows how perplexing would be the problem of investigating any statistical anomaly in the public health of the borough if undertaken by one unfamiliar with the distinctions which fashion has drawn between adjoining districts. It is therefore from within the borough that we must seek light. Fortunately, a group of the doctors practising in the borough are concerning themselves with the welfare of the community, as well as with the health of individuals. The North Kensington Medical Society, which has already shown signs of an active interest in the medico-social questions of the day, met on Oct. 8th at 85, Colville-road, W., to discuss with each other, and with Dr. J. Fenton, medical officer of health, the cause of the large increase in infantile mortality in 1928. The population of Kensington is 176,000, and the infantile mortality-rate rose from 61 in 1926 to 67 in 1927, and to 85 in 1928; the borough thus shares with Paddington the ignominy of losing 18 more infants under a year old for every 1000 births than the average London district.

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[1] Ministry of Health: Methods of Chemical Analysis as Applied to Sewage and Sewage Effluents. H.M. Stationery Office. 2s. 6d.

The reasons suggested by the speakers for this high mortality varied widely. Dr. E. M. Reece attributed it largely to overcrowding, poverty, and to lack of open spaces. Dr. A. K. Gibson and Dr. A. K. Barrett thought that maternal care must be at fault, and Dr. M. Hellier agreed that many of the mothers went out to work long before the child was fit to be left. Dr. W. C. Robinson spoke of the possible correlation between high infantile mortality and large families. Dr. A. B. Pastel proposed the separation of children suffering from tuberculosis, and the provision of an increased number of qualified midwives, as remedies which might be efficacious. Dr. D. M. Scrimgeour, Dr. R. H. Draper, and Dr. E. Lowlor emphasised the special dangers to which illegitimate and unwanted children were exposed, while Dr. M. W. Geffen had found illegitimate children to be well cared for and healthy. Dr. Christine Murrell and Dr. H. Sanguinetti believed that congenital syphilis accounted for more deaths than was generally admitted, but Dr. G. Slot agreed with Dr. Fenton that the syphilitic mother was rare. Dr. Fenton pointed out that there seemed to be no advantage from the point of view of infantile mortality in a rich population; moreover, since 32·8 per cent. of the deaths took place during the first four weeks of life housing conditions could hardly be incriminated. The closure of basements for residential purposes had its dangers, since unoccupied basements might collect vermin, and become more of a menace than occupied ones. Dr. Fenton concluded by welcoming the coöperation of doctors practising in his district. The outcome of the discussion was the passing of a resolution deploring the high infant mortality-rate in the borough, and proposing further investigation of deaths under one year of age. To this end it was suggested that three members of the Society should confer with the medical officer of health in order to arrange a scheme, or to make further use of existing methods of inquiry.

MEDICAL SCIENCE IN THE FIFTEENTH CENTURY.

A VOLUME[1] consisting chiefly of special studies of the philosophy of the fifteenth century, based in large measure upon manuscripts and unpublished material, makes it clear that the contributions made to medicine and surgery during the fourteenth and fifteenth centuries have been much undervalued. Disparaging generalisations at the expense of the Middle Ages should now be repeated only by those who refuse to give up any catchword or prejudice that was instilled into their minds in childhood. In the first chapter, which is perhaps the most interesting of all, the author introduces the reader to the scientific and other thought of the fifteenth century and aims at giving him some notion of what has been accomplished and what remains to be done in the way of historical investigation of this period. His own studies are recorded in the following chapters and in the appendix which occupies 100 pages. These concern medicine and the law, astronomy, mathematics, and speculative, moral, natural, and political philosophy. There are ten illustrations of manuscripts and diagrams, and the book contains not only a general index, but also an index of the manuscripts referred to. Publication has been assisted by a grant from the Dunning bequest left to Columbia University for the encouragement of historical studies. The inventiveness of the Middle Ages continued to manifest itself in the fourteenth and fifteenth centuries, and in the opinion o fthe author printing is about the only invention of this period thus far adequately studied. During the fourteenth century systematic dissection of the human body was practised for purposes of instruction; and advance was made in measures against infection as a source of disease, and long before the close of the fifteenth century mercury salve was used in the treatment of syphilis. The work of Henry de Mandeville reveals him as a pioneer of antiseptic surgery at the beginning of the fourteenth century, but perhaps the most striking instance of surgical achievement cited is a passage from Bartolommeo Fazio's *De viris illustribus* written in 1456. Mention is there made of the Brancas father and son, Sicilian surgeons, of whom the father was a direct forerunner of Gasparo Tagliacozzi, being—

> "the inventor of an admirable and almost incredible process. For he thought out a way to re-form and complete dissected and mutilated noses, and accomplished all this with wonderful art. Moreover, Antony, his son, added not a little to the beautiful invention of his father. For he devised a process by which mutilated lips and ears as well as noses could be repaired. And while the father had cut skin to piece out the nose from the face of the mutilated person, he took it from the arm so that no facial deformity resulted therefrom. And he inserted the remains of the mutilated nose and bound them up so tightly that the mutilated person could not even move his head. After 15 or 20 days he would little by little cut open the bit of flesh that adhered to the nose and re-form it into nostrils with such skill that the eye could scarcely detect where it had been joined on, and all facial deformity was completely removed. He healed many wounds which it seemed that no resource of medical art could heal."

During the fifteenth century, as in more recent times, the relative merits of law and medicine were occasionally the subject of debate. In course of a dispute of this kind Salutari pointed out that whichever profession is the nobler in origin, it is generally recognised that the lawyers occupy a higher social position. Carlo states that they are called lords and their wives are called ladies, whereas medical men are simply designated as masters, a name common to all vile craftsmen, while their wives receive no title whatever. To this Niccolo can only retort that professors of theology, the supreme science, are also called masters, and that the peasant sometimes calls his donkey "Lord." It would be interesting to hear a discussion on this subject 400 years later; the Medico-Legal Society might consider its inclusion in their programme.

THE MEDICAL REGISTER OF THE IRISH FREE STATE.

"THE Medical Register of Saorstát Éireann" appeared for the first time last week. It is the official register of medical practitioners in the Irish Free State, published by direction of the Medical Registration Council of Saorstát Éireann as ordered by the Medical Practitioners Act, 1927. The volume consists of XXII and 119 pages, and is sold at 10s. Besides the Register proper, it has a list of the members of the Registration Council, a copy of the Medical Practitioners Act, 1927, extracts from the Dentists Act, 1928, and tables of the various qualifications which are registrable. The Register contains the names and addresses of 4130 practitioners, of which 4085 were on the Register on the date of its establishment on May 26th, 1928, and 58 were added between that date and Dec. 31st, 1928. Twenty-five names were removed on account of death during that period. The arrangement of the Medical Register follows in its general lines that of the General Medical Register, but contains two additional columns, one to indicate the channel by which admission in the Register has been gained (General Register, Colonial, Foreign or Direct), and one for a serial number. The printing and format of the volume are attractive, and every care appears to have been taken to avoid errors.

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[1] Science and Thought in the Fifteenth Century. By Lynn Thorndike. New York: Columbia University Press. 1929. Pp. 387. 24s.

not stultify that diagnosis, if there is a history of halogen medication and clinical signs are sufficiently definite, for it is quite probable that the failure of the excretory mechanism is the cause of the rash.

Blood counts are sometimes indispensable adjuncts to correct diagnosis. Thus it should not be forgotten that pruritus, or an erythematous rash of wide distribution, may be the first symptom of leukæmia. Nearly all long-standing itching eruptions are associated with eosinophilia, and a pronounced excess is characteristic in dermatitis herpetiformis, pemphigus, and solar eruptions.

Of late years *X rays* have continued to play a not unimportant part in the determination of the focal sites of obscure chronic diseases. In dermatology their chief function has been in connexion with apical sepsis of the teeth, and such conditions as erythema multiforme, urticaria, and purpura have been cured or greatly benefited as a result of well-considered extractions. The interpretation of the radiograms is often a matter of difficulty. Cases are known in which the removal of condemned teeth had no effect on the cutaneous symptoms, and conversely, not a few in which, although the photographs were apparently negative, the extraction of teeth known to be dead and therefore septic foreign bodies, was followed by immediate and permanent benefit to the patient. Every case has to be judged on its own merits. Undoubtedly the dentist is a better tribunal than the physician, for he has other means of deciding the issue besides X rays. The final decision should rest with the patient, and neither dental nor medical persuasion should be too cogent.

HENRY G. SEMON, M.D., M.R.C.P.,
Physician for Diseases of the Skin, Royal Northern Hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. N. A. H. Barlow to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Sub-Lt. C. Seeley to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. G. Wilson is apptd. Dep. Asst. Dir.-Gen., Army Med. Servs., War Office, vice Bt. Lt.-Col. C. M. Drew, vacated.

Maj. F. C. Atkinson-Fleming, half-pay list, is restd. to the estabt.

TERRITORIAL ARMY.

Capt. C. A. R. McCay relinquishes his commn. on account of ill-health.

Lt. D. Stewart to be Capt.

Lt. W. T. de V. Thomson to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. R. Phillips, from Active List, to be Lt.-Col.

Lt. W. L. Lamb, from Active List, to be Lt.

MILITIA.

Maj. M. K. Nelson retires on attaining the age limit, and retains the rank of Maj.

ROYAL AIR FORCE.

The undermentioned are granted short service commissions as Flying Officers for three years on the active list: J. J. Corcoran, C. C. Fenton, C. G. Harold, A. Sheehan, D. D. Watson, and E. A. Wilson.

INDIAN MEDICAL SERVICE.

Lt.-Col. W. M. Houston to be Col.

The undermentioned retire: Lt.-Col. V. H. Roberts and Capt. J. C. Drummond, who receives a gratuity.

Temp. Lt. Bhairo Prasad Nigam relinquishes his temp. commn.

Lts. P. H. Cummins and J. J. Beausang to be Capts.

Cawash Hormuzsha Dhala and Shridhar Damodar Dalal to be Temp. Lts.

Maj.-Gen. Sir Walter H. Ogilvie retires.

The undermentioned relinquish their temp. commns.: Temp. Lt. Hari Narian Gupta and Temp. Lt. Tarachand Dayasingh Shahani.

The undermentioned have vacated appts. in India: A.D.M.S.: Lt.-Col. F. A. H. Clarke, R.A.M.C.; D.A.D.'s.M.S.: Lt.-Col. A. A. C. McNeill, I.M.S., Maj. G. L. Duncan, I.M.S.; D.A.D.H.: Maj. H. J. G. Wells, R.A.M.C.; D.A.D.P.: Capt. R. C. Wats, I.M.S.

Special Articles.

THE PANEL CONFERENCE.

PRIVATE PRACTICE AND THE HOSPITALS.

ON Oct. 24th the representatives of local medical and panel committees met in London for their annual conference. Dr. E. K. LE FLEMING presided for the fifth year in succession, and the meeting was held as usual in the British Medical Association's house in Tavistock-square.

Medical Certification: Disciplinary Procedure.

Last year's conference was largely devoted to discussing the reasons why claims for sickness benefit have lately increased. While protests were made against the allegation that panel practitioners in general have become careless in issuing certificates, it was agreed that a certain amount of laxity had always existed, and provisional approval was given to certain measures which would expose gross abuse of the sickness funds. The Insurance Acts Committee (I.A.C.) and the Ministry of Health have since been considering what action should be taken against practitioners who are thought to have made out certificates improperly, and the proposed machinery for dealing with such cases was explained to the conference last week. The Minister's first step is to refer the case to the panel committee (or to a committee formed for several counties) which will hear the charge and the evidence on both sides, and report whether the practitioner has failed to exercise due care in certification, and (if so) to what extent and how gravely. It will make recommendations to the Minister, and at the same time will furnish the defendant practitioner with a copy of its report and conclusions. If either the Minister or the practitioner is dissatisfied with the findings, the case will be referred to an appeal committee, which is likely to consist of three medical practitioners who are not officers of the Ministry. After considering the findings and recommendations of the panel committee, and (in case of appeal) of the appeal committee, the Minister will state what action he deems appropriate. The practitioner may then make further representations against the decision, and if he does not accept it the various findings and recommendations will be referred to an advisory committee composed of representatives of insurance practitioners, approved societies, and insurance committees.

In commending these plans to the conference, Dr. H. G. DAIN (chairman of the I.A.C.) said it was essential that the body which first heard the complaint should be professional, and that it should be able to make its representations direct to the Minister. The present system allowed of public criticism and press reports which caused regrettable misconceptions. On the other hand, the approved societies would not consent to any arrangement from which they were altogether excluded, and it was outside the province of the conference to tell the Minister what advice he should procure after receiving reports on the facts.

The constitution of the Minister's advisory committee provoked a discussion, in which Dr. C. F. T. SCOTT said it was wrong that professional matters should be judged by a predominantly lay committee. Like Dr. W. LOCK he held it contrary to the spirit of British justice that the Minister, an interested party, should appoint the tribunal to decide the issue. Dr. L. J. PICTON, for Cheshire, proposed that the advisory committee should be replaced by an independent barrister, sitting with a medical assessor, who would hear all parties and form an unbiased opinion. Panel practitioners, he said, had surrendered their claims to an appeal to the High Court because they were assured that cases would be referred to a professional committee—consisting of three medical officers of the Ministry and three of their own representatives. This committee was now to be disbanded in favour of a partisan body on which approved societies and insurance committees would have a majority.

Dr. DAIN replied that these criticisms of the scheme arose from misapprehension. There would be no interposition by laymen until the questions of fact had been decided. The advisory committee would not be able to re-try the case; it was not a tribunal or a court of appeal, it would not hear evidence or advocates, and its duty would merely be to advise what action should be taken on the proven facts. This meant that the approved societies and insurance committees were out out of the proceedings till after the case was judged, and this was as far as the Minister would go. If the approved societies were not allowed to say something to the Minister at some stage the scheme would fall through, and this would be a pity, because everyone was anxious to put a stop to the action of those few practitioners whose lax certification was prejudicing the position of their colleagues. Dr. E. R. FOTHERGILL called this "sentiment," and pressed for amendment of the draft regulations. But the conference did not accept his view, and ultimately gave its approval to the procedure proposed by the Ministry.

Dr. G. J. B. CANDLER-HOPE, for the North Riding, suggested that in cases of excessive certification the fine for a first offence should not exceed £5, and complained that the amounts withheld by the Ministry often bore no relation to the recommendations of the medical service subcommittees. No law was passed without stating a maximal penalty for its infringement, and he wanted to introduce the principle that breach of the regulations should be met by payment of a fixed sum. Dr. DAIN, however, took the view that each case should be decided on its merits. A maximum was undesirable because it tended to become a minimum, and it was not the least bit true to say that these things were decided at the mere whim of the Minister. "We have got rid of all that business now," said Dr. Dain, "and we are satisfied that the machinery introduced a year or two ago is working extremely well."—The North Riding amendment was lost.

Dr. J. NELSON, for Kingston-upon-Hull, proposed "that the statistics relating to the issue of certificates by doctors in each area should be circulated to panel committees as in the case of prescribing certificates." This was accepted by the conference on the ground that it might be useful to a practitioner to know how his issue of certificates compared with the average for the same district.

Reference of Cases to the R.M.O.

Dr. DAIN reported that approved societies were finding that the money available for referring cases to regional medical officers was all used up—(cheers). Surprising as it might seem, the societies were anxious not to refer cases unnecessarily, and hence they wanted to be able to tell which patients were being visited at home. It had therefore been suggested that Form Med. 40 should in future bear the alternative words "at your residence" and "at my surgery," so that by striking out one or other the doctor could indicate where he had seen his patient. Having stipulated that failure to strike out the words should never get the practitioner into trouble, Dr. Dain felt that here perhaps was a convenient occasion for agreement with the societies. But this warm breath of charity had no chance against a blast of six reasons to the contrary with which Dr. J. W. ANDERSON swept the conference. Blood ran cold throughout the room while Dr. Anderson spoke of unscrupulous patients who would strike out the words "at my surgery" so as to avoid going to the R.M.O., and there was a further shudder when he suggested that patients would insist on being seen at home if they got to know that this would save them from having their cases referred.

Two other questions concerning the work of regional medical officers were raised towards the end of the meeting. Dr. J. O. SUMMERHAYES proposed for East Sussex—

> That it be an instruction to the Insurance Acts Committee to take such steps as may be necessary in order to secure that the minimum time within which information required to be given to the regional medical officer shall not be less than seven days instead of 48 hours as at present.

He complained that 48 hours was an inconveniently short time for a reply, but Dr. DAIN said he hoped the conference would not agree to this. The practitioner's object was to get things dealt with expeditiously, and it would be a mistake to pour sand into the Ministry's machinery. The patient ought to go to the R.M.O. as soon as possible after seeing his own doctor, and thanks to a general speeding-up the interval had now been reduced to a week.—The motion was lost.

Dr. G. F. WHYTE, for Dundee, brought forward a motion urging that the present conditions governing appeal or arbitration against the decisions of the R.M.O. or D.M.O. (district medical officer) are unsatisfactory and suggesting that the I.A.C. should negotiate with the Ministry of Health and the Department of Health for Scotland in order to institute a medical board of appeal. Dr. Whyte thought that both patient and panel doctor had grievances. The patient's appeal from the R.M.O.'s decision was heard (if at all) only after long delay during which payment stopped, whilst the doctor had his opinion simply set aside by another doctor—often one, moreover, who saw but little practice and had acquired an official mind. Dundee believed it would be better if doubtful cases were referred to a special medical board.[1] Dr. DAIN agreed that the insured person had a very thin time in appeals against his society, but pointed out that the methods governing such appeals were no concern of the I.A.C. Where a practitioner protested against an R.M.O.'s decision the case was usually referred to another R.M.O. As there was no time for fuller discussion, Dr. Whyte agreed that his resolution should be referred to the I.A.C. for consideration.

Certificates for Convalescence.

On a motion by Hertfordshire suggesting that the medical certification rules might be altered "so that it is not essential that an insured person should have been under the continuous care of one practitioner for 28 days before that practitioner may issue a convalescent certificate," Dr. DAIN said that he thought the I.A.C. should tell the Ministry that the convalescence certificate was dangerous to doctors and useless to anyone else. He had often tried to get the period reduced from a month, and if no alteration could be made he thought that as a measure of safety practitioners should refuse to use this certificate. After properly saying that a person was unfit for work and required convalescent treatment it was undignified to be hauled up because the time happened to be a day short.—This question was referred to the I.A.C., together with a motion by Worcester to the effect that an insured person need only be incapable of work for 14 days, instead of 28, before a certificate may be issued.

At Hertfordshire's suggestion it was also agreed—

> That all National Health Insurance Certificates should have printed on them in red letters, similar to those on the front pages of the medical certificate books, that "These forms are to be used for National Health Insurance purposes only."

Prescribing and Dispensing.

The I.A.C.'s annual report says that the Minister of Health has appointed a central advisory committee to assist insurance committees "to proceed on uniform principles in defining drugs or medicines for the purpose of medical benefit." This committee will be asked to decide whether a substance or preparation is (*a*) never a drug, (*b*) always a drug, or (*c*) sometimes a drug. Since there is at present no way of dealing with insurance practitioners who prescribe on the official form substances which insurance committees do not regard as drugs, the new advisory committee has prepared a draft article which provides machinery for dealing with such cases. Dr. DAIN explained that the proposed regulations were framed on the assumption that this irregular prescribing did not require disciplinary action. and the general principle behind them was that if anything is ordered on a prescription the chemist must dispense it. The draft article was approved by the conference without discussion.

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[1] Similar views were set out in our correspondence columns on Oct. 19th, p. 850.—ED. L.

The report also says that the I.A.C. has received representations that the cost of such drugs as quinine urethane ampoules should not fall upon the dispensing doctor's 2*s*. 3*d*., or the non-dispensing doctor's 1*s*. 3*d*., per 100 patients, but should be a charge on the drug fund. Dr. DAIN announced that he had now been told by the Ministry that quinine and urethane and similar solutions were shortly to be placed on the list.[2] Dr. H. DICKIE spoke of the increase in the cost of medicines since the early days of the Act, and moved, for Northumberland, "that drugs administered personally by a practitioner, as part of a course of treatment, and not as an emergency, should not be required to be supplied by him at his own expense," as at present prescribed in the terms of service. This resolution, together with one by Northamptonshire about the prescription of liver extract, was referred to the I.A.C. for consideration.

Dr. DAIN reported that the new National Formulary had been adopted in about 50 of the 128 insurance areas in the country. Dr. H. S. BEADLES expressed the view of West Ham that while the new Formulary was part and parcel of the insurance scheme, it had not been prepared for the benefit of practitioners. (Indeed it would prevent them using their own local pharmacopœias.) The distribution should therefore be made gratis. This suggestion commended itself to the conference, which then proceeded to pass the following motion proposed by the I.A.C. :—

> That the Conference supports the Council of the British Medical Association in its efforts to obtain amendment of Section 3 of the 1925 Dangerous Drugs Act, and recommends that heroin and its salts should come under the same conditions as morphine and its salts ; also that the Council should on all possible occasions urge the Government not to enter into international conventions involving medical questions until the opinion of the medical profession has been ascertained.

Encroachment of Hospitals on Private Practice.

Dr. FOTHERGILL, for Brighton, drew attention to the additional benefit which is defined as "payments to hospitals in respect of the maintenance and treatment therein of members, and the payment of the whole or any part of the travelling expenses incurred by or in respect of members in travelling to and from hospitals." The work that should be done by private practitioners, he said, was going to hospitals where it was done gratuitously by medical men. It was essential therefore that certain lines should be laid down for the future, and he proposed a motion "that any scheme prepared by an approved society for the provision of additional benefits to prove acceptable to the medical profession should include the following :

> (*a*) That the arrangements for consultations and specialists' services should provide that these services shall be given, so far as is possible and consistent with the best interests of the patients, by a private practitioner at his consulting rooms or at the patient's own home, and not at the out-patient department of a voluntary or State institution.
>
> (*b*) That approved societies should be able to enter into financial arrangements with both voluntary and State institutions for the provision of hospital benefit for insured persons, such arrangements allowing insured persons to select as between the two classes of institution.
>
> (*c*) That hospital benefit be defined to include in-patient treatment, as also consultant and specialist services, which, consistent with the best interests of the patients, cannot be given by a private practitioner at his consulting rooms or at the patient's own home.

Dr. PETER MACDONALD thought the conference should not commit itself to these definitions without further thought. His experience of ophthalmic benefit showed that it often had to be given at clinics, and his experience of hospital management taught him that it might be quite impossible to make arrangements for insured persons to select the kind of hospital they required. Dr. LOCK also held that the proposals should go to the I.A.C. for consideration, and this suggestion was adopted by the meeting after Dr. SUMMERHAYES had expressed his fear that general practice would be wiped out by the Local Government Act. The time had come, he believed, to make a bold bid to recover the practice now being taken over by hospitals, specialists, and medical officers of health.

The Place of General Practitioners in Hospitals.

This opinion of Dr. Summerhayes' found much support in a subsequent discussion on a motion by Manchester demanding that practitioners should be allowed to attend and treat those of their patients who enter voluntary and municipal hospitals. Dr. E. JOHNSTONE, the proposer, felt that the future of the general practitioner depended on his participation in the work of public hospitals and public health services. Cut off from the instruments of his craft and the coöperation of colleagues he could never rise to be more than a distributor of stomach bottles and cough mixtures.—Dr. M. W. RENTON asked how medical men could become proficient in modern methods if they did not have access to clinics and hospitals.

Dr. BRACKENBURY proposed, as an amendment to the Manchester motion—

> That it is desirable that provision be made in, or in association with, voluntary hospitals and municipal hospitals, or in separate institutions, for practitioners to attend and treat those of their cases who are admitted to such institutions.

Dr. MACDONALD supported this resolution because it went beyond the declared policy of the British Medical Association. It was desirable that general practitioners should have access as soon as possible to the hospitals of the country, which had hitherto been looked on too much as the perquisite of specialists and consultants.

Dr. DAIN spoke of difficulties. The practitioner, he said, often fought shy of appointment to a hospital lest he should be compelled to work there when it was inconvenient. At big hospitals it would often be impossible to give the right of entry to a large number of doctors who could call on the services of the nursing staff. A questionaire had been sent out to voluntary hospitals all over the country, said Dr. Dain, to find out what facilities there already were for general practitioners to keep their patients under observation and treatment.

Sir RICHARD LUCE said that while he was in favour of general practitioners having access to hospitals for their patients, it was difficult to alter the closed system of staffing where it was already established. The hospitals to be transferred to municipalities offered a great chance to develop the work of practitioners in new places instead of disturbing the good work now being done.

Sir ROBERT BOLAM asked what the general practitioner really wanted in the hospital. Did he want to do general work or consultant work ? In voluntary hospitals did he want to compete with the honorary staff, or did he want to do the work of house surgeon or house physician ? Sir Robert thought the question should be referred to the I.A.C. for report.

Dr. D. C. MCARDLE had come to the conclusion that what most practitioners wanted was to be allowed to start their careers all over again, which was impossible. The real opportunity lay with the young men now coming out of the universities, who must not be allowed to fall into the rut of their predecessors in general practice.

Dr. SUMMERHAYES said that what he himself wanted was to be able to go into the hospital and see that his patient's broken leg had been set properly and was being nursed properly. He wanted to be able to do lots of things, including minor operations, which general practitioners could do perfectly well if they had the chance—indeed, much better than they were being done now.

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[2] In a recent "range of service" case the referees decided that the treatment of varicose veins in the leg by intravenous injections is within the range of an insurance practitioner's agreement.

Dr. Brackenbury's amendment was carried, and a proposal to refer the subject to the I.A.C. was lost (by a small majority) because the conference wished to express its general opinion at once.

Periodic Examination of Insured Persons.

Early this year the Lancashire Insurance Committee tried to get a ruling that healthy people are entitled to periodic medical examination by their panel doctors. The local panel committee objected, and maintained that a fee should be charged for a service of this kind. The I.A.C., though it did not dispute that it is part of the doctor's duty to examine any insured person who presents himself in the ordinary course of practice, informed the Ministry that it is of opinion that periodic and systematic examination of insured persons who believe themselves to be in good health is not within the present contract of insurance practitioners. Lancashire brought before the conference a resolution arising out of this decision, and calling for modification of the definition of the range of service. But Dr. DAIN persuaded the meeting to leave the problem alone for the present. The demand for examinations of this kind did not yet constitute any burden, and the fact that no fee need be demanded enabled medical men to deal in a human way with patients who asked a perfectly natural question. The trend of public opinion was such that in course of time panel practitioners would probably be asked on what terms they would render this service to all insured persons.

Importance of Keeping Medical Records.

Dr. C. EDE, for Wiltshire, proposed :—

That the conference instructs the Insurance Acts Committee to take steps to impress on every insurance practitioner the fact that owing to neglect in keeping the statutory medical records, many men are furnishing regional medical officers, and thus the Ministry, with misleading evidence which suggests that they are being overpaid, and are therefore jeopardising not only their own income, but those of their fellow practitioners.

It was an open secret, he said, that all over the country men were failing to put down all their attendances on the record cards. This would not matter a bit if it were not that R.M.O.'s were collecting the cards and analysing the figures at the Ministry. As it was, a day of reckoning was at hand. When the question of revision of the capitation fee was raised again these figures would be a trump card in the hands of the Ministry. The practitioners' representatives would either have to accept them or admit their inaccuracy—in which case the Ministry would retort : "But you've been *paid* to keep these records." There were only two ways out of the difficulty. If the profession was sufficiently strong and united it could refuse to have anything to do with records of attendances and visits—excluding clinical records, which were useful to the doctor and his patient. The other alternative was to take the action suggested by the Wiltshire motion.—Dr. DAIN described the present situation as "very awkward," and the motion was passed.

A Hardship for Pregnant Women.

Dr. J. J. BEKENN, for Birmingham, spoke of the resentment caused by approved societies sending pregnant women to the R.M.O. when they were nearing term. He proposed—

That when a medical practitioner has satisfied himself that an insured person is so far advanced in pregnancy that on that account she will not be able to work again until after her confinement, it shall be lawful for him to give a certificate to that effect, stating that the woman is unable to follow her employment, and that such certificate shall be sufficient warranty to pay the sick benefit until the termination of the pregnancy.

Dr. O. B. TRUMPER anticipated criticism of this motion by pointing out that quite a large number of the women were not going to be attended by the practitioner at confinement and therefore need not visit him.—Dr. A. W. HOLTHUSEN told of a chambermaid, pregnant eight months, who was described by her practitioner as unfit to work. Her approved society referred the case to the R.M.O., who saw her at eight and a half months and said she was fit to go on with her work as a chambermaid. The approved society then brought a charge of lax certification against the panel doctor!—The resolution was referred to the I.A.C., after the opinion had been expressed that it was very valuable to have patients calling weekly at the surgery during the last six weeks of their pregnancy.

The Range of Service.

Dr. FOTHERGILL, for Brighton, introduced a motion laying it down that when it has been decided that an operation or other service is outside the scope of a practitioner's obligation, it is no concern of any committee or authority to decide that the practitioner who renders the service has appropriate skill or experience.—This motion produced a long discussion, in the course of which Dr. DAIN said it was quite time that this question was reconsidered, inasmuch as new methods of treatment were continually being evolved which were outside the terms of contract but could easily be learnt. His suggestion that the resolution should have the attention of the I.A.C. was accepted.

Dr. RENTON proposed that the I.A.C. be instructed to draw up a list of services outside the contract of the insurance doctor. He thought that these should include the injection treatment of varicose veins, which was by no means easy, and should not be approached lightly. He had asked some junior surgeons at an injection clinic whether they would rather stake their reputations on 100 unselected cases of varicose veins or on 100 unselected cases of appendicitis. The answer was "the appendix every time."—Dr. DAIN asked the conference not to pass the motion. It was not the business of the I.A.C. to draw up a list, and anyone could obtain the Ministry's list on application.—His appeal was successful.

Miscellaneous Topics.

The three following motions were passed on the proposal of Newcastle-upon-Tyne, Kingston-upon-Hull, and Cumberland respectively :—

That in the opinion of the medical profession additional treatment benefits should be uniform and available to every insured person.

That the conference is of opinion that medical record cards should not be produced at a hearing before a medical service subcommittee without the consent of the insured person having first been obtained, except when such production is considered necessary, in his own defence, by the practitioner concerned ; and that the clerk to an insurance committee has no right to demand the production of a medical card for medical service subcommittee purposes.

That the Insurance Acts Committee be requested to consider the position of insured persons resident in convalescent homes in regard to being signed on by the medical officers in charge as temporary residents, whether they require medical treatment or not.

A motion was put forward by Buckinghamshire asking the I.A.C. to press for "further recognition by the Ministry of Health of the value of timeage and mileage spent by rural doctors on their insured patients." This motion was lost.

Dr. H. J. Cardale was elected chairman of the conference for the coming year, and the thanks of the conference were given to Dr. Le Fleming for his conduct in the chair.

PRESENTATION TO A PLYMOUTH SURGEON.—On Oct. 11th Mr. T. Young Simpson was presented with a walnut compactum cupboard and an illuminated autograph book from many of his medical colleagues on his retirement from practice owing to ill-health due to overwork. Mr. Simpson has had a large surgical practice in Plymouth and the surrounding districts since 1906, and his enforced retirement will be keenly felt by many of his medical confrères and a great number of the general public.

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Coroner's Inquest and Police Proceedings.

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THE preparation of surgical catgut involves the production of material which is free from bacterial contamination, and yet remains flexible, strong, and absorbable. Lord Lister, who introduced sterilised catgut into surgical use, spent 40 years in attempting to improve its manufacture, and the Medical Research Council, in a preface to a green book[1] published to-day, state that the work recorded therein stands in historical succession to his classical studies. They draw attention to the dilemma by which the catgut maker is confronted. Catgut can be efficiently sterilised, but every method of disinfection has some effect in diminishing the tensile strength of the ligature, upon which its surgical value and the safety of the patient depends. The efforts of Prof. Bulloch and his colleagues have been directed to ascertaining the methods by which bacteriological sterility can be achieved with least damage to the physical qualities of the material. Their investigations have had among valuable positive results at least one negative finding of importance—the discredit of biniodide of mercury as a suitable sterilising agent. The general conclusions reached are summarised as follows:—

1. It has been shown that the pH of the collagen ribbon wash liquid is an important factor in the production of ligatures. To prevent degradation a wash liquid of pH 4·7 is required, but for optimum strength pH 8–9. A compromise may be effected by carrying through most of the process of washing in a solution of pH 4·7 and finishing with a bath of alkali at pH 8–9. For this same reason the ribbons should not be washed in water before spinning.

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3. It has been shown that when ligature is treated with iodine an acid is produced which is harmful for the reason given in (1). Means of reducing or eliminating this effect have been worked out by the use of potassium iodate.

4. It has been demonstrated that the treatment of ligature for 8–9 days in such a way that it absorbs 12 per cent. of its weight of iodine ensures sterility.

5. The disadvantages of excessive treatment with iodine have been demonstrated and the advantages of removing the iodine from the ligature after sterilising indicated.

6. Data have been obtained whereby control of the amount of the absorbed iodine may be obtained.

7. The advantages of incorporating glycerol in the iodine solution and in the final alcohol solution have been illustrated, particularly from the point of view of flexibility of the ligature, and therefore, strength of the knot.

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Important practical issues are raised by this report. Deaths from tetanus and other infections are known to have resulted from the use of contaminated ligatures, and though fatal results attributed to the use of imperfect catgut are numerically very rare indeed in relation to the vast total number of ligatures used in surgical operations, it is nevertheless recorded that some infection was found in every one of eight batches of catgut ligatures purchased in 1927. The data given in this report and the experience gained in obtaining them have already been useful in the guidance of administrative action. The licensing authority under the Therapeutic Substances Act has decided to add surgical catgut to the list of substances subject to control under the Act, and in the future the profession and the public will have better guarantees that catgut supplied has, in fact, the purity and quality claimed for it.

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Hungary is rich in hypertonic bitter waters like those of Hunyadi János. Prof. DALMADY (Budapest) referred to the fact that the SO_4 ion which they contained increased secretion and transudation by the intestinal mucous membrane, but not the concentration of the blood. He showed that stronger Glauber's salt solutions were irritant and increased the formation of mucus, whilst the bitter waters had been drunk for many years without irritation and without any increase of alkali loss. They were of value in causing effortless evacuation, and in larger doses in medical and surgical practice where free purgation was desired; also for prolonged use in arterio-sclerosis and congestive cases with a tendency to hæmorrhage, and especially in certain toxæmias. Many chronic diseases were amenable to hypertonic waters, according to the old doctrine "qui bene purgat bene curat." An unbiased re-examination of this method of treatment was called for.

Prof. PINILLA (Madrid) contributed observations on the cryoscopy and viscosity of the hypertonic waters of Spain, of which that at Carabaña was a type. It had been clearly shown that a nervous stimulus was necessary for endosmosis, and Sanarelli had suggested that purgation was due to the stimulation of the nervous network by dissociated ions. Probably the process of purgation was brought about by the formation of hydrophile colloids and their supersaturation, analogous processes to those which took place in vegetable tissues in springtime, leading to the abundant production of liquids.

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Dr. A. **MOUGEOT** (France) found natural CO_2 baths of special value at the onset of cardiac failure. If properly given they were vasodilator and cardiotonic and could be safely used even in cases of extreme hypertension. He agreed with the German school of hydrology that patients with cardiovascular disease have everything to gain from baths and little or nothing from the ingestion of cold waters.

Dr. **KORNMANN** (Switzerland) agreed that every balneotherapeutic irritation-complex could be regulated according to its form and time doses, and that in many cases of circulatory disturbance an individual optimum of the circulatory dynamic could be brought about and maintained as a result of bath treatment.

Two discussions took place at the meetings of the Ligue International contre le Rheumatisme:

*The Relation Between Acute and Chronic Rheumatism.**

Docent Dr. **JULIUS VON BENCZUR** (Budapest) pointed out that the word rheumatism was used to include: (1) diseases of the organs of locomotion, excluding only the nervous and traumatic; or (2) every inflammatory affection about the joints of unknown cause; or (3) diseases produced by chill, irrespective of the common bacterial and metabolic factors. He regarded chronic rheumatism as a chain of constantly recurring reactions to rapidly repeated stimuli. Arthritis and peri-arthritis might arise purely from chill. There was a constant struggle between causes and resistance; the weaker the resistance, the stronger was the disease, and the greater was the effect of small causes. He agreed with the French conception, which the Germans also admitted, that certain subjects were "candidates for arthritic disease," by permanent or temporary predisposition from some metabolic irregularity. In such subjects chill might induce acute rheumatism, especially when accompanied by fatigue, which was also an important factor of causation. In the German Army 60 per cent. of cases of acute rheumatism occurred during the first year of service. A common disturbance in all forms of rheumatism was dysfunction of the small arteries and capillaries of the skin, with failure of the normal reaction to cold and heat and disturbance of blood-supply due to atony or hypertonia of these vessels. With reference to age-incidence in Hungary, the period of acute rheumatism was from puberty to 40 years, two-thirds of the deaths occurring between the ages of 5 and 25; muscular rheumatism and neuralgias, from puberty to 60; sciaticas and lumbagos, from 30 to 60; acute and subacute muscular rheumatism, from puberty to the climacteric, and primary chronic arthritis in the 'fifties.

Docent Dr. **ERNST FREUND** (Vienna) held that acute rheumatism was perhaps decreasing but more often than formerly passed over into a chronic stage in later years, from hereditary or acquired constitution. This was partly a senile change. The chronic cases without heart affection differed from the acute both clinically and prognostically.

Docent Dr. **GUNNAR KAHLMETER** (Sweden) said that in Sweden the arthritis which ran a chronic course from the outset was far more common than that which followed an acute attack; but it presented clinical features indicative of infection. These were: [illegible] elevations of temperature, blood changes [illegible] slight leucocytosis with [illegible] compr[illegible]mia, [illegible] of the [illegible] in 1926. displacement to the left in earlier cases and relative lympho- and mono-cytosis in more advanced cases, also increased V.S.); chronic endocarditis in 25–40 per cent. cases; emaciation and muscular weakness, and clammy skin. Besides this common (probably infective) form of arthritis, "climacteric arthritis" (probably not infective) was common in Sweden; monoarthritis and osteoarthritis were also to be classed as non-infective. He favoured Weil's view that rheumatic fever is not merely an acute disease but rather an illness like syphilis or tubercle, liable to recurrence in a chronic form after apparent recovery; and he believed that both the acute and chronic diseases might probably be due to a pure infection of the same virus, differing in virulence and the reaction provoked.

*The Hæmatology of Rheumatic Disease.**

Dr. **BILKEI PAP** (Budapest) agreed that many cases must be attributed to constitutional inferiority or diathesis, probably due to a disturbance of the vegeto-nervous system and which was unable to react towards infection. There was no characteristic blood picture and he therefore held that rheumatic polyarthritis was not a septicæmia. Much importance attached to the chemical and physical analysis of the blood albumins. Increases in fibrinogen and globulin and of flocculation could be measured and used for differential diagnosis. The precipitation (V.S.) test was also of much value. Infective forms of disease showed increased precipitation, but this test gave definitely normal results in degenerative, traumatic, and metabolic rheumatism.

Dr. **ARNOLD ZIMMER** (Berlin) stressed the frequency of association of arthritis with endocrine disturbance. There were many purely endocrine cases in which no infection was found and many infective cases in which no endocrine trouble was found, but there were many mixed forms differentiated by endocrine reactions, the majority being ovarian. Abderhalden had devised a method for determining the endocrine factor by an examination of the serum. The presence of endocrine albumins like that of other foreign albumins liberated a defensive ferment which destroyed these foreign bodies. The presence of the products of destruction could be measured by an interferometer and it was claimed that very minute alterations in the concentration of the serum could be detected. In healthy serums the proportion of derivatives from the several endocrine albumins was not constant but the relation between the products of the various endocrines was constant. He held that rheumatic cases showed departures from this normal relation.

Dr. **ANTON FISCHER** (Landesbad Rheumatism Research Institute at Aachen) discussed alteration in the albuminous bodies of the serum from the standpoint that rheumatism was a general disease with undiscovered abnormalities of metabolism. The sedimentation test had clearly differentiated cases showing active and inflammatory processes of every kind, but he had found that non-febrile chronic polyarthritis gave very high sedimentation rates, although many had no inflammatory symptoms. The explanation of increased sedimentation had still to be determined. It now appeared, however, that this increase was accompanied by a chemical alteration in the white corpuscles, 80 per cent. of cases showing increase of globulin. There was consequently increase of tryptophan and corresponding diminution of cystin. Severe arthritis also showed increased viscosity of the serum. The increase in a chemically different globulin seemed a definite finding. The lowered sugar tolerance observed by Pemberton in acute inflammatory arthritis was associated in the Aachen findings with increased sedimentation rate, but no liver abnormality was discovered. With regard to other blood conditions in rheumatism, Dr. Fischer found no definite changes in acid-base equilibrium, [illegible]lthough there was some diminution of the blood [illegible]aline reserve in inflammatory cases. With [illegible]erton and Race he found normal values for blood calcium, but observed no increase in excretion of sulphur with Cawadias, nor diminution of basic *metabolism with Pemberton. He doubted the value* of the Abderhalden method but spoke favourably of the possibilities of an immuno-diagnostic method.

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* [illegible]ta Rheumatologica, Anno I., [illegible] W. L. and J. Brusse's Uitgev[illegible]

Mr. JOSEPH RACE (Devonshire Hospital, Buxton) communicated some recent work showing that out of 100 cases of "rheum-arthritis" 68 had a count exceeding 9000 white blood cells, mainly leucocytes, but a number of cases had a low count. The latter were generally cases of long duration, showing a poor response to treatment. There was no leucocytosis in climacteric arthritis, and there appeared to be no correlation between increase of white cells and changes in suspension stability (V.S.). Cutaneous immunological tests had been made with filtrates from cultures of various streptococci, with negative results, but further work was eminently desirable.

THE LONDON MEDICAL EXHIBITION.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

(*Continued from p. 895.*)

BOOTS PURE DRUG CO. (Nottingham) had a display of fine chemicals and pharmaceutical preparations, especially prominent being the arsenobenzol preparation approved by the Ministry of Health. Stabilarsan, for vein injection; Sulphostab for subcutaneous and intramuscular injection; and Bismostab, a sterile suspension of pure bismuth in glucose solution. In addition, Hexyl-Resorcinol in special gelatin capsules, liver extract for the treatment of pernicious anæmia, and Ephedrine for use in asthma and hay-fever were prominently displayed. some of them making an imposing show in large vases, while a variety of tablets and pills made an attractive exhibit. Gonococcus vaccines, Chlor-san, a scientifically produced hypochlorite antiseptic which can be used as an oral or a nasal wash and in the bath, a new product, also received attention.—OPPENHEIMER, SON AND CO., LTD. (59, Clapham-road, London, S.W.), had an attractive display of their well-known productions, including Roboleine. a vitamin food with maltose, diastase, nitrogenous and phosphoric compounds; Vitad, a purified unsaponifiable fraction of cod-liver oil; Citragon, for the treatment of gonorrhœa; and therapeutic ointments such as Ung. Renaglandin, hæmostatic and vasoconstrictive, and Ung. Renaglandin anæsthetic, which contains 5 per cent. eucaine lactate.—THE MOND STAFFORDSHIRE REFINING CO., LTD. (Abbey House, Westminster, S.W.), displayed their germicide. for which is claimed complete penetration and harmlessness to tissues with good healing action. Indicated in many skin diseases the preparation is put up *in the form of liquid, ointment*, and capsules for internal use. Throat pastilles, a soap, and a dental cream of attractive flavour are also among the preparations supplied by this firm.—DIMOL LABORATORIES, LTD. (40, Ludgate-hill, London, E.C.), showed their well-known bactericide, which is claimed to be 85 times more efficient than pure phenol. It is indicated in all bacterial invasions of the intestinal tract, does not produce any toxic effect, and is voided with the fæces. The preparation is put up in the form of pulverettes and is prepared as syrup, pastilles, lavage powder, ointment, and as a dentifrice. In the form of snuff it can be supplied in a neat mechanical bottle for the pocket, so that a prophylactic against nasal infection is always at hand. —BRITISH ALKALOIDS, LTD. (104, Winchester House, London, E.C.), demonstrated their T.C.P. (Trichlorophenylmethyliodosalicyl in H_2O) a powerful germicide which is analgesic, antithermic, keroplastic, nonhæmostatic, non-caustic, and non-toxic. Externally it promotes rapid healing and internally administered in the form of a colloidal emulsion it can be used in all forms of hyperchlorhydria, dysentery, enteritis, and arterio-sclerosis.—W. MARTINDALE (12, New Cavendish-street, London, W.) had a wide selection of pharmaceutical preparations very well displayed. *Volume II. of the Extra Pharmacopœia*, the nineteenth, which has just been issued, was frequently examined with approval as it is concerned with developments in investigations, experimental research, and diagnosis, and contains much new matter in connexion with all departments of medicine.—THE PINEOLEUM CO., INCORP. (New York City) (BROOKS AND WARBURTON (40–42, Lexington-street, London, W.)), demonstrated Pineoleum, an anodyne, emollient, and deodoriser having the following composition: menthol, 0·520 g.; camphor, 0·520 g.; ol. eucalyptus and glob., 0·520 g.; ol. Zeyland cinn. (Ceylon cinn.), 0·208 g.; ol. dac. cupr. (oil of pine needles), 1·041 g.; aromatics, qs.; liquid petrolatum, 100 c.cm.—WILCOX, *JOZEAU* AND CO. (51, *Great St. Andrew*-street, London, W.C.) exhibited many different preparations of Lactéol (Boucard), a lactic ferment, including tablets and liquid in ampoules for intestinal treatment, powder for surgical. nasal, and aural treatment, ovales for gynæcological treatment, and suppositories.—SANDOZ CHEMICAL WORKS (5, Wigmore-street, London, W.). Among the wide selection of pharmaceutical preparations exhibited at this stand may be mentioned Calcium-Sandoz, a calcium salt obtained from an oxidation product of glucose containing 13 per cent. of lime which corresponds to 9·3 per cent. of calcium; this may be given orally, intramuscularly, or intravenously; Allisatin Brand Tablets, a new and tasteless method of administering allium sativum; and Belladenal Brand Tablets, analgesic, anticonvulsive, and hypnotic.—EVANS, SONS, LESCHER AND WEBB, LTD. (60, Bartholomew-close, London, E.C., and 56, Hanover-street, Liverpool), divided their exhibit into three sections: (1) biological products, (2) special preparations, and (3) medicated soaps. The second section included Cascaromat, a concentrated elixir of cascara; Purgoids, small white sugar-coated tablets containing a combination of phenolphthalein, aloin, ipecac., and belladonna which are effective without griping; and Maraphos, a tonic food for children after exhausting illnesses.—CHAS. ZIMMERMANN AND CO. (9–10, *St. Mary-at-Hill, London, E.C.)* included in their exhibit Posterisan, a local vaccine from *B. coli communis* in the forms of ointment and suppositories for hæmorrhoids; Bilival "Ingelheim," a gall-stone preventive; Chinosol, a water-soluble non-poisonous antiseptic which does not irritate the skin; and Papain "Dega Brand," a digestive ferment active in any media, acid, alkaline, or neutral.—ROBERTS AND CO. (76, New Bond-street, London, W.) presented a number of useful pharmaceutical preparations, including Ferrigen, iron arsenate in ampoules for increasing the number of erythrocytes in anæmic conditions—this is also prepared with the addition of strychnine sulphate; Robuval, an elixir of *strontium bromide* with an inodorous fluid extract of valerian, a nerve sedative; and Arcolax, specially selected and cleaned seeds of *Psyllium plantago*, for the treatment of habitual constipation.—THE ANGLO-FRENCH DRUG CO., LTD. (238A, Gray's Inn-road, London, W.C.), displayed a number of products of special interest, including Stannoxyl, Mycolactine, Iodobesin, and Orargol. Of particular note were the Bacte-Phages, the therapeutic bacteriophages of Prof. d'Herelle, available in various combinations for the treatment of bacillary dysentery, intestinal, respiratory tract, and purulent infections; Oleoformine, a cholagogue containing in tablet form cholic acid, hexamine, and sodium oleate; and Bakolyre, a solution of amino-acids and creatinin in ampoules for the treatment of tuberculosis and other states of denutrition.—MODERN PHARMACALS, LTD. (2, Calthorpe-street, London, W.C.), showed Tetrasthenol, an organic combination of iron, arsenic, glycerophosphate, and strychnine for subcutaneous injection in the treatment of anæmia, neurasthenia, and debility; Bicam, bismuth camphorate in ether washed olive oil, for the treatment of syphilis; and Sulfarsenol.—THE SACCHARIN

Corporation, Ltd. (72, Oxford-Street, London, W.), displayed Novocain, a local anæsthetic for dental and surgical work; Trevalin, a substitute for morphia free from the toxic effect of morphia on the heart; and Caustiscin, for devitalising dental pulp. It is made in varying strengths to suit individual cases and it is claimed to be quite painless in application, while its use obviates arsenical peri-odontitis.—Bristol Myers Company (112, Cheapside, London). The chief exhibits on this stall were Sal Hepatica, a well-known effervescent laxative which encourages a daily habit by stimulating the biliary flow (it is announced that this preparation is not advertised to the public); Ziratol, an antiseptic of the naphthalene series having approximately three times the germicidal efficiency of carbolic acid while being free from toxic action; and Ipana, an effective tooth paste which contains Ziratol, and thus exercises a germicidal effect, while it hardens spongy and bleeding gums.—Genatosan, Ltd. (Loughborough, Leicester), the makers of Sanatogen, Formamint, and Genasprin, included in their exhibit a full range of detoxicated and ordinary vaccines, including Anti-Coryza Vaccine Spray and an Anti-Diphtheria, Scarlet Fever, and Whooping-cough Spray for producing local immunity during epidemics. Attention was also drawn to Genozo Tooth Paste for the double purpose of beautifying the teeth and saving the gums.

Endocrines, Ltd., and E. H. Spicer and Co., Ltd. (72, Wigmore-street, and at Watford, Herts), showed a wide range of the "Harrower" endocrine preparations including Anabolin for the treatment of high blood pressure and Thymocrin for chronic psoriasis. Among "Homburg" preparations Salvochin and Transpulmin for use in pneumonia were also shown, as well as *B. acidophilus* Emulsion.—Armour and Co., Ltd. (Armour House, St. Martin's-le-Grand, London, E.C.), presented a very attractive display of gland products under the specific name of "Glanoid." Particular attention was called to a concentrated fluid extract of liver, each ounce of which represents 8 oz. of fresh calf liver prepared while containing the natural animal heat.—The British Organotherapy Co., Ltd. (22, Golden-square, London), exhibited a wide range of glandular products, monoglandular and pluriglandular, in the form of Opocaps, soluble capsules for oral administration, and Opojex, ampoules for hypodermic injection. Evatmine for asthma, hay-fever, urticaria, spasmodic affections, and chilblains was also shown, as well as Saccharomycin, a fluid yeast for boils, furunculosis, and acne.—G. W. Carnrick Co. (Brooks and Warburton, Ltd., 40–42, Lexington-street, W.) displayed endocrine products emphasising the fact that only fresh glands from healthy animals are employed and that all desiccations are made at low temperatures in vacuo. Special attention was directed to a liver extract for the treatment of anæmia, to Incretone, a liquid endocrine tonic, and Hormotone for the relief of many distressing symptoms at the menopause.—Crookes' Collosols (22, Chenies-street, London, W.C.) included in their exhibit, among other preparations, Collosol Argentum, Iodine, Calcium, Manganese, and a new combination of petroleum with Collosol Sulphur, presenting a laxative with intestinal disinfectant and deodorant properties.—C. J. Hewlett and Son, Ltd. (35–42, Charlotte-street, and 83–85, Curtain-road, London, E.C.), showed Hæmorrhaline, an ointment for hæmorrhoids, external and internal; Hormonigen, pluriglandular extracts; Mist. Pepsinæ Co. c. Bismutho, a remedy in gastric disorders; and Evapogens, or medicated skin lotions. Surgical instruments, dressings, and sprays were also exhibited. —Petrolagar Laboratories, Ltd. (Braydon-road, London, N.), presented their Petrolagar, an emulsion containing 65 per cent. of pure liquid paraffin and agar-agar, flavoured and palatable. The oil is atomised by hydraulic pressure in which state it is held by agar-agar. The preparation produces a normal soft, well-moulded intestinal mass.—Nujol Laboratories (Albert-street, Camden Town, London, N.W.). The intestinal lubricant, Nujol, was here demonstrated as a rational and efficient method for the treatment of intestinal stasis, as well as Mistol, a combination of menthol, camphor, and eucalyptol with a pure mineral oil for inflammatory conditions of the nose and throat.—The Angier Chemical Co., Ltd. (86, Clerkenwell-road, London, E.C.). Angier's Emulsion, which is petroleum with hypophosphites, is a bland and creamy preparation in perfect emulsion and can be administered in conditions where indicated either undiluted or in any desired beverage. Inquirers were supplied with a well-reasoned pamphlet on coughs and their treatment.—Kaylene, Ltd. (7, Mandeville-place, London, W.). exhibited a colloidally reversible hydrated silicate of alumnia in a state of ultra-microscopical subdivision known as Kaylene, an adsorbent of toxins and the products of putrefactive processes in the stomach and intestines, as well as Kaylene-ol for the elimination of the gastro-intestinal content, and other similar preparations.—Virol, Ltd. (Hanger-lane, Ealing, London). The composition of marrow-fat, glycerin extract of red bone-marrow, malt extract, eggs, lemon syrup. and salts of lime and iron known as Virol received much attention, as did also Virol and Milk in powder form, and Virolax. which is an emulsion of paraffin for use in intestinal toxæmia and its sequelæ.—Bengué and Co., Ltd. (24, Fitzroy-street. London, W.), in addition to Dr. Bengué's Balsam for use in rheumatism. gout, neuralgia, and other conditions, showed Pulmo (Bailly), an organic combination of calcium, phosphorus. and guaiacol for diseases of the respiratory organs, Arhemapecty. a new blood coagulant, Guipsine containing the active principles of fresh mistletoe for arterio-sclerosis, and many other useful preparations.—Dr. Joachim Wiernik and Co. (Berlin) (Coates and Cooper, 41, Great Tower-street, London, E.C.), manufacturers of the "Diwag" medical products, showed Pacyl, a derivative of cholin for administration per os for reducing blood pressure.—The Battle Creek Food Co. (Michigan, U.S.A.) (Coates and Cooper) showed biologic foods, including Lacto-Dextrine, being prepared for changing the intestinal flora by encouraging the growth of fermentative acid-forming bacteria, and Food Ferrin, a new iron food for which is claimed a remarkable efficiency in building up hæmoglobin; The Sicco Chemical Works (Berlin) (Coates and Cooper) exhibited the nutritive tonic food Siccopon. pure hæmoglobin in granule form to which is added lecithin, albumin, calcium lactate, and soluble silicic acid; and Reed and Carnrick (Jersey City, N.J.) (Coates and Cooper), among other preparations, showed Testacoids containing the hormones or antacoids of the testicle and the active principles of the prostate; Pancrobilin for the treatment of constipation and obstipation; and Analeptine for the treatment of rheumatism, gout, and in uric acid diathesis. —Temmler Chemical Works (Berlin) (Coates and Cooper) presented, among other preparations, Brosedan, a bromide bouillon indicated in epilepsy, extract of pine needles for bath treatments, and anti-conceptive tablets.—The Denver Chemical Manufacturing Co. (London, E.) showed Antiphlogistine, for which the properties are claimed of continuous application of moist heat, osmosis, and a power of stimulating the cutaneous reflexes to assist in maintaining the blood and lymph circulation of the part affected while hastening the elimination of toxins.—BiSoDol, Ltd. (12, Chenies-street, London), exhibited an antacid-digestive under their trade name intended to re-establish the normal alkalinity of the body without danger of systemic disturbance. It contains bismuth subnit., magnes. carb., sodium bicarb., carica papaya, diastase, and ol. menth. pip.

(To be concluded.)

Holloway Sanatorium.—Lady Midleton, chairman of the Surrey County Nursing Association, recently opened a nurses' home in connexion with the Holloway Sanatorium at Virginia Water. It is a detached building with rooms for 75 nurses, and has cost £35,000.

Correspondence.

"Audi alteram partem."

WHAT BECOMES OF MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—The consternation with which Dr. Graham Little was filled at getting to grips with the subject of his lecture on The Health and Conditions of Work of Medical Students was in some respects an unnecessary emotion. Some years ago I analysed the lives and subsequent histories of the students at St. Thomas's Hospital over a period, and my paper was published in the *St. Thomas's Hospital Gazette*. Sir Squire Sprigge has done the same with regard to a large group of the students at St. George's Hospital.[1] Sir James Paget had previously traced the fate of a large number of St. Bartholomew's students, and with those figures alone was Dr. Graham Little familiar.—I am, Sir, yours faithfully,

EDRED M. CORNER,
Consulting Surgeon to St. Thomas's Hospital.
Beaconsfield, Bucks, Oct. 24th, 1929.

THE NATURE OF BACTERIOPHAGE

To the Editor of THE LANCET.

SIR,—The annotation entitled A Polyvalent Bacteriophage in your issue of Sept. 21st (p. 621) contains several statements which merit some discussion. To begin with, the title itself is subject to criticism. In spite of our lack of knowledge of the nature of the principle, it must be admitted that its action is more in the nature of a virulence. Valence applies only to the degree of combining power of an element or radical. Its biological use is not only rare but does not apply to the action of bacteriophage. Furthermore, the term polyvirulent has found favour among authorities on this subject. In a recent issue of the *Journal of the American Medical Association* an editorial appeared entitled Bacteriophagy as a Therapeutic Agent. Bacteriophagy is the name of an action and not of a substance. This tendency to misuse the terms applied to a now well-known principle is but an indication of the superficiality of the consideration given to a phenomenon, which may be considered as the outstanding contribution of a generation to the sciences of bacteriology and immunology.

Your annotation states "if the bacteriophage will act as a destructive agent of these organisms in vivo the discovery is of immense importance." It has been repeatedly demonstrated that bacteriophage will produce lysis in vivo, hence it may be admitted that the discovery is of immense importance. Does this provoke a widespread willingness to give the principle adequate clinical trial? The annotation further bewails the failure of investigators to perform the clinical experiments which "should not be difficult to devise." Those who have attempted to prove the theories which offer such exceptional promise for the therapeutic value of bacteriophage have not found it impossible to devise adequate experiments. The difficulty has been, and still is, to obtain the necessary clinical material. I venture to state that if any individual or organisation will furnish the opportunity and the means to carry on investigation of the type indicated the answer will not be difficult to obtain nor long delayed. In view of the unusual theoretical considerations, it would seem that the world is a bit slow in seizing the opportunity which has so long been waiting. I have previously expressed the opinion that the explanation for this tardiness lies in the fact that bacteriophages at present available are, for the most part, active against bacteria which do not produce epidemic diseases. This is only true to a limited extent. The problems of cholera and dysentery supply the lack. Such infections, however, are a serious problem only in countries where investigative work on bacteriophage is limited or absent.

There is another factor related to the bacteriophage problem which has been emphasised, as yet, only by myself—namely, the rôle of the bacterial proteins present in bacteriophage filtrates. It is not out of place to point out that bacteriophage as now used contains substances (bacterial proteins) which in themselves, on theoretical grounds, should prove, perhaps, even more effective than the bacteriophage itself. There is much to criticise in the therapeutic experiments thus far performed aside from the failure to provide adequate controls. The fact that any success, however apparent, has attended the use of bacteriophage is in itself an indication of its tremendous potentiality. There is nothing to indicate the size of the dosage nor the method of administration except some undependable therapeutic trials. It has been sufficiently demonstrated that dosage and method of administration are factors intimately concerned with the success of the treatment.

Finally, it may be argued that animal experimentation should provide an answer for some of these perplexing questions. This indeed might prove to be the case could there be found a naturally infectious animal disease of well recognised ætiology against the causative agent of which a bacteriophage was available. Such diseases have been found, but d'Herelle has been practically alone in investigating them. His results merit greater consideration. In the absence of suitable infections in laboratory animals it might be pointed out that where such diseases as cholera, plague, and dysentery occur on a large scale; where the only hindrance to clinical experiment is lack of funds and possibly of organisation; and where the proposed therapeutic agent has been repeatedly shown to be innocuous, there is no logical objection to applying the method. Those workers who have had the vision to carry on the work of bringing recognition to what promises to be an effective agent for the control of infectious disease only ask for an opportunity to provide the controlled experiments that the acceptance of the method demands.

I am, Sir, yours faithfully,

N. W. LARKUM,
Immunologist, Michigan Department of Health.
Oct. 3rd, 1929.

ASPIRATION DURING TONSILLECTOMY.

To the Editor of THE LANCET.

SIR,—In an annotation which appeared in your issue of Oct. 12th (p. 784) mention was made of the possibility of pulmonary infection caused by aspiration during tonsillectomy under general anæsthesia. This prompts me to accentuate the importance of posture during and after the administration of an anæsthetic. The possible danger of inhalation of blood and septic matter from the mouth through the epiglottis should be borne in mind, whether the case be one of general surgery or one concerning the various regions of the mouth alone. *It would be best if the patient were* never allowed for more than a few minutes to be flat on his back with his face to the ceiling, unless this position is imperative from the surgeon's point of view.

In the induction stage the patient will soon be sufficiently subjective to allow his head to be turned well to one side, and so obviate by gravitation the collection of fluid in the epiglottic region. This position is easily maintained without the use of a pillow for most operations, and in those on the mouth the patient's shoulders, after induction, should be raised sufficiently high on a sand-bag to necessitate a well-arranged and suitable hyperextension of the head to gravitate blood and debris immediately into the inverted upper posterior nasopharynx. This leaves the region of the epiglottis clear of blood and saliva, while any excess of fluid can be swabbed out by the surgeon or his assistant from time to time, or by a suction apparatus if preferred, though this procedure is noisy and otherwise unpleasant.

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[1] THE LANCET, 1905, i., 695. The name of the hospital was not given at the time.—ED. L.

After operation there should be no pillows used, nor should the position be any but the lateral with the head well hyperextended until vomiting or coughing occurs. After this the patient will not be liable to inhale any matter into his trachea. In transit from the operating theatre the patient should always be carried feet foremost if he is to be taken upstairs, and head downwards if going downstairs, for the same reason of keeping fluids and debris gravitating away from the region of the epiglottis, and also for maintaining by gravitation a good blood-supply to the reflex centres. There is no apparent reason why the lateral position with hyperextension of the head and the use of no pillow should not be insisted upon, even in abdominal operations, the sitting-up position being substituted within 20 minutes or half an hour of the operation

I am, Sir, yours faithfully,
JOSEPH BIRT.

St. James' Court, Buckingham-gate, S.W.,
Oct. 18th, 1929.

A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—Accompanying a prospectus of a company formed, or about to be formed, for treatment centres for Electrotherapy, Physiotherapy, X ray diagnosis, &c., was a letter said to be addressed to the medical profession. On the back of that letter were two quotations from articles I had written, one in *The Lancet* of March 3rd, and the other in the *British Journal of Actinotherapy*. The use of my name is entirely unauthorised, and I have written to the secretary of the company protesting strongly against the publication of my name without my consent. I am, Sir, yours faithfully,
F. HOWARD HUMPHRIS.

Great Stanhope-street, Park-lane, W., Oct. 23rd, 1929.

THE MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LIMITED.

To the Editor of THE LANCET.

SIR,—Dr. Harvey Hilliard's letter in your issue of Oct. 5th (p. 744) raises an ethical question which should receive the careful consideration of all members of this Society.

First: Dr. Hilliard says, "Three important resolutions, of which due notice has been given, are to be moved at this meeting, but have been withheld from the agenda on the notice calling this meeting." In the report of the meeting in your issue of Oct. 12th (p. 798) I see that when Dr. Hilliard sent these to the office to be placed on the agenda of the meeting he was informed that they were matters arising out of the report and need not therefore appear on the agenda, a procedure approved by the legal advisers to the Society. Whether legal or not, surely it is not in the best interests of the Society as a whole that the motions of a member should be withheld in this way. Some might even consider it scandalous.

Secondly: As Dr. Hilliard points out, the board last year decided that they would not be justified in spending the Society's funds in sending out proxies to ensure the re-election of the directors retiring by rotation. They cannot, therefore, logically justify themselves for issuing proxies at the Society's expense this year. Their action in doing so is also the more unfortunate in that one of the motions was one fixing an age-limit of 65 years for directors. If this motion had been carried, four of the seven members of the board would have to retire. On the face of it, therefore, it might be interpreted as a deliberate attempt to keep themselves in office.

The resolution was withdrawn by the mover, Dr. Harvey Hilliard, who stated at the meeting that in his opinion the board had obtained their proxies under false pretences. He would not, therefore, submit his motion to what he considered an unfair vote.

No one would question the right of a board to issue proxies to protect itself as a whole against some attack upon its policy. If, on the other hand, the proxies were sent out to protect the interests of individual members, it is a volte face from the decision of last year.

If this practice is to continue, it seems that the average private member of the Society will never be able to contest the seats vacant upon rotation, because in his case he will have to finance the heavy expense necessary to obtain proxies, whereas the retiring members would be in the comfortable position of having their expenditure met from the Society's funds. Furthermore, the irony of the situation is that the board, in using the Society's funds is, in fact, using in part the candidate's own money deposited with the Society, to contest his election.

For this reason Mr. Steadman's candidature was not pressed to a poll, although he had received over 300 proxies. As one of his supporters, I do not feel that he received fair treatment.

I am, Sir, yours faithfully,
C. BOWDLER HENRY.

Harley-street, W., Oct. 22nd, 1929.

VACCINATION OR INOCULATION AGAINST SMALL-POX?

To the Editor of THE LANCET.

SIR,—In September, 1923, I vaccinated 285 persons (many of them under 18) with the same Government lymph with no ill-results, but the 286th (a girl of 15 years of age) died from encephalitis 15 days after a perfectly normal primary vaccination. The Committee on Vaccination, appointed by the Ministry of Health in 1926, have shown that vaccine virus is present in some brains of post-vaccinal encephalitis, but whether it is associated with some other agent is not quite clear at present. Yet the fact that the vaccine virus has been isolated from some brains of those who have died from post-vaccinal encephalitis naturally raises the question of the danger of using a living virus in vaccination work.

The recommendation of the Committee that vaccination shall be in "one insertion with a minimum of trauma" instead of four insertions has been adopted and recommended by the Minister of Health. It *may* be that this will diminish the risk of post-vaccinal encephalitis, and it would be interesting to know what are the statistics in America where this has been the practice for years, but one is inclined to query the advisability of using a *living* virus at all. We should hesitate to use living staphylococcus or streptococcus however dilute even in one insertion. In the summary of the Committee on Vaccination it is suggested that further research is desirable in exploring the possibilities of the use of a still further attentuated or of a killed virus as an immunising agent. It would be a great relief both to the community and to vaccinators if a killed virus was available for inoculation in place of the living virus as used in ordinary vaccination.

May I ask, through your columns, whether any experiments have been or are being done with the killed virus of vaccinia. Is it possible to produce immunity against small-pox by inoculation of a killed virus?—I am, Sir, yours faithfully,

Oxford, Oct. 26th, 1929. HENRY T. GILLETT.

⁎⁎ Post-vaccinal encephalitis is rare in the United States; our correspondent remarked a fortnight ago that only four cases had been reported. Little has been published on the use of killed vaccinia virus as a prophylactic; the results of its use so far seem to have been almost negative, and nothing encouraging has come from the more recent attempts. It is true that preventive vaccines of some other viruses have proved effective experimentally even when the vaccine has been made from virus which has been killed. In some cases, too, a killed vaccine has proved effective in practice when a dose of living virus has been given subsequently and a mild attack of the disease has thus been induced. In some infections including rabies, distemper, foot-and-mouth disease, and fowl plague, a killed vaccine has by itself conferred immunity, but only for a short time. It may be added that a stock of real small-pox virus would be difficult to obtain, and it would need to be free from other chance human diseases.—ED. L.

CONTAGIOUS ABORTION.

To the Editor of THE LANCET.

SIR,—Several references to contagious abortion in cattle and man are found in your recent issues. Rather less than 20 years ago, I think it was, this disease caused dire losses among dairy herds in parts of New Zealand. The United States had suffered previously and from there much instruction was available. It became recognised that an important contributory factor to the disease was insufficient provision of winter feed, leading to debility in the mother just when the calf in utero was making full demands on her constitution. Your authorities emphasise the digestive route of infection; it is an obvious route, but I question whether, once the disease is introduced to the herd, coitus may not be a method of transmission also.

About sixteen years ago in the Auckland province I attended a young primiparous woman for abortion. Her husband was slaughterman in a local butchery, and I knew that a large proportion of the beasts dealt with by him were cows fattened in consequence of sterility, proved or anticipated, following contagious abortion. As there was no other ascertainable cause for abortion in the fairly advanced stage of pregnancy of the patient, I attributed it at the time to contagious abortion transmitted from the cows through her husband. *I had no reason to suppose him to be* constitutionally affected by the disease.

I may add that the epidemic did good in bringing about a general improvement in method of winter feeding of dairy stock, and the disease is now a much less serious factor than at that time. A chair and teaching to exploit the relationship in disease of man and the lower animals would, I believe, prove of unimagined importance, and lead to wide revision of our social and sanitary methods and new angles of prevention and treatment.

I am, Sir, yours faithfully,
A. H. HALLEN, M.D. Edin.
Alexandra-road, South Hampstead, N.W., Oct. 27th, 1929.

THE BROWN v. WHITE BREAD CONTROVERSY.

To the Editor of THE LANCET.

SIR,—As one of the protagonists of whole-meal bread might I suggest that the Medical Research Council finance another series of tests on the respective values of whole-meal and white flour. In this series let the experimenters use a diet similar to that on which millions of our poorer workers in the industrial and mining centres seek to exist. Those who conducted the demonstration on the values of artificial sunlight at the Mansfield Colliery inquired into the feeding habits of the pit boys, and were amazed at the few who ever had fresh vegetables or fruit, *the main articles* at each meal being white bread, margarine, and tea.

It is well known to all interested in social welfare work that the expectation of life and freedom from disease are very great amongst agricultural labourers, and it is equally appreciated that they have an abundance of Nature's foods. On the other hand, the majority of poorer workers in our crowded areas *have very little fresh vegetables or fruit*, the bulk of their diet being white bread and preserved foods, all deficient in vitamins. When we reach a stage in which they are able to secure such a varied dietary as the one on which Dr. Hartwell and Prof. Mottram fed their rats, we shall not have the same anxiety as we have to-day about their feeding; but till that fortunate day arrives, I am of opinion that legal action should be taken to ensure that the poor shall have bread in the condition our ancestors were able to obtain it—i.e., with the most valuable vitamins and minerals still in it. I am also certain that the results of the experiment I suggest will prove on the side of brown bread.

I am, Sir, yours faithfully,
BRUCE BRUCE-PORTER.
Grosvenor-street, W., Oct. 26th, 1929.

To the Editor of THE LANCET.

SIR,—*There are many like myself* convinced believers in the superior nutritional value of whole-meal flour from clinical observation, who must feel sceptical as to the validity of the conclusions drawn by Prof. Mottram and Miss Hartwell from the recent experiments reported in your issue of Oct. 26th. It is surely an accepted fact by all students of nutrition that the various vitamins can only function adequately when the *general balance* of vitamins and other food factors is correct. In these experiments the test diets are, by their own showing, defective on other grounds, and therefore it would seem that the addition of vitamin B to one of them could not be expected to effect any improvement. The absence of a sufficiency of vitamin A alone would deter normal growth and seriously affect the health of the animal.

I venture to hope that experts who hold opposing views to those of Mottram and Hartwell will feel inclined to give the profession their views on these experiments. The clinicians are looking in vain for definite guidance on this vexed question.

I am, Sir, yours faithfully,
S. HENNING BELFRAGE.
Gloucester-place, W., Oct. 29th, 1929.

CLEAN SWIMMING BATHS.

To the Editor of THE LANCET.

SIR,—Belated though it is I greet with pleasure the report of the Ministry of Health on the Purification of the Water of Swimming Baths, which you annotated last week. I regret, however, that no mention has been made in the report of the strenuous, difficult, and prolonged pioneering work carried out at Poplar for over 20 years. Special reports of this work were always forwarded, in accordance with legal requirements, to the Ministry of Health, and it is these which, without doubt, form the basis of the report just issued.

I am, Sir, yours faithfully,
FREDK. WM. ALEXANDER,
Formerly Medical Officer of Health,
Oct. 26th, 1929. Metropolitan Borough of Poplar.

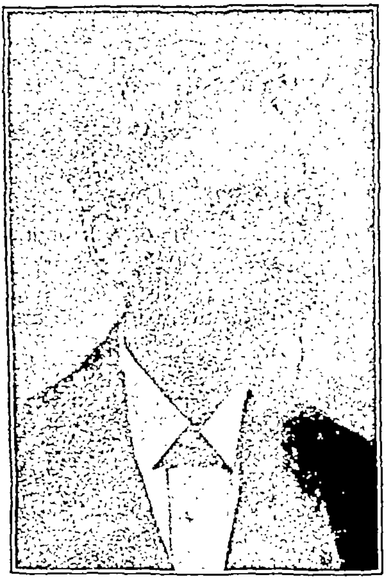
DUBLIN UNIVERSITY BIOLOGICAL ASSOCIATION.—The opening meeting of the session of this Association was held on Oct. 19th, when the President-elect, Prof. J. Brontë Gatenby, delivered an address on Radium, X Rays, and the Cell. He gave a careful survey of the knowledge of the action of rays on the cell, and related the results of experimental work done in his own laboratory. Prof. John Joly, F.R.S., gave an account of the pioneer work done in Dublin by the use of hollow needles containing radium or radium emanation in treatment, and described recent developments in needle technique. Dr. R. J. Ludford described his work at the Imperial Cancer Research laboratories on the cancer cell. Dr. W. C. Stevenson, Prof. M. R. J. Hayes, Sir William Wheeler, Prof. L. Abrahamson, and Prof. T. G. Moorhead spoke of the several applications of radium and other rays in medical and surgical treatment.

Obituary.

WILLIAM BEVAN-LEWIS, M.Sc. LEEDS, M.R.C.S., L.S.A.,

LATE DIRECTOR OF THE WEST RIDING HOSPITAL, WAKEFIELD.

WE regret to announce the death of Dr. William Bevan-Lewis, the well-known authority on mental disease and its pathology, which occurred on Monday, Oct. 14th, at Cardigan, in the eighty-third year of his age.



DR. BEVAN-LEWIS.

William Bevan-Lewis was the son of William T. Lewis, of Cardigan, in which city he was born in 1847, and received his early education. In 1864 he joined the medical school at Guy's Hospital, where, among the prominent members of the staff were then Sir William Gull and Henry Cock, while Wilks, Pavy, and Bryant were junior members. Bevan-Lewis was a distinguished student, being a prize-man throughout his career in the preliminary scientific and clinical subjects, and had to wait until his arrival at the age of 21 before he qualified in 1868 as M.R.C.S. Eng. and L.S.A. He would no doubt have gone far, both in professional and academic life in the metropolis, if an early marriage had not determined his choice of immediate private practice. In 1875, however, an opportunity came to him to pursue scientific studies towards which he had a particular impulse rare in those days, for few medical men half a century ago could have regarded an appointment at a lunatic asylum as offering great scientific opportunities. But with this view Bevan-Lewis, at the age of 28, joined the medical staff of the West Riding or Wakefield Mental Hospital, an institution which had been established some 60 years, and which had already obtained a reputation for the psychological study of its inmates. The medical school at Leeds was only ten miles away, and at Wakefield Ferrier did much of the work which resulted in the publication of his experimental researches in cerebral physiology, while Clifford Allbutt also studied there with fruitful result. Further, two of Bevan-Lewis's predecessors at Wakefield had been distinguished for their scientific output in relation to insanity—namely, the late Dr. H. C. Major, whose work on the histology of the brain in the insane was of real importance both in accomplishment and suggestion, and Sir James Crichton-Browne, the veteran psychologist. In going to Wakefield, therefore, Bevan-Lewis was treading in distinguished footsteps, and he was immediately confirmed in the career which he had adopted. He rose rapidly, first to be pathologist to the hospital, then to be deputy superintendent, and in 1884 he became medical director of the institution. This post he did not resign till 1910, thus completing 35 years of service, 26 of which were spent in the position of the highest responsibility.

Of Bevan-Lewis's ideals as to what such a post as medical superintendent of a large asylum should mean, there is no doubt alike from the results of his work and the recollections of the many who worked with and under him. From each and all there emerges the same picture of a man whose heart was in his researches, and whose inclination directed him towards the teaching and writing of the knowledge which he had to deliver, but conscientiousness and discrimination alike urged him to devote attention to the organising side of his duties. For he knew that if the advancement of psychology and pathology in relation to insanity were to be obtained, the sure way would be by the intimate study of the subjects of investigation placed beneath his hand. Hence the administrative side of his work was fruitful, including the starting of an out-patient department (then quite a novelty), the reconstruction of the pathological laboratory, the provision of separate wards for the treatment of imbecile cases, and the institution of a well-equipped block for the reception of early cases of mental disease.

While these things would have been sufficient to secure for Bevan-Lewis a high position in his specialty, his memory will be better preserved by his writings and teachings, which expressed the results of his personal and assiduous researches. He was for 25 years lecturer and examiner in mental disease at the University of Leeds, succeeding Crichton-Browne and Major in this post, which later, on the rise of the Leeds school of medicine into a University Faculty, became a professorship. In 1889 he published his well-known text-book of mental diseases, in which he proposed to record the existing knowledge of the pathological aspects of insanity. In this exhaustive work he was stimulated and supported not only by a recurrent staff of interested fellow-workers, but by the presence, as visitors to Wakefield, of a constant influx of young collaborators. This work was recognised on its appearance as practically the first attempt to present in the field of English psychological medicine a résumé of our knowledge of morbid changes in the brain of the insane. It was founded largely on original research, and illustrated with exceptionally good plates, and it was seen at once to supply defects in the treatises, for example, of Bucknill, Tuke, and Clouston. The book was reprinted ten years later, and, although in certain respects the contents were modified, its individual character remained, and this to such an extent that it was easy to hold that work done by others during the interval had not been sufficiently taken into account. But the author's scheme of presentation was simple and serviceable from a psychological standpoint, while, as a matter of fact, certain of the main theories as to minute structure which, when first made seemed to be incompatible with results obtained by experiment, have been since demonstrated by Sir Charles Sherrington and his followers as accurate. Thus and for nearly 30 years Bevan-Lewis had the satisfaction of coming into his own.

Prof. J. Shaw Bolton, Medical Director of the West Riding Hospital, writes:—" I feel doubtfully qualified to write even a brief psychological sketch of the great neurologist whom I succeeded at Wakefield Mental Hospital 19 years ago, for I saw Bevan-Lewis on the day of my election and on no other occasion. I remember vividly my interview with him in his drawing-room, now a dormitory of the institution. He was not in the least the man I had often pictured to myself during the 20 years I had been familiar with his work and reputation, and whose beautiful drawings of the cortex cerebri had first attracted my attention to neurology. He was quiet, dignified, and reserved, and though perfectly courteous, neither volunteered nor provided any information of value regarding the institution and my new duties. I could fully appreciate his point of view. I was a stranger about to undertake the work he was laying down and of which he was jealously proud; and his main object was to obtain the best terms possible for the staff he was leaving behind him. I parted from him with regret, feeling certain that I should never see him again. I wrote later asking if I could come over before he left Wakefield, but he replied that it was not necessary and that I should find everything in perfect order. A lengthy residence in Wakefield has satisfied me of the truth of this description of a mere interview as a picture of the mentality of Bevan-Lewis. He was an enthusiast, and a recluse with few interests beyond his scientific investigations. He was retiring and aloof, and rarely to be seen or interviewed, but this very attitude towards others, which might have led lesser men to be ignored, in the case of Bevan-Lewis was a powerful factor in the success of his administration. For he was successful, and during his 26 years as medical director he saw, and took a prominent part in, administrative changes and extensions which taken alone would have gained him a high reputation. He witnessed the opening of Menston and Storthes Hall Mental Hospitals, and the planning, building and early years of working of a new mental hospital attached to the Wakefield Asylum of old. He held views on mental hospital evolution which were almost prophetic. As early as 1889 he founded at Wakefield an out-patient department which is still flourishing, and during many years, until in fact the opening of Scalebor Park Mental Hospital rendered the step unnecessary, he provided private mental nurses to the district. Referring in 1889 to the proposal, under the auspices of the London County Council, to erect an acute hospital, providing accommodation for 100 patients, to appoint a staff of experienced visiting physicians, and to establish in connexion therewith a school for the scientific study of mental disease, he remarked:

> 'It must be admitted that the tendency to the establishment of the hospital system is the correct one, and that this end will be eventually realised. Within the metropolitan area the conditions are so peculiarly favourable to its development that one is surprised at the limited accommodation proposed by its advocates; *but as applicable to the provinces*, the difficulties of applying the system are obvious, and a modified procedure is necessarily demanded. That the large country asylums should eventually become receptacles for the hopelessly incurable chronic class, officered and managed upon a far more economical system than the present; that special hospitals for dealing with the acute insane, with a well-trained staff of experienced alienists, and affording facilities for a development of clinical teaching should be instituted; and that they should contain centres for scientific investigation and research, are facts so self-evident as to require no further emphasis here.'

"These views found expression in Bevan-Lewis's administration during the next 20 years. He left the chronic block as he found it, an antiquated building surrounded by high walls, and it is doubtful whether he even noticed its sanitary defects, so endeared to him was every brick of Wakefield. In 1900, however, he witnessed the opening of the acute hospital, a modern building replete with what were at that time unique means for research and methods of scientific treatment. This hospital contained a large lecture hall and library and several laboratories, and it possessed extensive provision for electro- and hydro-therapeutic methods of treatment. I believe that to a great extent the new hospital realised Bevan-Lewis's ideal, although its completion came too late to enable him with his enfeebled health adequately to administer it. Bevan-Lewis lived and worked in a world apart, and if he felt and resented the belated recognition accorded to his work on cortical localisation no one knew it. He justly acquired a great scientific reputation, and his position as a neurologist of the highest rank is now at its acme, when it is universally acknowledged that much of his best work waited for a quarter of a century for confirmation and acceptance."

In 1909 Dr. Bevan-Lewis was president of the Royal Medico-Psychological Association, but otherwise, owing partly to early want of recognition and partly to his own retiring disposition, he escaped all public acknowledgment for his valuable services to science and society. He received his reward, and to him it appeared a satisfactory one, in the grateful regard which he obtained from pupils, many of whom became well known and successful in their careers. Throughout his work at Wakefield he was assisted by a devoted wife, Rose Eve, the eldest daughter of Mr. W. C. Kaye, of Enfield, whom he had married when he was only 23 years of age. The loss of his wife occurred some years after his retirement from Wakefield, and was one from which he never recovered. He had no children.

THE NEW TREATMENT FOR BURNS.

A REPORT ON TANNIC ACID.

MANY substances have been used for burns since the time when carron oil was discarded from domestic medicine cupboards. The search has always been for an easily applied dressing that will not only relieve pain and mitigate shock but will have some antiseptic properties and will not require frequent changes. The substances found to have at least some of these desirable qualities vary widely, not only in composition but in physical properties. Among these powdered sodium bicarbonate, ointments spead on lint, paraffin wax applied with a spray, and liquids such as picric acid have had their supporters. It seems probable that these applications will all be replaced as routine methods of treatment by the use of tannic acid, the introduction of which is described by the Medical Research Council as "one of the most important recent advances that have been made in modern therapeutics."[1] Since Dr. E. C. Davidson, of the Henry Ford Hospital in Detroit, first advocated this method four years ago,[2] we have had evidence from various sources substantiating his good results.[3] These have now been confirmed by Mr. W. C. Wilson, *who is able to report a consecutive series of 117 cases* treated by this method in the department of surgery of the University of Edinburgh. The death-rate from all causes in this series was 11·1 per cent., the mortality in 105 children under 10 years of age being 10·5 per cent. compared with 38·7 per cent. in a series of comparable cases treated by other methods. The tannic acid is used in aqueous solution, which should be freshly prepared for each case (though not necessarily for each application), since after some weeks tannic acid in solution is changed to gallic acid, which has no power to coagulate protein.

The strength recommended is a 2·5 per cent. solution in warm sterile water, sprayed on the affected area, which has been gently cleansed with ether under a general anæsthetic, preferably gas and oxygen. An ordinary nasal spray atomiser can be used and the parts dried by means of electric lamp bulbs in the bed-cage or by a current of hot air from an electric drier. Spraying and drying are carried out at intervals of one hour till the parts are covered with a thin brown layer of coagulated tissue. This usually appears in burns of the second and third degrees after from 8 to 12 applications. In deeper lesions, and also when there is much exudation of serum from the raw surface, further applications may be required to procure a satisfactory coagulum. There is no danger of a too deep corrosive action when a weak solution is used.

In burns of the face the eyes, nostrils, and external auditory meatus are protected with moist wool during spraying.

Local Effects after Treatment.

After the first few applications pain is relieved and disappears. The parts rapidly become insensitive and subsequent spraying causes no discomfort.

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[1] The Tannic Acid Treatment of Burns. By W. C. Wilson. Medical Research Council, Special Report Series No. 141. London: H.M. Stationery Office, 1929. Pp. 31. 1s.

[2] Surg., Gyn., and Obstet., 1925, xli., 202.

[3] See THE LANCET, 1925, i., 330 and 351.

The thin brown leathery coagulated layer can be handled freely without risk of conveying infection to the underlying tissues, and its rigid splint-like character ensures the best conditions for the healing processes beneath it. In uncomplicated cases the coagulum should be left until it peels off readily, which it will do within two or three weeks in lesions of the second or third degrees. Areas still uncovered by epithelium are protected by sterile vaseline applied on strips of gauze.

Sepsis.—When sepsis is suspected, from the reddening of the surrounding skin or from the presence of a little sero-purulent discharge from the edge of the coagulum, no special treatment is necessary if the patient's general condition remains satisfactory. Gross infection, which rarely occurs except in association with the formation of sloughs in deep burns, leads to the formation of a collection of pus. The coagulum is pushed up by this pus and can usually be stripped off easily; if it continues to adhere firmly it can be cut away with scissors. In no circumstances should wet dressings be applied over the coagulum.

The provisional instructions for the first-aid treatment of burns by tannic acid will be set out in our columns next week.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 19TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 154 (last week 131); scarlet fever, 3549; diphtheria, 1582; enteric fever, 140 (last week 104); pneumonia, 1042; puerperal fever, 53; puerperal pyrexia, 124; cerebro-spinal fever, 6; acute poliomyelitis, 23; acute polio-encephalitis, 2; encephalitis lethargica, 9; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 22nd–23rd was as follows:—Small-pox 168 under treatment, 0 under observation (last week 166 and 3 respectively); scarlet fever, 2464; diphtheria, 2242; enteric fever, 69 (last week 39); measles, 186; whooping-cough, 131; puerperal fever, 23 (plus 13 babies); encephalitis lethargica, 126; poliomyelitis, 8; "other diseases," 20. At St. Margaret's Hospital there were 16 babies (plus 8 mothers) with ophthalmia neonatorum.

Of the notifications of enteric fever, 30 were received from the County of London—namely, Hackney, Islington, Lambeth, Paddington, St. Marylebone, Wandsworth, and Westminster each 1, Stepney 2, and Lewisham 21.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 7 (3) from enteric fever, 14 (0) from measles, 8 (2) from scarlet fever, 13 (1) from whooping-cough, 31 (6) from diphtheria, 136 (35) from diarrhœa and enteritis under two years, and 40 (7) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa are now definitely on the decline, the highest figures being reported from Liverpool 11, Birmingham 9, and Leeds 5, while Glasgow and Dublin report 8 each. The deaths from enteric fever outside London were reported from Bournemouth, Bristol, Salford, and Leeds 1 each; the 4 deaths in London occurred at Lewisham, where the outbreak to date (Oct. 29th) amounts to 64 cases with 5 deaths.

The number of stillbirths notified during the week was 257 (corresponding to a rate of 39 per 1000 births), including 48 in London.

VETERINARY RESEARCH AT LIVERPOOL.—The University has received £10,000 for research to be conducted under the direction of the William Prescott Professor in the Department of Veterinary Pathology. This sum represents contributions of £6000 and £3000 from two anonymous donors, and £1000 from Messrs. R. Silcock and Sons, Ltd., of Liverpool.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REASSEMBLY OF PARLIAMENT.

BOTH Houses of Parliament reassembled for the autumn session on Tuesday, Oct. 29th. The Government have in hand a considerable programme of legislation which they intend to pass before the Prorogation next July. Among the more important Bills are two dealing with Slum Clearance and Reform of the Factory Laws. These measures are likely to be introduced before Christmas, but it will depend upon the progress made with other Bills whether they proceed any further before the reassembling of Parliament early in the New Year.

The Government's Programme.

Mr. SNOWDEN, in announcing the Government's programme of business, said that it was proposed to proceed with the Unemployment Insurance Bill before the Christmas adjournment. It was hoped to make progress with other measures foreshadowed in the King's Speech, including the Factories Bill, to regulate hours of industrial employment. The financial resolution in connexion with the Highlands and Islands Medical Services (Additional Grants) Bill would be placed on the Order Paper on the following day, and a White Paper would also be available.

Notices of Motion.

In the ballot for notices of motion Lieut.-Colonel FREMANTLE gave notice that to-morrow week (Nov. 6th) he would call attention to ribbon development and move a resolution. Mr. T. HENDERSON also gave notice of a motion on the nationalisation of water-supply.

HOUSE OF COMMONS.

TUESDAY, OCT. 29TH.

Voluntary Hospitals and Motor Accidents.

Sir WILLIAM DAVISON asked the Minister of Transport whether, in view of the serious cost and difficulties thrown on voluntary hospitals throughout the country in the receiving and treating of persons suffering from motor accidents, and also in view of the fact that in very many cases no payment is made to the hospital in question by such persons for their treatment in the hospital, His Majesty's Government would consider the propriety of raising a central fund by means of a small deduction from driving licences, or otherwise, with a view to adequate payments being made to voluntary hospitals who are unable to obtain payment for services rendered in the case of motor accidents.—Mr. HERBERT MORRISON replied: I do not feel justified in recommending the legislation which would be required to impose a compulsory levy on the drivers of all motor vehicles for this purpose.

Sir WILLIAM DAVISON asked if the Minister of Transport did not recognise the serious position that many hospitals were in by reason of their often keeping a special ward, particularly in the country, to deal with motor accidents which interfered with the normal work of the hospitals, and was a great expense to them, when they were already finding it difficult to pay their way. He also asked if the Minister could not introduce some clause at any rate in the legislation which he had promised with regard to third-party insurance, which would deal with this matter.—Mr. MORRISON replied that they all recognised the financial difficulties of voluntary hospitals, but he was unable to agree that that was a question which exclusively related to the services required from the hospitals by motorists.

Mr. THURTLE asked if one of the remedies in this matter would not be for motorists to take more care.

Mr. ALBERY asked the Minister to consider the propriety of approaching the Automobile Association and the Royal Automobile Club with the suggestion that they should try to devise some means of collecting these sums for the hospitals.—Mr. MORRISON replied that there was no reason to believe that motorists as a class were less generous in their contributions towards the hospitals than any other section of the community, and it would be difficult to single them out from other users of the hospitals.

Mr. LOUIS SMITH asked the Home Secretary if he would obtain information from the police of the country of the number of accidents treated in local hospitals and resulting from the use of motors during the months from April to the middle of October, with the object of ascertaining the burden now placed on those institutions.—Mr. CLYNES replied: I have consulted my right hon. friend the Minister of Health, and am advised that the collection of the figures the hon. Member mentions would not secure the object he has in view; and as the figures could not be obtained without imposing great labour on the police, out of all proportion to the usefulness of any results that can be anticipated, I regret that I do not see my way to ask the police to furnish them.

Government and Slum Clearance.

Lieut.-Colonel FREMANTLE asked Mr. Snowden, Chancellor of the Exchequer (who is acting for the Prime Minister) whether the much-promised measure for slum clearance was included in what the right hon. gentleman called "minor *Bills*," or if it was not considered of sufficient importance to be introduced before Christmas.—Mr. SNOWDEN replied that he certainly would not include the Slum Clearance Bill among the minor measures to which he had referred. He hoped that when the Bill was introduced it would be recognised that it was a Bill of first-rate importance. The programme which the Government had outlined, and which they hoped to get through with the assistance of the Opposition, so far as their proposals met with approval, was rather ambitious. He could assure the House that the Slum Clearance Bill would be taken as soon as Parliamentary time permitted.

Procedure at Coroners' Inquests.

Sir KINGSLEY WOOD asked the Home Secretary whether he was aware of the considerable public apprehension concerning the recent conduct and procedure of certain coroners' inquests, particularly in relation to the ancient and well-established rights and liberties of the subject, and whether he could make any proposals or statement to the House on the matter.—Mr. CLYNES replied: I am obliged to the right hon. gentleman for his courtesy in giving me long notice of this question, and thus affording me the opportunity of consulting with my noble friend, the Lord Chancellor, and my hon. and learned friend, the Attorney-General, upon the legal aspects of the matter. As the right hon. gentleman is no doubt aware, the law relating to coroners' inquests was revised and brought up to date by a comprehensive measure passed only three years ago. The view in which the authorities I have consulted concur is that it would be a mistake so soon after the revision of the law to consider making another fundamental alteration because of what has happened in one or two quite exceptional cases. The provision under which coroners pursue their inquiries up to the point of enabling the jury to find the persons, if any, who have been guilty of murder or manslaughter, embodies the ancient common law of England. Having regard to the number of inquests held every year—over 30,000 in 1927—the criticisms of the working of this provision have been remarkably few, and, on the other hand, there have been very many cases in which its value has been clearly demonstrated. I propose, therefore, as at present advised, to take no action in the matter.

War Pensioners and Seven Years' Limit.

Mr. DAY asked the Minister of Pensions whether he was now in a position to make an announcement with reference to the Government's attitude regarding the abolition of the seven years' limit with reference to ex-Service men; and whether it was proposed to obtain powers to remove other pension grievances, including the amendments to the final awards regulations in the case of war orphans.—Mr. F. O. ROBERTS replied: I expect to be able very shortly to make a full statement on the point raised in the first part of the question. I am at the same time giving close attention to all difficulties that have been put before me in connexion with the administration of war pensions, and I shall do what is possible from time to time to remedy them.

University Graduates and Choice of a Career.

Mr. GRAHAM WHITE asked the Minister of Labour if she would circulate to the proper authorities at the universities periodical reviews of the various branches of industry and the professions, in order that undergraduates might be enabled to make plans for their future at a suitable time.—Miss BONDFIELD replied: The hon. Member is perhaps aware that my department, in collaboration with the Incorporated Associations of Headmasters and Headmistresses, recently began to issue through H.M. Stationery Office a series of pamphlets on the choice of careers. Copies of these are being sent to University Appointments Boards and to all secondary schools on the "recognised" list of the Board of Education. I will gladly supply the hon. Member with a list of these pamphlets so far as they have been completed, if he so desires.

Administration of the Factory Acts.

Mr. GRAHAM WHITE asked the Prime Minister if it was the intention of the Government to transfer the administration of the Factory Acts to the Ministry of Labour.—Mr. SNOWDEN replied: This matter has not been under the consideration of the Government.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—A. Buch and R. F. M. Child, St. Mary's Hosp.; V. J. H. Coldan, Beyrout; R. W. Goldsbrough, Leeds; A. Guirdham, Charing Cross Hosp.; H. C. Haige, St. Mary's Hosp.; G. A. F. Holloway and A. Kellner, London Hosp.; and R. K. Naudiel, Birmingham.

Medicine.—W. T. Ellis, Manchester and Charing Cross Hosp.; W. J. Frith, London Hosp.; A. Guirdham, Charing Cross Hosp.; W. M. Hamer, Manchester and Charing Cross Hosp.; W. St. A. Hendricks and R. J. Kagan, St. Mary's Hosp.; H. W. Maurer, Charing Cross Hosp.; T. M. White, Bristol; and F. A. Yarde, St. Mary's Hosp.

Forensic Medicine.—A. N. De Monte, St. Mary's Hosp.; W. J. Frith, London Hosp.; B. C. Ghose, Durham; R. Gilmore, Manchester; A. Guirdham, Charing Cross Hosp.; W. St. A. Hendricks, St. Mary's Hosp.; G. A. F. Holloway, London Hosp.; C. Hortop and A. D. H. Hugo, Guy's Hosp.; A. Liberis, St. Bart.'s Hosp.; W. McDermott, London Hosp.; J. E. Moody, St. Mary's Hosp.; L. J. Pearson, Birmingham; T. G. Robinson, Guy's Hosp.; L. C. H. Sykes, Leeds; and F. A. Yarde, St. Mary's Hosp.

Midwifery.—M. Asaad and R. F. M. Child, St. Mary's Hosp.; A. Clark, Glasgow and London Hosp.; C. E. P. Davies, Guy's Hosp.; A. N. De Monte, St. Mary's Hosp.; H. R. Fosbery, Middlesex Hosp.; A. Guirdham, Charing Cross Hosp.; J. E. R. Heppolette, St. Mary's Hosp.; G. A. F. Holloway, London Hosp.; D. W. Hoodless, Charing Cross Hosp.; V. J. Lopez, St. Mary's Hosp.; W. McDermott, London Hosp.; L. J. Pearson, Birmingham; and S. Ramadas, St. George's Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and *midwifery*: A. Clark, A. N. De Monte, W. T. Ellis, R. W. Goldsbrough, A. Guirdham, W. M. Hamer, W. St. A. Hendricks, G. A. F. Holloway, C. Hortop, W. McDermott, and T. M. White.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial on Oct. 26th the following diplomas were conferred:—

D.P.H.—H. J. Gibson, *David Lennox, *K. A. T. Martin, Sarup Narain and N. S. Turnbull.

* In absentia.

UNIVERSITY OF SYDNEY.—Dr. H. Whitridge Davies, who for the last three years has been lecturer in physiology and pharmacology in the University of Leeds, has been appointed to the Chair of Physiology at the University of Sydney.

Dr. Davies is an Australian by birth, and is the son of Mr. Harold Davies, professor of music at the University of Adelaide. After graduating at Adelaide, he came to Europe with the Australian Army Medical Corps, and served in France. He subsequently became research assistant to Dr. J. S. Haldane, at Oxford, and in 1921 he worked in the Department of Therapeutics in the University of Edinburgh under Prof. Jonathan Meakins. Later he spent a year at the Rockefeller Institute, New York.

RADIOLOGICAL CONGRESS IN LONDON.—The annual congress of the British Institute of Radiology, incorporated with the Rontgen Society, will be held at the Central Hall, Westminster, from Dec. 4th to 6th. There will be a trade exhibition of X ray apparatus. The Silvanus Thompson and Mackenzie Davidson memorial lectures and other addresses will be given in the Congress Hall adjoining the exhibition.

LORD MOYNIHAN ON VOLUNTARY HOSPITALS.—Speaking at Dewsbury on Oct. 15th, Lord Moynihan said he believed we had now arrived at the most critical period in the history of hospital administration in this country. Hitherto it had required a confession of pauperism to allow a patient to receive benefit from the poor-law hospitals, but under the new Local Government Act the work of all the hospitals could be coördinated, the number of available beds doubled, and the disgrace of long waiting-lists reduced. It was the hope of the medical profession that the standards and ideals of the voluntary hospitals would guide and inspire the work of the old poor-law institutions under the new control. It must be recognised, however, that physicians and surgeons required for the adequate staffing of these hospitals did not at present exist. Special and arduous training was needed before a man could undertake consulting duties, and the responsible authorities must go slowly at first and increase only at the rate at which fully qualified persons became available for the work. General practitioners should be given greater facilities for keeping in touch with their patients under treatment, and for following the practice of the hospitals so as to keep themselves abreast of the advances of medicine. The great imperfection of the National Health Insurance Act from the medical standpoint was that it gave the practitioner no chance of availing himself of hospital practice or of getting post-graduate training.

The thin brown leathery coagulated layer can be handled freely without risk of conveying infection to the underlying tissues, and its rigid splint-like character ensures the best conditions for the healing processes beneath it. In uncomplicated cases the coagulum should be left until it peels off readily, which it will do within two or three weeks in lesions of the second or third degrees. Areas still uncovered by epithelium are protected by sterile vaseline applied on strips of gauze.

Sepsis.—When sepsis is suspected, from the reddening of the surrounding skin or from the presence of a little sero-purulent discharge from the edge of the coagulum, no special treatment is necessary if the patient's general condition remains satisfactory. Gross infection, which rarely occurs except in association with the formation of sloughs in deep burns, leads to the formation of a collection of pus. The coagulum is pushed up by this pus and can usually be stripped off easily; if it continues to adhere firmly it can be cut away with scissors. In no circumstances should wet dressings be applied over the coagulum.

The provisional instructions for the first-aid treatment of burns by tannic acid will be set out in our columns next week.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 19TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 154 (last week 131); scarlet fever, 3549; diphtheria, 1582; enteric fever, 140 (last week 104); pneumonia, 1042; puerperal fever, 53; puerperal pyrexia, 124; cerebro-spinal fever, 6; acute poliomyelitis, 23; acute polio-encephalitis, 2; encephalitis lethargica, 9; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 22nd–23rd was as follows:—Small-pox 163 under treatment, 9 under observation (last week 166 and 3 respectively); scarlet fever, 2464; diphtheria, 2242; enteric fever, 69 (last week 30); measles, 186; whooping-cough, 181; puerperal fever, 23 (plus 13 babies); encephalitis lethargica, 126; poliomyelitis, 8; "other diseases," 20. At St. Margaret's Hospital there were 16 babies (plus 8 mothers) with ophthalmia neonatorum.

Of the notifications of enteric fever, 30 were received from the County of London—namely, Hackney, Islington, Lambeth, Paddington, St. Marylebone, Wandsworth, and Westminster each 1, Stepney 2, and Lewisham 21.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 7 (3) from enteric fever, 14 (0) from measles, 8 (2) from scarlet fever, 13 (1) from whooping-cough, 31 (6) from diphtheria, 136 (35) from diarrhœa and enteritis under two years, and 40 (7) from influenza. The figures in parentheses are those for London itself.

Deaths from diarrhœa are now definitely on the decline, the highest figures being reported from Liverpool 11, Birmingham 9, and Leeds 5, while Glasgow and Dublin report 8 each. The deaths from enteric fever outside London were reported from Bournemouth, Bristol, Salford, and Leeds 1 each; the 4 deaths in London occurred at Lewisham, where the outbreak to date (Oct. 29th) amounts to 64 cases with 5 deaths.

The number of stillbirths notified during the week was 257 (corresponding to a rate of 39 per 1000 births), including 48 in London.

Veterinary Research at Liverpool.—The University has received £10,000 for research to be conducted under the direction of the William Prescott Professor in the Department of Veterinary Pathology. This sum represents contributions of £6000 and £3000 from two anonymous donors, and £1000 from Messrs. R. Silcock and Sons, Ltd., of Liverpool.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

REASSEMBLY OF PARLIAMENT.

Both Houses of Parliament reassembled for the autumn session on Tuesday, Oct. 29th. The Government have in hand a considerable programme of legislation which they intend to pass before the Prorogation next July. Among the more important Bills are two dealing with Slum Clearance and Reform of the Factory Laws. These measures are likely to be introduced before Christmas, but it will depend upon the progress made with other Bills whether they proceed any further before the reassembling of Parliament early in the New Year.

The Government's Programme.

Mr. Snowden, in announcing the Government's programme of business, said that it was proposed to proceed with the Unemployment Insurance Bill before the Christmas adjournment. It was hoped to make progress with other measures foreshadowed in the King's Speech, including the Factories Bill, to regulate hours of industrial employment. The financial resolution in connexion with the Highlands and Islands Medical Services (Additional Grants) Bill would be placed on the Order Paper on the following day, and a White Paper would also be available.

Notices of Motion.

In the ballot for notices of motion Lieut.-Colonel Fremantle gave notice that to-morrow week (Nov. 6th) he would call attention to ribbon development and move a resolution. Mr. T. Henderson also gave notice of a motion on the nationalisation of water-supply.

HOUSE OF COMMONS.

TUESDAY, OCT. 29TH.

Voluntary Hospitals and Motor Accidents.

Sir William Davison asked the Minister of Transport whether, in view of the serious cost and difficulties thrown on voluntary hospitals throughout the country in the receiving and treating of persons suffering from motor accidents, and also in view of the fact that in very many cases no payment is made to the hospital in question by such persons for their treatment in the hospital, His Majesty's Government would consider the propriety of raising a central fund by means of a small deduction from driving licences, or otherwise, with a view to adequate payments being made to voluntary hospitals who are unable to obtain payment for services rendered in the case of motor accidents.—Mr. Herbert Morrison replied: I do not feel justified in recommending the legislation which would be required to impose a compulsory levy on the drivers of all motor vehicles for this purpose.

Sir William Davison asked if the Minister of Transport did not recognise the serious position that many hospitals were in by reason of their often keeping a special ward, particularly in the country, to deal with motor accidents which interfered with the normal work of the hospitals, and was a great expense to them, when they were already finding it difficult to pay their way. He also asked if the Minister could not introduce some clause at any rate in the legislation which he had promised with regard to third-party insurance, which would deal with this matter.—Mr. Morrison replied that they all recognised the financial difficulties of voluntary hospitals, but he was unable to agree that that was a question which exclusively related to the services required from the hospitals by motorists.

Mr. Thurtle asked if one of the remedies in this matter would not be for motorists to take more care.

Mr. Albery asked the Minister to consider the propriety of approaching the Automobile Association and the Royal Automobile Club with the suggestion that they should try to devise some means of collecting these sums for the hospitals.—Mr. Morrison replied that there was no reason to believe that motorists as a class were less generous in their contributions towards the hospitals than any other section of the community, and it would be difficult to single them out from other users of the hospitals.

Mr. Louis Smith asked the Home Secretary if he would obtain information from the police of the country of the number of accidents treated in local hospitals and resulting from the use of motors during the months from April to the middle of October, with the object of ascertaining the burden now placed on those institutions.—Mr. Clynes replied: I have consulted my right hon. friend the Minister of Health, and am advised that the collection of the figures

Hospital Coöperation at Newcastle.—An advisory committee representative of the voluntary hospitals of Newcastle-on-Tyne has been formed to coöperate *with the municipality in hospital matters, especially* for the prevention of overlapping and for making the best use of the available beds. It is pointed out that, while Newcastle Royal Infirmary has a waiting-list of 2000, there are other voluntary hospitals, fully staffed, not many miles away, with many unoccupied beds.

School Hygiene in Glasgow.—Mr. John Clark, LL.D., who has just retired from the position of Director of Education in Glasgow, was entertained last week to a complimentary luncheon by his many friends in Glasgow, medical and otherwise, in recognition of his enthusiasm in promoting the teaching of hygiene at the training colleges. Both the system of medical examination and the treatment of school-children owe a great deal to his intelligent sympathy and encouragement. He had personal experience of American methods and admittedly education in Glasgow will miss his driving force.

Treloar Cripples' Hospital.—Lord Ampthill, Pro-Grand Master of the United Grand Lodge of England, last week, with masonic ceremony, laid the foundation-stone of the new wards of the Lord Mayor Treloar Cripples' Hospital and College at Alton, Hants. The new buildings will replace the present worn-out wooden huts; they will accommodate 355 crippled children besides 50 crippled boys who are being trained in the college, and will cost £100,000. Last week, also, the coming-of-age dinner of the hospital took place at the Mansion House, under the presidency of the Lord Mayor. It was then stated that since 1908 the hospital had dealt with 6000 children, 95 per cent of them successfully.

Grangethorpe Hospital Closed.—Grangethorpe Hospital, Manchester, one of the best-known war hospitals in the country, *has after 11 years finally closed its doors*, the last patients being transferred elsewhere. During this time 16,000 men have received treatment in the hospital and 7000 operations have been performed. Before the war it was a private residence, and in 1918 it was bought for £11,000 by the trustees of the East Lancashire Homes for Disabled Sailors and Soldiers. For some years the work has been carried on under the authority of the Ministry of Pensions. The building has been presented to the Manchester Royal Infirmary, but it has not yet been decided how the hospital will be utilised. A suggestion has been made that it should be converted into a hospital for middle-class patients who cannot afford nursing-home fees yet wish to pay for treatment.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

Thursday, Nov. 7th.—4.30 p.m. *The following papers will be read*:—W. A. Lamborn: The Remarkable Adaptation by which a Dipterous Pupa (Tabanidæ) is preserved from the Danger of Fissures in Drying Mud (communicated by E. B. Poulton); H. E. Roaf: The Absorption of Light by the Coloured Globules in the Retina of the Domestic Hen (communicated by Sir Charles Sherrington); R. G. Tomkins: Studies of the Growth of Moulds. I. (communicated by Sir William Hardy); R. H. Stoughton: The Morphology and Cytology of Bacterium Malvacearum E.F.S. (communicated by Sir John Russell); E. C. Smith: On the Coagulation of Muscle Plasma (communicated by Sir William Hardy). *The following papers will be read in Title only.*—Sunder Lal Hora: Ecology, Bionomics and Evolution of the Torrential Fauna (communicated by J. H. Ashworth); N. J. Berrill: Studies in Tunicate Development. Part I. (communicated by D. M. S. Watson); J. C. Kernot, J. Knaggs and Madge Kaye: The Swelling of Fish Skins in Solutions of Inorganic and Organic Acids (communicated by Sir William Hardy); A. V. Hill: Anaerobic Survival in Muscle; A. V. Hill and P. Kupalov: Anaerobic and Aerobic Activity in Isolated Muscle; Sybil Cooper and D. Denny-Brown: The Interaction between two Trains of Impulses converging on the Same Motoneurone (communicated by Sir Charles Sherrington); C. H. Best and Ruth Partridge: Observations on Olympic Athletes (communicated by A. V. Hill); H. S. Holden: On the Structure and Affinities of Ankyropteris Corrugata (communicated by D. H. Scott); W. R. I. Cook and E. J. Schwartz: Life-history, Cytology and Method of *Plasmodiophora brassicæ* Woron, the Cause of Finger and Toe Disease of Cabbages and other Crucifers (communicated by E. J. Butler); R. Broom: On the Structure of the Mammal-like Reptiles of the Suborder Gorgonopsia; H. K. Mookerjee: On the Development of the Vertebral Column of Anura (communicated by E. W. MacBride); H. K. Mookerjee: On the Development of the Vertebral Column of Urodela (communicated by E. W. MacBride; R. R. Gates and F. M. L. Sheffield: Megaspore Development in Œnothera Rubricalyx (communicated by Sir John Farmer); C. F. A. Pantin: On the Physiology of Amœboid Movement. I., II. and III. (communicated by E. J. Allen); O. Rosenheim, and N. K. Adam: Monomolecular Films of Irradiated Ergosterol in Relation to the Production of Vitamin D.; R. N. Mukerji: Effect of X-Radiation on the Spermatogenesis of Lepisma Domestica (communicated by J. P. Hill); J. B. Gatenby, R. N. Mukerji, and Sylvia Wigoder: The Effect of X-Radiation on the Spermatogenesis of Abraxas Grossulariata (communicated by J. P. Hill).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Nov. 5th.—8.30 p.m., Orthopædics. Presidential Address: Mr. D. McCrae Aitken: Respiratory Rhythm in Physiological Relation to Movement and Posture, with Suggested Applications to Treatment. (Illustrated by cinematograph.) 8 p.m., Pathology. Laboratory Meeting at St. Mary's Hospital (Inoculation Department), W. Communications:—L. Colebrook: Sterilisation of the Hands. R. M. Fry and E. H. Davey: The Vernes Test for Tubercle. J. Freeman: Rush Inoculation. R. Hare: Variations in Streptococcal Cultures. I. Maclean: A Bacillus Found in Dental Granulomata. G. Roche Lynch: An Electrolytic Marsh Apparatus for the Estimation of Minute Amounts of Arsenic, Using a Mercury Cathode. Demonstrations:—Sir Almroth Wright: Intertraction. A. Fleming and S. Craddock: The Use of Penicillin in the Isolation of Some Bacteria. G. E. Harre: Human Tar Cancer. D. M. Pryce: The Halo Method of Mensuration. W. D. Newcomb and J. W. Orr: Recent Pathological Specimens. F. T. Ridley: Ossification in the Choroid.

Wednesday.—5 p.m., History of Medicine. Papers: Mr. W. J. Bishop: English Physicians in Russia in the Sixteenth and the Seventeenth Centuries. Dr. J. F. Fulton: Edward Selleck Hare (1812–38) and the Syndrome of Paralysis of the Cervical Sympathetic. 8.30 p.m., Surgery. Discussion on Surgery of the *Spinal Cord. Opener: Mr. Hugh Cairns. Speakers:* Mr. Donald Armour, Mr. Geoffrey Jefferson, Sir Percy Sargent, and others.

Thursday.—5.30 p.m., Tropical Diseases. Prof. A. C. Ukil: Epidemiology and Pathology of Tuberculosis in India (illustrated by lantern slides). Dr. G. Giglioli (provisionally): Paratyphosus C Infections in British Guiana—Sterile Abscess in Treatment (demonstration of specimens—lantern slides). Dr. W. Broughton-Alcock: Section Showing Structures Morphologically Resembling Spirochætes of a Species Common to the Mouth, Lying Deep Within the Mucous Membrane (for opinion). N.B.—Change in hour of Meeting.

Friday.—5.30 p.m., Clinical. (Cases at 5 p.m.) Cases: Dr. C. Worster-Drought: Von Recklinghausen's Disease with Large Cervical Tumour. Dr. H. V. Morlock: Albinism with Enlarged Spleen; Congenital Syphilis with Anæmia. Mr. Cecil P. G. Wakeley: Osteomyelitis Treated by Bone Graft; Cirrhosis of the Liver After Talma-Morrison Operation. Dr. Gerald Slot: Congenital Heart. Mr. R. Rutherford: Late Rickets with Fractures. Dr. Terence East: Hæmophilia. Dr. L. S. T. Burrell: Von Recklinghausen's Disease. Dr. A. J. Scott Pinchin: Case of Coronary Thrombosis with Ventricular Aneurysm; Case for Diagnosis 8.30 p.m. Ophthalmology. (Cases at 8 p.m.). Papers: Dr. Cammidge: Retinitis in Diabetes. Mr. Tudor Thomas and Mr. M. S. Mayou: Sarcoma of the Iris. Mr. M. S. Mayou: Sarcoma of the Iris. Cases and Demonstrations: Miss Hamilton McIlroy: Case of Hereditary Ptosis with Epicanthus. Mr. Tudor Thomas: A Steriliser for Ballantyne's Drop Bottles: A Pair of Prismatic Spectacles. Other cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

Tuesday, Nov. 5th.—5 p.m., Dr. J. A. Arkwright: The Virulence of Micro-organism in Infective Disease (*Bradshaw Lecture*).

Thursday.—5 p.m., Dr. G. F. Still: The History of Pædiatrics in the Seventeenth and Eighteenth Centuries (First Fitzpatrick Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

Monday, Nov. 4th.—5 p.m., Mr. C. P. Wakeley: Specimens of Cysts.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Nov. 4th, to Saturday, Nov. 9th.—Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon., 5 p.m., Lecture by Mr. W. B. Gabriel: Common Rectal Complaints. No fee.—Tues., 8.30 p.m., Dr. J. W. McNee: Structure and Functions of the Spleen in Relation to Its Diseases. Fri., 8.30 p.m., Dr. O. L. V. de Wesselow: Nephritis and Œdema. Two lectures especially suitable for M.R.C.P. Candidates.—Royal Waterloo Hospital, Waterloo-road, S.E. Wed., 10 a.m., Dr. Cecil Bull: *Demonstration of Gastric Diagnosis.* No fee.—Prince of Wales's General Hospital, Tottenham, N. Wed., 2 p.m., Mr. W. Ibbotson: Demonstration of Throat Operations. No fee.—Central London Ophthalmic Hospital, Judd-street, W.C. Special Post-graduate course in Ophthalmology. Every afternoon for four weeks, demonstrations and lectures.—Royal Waterloo Hospital, Waterloo-road, S.E. Special post-graduate course in Medicine, Surgery, and Gynæcology. Every afternoon and some mornings for three weeks.—LONDON LOCK HOSPITAL, Dean-street, W. Post-graduate course in Venereal Disease. Daily every afternoon and evening. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Nov. 4th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.

WEDNESDAY, Nov. 6th.—4 P.M., Mr. V. Zachary Cope: Radium Therapy.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 4th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Nov. 4th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Affections of the Optic Nerves.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Tumours of the Cerebral Hemispheres.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Ocular Palsies.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Infectious Diseases of Nervous System.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road.

FRIDAY, Nov. 8th.—4 P.M., Mr. A. Lowndes Yates: Diagnosis and Treatment of the Common Forms of Deafness.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Nov. 5th.—3.15 P.M., Mr. L. E. Barrington-Ward: Visceroptosis.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Nov. 6th.—4.30 P.M., Mr. Kenneth Walker: The Enlarged Prostate.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Shadwell, E.

WEDNESDAY, Nov. 6th.—4.15 P.M., Clinical Meeting and Demonstration of Cases in the Wards. Open to all practitioners.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

WEDNESDAY, Nov. 6th.—2.30 P.M., at B.M.A. House, Tavistock-square, W.C. Quarterly Meeting. Dr. T. Saxty Good: Some Experiments with Suggestion and Association Tests in the Feebleminded. Dr. Geoffrey Shera: Bacillus Acidophilus Deficiency in Mental Patients.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Nov. 5th.—5 P.M., Dr. H. MacCormac: Diseases Due to Animal Parasites.

THURSDAY.—5 P.M., Dr. W. J. O'Donovan: Occupational Dermatitis.

INSTITUTE OF HYGIENE, 28, Portland-place, W.

WEDNESDAY, Nov. 6th.—3.30 P.M., Dr. J. B. Alexander: Modern Diet: Its Effect on the Digestion.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Nov. 6th.—4 P.M., Mr. Stanford Cade: The Possibilities and Limitation of Radium Treatment.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

MONDAY, Nov. 4th.—5 P.M., Prof. Leonard Hill: Atmospheric Pollution.

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.

FRIDAY, Nov. 8th.—5 P.M., Prof. V. H. Mottram: Human Nutrition. (Fourth of six lectures.)

KING'S COLLEGE, Strand, W.C.

TUESDAY, Nov. 5th.—5 P.M., Mr. J. W. Pickering, D.Sc.: Blood Plasma and Platelets. (Last lecture.)

THURSDAY.—5 P.M., Mr. J. A. Hewitt, D.Sc.: Metabolism of the Carbohydrates and Fats. (Last lecture.)

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Nov. 7th.—9 P.M., Dr. Edward Mapother: Prognosis in Mental Disorder.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

FRIDAY, Nov. 8th.—6 P.M., Dr. Eric Pritchard: Preventable Disease.

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.

FRIDAY, Nov. 8th.—4.30 P.M., Dr. Arthur F. Hurst: Precursors of Carcinoma of the Stomach. (Schorstein Memorial Lecture.)

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Nov. 4th.—5 P.M., Dr. R. J. Brocklehurst: Secretion of the Digestive Juices. (Last lecture.)

THURSDAY.—5.30 P.M., Rt. Hon. the Viscount Grey of Fallodon: Natural History, the Pleasure and Purpose of Observation. (Rickman Godlee Public Lecture.)

FRIDAY.—5.30 P.M., Mr. C. S. Elton: The Future of Animal Ecology. (Last lecture.)

ANCOATS HOSPITAL, Mill-street, Manchester.

THURSDAY, Nov. 7th.—4.15 P.M., Prof. J. B. S. Stopford: Spinal Tumours.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Nov. 5th.—4.15 P.M., Dr. A. H. Holmes: Meningitis.

FRIDAY.—4.15 P.M., Dr. H. Herd: Behaviour Disorders of Childhood.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.

FRIDAY, Nov. 8th.—3.30 P.M., Dr. Naish: Gastro-Intestinal Disorders in Infancy and Childhood.

Appointments.

GOUGH, A., M.B., Ch.M. Leeds, F.R.C.S. Eng., has been appointed Hon. Surgeon, Hospital for Women, Leeds.

McCURRY, A. L., M.D., B.Ch. Belf., D.O.M.S., Assistant Honorary Ophthalmic Surgeon to the Leicester Royal Infirmary.

MACINTOSH, J. M., Ch.B., M.D. Glasg., Assistant Medical Officer of Health, Northamptonshire.

Certifying Surgeons under the Factory and Workshop Acts: VAISEY, G. N., L.R.C.P. Lond., M.R.C.S. (Freshford, Somerset), and CONFORD, G. J., M.D. Oxf., B.Ch. Lond. (Felixstowe).

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—H.S. Also Asst. H.S. At rate of £175 and £130 respectively.

Birmingham City.—Asst. M.O. £750.

Birmingham, Highbury Hospital.—Res. M.O. £350–£400.

Birmingham, Queen's Hospital.—Res. Anæsthetist. £70–£100. Also Jun. R.S.O. £100.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Blackheath and Charlton Hospital.—Vacancies on Hon. Med. Staff.

Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200. Also Clin. Asst. to Ear, Nose and Throat Dept. £100.

Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.

Bootle Borough Hospital.—Hon. Surgeon. Also Jun. H.S. At rate of £125.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £150.

Brighton, Royal Sussex County Hospital.—Sen. Asst. Path. £350.

Brighton, New Sussex Hospital for Women and Children, Windlesham-road.—Radiologist. £100. Also H.P. and H.S. Each at rate of £50.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Asst. S.

Chester Royal Infirmary.—H.S. £120.

Colchester, Essex County Hospital.—Asst. H.S. and Registrar. £120.

Coventry and Warwickshire Hospital.—Res. H.P. £160.

Derby County Borough.—M.O.H. £1100.

Dewsbury County Borough.—M.O.H. and School M.O. £900.

Douglas, Isle of Man, Noble's Hospital.—Res. H.S. £175.

Durham County Council.—Asst. Welfare M.O. £600.

East Ham County Borough.—Deputy M.O.H., &c. £700.

Elizabeth Garrett Anderson Hospital, Euston-road.—H.P. Obst. Asst. Three H.S.'s. Each at rate of £50. Also Clin. Assts.

Gloucester, Gloucestershire Royal Infirmary.—Second H.S. At rate of £100.

Gravesend and North Kent Hospital.—Jun. H.S. At rate of £80.

Great Yarmouth General Hospital.—Jun. H.S. £125.

Hampstead General and North West London Hospital, Haverstock Hill, N.W.—Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Hertford County Hospital.—H.P. At rate of £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. At rate of £250.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.

Hove, Lady Chichester Hospital.—H.P. At rate of £100.
Isleworth, West Middlesex Hospital.—Asst. to Med. Supt. £250.
Inverness, Northern Infirmary.—Hon. Radiologist.
Italian Hospital, Queen-square, W.C.—Res. M.O. At rate of £150.
Jersey General Hospital, &c.—Res. M.O. £200.
L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Leeds General Infirmary.—M.O. in charge of Radium Dept. £600.
Leeds Hospital for Women.—Hon. Asst. S.
Leicester Royal Infirmary.—Third Res. Anæsthetist. At rate of £250.
London County Council.—Res. Deputy Med. Supt. at The Manor, Epsom. £500.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. Radiologist.
Manchester City.—Asst. Tuber. O. £650.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. £200.
Manchester, Salford Royal Hospital.—H.P. £125.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
North Middlesex Hospital, Silver-street, Edmonton, N.—Res. M.O. £200.
Nottingham General Hospital.—Second Cas. O. At rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Med. Reg.
Public Dispensary, 12, Drury-lane, W.C.—Res. M.O. £150.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. £100. Surgeon to Ear, Nose and Throat Dept. Also H.S. At rate of £100.
Radium Institute, Riding House-street, W.—Assistant to Medical Department. £600.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal Northern Hospital, Holloway, N.—Med. Reg. £100. Also H.S. At rate of £70.
Royal Society, Burlington House, W.—Foulerton Research Student. £700.
St. John's Hospital, Lewisham, S.E.—Physician to Children's Dept.
St. Mark's Hospital for Cancer, &c., City-road, E.C.—Clin. Assts.
Sheffield, Children's Hospital.—H.P. Also Third Res. M.O. Each £100.
Sheffield Royal Hospital.—Res. Anæsthetist. £80.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept. Also Clin. Asst. to Med. Depts. Each £250.
Sheffield University, Faculty of Medicine.—Lecturer in Pathology. Also Demonstrator in Pathology. Each £500.
Smethwick County Borough.—Part-time M.O. for Infant Welfare. 1½ gns. per session.
Southampton County Borough Isolation Hospital.—Res. M.O. £360.
Southern Rhodesia Government.—Director of Public Health and Medical Services. £1750.
Walsall General Hospital.—Sen. H.S. Also H.S. At rate of £200 and £150 respectively.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
West London Hospital, Hammersmith, W.—Asst. Surgeon Dentist.
Willesden General Hospital, N.W.—Res. H.S. At rate of £100.
Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Selby (Yorks).

Births, Marriages, and Deaths.

BIRTHS.

Brown.—On Oct. 25th, at The Vine, Sevenoaks, the wife of W. G. Scott Brown, F.R.C.S., of a son.

Davey.—On Oct. 25th, at "Rockleigh," Gloucester, the wife of Dr. E. N. Davey, of a daughter.

Mackie.—On Oct. 20th, at Louth, the wife of Col. F. P. Mackie, I.M.S., of a son.

MARRIAGES.

Hilton-Sergeant—Walker.—On Oct. 16th, at Dalton Church, *Frederick Cavendish Hilton-Sergeant, Captain R.A.M.C.*, to Kathleen Margaret Howard, second daughter of Mr. and Mrs. Howard Walker, Dalton Grange, near Wigan.

Sexton—Allen.—On Oct. 26th, at Ipsley, Frederic Braemar Worth Sexton, L.D.S. R.C.S. Eng., of Plymouth, to Joan Florence, only daughter of Mr. and Mrs. Allen, of Beoley.

DEATHS.

Braye.—On Oct. 10th, at Hastings, Reginald James Braye, M.R.C.S., L.R.C.P. Lond., late of Leicester.

Cooke.—On Oct. 23rd, at Sawston Vicarage, Cambridge, Thomas Burnard Alfred Cooke, M.R.C.S., L.R.C.P.

Dickson.—On Oct. 22nd, suddenly at "Hartree," Shanklin, Isle of Wight, Frank Lindsay Dickson, M.B., Ch.B., aged 56.

Kendrew.—On Oct. 23rd, in a nursing home, London, Alexander John Kendrew, M.C., M.B., White House, Mile End, Colchester.

Rowlands.—On Oct. 25th, at the Gables, Bromsgrove, Worcestershire, William Herbert Rowlands, M.R.C.S., L.R.C.P.

Russell.—On Oct. 13th, at Holyhead, William Fox Russell, M.B., aged 65 years.

Smith.—On Oct. 22nd, at Trevenn, St. Austell, Cornwall, Ernest George Smith, M.R.C.S., L.R.C.P. Lond., late of Ford Park-road, Plymouth.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ARTIFICIAL CREAM ACT PROSECUTION.

In our issue of August 24th (p. 418) we noted the first prosecution under the Artificial Cream Act, 1929. Our summary of the evidence attributed to the defendant company (the Ferns Pure Milk and Cream Co.) the statement that a Government analysis showed that its cream was reconstituted cream with a low fat content. The company supplies us with independent analyses, showing the fat content of the preparation, and points out that its manager, in the evidence referred to, was referring not to the company's cream, but to that sold by certain dairy companies. We gladly publish the correction, and regret the occurrence of the error.

SEWAGE DISPOSAL.

In his Chadwick lectures, delivered on Oct. 17th and 19th, Mr. A. J. Martin dealt broadly with the problems of sewage disposal. Concentration of population gives rise to many difficulties which do not occur in scattered communities, not the least of these being the disposal of excreta. To illustrate the rather reckless way in which our not very remote ancestors dealt with sewage, Mr. Martin quoted Sir Robert Rawlinson's question, "Is it better to kill fish, or to kill men?" Methods of land disposal, appropriate enough when land was cheaper, had had their day, and chemical precipitation was a thing of the past. Sewage was by no means the dead and depressing thing that it looked, as it contained in itself the agents of its own purification. It was, however, necessary to give these organisms a chance of doing their work, to provide laboratories, and, in some cases, reagents for them. The modern bacteriological treatment *of sewage had its beginnings in the coke-bed set up by the* London County Council on the advice of Mr. Dibdin, and the septic tank first erected by Cameron at Exeter. The problem of sewage purification is too often complicated by the presence in sewage of large quantities of industrial wastes, among which the products of two new and growing industries, beet sugar and artificial silk, present special difficulties, which are not yet fully overcome. Many streams are badly polluted with these by-products, which are often discharged without appreciable treatment.

In his second lecture, which was largely historical, Mr. Martin stated that the purification of foul matter is most effectually achieved by oxidation; but whereas solid refuse is quickly burnt at a high temperature, the waste matters in sewage, *diluted as they are with many thousand times* their weight of water, can only be oxidised by the slow processes of moist combustion at ordinary temperature. In a small country like England, with no great lakes or rivers where this process can go on in very dilute solutions without artificial aid, special works and artificial means of introducing the necessary oxygen must be adopted. Even a vast country like the United States of America has sewage problems which are still outstanding. The ease with which a large proportion of the suspended solids of sewage can be removed by sedimentation points, said Mr. Martin, to this as an obvious preliminary measure before bacterial (or rather biological) treatment is used. Fifteen years ago it appeared that sedimentation tanks followed by treatment on trickling filters would *be the standard form of disposal*, but at that time Dr. Fowler threw a bombshell into the camp in the form of the activated sludge process. In this the usual course is reversed, and instead of the sewage passing over the active material, this latter, in the form of a flocculent humus-like suspension, is passed through the sewage. More was expected of the activated sludge process than has perhaps been realised, and where full purification is required it is usually advisable to provide filters. Nevertheless, by interposing activated sludge treatment, a city like Birmingham has been able to save the cost of laying down an additional acre filter-bed each year. London sewers laid 60 years ago are still doing good work, and for half a century the Thames has received the whole of the liquid sewage; *but the volume discharged is now out-*growing the capacity of the river to deal with it, and the London County Council are about to lay down supplementary works of a novel character. What to do with the sludge produced by sedimentation is not easy to decide. In some places it is dealt with by digestion, and latterly successful attempts have been made to utilise the large volumes of combustible gas evolved. At Essen, Dr. Imhoff sells the gas so produced to the municipality, and Mr. Martin remarked, for the benefit of Sir G. W. Humphreys, who was in the chair, that the northern outfall for London sewage was adjacent to the Becton gas-works. He closed with a note of warning about the waste of nitrogen involved in most of the present means of sewage disposal.

MATERNAL MORTALITY AND PUBLIC OPINION.

Mr. Arthur Greenwood, speaking at a Conference arranged by the Maternal Mortality Committee, and held at the Central Hall, Westminster, on Oct. 22nd, mentioned two of the good things which, as Minister of Health, he had inherited from his predecessor. These were the committee appointed to make a scientific investigation into the problem of maternal mortality, still at work, and the departmental committee on the training and employment of midwives, which had already reported. He also drew attention to the memorandum of the British Medical Association setting out a scheme for a national maternity service, and to the findings of the Royal Commission on National Health Insurance. Some of the recommendations of the committee on midwives could be set in motion under existing laws, but the major proposals of the report would require legislation. Many local authorities were not at present using a fraction of their powers in the matter of maternity service, and he was prepared to encourage, stimulate, and press them in every way to make effective the powers they already possessed. This, however, was largely a matter of public opinion; if 20 millions of people urged certain things with strength and determination, those things would be done. Mr. Greenwood said that he was no opponent of fresh legislation and, though it was difficult for him to give any pledge, he hoped it might be possible, at no distant date, to deal with the problem in a broad and comprehensive fashion, fitting it into the general provision being made to maintain and improve the standard of public health, and also into the provision being made through a system of social insurance.

This statement made it easy for Mrs. Hubback to introduce a resolution welcoming the recommendations of the departmental committee to make available for all mothers skilled attention and nursing before, during, and after childbirth, urging the Minister of Health to put the recommendations into force as soon as possible, and pledging the Conference to give him active support. It was evident, she said, that the Minister was going to merit his title, and all the public had to do was to back him up. Dr. H. B. Brackenbury, chairman of the Council of the British Medical Association, went further, saying that medical men had already shown themselves entirely in sympathy with the movement, of which they had, indeed, been pioneers. Public opinion was already ripe for action, and officials need have no hesitation in going ahead at once with a scheme such as that outlined by the British Medical Association. If Mr. Greenwood had introduced a measure on this subject as his first Bill, after taking office, there would have been no opposition. At the end of the meeting Mrs. Hubback's resolution was put to the Conference by Lady Cynthia Colville, the chairman, and was passed unanimously.

THE PATHOLOGIST ABROAD.

Dr. Austin Freeman[1] in this substantial volume brings together 37 examples of the uncanny detective ability of his now famous creation, Dr. Thorndyke. Seeing that Dr. Freeman has done medical service as house physician to the Middlesex Hospital, as a colonial surgeon, and as a surveyor and naturalist on political expeditions, he is able to conduct his readers from personal knowledge along very varied and curious pathological paths; and as all this assortment of wisdom resides, filed and indexed, in Thorndyke's brain, it becomes *natural* that he should regularly arrest the course of crime by the discovery of clues, the bare existence of which could never have been anticipated by the actor—"natural" is the right word, for Dr. Freeman, with great skill and accuracy, contrives always to account satisfactorily for episodes that are incredible. That is the main reason for his well-deserved popularity as a writer of detective fiction, and it is because he is so well documented that he has been able to create interest in what he terms the inverted story. Such a story opens with a narration of what has happened, so that the pleasure of the reader is not due to any excitement as to who did the crime or as to how it was done; these things we are told, but the fun depends on the intellectual exercise spent upon estimating the methods employed in detection. Obviously such a machinery for telling a story could only be employed by a writer who felt perfectly sure that each step in tracking down was taken upon sure ground.

Many will have seen some or all of these stories before, but no one without Thorndyke's powers of memory can have kept such an assortment of episodes in their head. We commend the book, as a diversion, to all our readers.

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[1] Dr. Thorndyke, His Famous Cases. By R. Austin Freeman. London: Hodder and Stoughton. 1929. Pp. 1088. 7*s.* 6*d.*

MUSSEL POISONING.

A MYSTERIOUS poisoning has been found to result from the eating of mussels on the western American coast, particularly in districts north of San Francisco. Investigators have satisfied themselves that the poison is not formed by bacteria and that it is heat stabile in acid solutions. No means have been discovered yet of distinguishing wholesome from poisonous mussels. It is thought that the poison results from some metabolic disorder of this shellfish influenced by its food, and perhaps by the spawning conditions. It may be necessary to determine a closed season for mussels, in this region at least. In the meantime warnings have been issued by the California State Department of Health as to the danger of using mussels for food. Those who, soon after eating mussels, experience tingling or numbness around the lips and a prickly sensation in the finger tips or toes, are advised to call a physician at once.

THE CALL OF THE HIGH-VELD.

UNDER this title Dr. L. E. Hertslet has written a useful little pamphlet for "South African Railways and Harbours," which can be obtained from any office of Messrs. Cook and Son, and from the offices of the Union of South Africa, Trafalgar-square, W.C. The author gives a brief summary of the climatic and physical features of the country together with health statistics, an account of the facilities for recreation, and many notes which will be helpful to those who contemplate visiting "a land where the summer nights are cool and the winter days filled with sunlight, where it is not too wet and seldom too dry, where the barometer 'plays no tricks,' where the health-rates are good, where the altitude is not troublesome, and the atmosphere delightfully clear."

MECHANICAL MAN.

Mr. H. Stafford Hatfield, the author of Automaton, or the Future of the Mechanical Man,[1] gives instances of automatic processes either already invented or capable of being brought into existence and draws gloomy conclusions from their contemplation. He suggests that as these devices come into being life will become dreary and monotonous, ignoring the fact that the more complicated and skilled machinery and processes become the more skilled are the men needed to tend them. He argues from analogy that modern civilisation, largely based on such automata, must fall away just as it has risen. Analogy, however, here seems false, since the human race has been steadily, but with increasing velocity, developing its command over its environment for some half million years. We can afford to disregard the possible decline of a wave of progress which is still rising after so prolonged a period.

SNAKE-BITES.

A LITTLE book,[2] by Mr. F. W. Fitzsimmons, Director of the Port Elizabeth Museum, Cape Town, supplies in accessible form an account of the right ways of treating snakebite. The mortality, permanent physical and mental disability arising from snake-venom poisoning in South Africa is known to be comparatively heavy, though no statistics are kept of the number of cases of snake-bite. Both the expert and the tyro in snake-lore will find matter to interest them in this book, and the section dealing with the prevention of snake-bite is of especial interest. Medical officers and adventurous members of the lay public will also acquire much accurate information upon snakes and their unwelcome habits.

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[1] London: Kegan Paul, Trench, Trübner and Co. Pp. 100. 2*s.* 6*d.*

[2] Snakes—and the Treatment of Snake-bite. The Speciality Press of S. Africa, Ltd. 1929. Pp. 70.

A REMARKABLE HOSPITAL BAZAAR.—A five days' bazaar in aid of the new Infirmary at Dewsbury has produced £22,153.

HOSPITALS AND MOTOR ACCIDENTS.—Members of Parliament who are interested in hospital questions and regional secretaries of the Association are being circularised by the Council of the British Hospitals Association with reference to the expense caused to hospitals by the treatment of sufferers from motor accidents. The Council say they have agreed to press for some recognition of the claims of the voluntary hospitals in this regard. Earl Russell, who is about to introduce a Bill dealing with road traffic, has informed Sir Arthur Stanley that the advisability of including in the measure some form of compulsory insurance for motorists is under consideration. Last year the treatment of patients injured in motor accidents cost three Glasgow hospitals over £10,000.

Bradshaw Lecture

ON THE

VIRULENCE OF THE MICRO-ORGANISM IN INFECTIVE DISEASE.

Delivered before the Royal College of Physicians of London on Nov. 5th, 1929,

By J. A. ARKWRIGHT, M.D. Camb., F.R.S.,

FELLOW AND COUNCILLOR OF THE COLLEGE; ASSISTANT BACTERIOLOGIST AT THE LISTER INSTITUTE.

The problem of virulence has been and still is among the most arresting and fundamental subjects in the study of infective disease. Like that of the Origin of Sin, which has proved a difficult knot to loose even by the combined efforts of theologians and psychologists, and the Mystery of Pain, which was dealt with in so illuminating a manner by James Hinton, a distinguished Member of the sister College, the nature of virulence in infective disease has been the subject of much speculative discourse. In the case of virulence this phase of speculation has now given way to one of fruitful experimental investigation.

Since the doctrine of *contagia viva* has been firmly established the epithet "virulent" has been transferred from the disease to the living causal parasite by a lively metaphor which envisages a venomous germ attacking the innocent animal body.

Twenty years ago it was pointed out to me by the Director of the Lister Institute that the decline in cultures of bacteria from a state of high virulence and their occasional return to malignant activity, especially during sojourn in the animal body, was still a most baffling phenomenon, and one which often presented formidable obstacles to experimental workers and frustrated therapeutic investigations; consequently that it was worthy of deliberate study, though the elucidation might be long delayed. At that time the elusiveness of virulence in cultures of *Bacillus pestis* was a constant source of difficulty in preparing and testing plague vaccine and the obstacle has not yet been entirely overcome. The reason of the behaviour of attenuated cultures of *B. anthracis*, such as were used by Pasteur for anthrax vaccination, was and still is an unsolved problem, and the matter has not yet been specially examined by more recent methods. During the last 15 or 20 years, however, a certain amount of light has been thrown on the subject from various sides.

The experimental bacteriologist is apt to seek virulent cultures and to express pleasure when he obtains them. This craving might well be the sport of the uninitiated, since superficially it suggests the practices of a professional poisoner or the infatuated action of desperate combatants in modern warfare, as dreamt of by overwrought and ill-instructed military hygienists. Let us hope, however, that these things are but the food on which nightmares are nourished.

It may be well to recall shortly the reasons for the study of virulence in disease-producing parasites.

(1) In the first place it has been the belief of clinical observers and some epidemiologists that unusual virulence of the *materies morbi* is the reason of the greater severity and higher mortality of one outbreak of infectious disease than of another. It has, however, on the other hand, been suggested that these differences are due rather to changes in the population attacked, induced by temporary causes such as climatic, or dietary changes or by more subtle factors, which bring about a greater or less resistance of the animal subject. These contingencies are very hard to determine or estimate even by the skilful collection and treatment of statistics. In the hope of understanding these occurrences and of guarding against the more severe outbreaks, it is obviously important to know to what extent the living parasitic agent which excites the disease can itself vary, and to find out whether this change can be controlled. Again (2) the experimental pathologist often desires to have at hand a uniformly and sometimes an excessively active causal micro-organism in order to produce at will some disease in animals, for the study of all its features and especially so as to be able to test various remedial or preventive measures. For these purposes it may be necessary to make observations on a series of animals inoculated with uniform doses of the infective agent. (3) Knowledge and control of virulence are particularly important when actual cultures of the pathogenic agent, alive or dead, are used for prophylactic purposes. Moreover, in certain instances one culture or sample of pathogenic material will produce a mild attack which protects against the more severe, as in vaccinia, rabies, fowl-pox, and anthrax. For such purposes cultures or "inocula" of both weak and strong virulence but containing microbes otherwise the same are needed for experiment. Also (4), the use of dead bacteria as prophylactic "vaccines" has introduced the question whether it is needful that the cultures should have had all the properties of pathogenicity when they were alive, or whether virulence and toxicity are mere excrescences which may cause undesirable symptoms, even when the cultures used are dead, but that these qualities are not essential in order to stimulate the apparatus of defence. In the case of the allied procedure for producing antitoxin it is, of course, now well known that certain toxins, such as diphtheria toxin, can be changed into toxoids, or anatoxin, which has no obvious poisonous action but yet can be used to produce antitoxin in the bodies of man and animals. But the desirability of using virulent bacterial cultures for vaccines has been comparatively little studied.

For all these reasons the study and control of virulence are of prime importance.

(5) Allied to changes in virulence, but probably not due to exactly the same factors, are the changes in pathogenic bacteria, protozoa, and viruses which so adapt them to the animal host that they cause disease in one species but not in another. One may adduce many modern instances which appear in the recent work on pasteurellosis or hæmorrhagic septicæmia of animals, vaccinia, distemper, foot-and-mouth disease, herpes, &c. It is obvious, therefore, that variation in virulence is no idle study.

It is, then, of the *variability* of bacteria as regards their virulence and their capacity for harmful action on the bodies of animals that I wish to treat.

The Meaning of Virulence.

Virulence in the general sense is the property by which a pathogenic micro-organism causes death or reaction of the part or parts of the body invaded and so leads to disease. Infective disease may be defined as the resultant or sum of the action of the infecting agent and the reaction of the body.

It has sometimes been objected that it is idle to speak of the virulence of a bacterium, since this quality depends on the interaction of the micro-organism and the animal which it infects and on the conditions which it finds in its host. The reason given for this opinion is in itself very true, but since the great variability of strains or races of pathogenic bacteria is now well recognised it has become clear that differences in the characters of different cultures of the same microbe may be such as to render it highly active or almost inert in respect of disease production, when introduced into the body even of a highly susceptible animal. A more just criticism is that the term virulence, as often used, includes a number of different qualities. The different forms of pathogenic action no doubt often combine to produce the result so that it is difficult to say which is most active in a given case. Since, however, I wish to deal chiefly with a particular part of the subject, I must make an attempt to analyse the property of pathogenicity and show how the different qualities affect in the chair, that the northern outfall for London sewage was adjacent to the Becton gas-works. He closed with a note of warning about the waste of nitrogen involved in most of the present means of sewage disposal.

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This statement made it easy for Mrs. Hubback to introduce a resolution welcoming the recommendations of the departmental committee to make available for all mothers skilled attention and nursing before, during, and after childbirth, urging the Minister of Health to put the recommendations into force as soon as possible, and pledging the Conference to give him active support. It was evident, she said, that the Minister was going to merit his title, and all the public had to do was to back him up. Dr. H. B. Brackenbury, chairman of the Council of the British Medical Association, went further, saying that medical men had already shown themselves entirely in sympathy with the movement, of which they had, indeed, been pioneers. Public opinion was already ripe for action, and officials need have no hesitation in going ahead at once with a scheme such as that outlined by the British Medical Association. If Mr. Greenwood had introduced a measure on this subject as his first Bill, after taking office, there would have been no opposition. At the end of the meeting Mrs. Hubback's resolution was put to the Conference by Lady Cynthia Colville, the chairman, and was passed unanimously.

THE PATHOLOGIST ABROAD.

Dr. Austin Freeman [1] in this substantial volume brings together 37 examples of the uncanny detective ability of his now famous creation, Dr. Thorndyke. Seeing that Dr. Freeman has done medical service as house physician to the Middlesex Hospital, as a colonial surgeon, and as a surveyor and naturalist on political expeditions, he is able to conduct his readers from personal knowledge along very varied and curious pathological paths; and as all this assortment of wisdom resides, filed and indexed, in Thorndyke's brain, it becomes *natural* that he should regularly arrest the course of crime by the discovery of clues, the bare existence of which could never have been anticipated by the actor—"natural" is the right word, for Dr. Freeman, with great skill and accuracy, contrives always to account satisfactorily for episodes that are incredible. That is the main reason for his well-deserved popularity as a writer of detective fiction, and it is because he is so well documented that he has been able to create interest in what he terms the inverted story. Such a story opens with a narration of what has happened, so that the pleasure of the reader is not due to any excitement as to who did the crime or as to how it was done; these things we are told, but the fun depends on the intellectual exercise spent upon estimating the methods employed in detection. Obviously such a machinery for telling a story could only be employed by a writer who felt perfectly sure that each step in tracking down was taken upon sure ground.

Many will have seen some or all of these stories before, but no one without Thorndyke's powers of memory can have kept such an assortment of episodes in their head. We commend the book, as a diversion, to all our readers.

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[1] Dr. Thorndyke, His Famous Cases. By R. Austin Freeman. London: Hodder and Stoughton. 1929. Pp. 1088. 7*s.* 6*d.*

MUSSEL POISONING.

A MYSTERIOUS poisoning has been found to result from the eating of mussels on the western American coast, particularly in districts north of San Francisco. Investigators have satisfied themselves that the poison is not formed by bacteria and that it is heat stabile in acid solutions. No means have been discovered yet of distinguishing wholesome from poisonous mussels. It is thought that the poison results from some metabolic disorder of this shellfish influenced by its food, and perhaps by the spawning conditions. It may be necessary to determine a closed season for mussels, in this region at least. In the meantime warnings have been issued by the California State Department of Health as to the danger of using mussels for food. Those who, soon after eating mussels, experience tingling or numbness around the lips and a prickly sensation in the finger tips or toes, are advised to call a physician at once.

THE CALL OF THE HIGH-VELD.

UNDER this title Dr. L. E. Hertslet has written a useful little pamphlet for "South African Railways and Harbours," which can be obtained from any office of Messrs. Cook and Son, and from the offices of the Union of South Africa, Trafalgar-square, W.C. The author gives a brief summary of the climatic and physical features of the country together with health statistics, an account of the facilities for recreation, and many notes which will be helpful to those who contemplate visiting "a land where the summer nights are cool and the winter days filled with sunlight, where it is not too wet and seldom too dry, where the barometer 'plays no tricks,' where the health-rates are good, where the altitude is not troublesome, and the atmosphere delightfully clear."

MECHANICAL MAN.

Mr. H. Stafford Hatfield, the author of Automaton, or the Future of the Mechanical Man,[1] gives instances of automatic processes either already invented or capable of being brought into existence and draws gloomy conclusions from their contemplation. He suggests that as these devices come into being life will become dreary and monotonous, ignoring the fact that the more complicated and skilled machinery and processes become the more skilled are the men needed to tend them. He argues from analogy that modern civilisation, largely based on such automata, must fall away just as it has risen. Analogy, however, here seems false, since the human race has been steadily, but with increasing velocity, developing its command over its environment for some half million years. We can afford to disregard the possible decline of a wave of progress which is still rising after so prolonged a period.

SNAKE-BITES.

A LITTLE book,[2] by Mr. F. W. Fitzsimmons, Director of the Port Elizabeth Museum, Cape Town, supplies in accessible form an account of the right ways of treating snake-bite. The mortality, permanent physical and mental disability arising from snake-venom poisoning in South Africa is known to be comparatively heavy, though no statistics are kept of the number of cases of snake-bite. Both the expert and the tyro in snake-lore will find matter to interest them in this book, and the section dealing with the prevention of snake-bite is of especial interest. Medical officers and adventurous members of the lay public will also acquire much accurate information upon snakes and their unwelcome habits.

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[1] London: Kegan Paul, Trench, Trübner and Co. Pp. 100. 2*s.* 6*d.*

[2] Snakes—and the Treatment of Snake-bite. The Speciality Press of S. Africa, Ltd. 1929. Pp. 70.

A REMARKABLE HOSPITAL BAZAAR.—A five days' bazaar in aid of the new infirmary at Dewsbury has produced £22,153.

HOSPITALS AND MOTOR ACCIDENTS.—Members of Parliament who are interested in hospital questions and regional secretaries of the Association are being circularised by the Council of the British Hospitals Association with reference to the expense caused to hospitals by the treatment of sufferers from motor accidents. The Council say they have agreed to press for some recognition of the claims of the voluntary hospitals in this regard. Earl Russell, who is about to introduce a Bill dealing with road traffic, has informed Sir Arthur Stanley that the advisability of including in the measure some form of compulsory insurance for motorists is under consideration. Last year the treatment of patients injured in motor accidents cost three Glasgow hospitals over £10,000.

The application of chemical researches to bacterial variation will be pointed out later. The two branches of investigation have helped each other, and, as will be seen later, much of the older chemical work was less fruitful than it might have been because bacteria were regarded too much as a whole, without appreciating that they might consist of separate parts of diverse function and composition. In consequence, the variation of these parts when it occurred was taken to mean a change in a single chemical substance, instead of independent variations quantitative and qualitative in the separate parts or "organs" of the bacillus. It is now known that both these kinds of changes occur, but the speculations of former days did not give a correct interpretation of the facts.

(3) *Bacterial Variation.*—The lines along which more strictly defined bacteriology is progressing are those which I chiefly desire to emphasise. They are based on the evidence of variability of bacteria, especially as regards virulence amongst other characters which has received much attention of late years. Finished results must not be expected at present. Suggestive facts and a few experimental hints are all that can be boasted of as yet, but they are of great promise.

There are two main aspects of variation in virulence, and it is necessary to consider them separately. The first is the evidence of their different behaviour in the animal body, and the second is the evidence of variation in the morphology of the bacteria and their colonies and in their chemical composition and properties in vitro.

VARIED BEHAVIOUR OF ORGANISMS IN THE BODY.

Variation in toxigenicity.—In artificial cultures the same strain of a bacillus may vary very much from time to time in the concentration of toxin which it will yield, a fact which is the bugbear of those whose duty it is to obtain a "good" toxin for the production of antitoxin. Non-toxigenic variants of the diphtheria bacillus have been isolated from strains of high repute as toxin makers by several workers, Baerthlein, Maitland, and Crowell, though other good observers have repeatedly failed to do so.

Variation in invasive power.—Virulence in the stricter sense means ability to invade the tissues of the host and multiply there. In many cases the laboratory in-vitro tests of virulence have been made by techniques which show the readiness with which the bacteria will undergo bacteriolysis or be taken up by phagocytes or behave in the complement-fixation reactions when under the influence of specific immune serum containing antibodies. These experiments are really concerned with the question whether the particular serum fits the bacteria—i.e., contains antibodies to the special antigens in the particular cultures used. They do not indicate their capacity for infecting susceptible animals. The most desirable tests of virulence are those which show the effect of the serum and tissues of the normal susceptible animal on the bacterial strain rather than the effect of the serum of an immune animal. In practice it is the susceptible animal which is the measure of virulence and not one which is immune. At present the direct test of pathogenicity and lethal effect of inoculated cultures is the best method of estimating virulence, but this is open to many special difficulties and fallacies, and it is partly on this account that the more easily recognisable characters of cultures in vitro which are correlated with virulence are of special value.

Variations in virulence shown by animal experiment.—The virulence of different cultures of the same strain of the same kind of micro-organism may vary enormously as shown by animal experiment. The pneumococcus and streptococcus are well known instances of this. Griffith obtained two variants of a single strain of pneumococcus with very wide differences in virulence. Dr. G. F. Gaskell in a former Bradshaw lecture described the pathology of pneumonia in rabbits which had been produced by the inoculation of cultures of different virulence. He found the variation in virulence such that the minimum lethal dose for a mouse varied between 1·0 c.cm. and one ten-millionth of 1·0 c.cm. of an 18 hours' broth culture. Eagles examined four different variants of a single strain of streptococcus and found that their lethal doses varied from 10 million to 100 cocci. G. S. Wilson injected mice with virulent and non-virulent cultures of *B. aertrycke* and found that whereas the former killed 2 mice out of 20, the virulent variant killed 18 or 19 out of 20 in one-twentieth of the dose, a difference of 1 to 180. Comparable differences may be found in *B. pestis*, *B. anthracis*, and the filtrable viruses.

Since variation in virulence of cultures is an accepted fact, several questions at once arise. What is its exact nature—i.e., what is the intimate change in the bacteria composing the cultures? How can these changes be encouraged or prevented? What other changes accompany changes in virulence? How are the changes observed to appear?

Pfeiffer in 1903 discussed the known facts and regarded the loss of virulence as of the same kind as atrophy of function from disuse, and its recovery as due to renewed opportunity for action aided by survival of the fittest—i.e., of the most virulent bacteria—in the animal body. A view essentially similar to this is perhaps the most acceptable to-day. At that time, 20 years ago, however, much ingenuity was expended in trying to fit in the facts with complicated views about haptophore and toxophore or ergophore chemical groups in the bacteria. These views dealt with substances too hypothetical to allow of profitable argument or sound conclusions and subsequent verification. Such conceptions still have their value, especially in relation to exotoxins, but seem to have led the protagonists astray. Pfeiffer and Hamburger believed that it was the antibacterial action of the amboceptors in the serum of normal animals which accelerated or brought about the change and that consequently culture in the serum or the bodies of immune animals would be still more effective in promoting virulence. Walker and Shaw attached more importance to the destructive action of the complement or alexin in this capacity. It is probable that neither as such has much influence and certainly the evidence points to the so-called amboceptor having an exactly opposite effect.

KINDS OF VARIATION.

Variation in bacteria as in other living things may concern large or small changes, in single or in groups of characters. Such characters are motility, serological properties, manner of growth in culture, agglutinability by salt, &c., in addition to changes in virulence.

It has been considered an important question from the point of view of the geneticist whether the changes are all due to loss or may also be due to acquirement of a character. It is often hard or impossible to say which is which, for an apparent gain may be due to the loss of some inhibitory factor and vice versa. If the acquiring of the power to ferment a sugar or if the gain of a capsule and of virulence or the adaptation to a new species of host is a true gain, as these changes appear to be, then gains certainly occur as well as losses. It has been argued that the apparent acquisition of a new character is really due to the survival of the few individuals which have had this character all the time, or even to the hypertrophy of a dormant character and not to a really new acquisition. But it is not clear why such latent properties in a culture should be postulated if they cannot be observed. It seems probable that a character first appears in a few individuals, and that then its relative increase is encouraged by selection, and often the same factor in the environment which produces the first variants also favours their selection. This is very strongly indicated when a species of bacterium acquires the property of fermenting a sugar on which it did not act on in the first place. The presence of the sugar conditions the appearance of a few bacteria capable of effecting the fermentation, and these are then encouraged and selected because they have the advantage of a new pabulum which is denied to the others. In the same way, and perhaps for the same reasons, there is a likelihood that adaptation to animal tissues and juices is produced by the presence of these tissues or their chemical constituents which first produce a new quality in the bacteria and then afford an additional nutriment to the new race which increases in consequence.

The bogy of inheritance of acquired characteristics, moreover, need have no terrors for the bacteriologist, since bacteria are not known to have differentiated reproductive organs nor to undergo conjugation or a sexual phase, though such life-histories have been described. Consequently the theoretical readjustment with reversion to type at these stages need not be taken into account. There seems to be no sound theoretical objection to hereditary variation of bacteria being influenced by direct environmental influence followed by environmental selection. Such variations have been described in the kind of variants called "clones" in protozoa which persist for long periods of repeated asexual multiplication but are believed usually to come to an end when conjugation has occurred. Such automatic intensifying action on variation by the environment which both causes variation and then selects the variant seems especially indicated in certain bacterial variations—e.g., (1) the fermentation of a new sugar, (2) adaptation of a species of bacterium to a new host, (3) increase of virulence during passage through a susceptible animal, (4) diminution of virulence during passage through immune serum, (5) the change from a non-virulent uncapsulated pneumococcus into a capsulated virulent variant, which has been described by Griffith as the result of passage through a mouse together with a dead emulsion of capsulated pneumococci.

VARIATIONS WHICH CAN BE DETECTED IN CULTURES.

Variants of very diverse characters can be obtained by selection of colonies on agar culture medium. Almost every known character has been observed to vary in one species of bacterium or another. By persistent selection of colonies growing on agar plates made from old broth cultures or from cultures in special media a persistent or hereditary variant can be obtained corresponding to each of these altered characters. Some of the best marked hereditary variants that can be detected in cultures must be described.

Variants are said to be hereditary when they can be kept pure by subculturing on agar at fairly short intervals without the need for fresh selection of isolated colonies. Four very distinct kinds of variants are now well known in the group of intestinal bacteria which includes *B. coli*, *B. typhosus*, and *B. paratyphosus*. Many other hereditary variants are also recognised, but these four have been shown to have a definite position as regards virulence. The four variants are as follows.

(1) The so-called normal strain recently isolated from the body. This is typically motile and makes a turbid growth in culture bouillon, and on nutrient agar forms round, dome-shaped colonies with smooth shining surface and a regular margin. This is called the smooth motile form or shortly the S.M. form.

(2) Colonies on agar of such a strain can often be found which are similar in appearance but contain only non-motile bacteria; these may be indicated as S.N.M. This variant has been called the O form by Weil and Felix because the growth in the case of *B. proteus* is different from that of the motile form. The latter makes a confluent filmy growth all over the surface of agar and consequently Weil and Felix called it the H form because of the "Hauch" or film characteristic of it. The non-motile form they described as "ohne Hauch" or "O."

(3) The next variant is also motile like the S.M. or normal, but instead of growing in smooth round shiny colonies with even edges the colonies are more or less irregular in outline, rough and uneven or dull on the surface, and of a granular and often opaque texture and a jagged outline. This has been called the Rough or R form to distinguish it from the S. Since it is motile it is also named R.M.

(4) The fourth form or R.N.M. is non-motile, like the second, but is rough like the third.

Mixed and intermediate variants occur, but these four forms can often be obtained pure with some little trouble by repeatedly selecting colonies; they will then often keep constant if transplanted at intervals of a week for very many subcultures, each of which represents hundreds of thousands of divisions or bacterial generations.

Virulence and capsule.—Perhaps the most important variants for my present purpose besides those described above are the capsulated and non-capsulated forms of pneumococcus and of the pneumobacillus of Friedländer whose colonies can be recognised on solid media. These will be again referred to later.

The four forms of variants of *B. typhosus*, &c., depend on two pairs of characters for their differentiation, motility, and absence of motility, "smoothness" and "roughness." The corresponding components are the flagella, which are responsible for motility, and the "smooth" (S) somatic antigen or the "rough" (R) somatic antigen, which constitute smoothness or roughness.

WANT OF CONNEXION BETWEEN VIRULENCE AND MOTILITY: PRESENCE OF FLAGELLA.

As far as the evidence goes at present "motility" has no relation to virulence nor to toxigenicity. That is to say, a motile S and a non-motile S culture are both of approximately the same pathogenicity as far as is known, and the same is true of a rough motile and a rough non-motile, though in this case the pathogenicity is of a very low order.

Motility means the presence of flagella, and the presence of this constituent in emulsions of motile bacteria is shown by the manner of reaction with specific agglutinating serum. The flagellated bacteria agglutinate in large loose fluffy floccules and emulsions of the non-motile variant with agglutinating serum form small, dense granular clumps. It has, in fact, been shown that motile bacteria possess two kinds of agglutinable substances which condition the formation of clumps with specific sera, whilst the non-motile form has only one corresponding to the bodies of the bacteria which is consequently called the somatic substance as opposed to the flagellar substance. When an animal has been infected with or inoculated with motile bacteria two agglutinins appear in its serum which act on the flagella and the bodies respectively, but if a non-motile and completely unflagellated variant or species has been inoculated then the serum contains only agglutinins for the somatic antigen or agglutinable substance.

As has been pointed out above, it is the somatic substance which is most nearly related to virulence and the flagellar has not been shown to make much difference in this respect. It has also been shown that such reactions with serum in vitro as bacteriolysis, bactericidal action, and complement fixation are for the most part, if not quite entirely, concerned with the somatic part of the bacteria and are related to the nature of the somatic antigen, but they have very little indeed to do with the flagellar part. It has also been found in *some* experiments that in order to give an animal protection against a particular motile organism it is unnecessary to use a motile form or variant for the protective inoculation or vaccine. This is in harmony with what has just been said about most of the known in-vitro immunity reactions being all concerned with the somatic part of the bacteria.

The hypothesis that the elaborate flagellar apparatus of such bacteria as the typhoid or paratyphoid bacillus is of no importance as regards pathogenicity is at first sight rather startling, but it is borne out by certain other facts. It has been observed that motility varies with the temperature of incubation in some strains of *B. typhosus*, *B. paratyphosus* A, and other bacteria. For instance, all strains of *B. pseudo-tuberculosis rodentium*, a plague-like bacillus which causes disease in guinea-pigs and rabbits and occasionally in man, are motile when the incubator is kept at 70° to 80° F., but when the cultures are kept at 95° to 98° F. they are no longer motile and often they do not form any flagella. This fact alone suggests that flagella do not play an important part in infection, since the body is never cool enough for them to develop readily in these strains, which may nevertheless be quite pathogenic.

Further, it is not very uncommon to obtain from the blood in typhoid fever only non-motile cultures. It is true that they usually become motile after being subcultured once or twice, but the motile character is evidently suppressed in the blood and tissues of these patients, and this assumption is made the more probable by finding that in some groups of cases the patient's serum when used for a Widal reaction fails to give the typical flocculent clumping of flagellar agglutination even when the emulsion used for the test is well endowed with flagella. This defect in the typical Widal reaction was found in 25 per cent. of the cases of typhoid examined by Felix in Palestine and in 75 per cent. of cases tested by Pijper in Johannesburg. Other workers in South Africa have had a similar experience. So frequently did Pijper find the Widal test fail that he ceased to attach much importance to it. It is now, however, realised, as the result of Felix's work, that the serum of such patients does still agglutinate the bodies of typhoid bacilli in a characteristic manner, though the serum contains no flagellar agglutinins. The somatic clumping is not so obvious and needs some hours incubation of the agglutination tubes before it is apparent. For this reason somatic agglutination has very often been missed and not taken into calculation in agglutination experiments.

RELATION OF THE SOMATIC ANTIGEN TO VIRULENCE.

Since the flagellar part of the bacteria appears to be of such little pathogenic importance it remains to consider the constituents of the bacterial bodies which can be detected and to some extent measured by serum reactions, especially by agglutination, which is probably a fair measure of the somatic antigens.

R. variant. Non-virulent.—In old laboratory cultures of *B. typhosus* and *B. dysenteriæ*, the specific smooth somatic agglutinable substance often becomes altered to that found in the R form so that it loses its specificity. These R bacteria then give less specific reactions and they agglutinate with sera made for the R form of other species of bacteria and have also lost their virulence. This "rough" change is promoted by growth in strong nutrient broth. In much more dilute broth—e.g., diluted with water four or five times—it keeps its S characteristics much longer. The replacement of S by R bacteria in old laboratory cultures in great part, if not altogether, accounts for their loss of virulence.

R variant produced by anti-"S" serum.—Not only are the R forms found in old laboratory cultures, but the S may be changed to the R antigen by more active means. If an S culture is grown in serum of an animal which has been immunised against the S form of the same bacillus, the S character gradually disappears from the culture and some, or all, of the bacteria become rough. At the same time the culture becomes non-virulent. This has been observed in part by several workers, Stryker, Walker, and others, and more definitely recently by Griffith, Reimann, Pitt, and myself. It is clear now that it is the actual antibody in the S anti-somatic serum which produces or accelerates this change, and that other antibodies do not have any effect. When the R somatic antigen has displaced the S, the S antiserum no longer has any somatic specific antibodies for such R bacteria. In spite of the lack of virulence of the R form it does not appear to lack vitality and vigour for vegetative growth.

CHEMICAL ANALYSIS.

It is in the attempt to solve the problem of the real difference between the S and R forms that the biochemist has stepped in and materially helped the concept of virulence.

Carbohydrate specific soluble substance.—The work of Heidelberger, Avery, Zinsser, and Landsteiner has introduced a new idea into the study of virulence. Their results are strongly supported on the theoretical side by Landsteiner's work on other kinds of substances which evoke antibodies in the blood of animals.

The virulent capsulated pneumococcus and the similar cultures of the capsulated so-called pneumobacillus of Friedländer when analysed chemically have been shown to contain a carbohydrate substance which is absent from the uncapsulated or "degraded" cultures which lack virulence. The capsule appears to consist largely of the carbohydrate or polysaccharide which has been called the "specific soluble substance," united with protein. It seems certain that this high development of the capsule is responsible for virulence and specificity and that the protein with which the carbohydrate is combined and which alone remains in the uncapsulated variety while sufficient for the life and growth of the microbe does not of itself determine high virulence. Not only is this the case, but the potent specific substances present in the blood of the immunised animal which counteract the effect of virulent cultures are not formed unless the carbohydrate or specific soluble substance is present in the immunising inoculum. This specific substance is not in itself, however, particularly toxic, nor does it evoke antibodies in the blood serum unless it is united with the protein substance which is always present, and which is apparently the most essential component of the bacterium as regards life and growth, apart from survival in the animal body and parasitism.

At first it looks as if the coincidence of capsule and virulence might be merely a restatement of the old observation that capsulated were more pathogenic than uncapsulated bacteria in certain species, and might be due to the old belief that the capsule protected the bacillus against phagocytosis by its physical interference with the process. There is, however, more in it than that, and there is a distinct advance in knowledge. Besides the satisfaction of having pushed the understanding of the matter back to the more intimate chemical structure, the capsule of different types of pneumococcus has been shown to be different chemically, and since the virulence of the types varies, so also the virulence may be said to vary with the chemical composition of the capsule. Type I. pneumococcus is much more virulent than type II., and the sugar obtained from it by analysis is different.

Moreover, there is very good reason to believe that a similar addition of a carbohydrate "specific soluble substance" to the protein of the bodies determines the difference in pathogenic activity and serological behaviour of the S and R variants of *B. typhosus* or *paratyphosus*, though in these bacteria there is no suggestion of a capsule being present.

Streptococci are a much more difficult problem, but they yield to chemical analysis essential differences in the composition of virulent and non-virulent cultures, and these have to some extent been correlated with the manner of growth, though in this group the superficial differences in the colonies are not quite the same, and still need further study before their significance is established. It seems as if the specific soluble carbohydrate substance comprised in the capsulated and S cultures was the essence of virulence and specificity which, as it were, gave a fillip to the bacteria and enabled them to cope with the conditions in the animal body.

A theoretical but not unimportant question is, how does the bacterium get this new substance? Is it merely due to a development and increase of an already existing part or function, or is it really an acquirement taken up whole and worked into its organisation like food and perhaps derived direct from the susceptible animal, or does it arise by the reaction of the bacterium to the juices and cells of the host? Certain bacteria are well known to increase in virulence when grown in normal serum in vitro.

The idea of an actual acquirement by the microbe from outside seems crude at first sight, but seeing that the capsulated state of the pneumococcus is not as a rule permanent and is often rather fugitive on artificial media which do not contain animal products, such as serum, the persistence of the capsule for the limited number of generations during which it usually continues in artificial media might perhaps be due to purely passive inheritance. Griffith, in 1928, using what appear to have been ample controls, found that if a living uncapsulated non-virulent pneumococcus were injected subcutaneously into a mouse together with a large amount of an emulsion killed by heat of a virulent culture of capsulated pneumococcus, then the mouse might die with virulent capsulated pneumococci in the blood of the same type as that of the heated culture. Neufeld and Levinthal, in the latter part of the same year and Reimann more recently, have confirmed this observation in essential points. This suggests that the presence of the specific soluble substance from the heated capsules enabled the uncapsulated or degraded culture to acquire virulence for the mouse and capsulation by assimilating the material from its environment. This is a remarkable feat and if fully corroborated will mean a great advance in the theoretical position. It is *not* intended to maintain that no parasitism can occur without these or somewhat similar changes in the capsular or somatic composition, but in the case of the more virulent microbes which have been investigated this appears to be so.

Immunity and prophylaxis in relation to variants.—In a few instances in which experiments have been made and a definite answer obtained, not only does virulence appear to be dependent on chemical changes or on the presence of special chemical constituents, but also the production of specific antibodies and immunity by inoculation of the bacteria, whether dead or alive, appears to depend on the same factor. Vaccines which do not contain bacteria endowed with the specific soluble substance are neither actively pathogenic nor of much value for prophylaxis.

CORRESPONDENCE OF IN-VIVO AND IN-VITRO CHARACTERS.

The thesis which I wish to support, therefore, is that there is often a correspondence in variants between in-vivo and in-vitro characters, and that capacity for parasitism can in certain cases be detected by examining the saprophytic characters. A virulent has often essential differences from a non-virulent which are recognisable apart from the animal body, and these differences are of a definite kind.

To take a concrete example, the *B. aertrycke* or *B. enteritidis* of food poisoning has so-called forms named in bacteriological jargon "smooth" and "rough" variants. These are distinguished usually in the following way: (1) By the R being agglutinable by salt solution and forming a deposit in broth culture with clear liquid above, whilst the S is not agglutinated by weak salt and in the broth culture is uniformly turbid. (2) By the smooth, shiny, round colonies of the S and the irregular, flattened, granular colonies of the R form. (3) By the production of different antibodies in animals by the two forms and their differential reactions with them. These serum reactions appear at present to be the most constant and serviceable in-vitro tests of the difference. (4) By chemical differences, on which the previous characters and especially the last appear to depend. This is probably the most fundamental character which has been discovered. (5) By the loss or gain of virulence. (6) There may be loss or gain of toxigenicity associated with the change in virulence, or toxigenicity may appear to be quite independent. (7) Associated with the last four characters, ability or inability to produce specific resistance in animals with dead vaccine, has certainly been demonstrated in some cases, and this property may be retained by the emulsions used as vaccines even after boiling or treatment with alcohol. (8) A further change or state associated to some extent with the foregoing is very prominent sometimes. Adaptation to a particular species of animal cannot be recognised in vitro, but as far as observation goes the R form is not capable of adaptation. In other words, a virulent adapted strain is always S.

It is fair, then, to claim that the study of virulence and all that it implies has made a definite step in advance in the last ten years by the convergence of pure bacteriology, epidemiology, and chemistry on the problem, and many new directions for future advance have been indicated and paths for investigation have been opened up.

THE USE OF A
NEW QUINOLINE DERIVATIVE IN THE TREATMENT OF INFECTION.*

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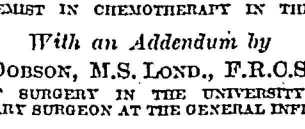
IN a paper[1] published by Browning, Cohen, Ellingworth, and Gulbransen, in 1926, a number of derivatives of anil-quinoline were shown to possess strong antiseptic properties.

They represent a new group of compounds, not hitherto used as antiseptics. These substances are crystalline solids which display a characteristic green reflex, and form in water blue and violet solutions. Since, however, the substance is used in very high dilution, the stains of its solutions on linen are easily removed by ordinary washing processes. Owing to the instability of these compounds towards hydrochloric and other strong acids, they are unsuitable for administration by the mouth, unless special provision is made for protecting them in their passage through the stomach.

The member of the group selected for these experiments was No. 48 of the series described in the paper and has the following formula:—



2 (*p*-Dimethylamino anil) 6 methyl quinoline methochloride.

It may be mentioned that two other substances (Nos. 52 and 59 of the series) were first selected for preliminary tests, but their almost complete insolubility in normal saline was a serious drawback.

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* The work reported in this communication was done with the support of the Medical Research Council.

[1] Proc. Roy. Soc., B., 1926, c., 293.

Although slightly less powerful in antiseptic action than these compounds, No. 48 is much more soluble in normal saline. With the object of further increasing the solubility of the substance, an attempt was made to prepare a sulphonated derivative. This product, subsequently referred to as "48 S,"[1] although not the desired sulphonated compound, nevertheless proved on comparison with 48 to be superior in antiseptic power and to possess lower toxicity. The nature of the difference between 48 and 48 S is not at present known.

Antiseptic Tests.

Various amounts of a 0·02 per cent. (1 in 5000) solution of 48 S in normal saline were added to tubes of 1 per cent. peptone water and 20 per cent. serum-peptone water to give a series of concentrations from 1 in 50,000 to 1 in 1,000,000. These were inoculated with a loopful from a light emulsion of *Staphylococcus aureus* and *B. coli*. The tubes were incubated for 18 hours and subcultured on to agar plates. From the results of a number of tests the following figures represent a fair average for the minimum concentrations which effected complete sterilisation.

Anil-quinoline 48 S.

1 per cent. peptone water.		20 per cent. serum-peptone water.	
S. aureus.	*B. coli.*	*S. aureus.*	*B. coli.*
1/500,000	1/350,000	1/400,000	1/300,000

For comparison, simultaneous tests were made with acriflavine, which is a recognised efficient antiseptic in common use.

Acriflavine.

1 per cent. peptone water.		20 per cent. serum-peptone water.	
S. aureus.	*B. coli.*	*S. aureus.*	*B. coli.*
1/200,000	1/100,000	1/200,000	1/100,000

It will be seen from the above figures for 48 S that the potency is only slightly diminished by the addition of serum, in agreement with the observations previously recorded by Browning and his co-workers with respect to this group of substances.

With regard to the figures for acriflavine, although too great weight need not be attached to the differences in the values obtained (compare Browning and Gulbransen,[2] 1921), the comparison indicates that 48 S is more potent than acriflavine, and encouraged us to proceed with clinical tests.

Toxicity Tests.

The toxicity of 48 S was tested on rabbits by intravenous injection of a 0·5 per cent. (1 in 200) solution in normal saline, this forming an exacting test of the toxic action of the substance. Consideration of an extensive series of tests (75 rabbits) showed the mean dose tolerated by a 4½ lb. rabbit to be in the neighbourhood of 9 c.cm., equivalent in drug content to 45 c.cm. of the strongest solution later used intravenously in clinical practice. It will be seen, therefore, from the figures quoted later, that the clinical administration of the substance was far within the probable limit of tolerance for man.

Clinical Tests.

In view of the comparatively high antiseptic power and the relatively low toxicity of 48 S, it was decided, with the sanction of Prof. Dobson and the members of the honorary staff of the General Infirmary at Leeds, to test this compound in the treatment of all varieties of both local and general infective conditions. Its use at the above hospital has been extensive during the past 18 months.

Whilst it is impossible to give a detailed report of the in-patients (exceeding 1000 in number) treated with 48 S, or of a considerably larger number of out-patients, an attempt will be made to classify the cases treated according to the method of usage of the antiseptic, to state results, and to give a comparative impression of the value of 48 S. In certain sections, typical and instructive cases will be quoted.

It must be remembered how exceedingly difficult it is to assess the value of an antiseptic. There is no satisfactory bacteriological test; we have tried the method of taking swabs, growing cultures at intervals, and counting the number of colonies per unit field; but there are many fallacies and drawbacks in this method. Practically speaking, the only method is to judge the antiseptic on the clinical results obtained, and to compare the results with those obtained when using other antiseptics. Principally we have relied on this method. It has been advantageous, because the expenditure of a long period of time has been necessary, which is essential if a thorough clinical test of any antiseptic is to be made.

Groups of Cases in which 48 S has been Used.

A. It has been used as a prophylactic *antiseptic dressing* or *pack* in the treatment of: (1) Potentially infected accidental wounds and abrasions, as met with in the casualty department. (2) Extensive laceration of soft tissues, either alone or associated with fracture, requiring a thorough toilet of the wounds under general anæsthesia. (3) Circumcisions, amputation stumps, skin grafts. (4) The post-rectal space after operation for prolapse or excision of the rectum or after interstitial irradiation of cancer of the rectum with radium.

B. As a *local application* and *pack* in the treatment of gross infections: (1) Acute infections of the skin and subcutaneous tissues—i.e., boils, carbuncles, and cellulitis. (2) Suppurative hæmatomata. (3) Acute suppurative bursitis. (4) Acute suppurative lymphadenitis. (5) Ischiorectal and perianal abscesses. (6) Infected abdominal wall wounds—e.g., after operation for acute perforated appendicitis. (7) Fungating growths.

C. As an *irrigant* in the treatment of acute infections of bones and joints, such as acute infective osteomyelitis and acute suppurative arthritis.

D. As an *irrigant* in the treatment of chronic long-standing infections, comprising chronic infective osteomyelitis of the lower jaw, chronic empyemata, and suppurating hydatid cyst of the liver, after marsupialisation.

E. As a *genito-urinary irrigant* in cases of: (1) Acute and chronic cystitis. (2) Suprapubic bladder washing after cystotomy for enlarged prostate, vesical calculus, ruptured bladder and urethra, or malignant papilloma of bladder treated by diathermy. (3) Wheelhouse and Symes's external urethrotomy. (4) Perineal section for extravasation of urine. (5) Nephrostomy for pyonephrosis.

F. *Intravenous administration* in cases of septicæmia with a positive blood culture.

Clinical Results.

The following is a brief résumé of the clinical results obtained in each of the above groups.

Group A.—The strength of solutions used varied from 0·05 per cent. to 0·1 per cent. (1 in 2000 to 1 in 1000) in normal saline solution. As a modification we have tested the antiseptic in hypertonic saline—i.e., 2–3 per cent.—but this possesses no obvious advantage over normal saline. We are of opinion that the results obtained in this class of case are satisfactory. They are particularly striking in the case of the extensively lacerated wounds which are so common as a result of machinery or motor accidents. Cases of severe mutilation of the limbs associated with bad comminuted fractures have given excellent results.

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[1] It is suggested that this substance should be called "quinanil."

[2] Brit. Jour. Exp. Path., 1921, ii., 95.

The antiseptic is a bland, non-irritant one, and can be used in abundance without any tissue damage or irritation. Its use can be prolonged; the granulation tissue which forms is firm, not swollen or œdematous, of the healthiest colour, and not protuberant.

Group B.—Here again the results have been satisfactory. In such cases as deep abscess cavities—e.g., ischiorectal—where it has been essential to pack the cavity most carefully and over a long period of time in order to ensure healing from the depth of the wound, there has been no indication of tissue damage or irritation. Epithelialisation from the edges of the wound is encouraged.

Group C.—In the case of acute infections of bones and joints, 48 S has received a thorough clinical test. The strength of solution used has varied, depending upon age and type of infection, from 0·01 per cent. to 0·1 per cent. (1 in 10,000 to 1 in 1000) in normal saline solution. The method of application has been by intermittent flushing of the wound, always keeping it moist by the aid of Carrel tubes. It is our opinion that in these cases the infection is more quickly brought under control, the separation of the sequestrum occurs more readily, and consequently the healing process is more rapid than has been our experience with other antiseptics generally employed in the treatment of these conditions. In uncomplicated cases, within 14 days of the original gutter operation for the drainage of the medullary cavity of the bone, the wound presents a firm, reddish pink, healthy granulating surface extending into the depths of the bone, and interrupted only by the yellow edges of the sequestrum in the process of separation.

One case of acute suppurative arthritis of the hip-joint is worthy of mention:—

The patient, aged 16 years, was admitted under the care of Mr. Dobson, complaining of excruciating pain in the left hip-joint of six weeks' standing. She was profoundly ill on admission, with temperature 103° F., respirations 28, and pulse 120. Examination revealed the fact that there was an acute suppurative arthritis, together with pathological dislocation of the left hip-joint. Exploratory arthrotomy was performed by one of us (G. A.). The head of the bone was excised and the joint drained. Continuous irrigation with 0·1 per cent. (1 in 1000) 48 S in normal saline solution was carried out. Immediately after operation the patient was profoundly ill, but apparently suffered no toxic effects from the large amounts of 48 S used.

To-day, ten months after her discharge from hospital, the wound is perfectly healed, and walking is almost devoid of limp. Examination of the joint reveals complete bony ankylosis in a position of 30° flexion and 30° abduction. X ray examination confirms the clinical findings.

Group D.—In this type of subacute and chronic infections the results are quite naturally not so striking as in the former classes, but nevertheless these cases have done well. The same strengths of solution in normal saline have been employed. In some cases 48 S has been used solely; in others its use has followed upon previous treatment with other antiseptics.

Group E.—As a genito-urinary antiseptic much weaker concentrations have been employed—namely, 0·005 per cent. to 0·05 per cent. (1 in 20,000 to 1 in 2000) in normal saline. The results have been encouraging. It should be remembered that the antiseptic is precipitated by concentration of salts such as are met with in normal urine, and in order to avoid this preliminary washing out with normal saline and boric lotion is carried out. Cases of bad cystitis in association with gonorrhœal and traumatic strictures of the urethra, enlargement of the prostate, and malignant papilloma of the bladder have responded satisfactorily.

A man, aged 58, was admitted to hospital under the care of Mr. Dobson, suffering from an extensive malignant papilloma of the bladder, associated with a stinking cystitis. Mr. Dobson performed a suprapubic cystotomy and found it impossible to proceed further on account of the cystitis. Suprapubic irrigation of the bladder with 0·05 per cent. (1 in 2000) 48 S in normal saline reduced the degree of cystitis in a remarkable manner within ten days.

Another man, aged 36, was admitted to hospital under the care of Mr. Dobson, suffering from rupture of the urethra in association with a fractured pelvis. Operation was immediately performed by one of us (G. A.). Perineal section was performed, but it was impossible to repair the tear in the urethra without preliminary suprapubic cystotomy and retrograde catheterisation. Eventually repair of the urethra was accomplished, and all the wounds left open. Irrigation of the bladder with 0·05 per cent. (1 in 2000) 48 S in normal saline was carried out during the patient's stay in hospital of ten weeks. To-day, eight months after operation, the patient is perfectly well, with no trace of cystitis.

Group F.—The nine cases of septicæmia treated by intravenous injection are as follows:—

(1) Six cases of acute infective endocarditis. No successes have been obtained. All the cases treated had a positive blood culture (streptococcus) and were all well advanced when they came under treatment. The initial intravenous dose was 20 c.cm. of 0·1 per cent. (1 in 1000) 48 S in normal saline solution, and this was repeated daily, increasing by 5 c.cm. on alternate days up to as much as 50 c.cm. Although all the cases proved fatal, it is significant to note that the temperature dropped after energetic administration of 48 S, and no toxic effects were manifested.

(2) One case of pneumococcal septicæmia and one case of staphylococcal septicæmia with bronchopneumonia. Both these cases terminated fatally.

(3) One case of streptococcal septicæmia with a positive blood culture, which recovered. This patient was under the care of Dr. J. le F. C. Burrow, to whom we are indebted for permission to publish the case.

The patient, a male aged 20, commenced his illness suddenly with a rigor. He continued for more than a week with severe backache and pains in the legs, high temperature, and shivering attacks. On admission to the hospital he was extremely ill, pulse 130, respirations 24, temperature 102°, pale, sweating, and semi-delirious. He made much complaint of pain in the legs, and especially in the region of the right hip, such that an acute arthritis of this joint was suspected. There were enlarged and tender inguinal glands, and an examination of the foot revealed a septic heel. A blood culture taken on the day of admission revealed the presence of a hæmolytic streptococcus.

It was decided to institute a vigorous course of intravenous antiseptic treatment, using a 0·1 per cent. (1 in 1000) solution of 48 S in normal saline. 20 c.cm. were administered at once, and on succeeding days for three days, when the dose was increased to 30 c.cm. and given for six days. Thus in ten days the patient received 260 c.cm. During this period the temperature was remitting daily between 103·5° and 100°. It then continued to intermit, gradually falling, however. On the tenth day after admission the temperature was normal, with an evening rise to 99·5°. Intravenous treatment was then stopped. Meanwhile the heel was incised, and a quantity of pus obtained. A large abscess of the right buttock appeared, and was drained on the tenth day after admission. A blood culture taken the next day was sterile. The patient's general condition was greatly improved, and the pulse was normal. His convalescence was uninterrupted for a fortnight, when he had a 48-hour pyrexial bout due to nasopharyngeal infection. A third blood culture taken immediately after this was also sterile. He was discharged after a short convalescence cured, and remains perfectly well to-day nine months afterwards.

Whilst we cannot attach great importance to the value of one particular case, we deem the above worthy of record.

Summary.

"48 S" is a slight modification of an antiseptic previously described by Browning and co-workers. The action of this antiseptic is only slightly diminished by the presence of serum, and the substance has a *relatively* high antiseptic titre, together with a low toxicity. The above clinical results indicate that 48 S is an antiseptic which is valuable in the treatment of all classes of surgical infections.

Addendum by Prof. Dobson.

Nothing is more difficult than to estimate the value of an antiseptic either in the prevention or in the treatment of septic processes. So far no scientific method has established itself as of value in such estimation, and one is left to depend entirely on personal opinion. Too often such opinions are valueless, being the outpourings of undiscerning enthusiasts. No surgeon who can recollect during the war the recurring waves of enthusiasm which greeted the advent of the latest antiseptic from "strong mixture" to plain soap can remain other than sceptical about another new remedy. But the search still continues for an antiseptic which, when applied in time, will prevent the development of sepsis and, when this process is established, will control and subjugate it. It cannot be maintained that this substance, 48 S, is such an antiseptic. Yet in my opinion it possesses qualities superior to those of any other similar substance of which I have experience. It is worthy of an extended trial, which I hope it will receive.

THE VALUE OF BISMUTH IN THE TREATMENT OF SYPHILIS.

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AND

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BEFORE bismuth was definitely introduced for the treatment of syphilis in 1920 by the French workers, Levaditi and Sazerac, organised research had already been undertaken in Germany with a view to the use of this substance in the treatment of spirillas and related infections. These investigations, however, did not lead far because of the high toxicity of the preparations or compounds. As early as 1908 Uhlenhuth in the Imperial Hygienic Institutes treated trypanosome infestations with bismuth combined with arsenic. With the same end in view Ehrlich and Karrer in 1913 made a preparation of bismuth and arsenobenzol which unfortunately proved very unstable and therefore could not be used in practice. Not until 1919 did German writers publish a communication dealing with investigations on bismuth; in that year Kolle and Ritz used intravenous injections of colloidal bismuth in the treatment of syphilis in rabbits. This substance, however, proved extremely toxic and the investigations were therefore discontinued.

The studies of bismuth, begun in 1916 by Sauton and continued by Levaditi and Sazerac, who published their results in 1920, were first investigated in Germany in 1922 by Hugo Müller, who used the original French preparations. In the same year the first German antisyphilitic bismuth preparation was produced in Hamburg by the chemical firm of Tosse. This was "Bismogenol," and it was at once introduced into therapeutics by Doselaers. Other preparations of bismuth followed and were extensively investigated from the clinical side, and a large number were found to be active. A recent review by Hugo Müller and Kohlenberger shows that there are now about 17 German preparations of bismuth for the treatment of syphilis. Erich Hoffmann is justified in describing this state of affairs as harmful.

After six years of clinical observation and therapeutic administration we give our general conclusions on the value of bismuth treatment. There can be no doubt that the introduction of this metal represents a definite step forward in the treatment of syphilis, and the views of the few observers who contest this point (de Stefani, Villarejo, Bonnamour-Delore) do not essentially alter our opinion. Hugo Müller, to whom we owe an excellent summary on the technique of bismuth treatment, justly remarks that the various authorities who have made comparative studies of the therapeutic value of bismuth, salvarsan, and mercury have started from different standpoints. Some laid more stress on the rapid disappearance of the spirochætes when there were manifest symptoms and bismuth was the only treatment employed. Others attached more importance to the change in the reaction of the serum, or to the clinical progress, or to the rapidity of the disappearance of the obvious symptoms. Further, it must be remembered that different investigators used different preparations of bismuth of very varied composition, a fact which will certainly account for differences in the final verdicts. Lomholt states that different bismuth compounds are absorbed at very varying rates. This author has made an excellent contribution to the question of the chemical action and the fate of bismuth in the body, and in his most recent summary (1928) remarks upon the defective knowledge and erroneous ideas which exist on this subject. As the rate of absorption varies it follows that the effect must vary. "The decisive factor for the potency of action is the amount of bismuth metal which they contain and the rapidity with which they are taken up from the site of their deposit and pass into the body." The amount of bismuth varies extraordinarily—according to Langer as much as 20–100 per cent.—in the different preparations and also varies in different batches of the same preparation (Grumach, Engelhardt). The rapidity of absorption depends considerably on the method of application, on the solvent or suspension medium, and on the concentration and the size of the particles.

There is an extensive literature on the pharmacological, toxicological, and chemotherapeutic aspects of bismuth, especially in the treatment of syphilis, and it would lead too far to go into the details here. Engelhardt has recently published for the first time the results of researches, with methods to which no objection could be taken, on the excretion of bismuth from the human organism, with special reference to the significance of the various preparations and various methods of their use in the treatment of syphilis. This work calls for special attention.

Intramuscular Injection of Bismuth.

At the present time the method most generally adopted in Germany is the intramuscular injection of insoluble salts. Intravenous injection (Nadisan soluble, Nadisan colloidale, Sigmuth, Salluen, Wismulen, Bismuto-Yatren, Solvitron, &c.) has been practically abandoned, despite certain good reports (Memmesheimer, de Medina), primarily because of the great danger of shock and acute yellow atrophy of the liver, but also because the effect is in some respects weaker—e.g., on the serum reaction (Müller and Kohlenberger, Pautrier and Benech). In October, 1926, Hugo Müller sent a circular letter to German institutions where bismuth preparations were most in use, and he reports that over one-half of all the clinics employ the first German bismuth preparation—i.e., Bismogenol. We have used this preparation in our own clinic for the last six years, although we have also employed others. Our conclusions on its value for antisyphilitic treatment are based upon a relatively large number of clinical cases kept under observation for a comparatively long time.

Bismogenol is a suspension of a bismuth compound of a highly valent oxybenzoic acid in olive oil; it is thus a salicylate derivative, possibly identical with bismuth salicylate. Its content of bismuth is 50–60 per cent. or 0·05–0·06 g. per c.cm. Engelhardt has discussed the absorption of the preparation and has shown that Bismogenol is "the one bismuth preparation which is absorbed with the rapidity required." He further observed as a remarkable fact that Bismogenol is followed by a diuretic action which is not noted to such an extent after other bismuth preparations (a daily diuresis of 4–5 litres during the first ten days of treatment). There is a considerable literature on Bismogenol, including work by investigators from other countries as well as Germany. One great and indispensable therapeutic fact that emerges from all this work is that Bismogenol is, in the widest sense, an innocuous preparation. This is clearly shown by a case in this clinic which has been described by Prater.

> A patient had two injections of 10 c.cm. of Bismogenol at an interval of three days, the usual dose being 1 c.cm. As a result of this enormous overdose the patient had a mild stomatitis and a slight trace of albumin appeared in the urine, but there were no local signs of irritation. Six weeks

after the two injections a skiagram failed to reveal any deposit of bismuth.

Bismogenol is not subject to bacterial contamination. even if the vessel containing it is exposed to the air, Deselaers and Kafka have shown that Bismogenol remains sterile under these conditions, and we have been able to confirm their observation.

Experiences with Bismogenol.

Two reports have been issued from this clinic at the conclusion of a large series of investigations on the therapeutic effect of this preparation. One of us (Ritter) described his experiences one year after the introduction of Bismogenol, when he stated that the method of treatment with it showed remarkably good progress. There was not one failure in six cases of primary syphilis with a negative Wassermann. The reaction remained negative after the healing of the clinical signs. In other words, this preparation acted as an abortive agent on the disease. The effect of the exclusive use of bismuth in secondary and tertiary syphilis was good, the effect on the serum reaction being particularly noteworthy. In a work which appeared two years later Lauterbach was able to confirm Ritter's observations on the basis of a much greater clinical material. He also had at his disposal a series of patients who were treated by Bismogenol exclusively with excellent results. It is noteworthy that one patient who was treated for secondary syphilis with bismuth subsequently acquired a reinfection. Lauterbach also mentions especially the good effect on the Wassermann reaction (W.R.).

After six years' experience with this preparation our opinion of it has undergone no modification. Unpleasant effects have hardly ever been encountered, especially not the "embolia cutis medicamentosa" (exanthematica, bullosa, gangrænosa) described by Freudenthal, Nicolau, and Nagel. Freudenthal, who described it first, designated it as a "local embolic Bismogenol-exanthem," but it has not been observed in the many thousands of injections undertaken during the course of a year. Other skin eruptions have been described by authors such as Buy, Wenniger, Grön, Müller, Hudelo, and Ravaut) after the administration of other bismuth preparations as well as after Bismogenol (Kerl), but we have not observed any of them. There is, however, one exception in a patient who is still in the clinic and whose case should be described on account of certain important points.

A female patient, aged 19 years, suffering from obvious syphilitic signs (papules, spirochæte-positive) had received an intramuscular injection before admission. The nature of the preparation could not be ascertained. Otherwise there had been no treatment. On admission the W.R. was strongly positive. An intramuscular injection of 1 c.cm. of Bismogenol was given. The next day the patient had a high temperature and a generalised dermatitis of a scarlatiniform type, of the characters with which we have been familiarised by Jähnke and Schäcker and Pawlas. Venesection was performed and Ringer's solution was infused, and in a few days the manifestations subsided, but the rash returned after eight days in a milder form, although the patient had no more Bismogenol. After this relapse had disappeared 1 c.cm. of Bismogenol was given again, whereupon the temperature rose once more and there was a repetition of the rash. There was a very strongly positive intramuscular reaction with 0·1 c.cm. of Bismogenol, and a pad soaked in Bismogenol could not be kept on the skin of the forearm for longer than ten minutes because of the intolerable burning and blistering. Thus there was in this case an intense hypersensitiveness to Bismogenol. The behaviour of the skin to other preparations of bismuth has not so far been tested. The patient tolerates salvarsan exceedingly well. After the subsidence of the second outbreak of the rash the W.R. was completely negative, and the syphilitic manifestations were completely cured.

This case provides one of the best proofs of Ritter's contention of the importance of toxic exanthemata as non-specific curative factors in syphilis.

By-effects were seldom seen. That most frequently c[illegible]s a bismuth line, more especially in [illegible] had the bismuth at the conclusion ma[illegible]ment—in other words, patients [illegible]ged 30, [illegible] liable to absorb the drug [illegible]on, suffer in large amounts. The line, however, was invariably slight. A fully developed stomatitis was seen very rarely, but we always insist upon a very thorough hygiene of the mouth during an antisyphilitic treatment. We have never seen any disturbance of the intestinal tract nor any derangement of the nervous system, and damage to the kidneys was also very rare. In no case was there any permanent injury; at most some epithelial cells could be found in the urine, but without albumin. Naturally, the urine must be most carefully examined during a bismuth treatment. None of the patients ever complained of pain at the site of the injections, which were never objected to, even by the most sensitive patients.

The Relationship of Bismuth to Salvarsan and Mercury.

As with every new form there were at first some optimists who wished to place bismuth on a higher plane than salvarsan in the treatment of syphilis. Ritter uttered a warning against this in his first work, and the experience of the following year, based upon comparative researches, showed that he was correct. Lomholt laid great stress on the far-reaching pharmacological and toxicological similarity of bismuth and mercury. From a therapeutic standpoint both metals produce a rapid saturation of the body with a large amount of the metal which, however, is well borne. The saturation persists for a very considerable time, Owing to this similarity Lomholt is of opinion that bismuth may replace mercury in the treatment of syphilis, because the by-effects of the latter drug are much more severe, but that bismuth can never replace salvarsan. Hugo Müller, on the other hand, states that bismuth appears to be superior to mercury—apart from grey oil and calomel—but that otherwise it is not correct to speak of a complete substitution of mercury by bismuth. Bismuth cannot be regarded as irreplaceable in the sense that salvarsan is, because the latter holds a unique position in the campaign against syphilis as a human plague.

Naturally, different views on this matter are more or less subjective and are not capable of proof. Our own opinion, based upon experience, is that bismuth is definitely superior to mercury. Since using bismuth in our clinic we have not once given an injection of mercury. The question of inunction treatment is, however, not under consideration here, and we are also of opinion that the substitution of bismuth for salvarsan does not come under discussion. Each of these drugs has its own definite indication which mainly follows the natural course of the disease. To a certain extent the two drugs coincide at a certain point, and then they should be given in combination, for one of the most important advances in the modern treatment of syphilis appears to be the realisation that each case must be treated individually and any scheme should only be adhered to loosely. In choosing the form of treatment we must reckon to a very great extent on the coöperation of the powers of immunity possessed by the body, and we must be most careful not to disturb the state of immunity which is the resultant of the play of infection and defence. Our opinion agrees with that of other authors (Buschke, Langer, Nonne) that bismuth is well adapted for this purpose.

It was mentioned above that, at first, cases of primary chancre with a sero-negative reaction were treated with Bismogenol in an abortive manner, and that as a matter of fact permanent cure was attained. This method was at that time applied exclusively for the purpose of testing the Bismogenol, but it should not be adopted in practice. In this type of case salvarsan is absolutely indicated and should be used in combination with bismuth as an abortive treatment. Salvarsan will remove the actual state of infectivity with the maximum rapidity; its sudden powerful action may prevent the infection of the entire body. By means of the bismuth a long persistent effect over a certain period is assured, and this acts as a prophylactic against relapses. The further the syphilis extends the stronger is the indication for bismuth in its treatment. Although some authorities advocate abortive treatment by means of salvarsan alone, and some indeed assert that combination with other remedies weakens the effect of the salvarsan (Stühmer, Fantl), the great majority take their stand on the combined treatment of secondary syphilis. Gougerot goes even farther when he says "after the first year salvarsan treatment is no longer imperative." The longer the syphilis persists the less becomes the necessity for salvarsan and the greater the indication for bismuth. The whole tendency of the schemes of treatments inclines towards the latter, and in further combination treatment iodine takes the place of salvarsan. The only exception to this is in cases where the cerebro-spinal fluid is positive in the stage of late latency, when a combined malarial treatment should be undertaken. At the conclusion of the malarial course a further course, in the form of an abortive treatment, should be given.

The very great value of bismuth, especially for the treatment of the later stages of syphilis, is undoubtedly due to some extent to the fact that it is a mild and yet durable remedy which serves as a preparation for more intense courses of treatment. It is never followed by the severe reactions which are often seen in the later stages after salvarsan. Bismuth is never contra-indicated at the beginning of an antisyphilitic course, with the one exception of early abortive treatment, whereas there are many contra-indications to salvarsan in the later stages. On the other hand, bismuth is indispensable in those cases which are hypersensitive towards salvarsan or mercury.

A Scheme of Treatment.

In the course of years a definite scheme of treatment has been worked out; it is tabulated herewith. No attempt will be made to compare this scheme with the many others which have been published from different clinics, but one point should be emphasised in the words of Jadassohn, "it is certainly not desirable to adhere slavishly to a scheme, which is by no means unnecessary in syphilis . . . but every scheme affords the opportunity of individualising."

We have adopted the following as divisions of the different stages of syphilis.

1. *Incubation Period.*—Three to five weeks. Variations from six days to six weeks.

2. *Primary Syphilis.*—Stage of primary chancre.

3. *First to Second Stage of Syphilis.*—As primary stage; but there is a positive Wassermann reaction without any clinical signs of generalisation.

4. *Secondary Syphilis.*—Manifest clinical signs of generalisation; spirochætes present; Wassermann reaction positive. In rare cases both these signs may be negative. Duration of secondary period generally four years, chiefly depending upon the state of immunity.

5. *Tertiary Syphilis.*—Manifest clinical symptoms coming on after the secondary period with positive Wassermann reaction. The presence of spirochætes is exceptional, and their absence the rule.

6. *Latent Syphilis.*—A general term for stages wherein the syphilis only manifests itself by a positive serum reaction, but no definite clinical signs are present. Its subdivisions are: (*a*) Early latency: three to five years after infection. (*b*) Late latency: after three to five years subsequent to infection.

The fundamental condition of treatment must be accurate diagnosis—i.e., the demonstration of spirochætes or of a positive Wassermann reaction after the exclusion of other causes. Observation may in itself be treatment.

(A) *Incubation Period.*—Observation.

(B) *Primary Syphilis.*—Administration of large doses of salvarsan in three courses as soon as the diagnosis has been verified. First day: 0·45 g. neosalvarsan. Second day: 2 c.cm. Bismogenol. Third day, 0·45 g. neosalvarsan. Fourth day: 0·45 g. neosalvarsan. Fifth day: 2 c.cm. Bismogenol. Sixth day: 0·6 g. neosalvarsan. Seventh day: 2 c.cm. Bismogenol. Eighth day: 0·6 g. neosalvarsan.

This is to be followed every four or five days by 0·6 g. of neosalvarsan and 2 c.cm. of Bismogenol twice weekly.

Total amount of salvarsan	5–5·5 g.
" " Bismogenol	20 c.cm.

Twenty-four hours after the first injection a W.R. test must be done and repeated every eight days during the treatment and 14 days after its termination.

Second Course of Treatment (30 days later).—First day: 2 c.cm. Bismogenol. Second day: Interval. Third day: 2 c.cm. Bismogenol. Fourth day: 0·45 g. neosalvarsan.

Then two injections of 0·45 g. neosalvarsan in the week and two injections of 2 c.cm. Bismogenol. In the following week two injections of 0·6 g. of neosalvarsan and of Bismogenol. Total amount as in first course of treatment. W.R. test as in first course and then at the end of the treatment and subsequently every month.

Third Course of Treatment (90 days later, last course).—The scheme is as in previous course; the W.R. tests included. If the reaction is negative no further treatment is given. Observation for possible later internal manifestations.

First to Second Stage.—Treatment as in secondary syphilis.

(C) *Secondary Syphilis.*—The treatment must avoid the production of a severe Jarisch-Herxheimer reaction on the one hand and of inadequate treatment and waste of effort on the other.

First Course.—Same scheme as second course of primary syphilis, with Wassermann test at the end of the course. Potassium iodide should be given in the interval until the second course begins.

Second Course (30 days later).—Identical with the first course.

Third Course (90 days later).—Similar to the other courses.

If the reaction remains negative after the first course no further treatment is required after the third course; but monthly tests should be made at first, and later on quarterly and half yearly. The cerebro-spinal fluid should be examined after three to five years. If this is positive treatment should be given as for latent syphilis. If, on the other hand, there are variations in the reaction during the subsequent courses further treatment will be required until the Wassermann reaction remains negative, and then two more courses should be given subsequently.

(D) *Tertiary Syphilis.*—It may be accepted as a principle that the skin, by the production of tertiary syphilitic manifestations, indicates that it has attained a very intensive degree of allergic sensitiveness and that the case in question is especially characterised by a great esophylactic action.

(*a*) *Simple skin cases*, without complications in the heart, vessels, bones, and especially in the cerebro-spinal fluid, can be relieved by Bismogenol injections, oral administration of potassium iodide, Zuttman's solution, and general tonics. Careful observations of internal organs and central nervous system is necessary; if these are healthy prolonged iodide administration should be given after the disappearance of skin symptoms, but observation must be continued. The Wassermann reaction must under no circumstances be forced to become negative.

(*b*) *Skin Cases Combined with Diseases of Internal Organs.*—The principle should be that of individual treatment of each case with reference to age and general condition. Long treatment with potassium iodide, inunction, and bismuth should be tried before resorting to salvarsan, in order to avoid the dangers of the latter. In detail:—

(1) *Heart and Blood-vessels.*—In addition to Bismogenol and potassium iodide a subsequent course of neosalvarsan is given in small individual doses (0·15–0·3 g. per dose), until a total quantity of 5 g. has been given, according to the amount of toleration, and repeated as in secondary syphilis.

(2) *Kidneys.*—Bismogenol and mercury, potassium iodide, and neosalvarsan are given with general care.

(3) *Liver.*—Salvarsan, potassium iodide, Bismogenol, and dietetic treatment are given, together with general care.

(*c*) *Skin Cases Combined with Disease of the Cerebro-spinal Fluid.*—Combined malarial treatment (compare work of Ritter-Völker). Contra-indications: Simultaneous presence of a renal or hepatic disorder; this must be dealt with first and then malarial treatment instituted. Simple syphilitic meso-aortitis is no contra-indication to malarial treatment.

(E) *Latent Syphilis.*—The examination of the cerebro-spinal fluid plays an essential rôle, especially in establishing the existence of a late latency, and also in treatment. A series of investigations has shown that:—

(*a*) In the stage of early latency the results of examination of the cerebro-spinal fluid are very varying.

(*b*) The cerebro-spinal fluid may become normal spontaneously if it has already been pathological.

(*c*) Energetic treatment is capable of making the fluid normal.

(*d*) As a rule the state of the cerebro-spinal fluid apparently remains constant for two to three years after infection (Meirowsky).

In the following scheme of treatment the term "well treated" signifies a method of treatment which corresponds to our directions for primary or secondary syphilis. "Insufficiently treated" signifies cases which have not undergone the courses prescribed by our scheme, or cases which have had inadequate dosage or where the intervals between the injections have been too long.

(1) *Early Latency.—Positive W.R.* (*a*) Well treated; repetition of treatment as for secondary syphilis. If there is no change, malarial treatment (relative indication as a result of resistant serum reaction).

(*b*) Insufficiently treated: treatment as for secondary syphilis; otherwise procedure as in (*a*), when the Wassermann reaction remains positive.

Negative W.R.—(*a*) Well treated; no further treatment, careful clinical observation, and eventually examination of cerebro-spinal fluid at onset of late latency.

(*b*) Insufficiently treated: consider whether diagnosis of syphilis was correct; no treatment; procedure as in (*a*).

(2) *Late Latency.*—For every further decision in these cases it is necessary to obtain the result of the examination of the cerebro-spinal fluid.

Positive W.R.—(*a*) Well treated:—

(1) Positive W.R. in cerebro-spinal fluid: combined malarial treatment.

(2) Negative W.R. in cerebro-spinal fluid: Salvarsan treatment contra-indicated. Generally mild treatment with Bismogenol and potassium iodide is advisable, with careful observation and subsequent repetition of the lumbar puncture. Combined malarial treatment is given when there is a relative indication owing to resistant Wassermann test.

(*b*) Insufficiently treated.

(1) Positive W.R. in cerebro-spinal fluid: combined malarial treatment.

(2) Negative W.R. in cerebro-spinal fluid: very careful observation: procedure as in (*a*), subsection (2).

Negative W.R.—(*a*) Well treated.

(1) Cerebro-spinal fluid positive: after the exclusion of any possible error in this test malarial treatment (for which this is a most precise indication).

(2) Cerebro-spinal fluid negative: no treatment; careful observation.

(*b*) Insufficiently treated.

(1) Cerebro-spinal fluid positive: malarial treatment (most precise indication).

(2) Cerebro-spinal fluid negative: consider whether the diagnosis of syphilis was correct; no treatment; careful observation.

(G) *Congenital Syphilis.*—Treatment should only be given when the diagnosis of an existing syphilis has been absolutely established.

(1) Mother obviously syphilitic during pregnancy: good prophylactic treatment; careful clinical and serological observation of child without treatment.

(2) Mother with latent syphilis: no treatment during pregnancy or first discovery of syphilis in mother towards end of pregnancy, and no treatment in a prophylactic sense.

(*a*) Child clinically healthy: serological examination to be repeated often; treatment as for secondary syphilis if Wassermann reaction is positive; salvarsan, inunction treatment, and later Bismogenol.

(*b*) *Child evidently syphilitic*: treatment as for secondary syphilis (neosalvarsan 6–10 mg. per kilo body-weight, thus beginning with 0·02, later 0·03 g.–0·05 g.; subsequently inunction treatment, 0·5 g. each dose *in four parts*, then bath, interval of two days, repetition; about 30 rubbings and duration not more than five minutes. The ointment should be made to penetrate rather than be merely rubbed over. As an introduction to the treatment in pemphigus give sublimate baths (1 g. of corrosive sublimate dissolved in 100 c.cm. of absolute alcohol; 20 litres of water to be added to this *mixture*, at 35° C.; duration of bath 30 minutes). If there is any mercurial dermatitis the drug must be given internally thus:—

℞ Hydrarg. iodat. flav. .. .. 0·01
Pulv. gummos .. .. 0·5
Sig: One to three powders daily.

Careful observation must be *made of the stools*. The decision regarding the quantity of the drug which is to be administered must be based entirely on the constitution of the infant. As a rule there should be three courses of treatment in the first year, two courses in the second year, and one course in the third year.

3. Late congenital syphilis: as a rule treatment should be as in tertiary syphilis. When clinical signs have disappeared an examination must be made of the cerebro-spinal fluid.

(*a*) Negative Wassermann reaction:

(1) Cerebro-spinal fluid negative: no treatment.

(2) Cerebro-spinal fluid positive: malarial treatment, definite indication.

(*b*) Positive W.R.

(1) Cerebro-spinal fluid positive: malarial treatment, very strong indication.

(2) Cerebro-spinal fluid negative: no treatment, clinical observation, indication for malarial treatment relative.

This scheme offers a mode of treatment which is free from danger; but treatment must always be entirely conditioned by the state of the patient.

ELECTRICAL TREATMENTS IN ACUTE CONDITIONS.

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FOR many years electrical currents have been employed only in convalescent, or chronic conditions, and little or no thought has been given to the possible benefits they might bring to patients suffering from acute illnesses such as pneumonia, peritonitis, septicæmia, collapse, or shock.

This is very natural in view of the history of the development of electrotherapeutics. One of the earliest forms of electrical treatment was the "static machine." In this treatment the patient was near a big, unwieldy apparatus on an insulated glass-legged table, and was frequently the recipient of sparks and purposeful small shocks. With such a setting the mind does not even associate anything sedative, much less a sick room. Then came the so-called "Faradic currents," with their stimulation of muscle contractions, and the far more painful "Galvanic" contractions. Ionisations had their day, and were frequently carried to the point of toleration by the patient; even ultra-violet light, with its stinging erythema, and diathermy with its ability to coagulate and burn, all helped to make electrical treatment a process that required somewhat of robustness on the part of the patient.

It is, therefore, not in the least surprising that the possibilities of electrical currents in acute illnesses should have failed to receive recognition or support from those who had experience of its earlier and more common uses.

Since ultra-violet light has become more and more familiar to practitioners the interest in physical means of treatment has grown, and with this growth has come a realisation that, with suitable technique, this current can be so employed that it either can function as an intense counter-irritant or be so truly sedative that it is the treatment of choice for relieving pain in acute burns of the youngest babies. In America for some years Eaton Stewart at New Haven has been employing diathermy in all stages of pneumonia; and Crile at Cleveland has been using this current actually during and immediately after serious operations as a means of reducing operative and post-operative shock. Although I am not aware of any literature published in England on the subject of electrotherapeutics in acute ailments, it is clear that Eaton Stewart's pioneer work is beginning to bear fruit, for the medical wards of St. Bartholomew's are wired for diathermy, and, at the West Middlesex, diathermy in pneumonia is now practically a routine procedure.

In a paper I read at the School of Medicine for Women in 1926, my experience of diathermy in pneumonia was limited to six cases in all; one acute, in a child of 6, one unresolved pneumonia, and four broncho-pneumonias in patients varying from the age of 3 to 85. At that time, beyond having treated a somewhat similar number of burns with ultra-violet light, the only recent or acute conditions I had treated in large numbers were fractures and lymphangitis. The high percentage of these cases that received genuine relief and help have undoubtedly accounted for the rapid growth in the number of acute conditions that I have been called upon to assist during the last two years, both in hospital and in private. Among these cases there are pneumonias of all kinds and descriptions, acute and spreading lymphangitis, peritonitis with temperature and profuse and offensive discharges, acutely septic joints and, last but not least, burns of all degrees.

Selection of Treatment.

In the primary selection of electrical treatment for any acute condition the first essential is to endeavour to visualise the actual pathological condition and the physiological response most desired; and then, with the knowledge of the physiological effects of various currents and current strengths, selection can be made without difficulty, and suitable technique employed with confidence. The simplest type of case to consider is the severe recent injury, and one case in particular comes to my mind.

The patient, a male adult railway worker, had had his pelvis crushed and fractured, and was suffering severe pain, and the region of the injury was greatly swollen and œdematous. The pathological condition here was, therefore, injured, and hypersensitive nerve-endings, muscle spasm and effusion each reacting adversely on the other.

The desired physiological response would therefore obviously be reduction of muscle spasm, of pain, and of swelling. Now the direct current has at its positive pole certain physiologically proved characteristics—namely, anelectrotonus, or the depression of sensitivity in nerve tissues; cataphoresis, or the carrying of water towards the cathode; and the removal of the demarcation currents of injury (Hermann) in muscle. This current, therefore, if exhibited with a technique that brings out these physiological attributes, is uniquely suited for such a case. And so it proved.

Large pads of gamgee wrung out in 1 per cent. zinc sulphate solution were placed over and near the pelvis, especially over the lower abdomen, which was the site of the greatest pain and swelling; an indifferent electrode was applied to a forearm, so that the current could flow in the direction of the lymph stream, and a current of two to four milliampères was utilised for 15 to 20 minutes. On this occasion the apparatus used was what is known as a galvano-set, but in bed cases the new portable direct current apparatus, known as the Medelect, is even more satisfactory. After the first treatment pain was so much relieved that some natural sleep could be obtained, and within two or three days pain and muscle spasm were gone and swelling rapidly diminishing. I have given technical details of this method elsewhere.[1]

Diathermy in Poliomyelitis.

Perhaps the next most simple condition to consider from the pathological point of view is an acute attack of poliomyelitis. Here we all have a vivid picture of an inflamed and congested area of the spinal cord, the inflammation leading to such congestion that the life of the anterior horn cells becomes precarious, many may die, and some recover with difficulty. To restore the normal physiological condition of the cord we would, if we could, at once reduce the congestion and allow circulation in arterioles, capillaries, and venules to carry out its ordinary work of nutrition. We know, however, that the affected parts are deeply placed in a bony canal, and that fomentations on the skin would have no chance of effective action. So we turn to the late Sir William Savory's great maxim, given in his famous lecture, when he came into the lecture theatre, looked at the students, said "Gentlemen, rest all inflamed parts," and for the remainder of the hour never uttered another word. There is not an authority on this ailment that does not lay down emphatically that electrical treatment in the acute stages must never be employed. When, however, we come to their recommendation for electrical treatment in the later stages, these are all of a "stimulative" nature, and the possibility of fomenting the spinal cord region has obviously never been considered. If the inflamed spinal cord lay within reach of fomentations, as does, for example, lymphangitis in an arm, fomentations would undoubtedly be added to the treatment of "rest."

Can electricity provide a current free of any trace of stimulation of such a nature that it can, to some extent, act as a fomentation for so deeply placed and protected a structure as the spinal cord? The answer is, it can.

In diathermy, thanks to the work of d'Arsonval and others, it has been shown conclusively that, when current reversals occur at rates over 50–100,000 per second, all stimulation ceases. Now modern diathermy machines have current reversals from a half to three million times per second according to the way they are made; so even those with only 500,000 reversal have passed the stimulation range many times.

The diathermy current is closely allied to the wireless wave, and on passing through tissues they readily become degraded to heat waves, identical with the heat waves given out by a fomentation, a hot water bottle, or the water in an arm bath—with this difference, that their initial structure is such that they can pass through all kinds of tissues, whether conducting or non-conducting, and where they meet relatively poorly conducting tissues, such as bone, their change into heat waves is more rapid than in such vascular structures as muscles. It is therefore obvious that in diathermy we have a current capable of fomenting the neighbourhood of the injured spinal cord without any vestige of stimulation.

Although these facts have been emphasised, both in France and in England, the prejudice against using electrical treatment during the acute stage of poliomyelitis still remains—because electrical treatment calls up pictures of muscle contractions and stimulation admittedly to be avoided at all costs. In consequence of this very natural prejudice, I have only had experience of two cases during the really acute stages, and, with the known vagaries of this complaint, the mere fact that their pain disappeared rapidly and recovery was practically perfect does not, unfortunately, enable me to claim any specific benefit from the treatment. It is, however, justifiable to say that the clinical response corresponded with the theoretical considerations previously formulated. The technique would be simple and would consist of applying over the spine where the lesion is known to be a metal electrode, covered in two thicknesses of lint, wrung out in super-saturated saline solution. This electrode should be at least 6 in. to 9 in. square, and a similar electrode is placed over the soft parts of the abdomen. The actual size of the electrode should be determined by the area of the soft abdomen. A current of almost 1 ampère is passed for 20 minutes, and, if the pads are bandaged on with a thin rubber bandage, uniform contact will be secured, and the risk of burning be reduced to zero, as pads of these sizes, if carefully applied, will carry nearly twice this current, even in quite a young child, for considerable periods. One has, therefore, a large margin of safety.

Diathermy in Pneumonia.

Exactly the same pathological and physiological considerations arise in cases of pneumonia, bronchopneumonia, and allied conditions. I will not give clinical notes of the cases that I have treated with diathermy, since my experience of the benefits of this current entirely confirms the work of Eaton Stewart, and his book, "Diathermy with Special Reference to Pneumonia," is a sane and well-balanced treatise on the subject. The technique I employ for diathermy in pulmonary cases is precisely similar to the one just referred to, except that where patients are collapsed or suffering from difficult and hampered breathing the pads are slipped under each armpit, and the patient's elbows are held gently against the pads by nurse and doctor, so that the arm can follow respiratory movements without hindering them in the least. This method entails a minimum of disturbance of the patient.

One recent case of Dr. W. Byam's may be cited as illustrating several points in the application of diathermy in the early stages of pneumonia. In this patient, a man of 73, with the sputum yielding a nearly pure culture of pneumococci and the lungs showing the early signs of consolidation, the chief anxieties were restlessness, continuous cough, and absence of any desire to sleep. During the first application the cough ceased, the patient fell asleep and had six hours' further restful sleep after the treatment ceased.

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[1] Brit. Med. Jour., 1934, i., 743.

I wish to dwell at some length on certain effects of the diathermy current which are not, in my opinion, related to its action as a sedative fomentation. One of the first things that strikes the patient, the observing practitioner, and the technical expert is the restful after-effect, hours of quiet sleep often following the very first application. Another easily made clinical observation is a curious change in the type of respiration, which from being like an inverted V becomes definitely more smoothly undulatory in type. Also in delirious and wandering patients the delirium frequently ceases abruptly during treatment, and the patients converse intelligently.

Physiological Action of Diathermy.

Breathing that becomes deeper and more physiological in type, sleep or rest for periods far longer than could be accounted for by any single fomentation; an improved pulse volume—all these reactions are suggestive of some specific action of the diathermy current on the sympathetic system.

It has long been taught that diathermy acts only by heat, and has no specific action due to its wave-length. The very name of diathermy supports this theory. As I have said, however, diathermy currents are practically identical with ordinary wireless waves (one machine I have has a wave-length of 365 metres). This current, therefore, does not primarily belong to the heat, or infra-red, portion of the ether scale, but it does make itself manifest as heat *after* it has been absorbed, and to appear as such these waves must have first been absorbed and then changed to heat waves.

It is known that other parts of the ether scale such as radium, X rays, and ultra-violet light, have each their own peculiar specific effects, and it is reasonable to presume that diathermy, which only differs in the length of its waves, also has its own specific effects, even if these cannot be immediately recognised.

This being so, the question arises whether there are any clinical indications, other than those already given, that diathermy currents have any specific action, and, if so, on what particular structures do they exert this action.

Let us once more turn to poliomyelitis, but this time to the chronic case, with its cold blue atrophic lower limb. Give such a child diathermy from over the anatomical position of the injured cord to the abdomen three times a week (never at first to the affected limb), and at the end of 12 treatments the limb will be showing signs of increased warmth and improved trophic condition, not only during the actual treatment, but between treatments. What mere heat could do this?

Diathermy is recommended by Osler as the treatment of choice in hyperpiesia, but the effects obtained are not shown on the sphygmomanometer, but in the diminution of cramps, of head pains, giddiness, and indeed of those symptoms of sympathetic derangement of which the patient complains as the cause of his difference from normal health. In Crile's clinic in Cleveland diathermy is equally employed for cases of shock and collapse where the blood pressure is below normal.

For years I have been in the habit of giving abdominal diathermy to those cases of wasting debility associated with gastro-intestinal symptoms, and I use this current as a powerful aid to effective ultra-violet light treatment. If it be allowed that diathermy does have its own specific action, and that this action on the sympathetic system is of the nature of a "governor," there is nothing strange in finding it successfully employed, both in hyper- and hypopiesia, for are not the vaso-constrictor and vaso-dilator fibres themselves fibres of the same sympathetic system? With the acceptance of this theory of its action the observed effects on rest, breathing, &c., in pneumonia and allied conditions are understandable and logical, as are the effects of this current when employed in cases of shock, collapse, and affections of digestion.

It will, I think, be generally agreed that the pathology of shock and collapse is intimately associated with extreme derangement of the sympathetic mechanism. The physiological need is therefore restoration of tone and balance in this system. What is ordinarily done for the patient suffering from severe shock? Heat is applied in all kinds of ways, every effort and device that can be thought of to raise the blood pressure is resorted to; yet I have not heard of, or seen, except in the single case of Crile's clinic in Cleveland, diathermy being employed in shock and collapse if only as a supplier of heat. If my arguments in favour of this current having its own special field of activity carry conviction, what a sphere of research is opened!

A point that is often raised when discussing the advisability of utilising diathermy in serious conditions is that the application of the pads will disturb the patient. In employing diathermy, general metabolic saving can be effected without any disturbance of the patient if electrodes are either bandaged on to the sole of each foot, using the same technique as described above, or to each hand, forearm, or upper arm. It is clear that this method, especially when applied to the feet, constitutes practically no disturbance to the patient. It also obviates any risk of burning, for the portable machines are not capable of giving sufficient current when such a large resistance as leg to leg is in the circuit as will lead to burning, and firm bandaging, such as can be effected in these positions, is the best protection of all. For the last seven years in my department at the Royal Free Hospital infants with poliomyelitis have been treated not only without any trace of burn but with highly encouraging results.

Sepsis and Ultra-violet Light.

In the foregoing survey I have endeavoured to show the principles, pathological and physiological, that make me select either the direct current or diathermy, and I have said nothing about the treatment of septic conditions, such as peritonitis after operation, or other grave infections, such as septicæmia. Here ultra-violet light has a genuine field of usefulness. I have dealt elsewhere with its action in raising the hæmobactericidal power of the blood, but here I may perhaps refer to the possibilities of local treatment of septic cavities or sinuses, such as occur in peritonitis or osteomyelitis.

Provided there is adequate drainage, or, rather, adequate access, I have found that local ultra-violet light, by means of sterilised quartz rods attached to a water-cooled Kromayer lamp, act entirely locally and with a rapidity and effectiveness that suggests almost a special reaction under these conditions. It is easy to formulate reasons why there is no general reaction, even to intensive local treatments; for instance, it is possible to argue that the local reaction is on all fours with milk sterilisation by the mercury-vapour lamp, where thin films of bacteria-containing fluid are brought into close contact with the actual bactericidal rays of this current.

A case of necrosis of the lung provides an interesting illustrative case of this type. This patient, a child aged 6, under the care of Dr. Chodak Gregory, was almost in extremis, when doses of light from a mercury-vapour lamp, at 30 in. for three minutes, were applied to the huge offensive necrotic hole in the chest. From the first application there was a favourable local reaction which rapidly increased, and in a few days the patient was out of danger and made an uninterrupted recovery. In this case the treatment and the response were so obviously connected that the amelioration was clearly the work of the light on the local condition.

Burns.

There is one condition which I have left to the last, partly because it interests me acutely and partly because I can advance no theory that explains satisfactorily why the treatment I now invariably use is so uniformly successful in its results. The condition to which I refer is burns.

For these I employ extremely small doses of ultra-violet light from a full-sized mercury-vapour lamp at 30 in. for two minutes; the burnt surface being either covered with liquid paraffin or ambrine, the remainder of the limb being protected from the rays. The liquid paraffin or the ambrine are highly fluorescent in the presence of ultra-violet light, and therefore diminish the dosage materially, and change the incident ray to another which they give out. The second patient I ever treated by this method had third-degree burns of both breasts, and when doses of light were first administered was in a state of collapse from the repeated anæsthetics and/or pain of the dressings. From the first application of ultra-violet-light re-dressings were practically painless; recovery was uninterrupted, and the patient has since successfully suckled two babies at the breast.

An investigation of burns treated by this method is now proceeding, and I will content myself by recording the facts that pain is more rapidly alleviated by this treatment than by picric acid, tannic acid, liquid paraffin, or ambrine alone, and that healing is more rapid, and that the resulting scar is better. All this happens with a current which can readily cause erythema and desquamation of the epithelium. If the paraffin technique is not employed the pain and healthy formation of elastic epithelium is not helped. It seems to be essential, and the fluorescence of this material would appear to have something to do with the results. This question, and the question whether diathermy has a specific action on the sympathetic, must be left for future research.

Conclusion.

I will close with a plea and a warning. The plea is, that when electricity is to be used in acute illness it should not be asked to do the impossible by being called upon only when the patient is semi-moribund. The warning is, that practitioners should avoid employing persons not medically qualified for giving electric treatments in acute illness unless they have themselves mastered the technique. To emphasise the reality of this warning, I will mention a case recently brought to my notice where the spreading septic condition had been checked by competent and successful surgery, only to be thwarted by an injudicious dose of ultra-violet light, resulting in œdema, with consequent hindrance of the previously adequate drainage, and finally death.

It is therefore justifiable to claim that advances in our knowledge of electrical current now enable us to:

1. Eradicate, when so desired, all stimulative and irritative characteristics inherent in certain types of current.
2. Produce currents with true sedative effects.
3. That in consequence the direct current can now be used with benefit to reduce pain and spasm in recent fractures, &c.; diathermy employed in pneumonia, shock, collapse, &c.; and ultra-violet light in burns and septic conditions, with advantage to the patient.

SALFORD ROYAL HOSPITAL.—At the annual meeting it was stated that the number of patients treated during the year was 49,600. In order to provide the purchase-money for the premises recently acquired for the hospital extension, and to reduce the large bank overdraft, the board of management had been reluctantly compelled to sell hospital investments amounting to over £31,000. Plans have been approved for a paying patients' hospital with 45 beds—a complete block with separate nursing staff and servants. As a result of motor accidents during the past year, 90 in-patients and 144 out-patients were treated in the hospital, at a cost of £514, and the amount contributed was only £34. The expenditure of the hospital in excess of income for the year was £13,200.

Clinical and Laboratory Notes.

FOREIGN BODIES AND NASAL CARRIERS OF DIPHTHERIA.

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NASAL carriers of diphtheria bacilli are common, but foreign bodies in the nares, producing a carrier condition, are rare.

Scholes[1] has seen five cases of unilateral nasal discharge (containing virulent diphtheria bacilli) due to foreign bodies in the nose. In THE LANCET in 1922 Keen and Carson[2] described two cases of nasal diphtheria due to foreign bodies, and Barnes[3] one case, due respectively to shoe buttons and a piece of rubber (but it is not stated that the virulence of the organisms was determined). Also Forbes[4] described a case of nasal discharge due to a button in which the organisms were tested and found to be virulent. In none of these cases does a Schick test appear to have been carried out.

Three Cases out of Nearly Two Thousand.

Some idea of the comparative rarity of the condition may be gathered from the fact that out of a series of 1968 cases admitted to the Ilford Isolation Hospital the condition has only been found on three occasions. The following case is therefore of interest:

A boy, aged 9 years, was found at routine medical inspection at school to be suffering from an unilateral nasal discharge excoriating the nares. A swab was taken which showed morphological Klebs-Löffler bacilli (K.L.B.), and the boy, at the request of the parents, was removed to the Isolation Hospital on June 11th, 1929, and placed in a separation ward for observation. A swab from the right nostril was positive for K.L.B., and from the left nostril negative. The organisms found in the nose were tested on a guinea-pig and found to be virulent. The boy was Schick negative, showing that he was a true diphtheria carrier. On careful examination a foreign body was located far back in the right nostril, and with some difficulty was removed with forceps. The foreign body consisted of a rolled piece of material which proved to be a maker's tape from the back of a man's tie. The nasal discharge ceased after the removal of the foreign body. Swabs from the right nostril were positive for K.L.B. two days later, but became negative 11 days later, and were again negative after a further seven days.

Examination of the maker's tape showed that the tie had been purchased in Exeter, and on inquiry it was found that the boy had visited Devonshire in July, 1928, and at that time had been seen playing with the piece of tape, and also with a small stone which he had pushed up his nose. The stone was recovered from the nose, and it was thought that the tape had come down also. The boy returned home in October, 1928, and in January, 1929, the nasal discharge began. He had been taken to a doctor, who had thought he had a polypus. He had never had diphtheria; no diphtheria cases had occurred at the house in Devonshire and none in Ilford. He had only been in Ilford 11 weeks when he was examined at school; previously to that he had resided at Hackney. On inquiry at Hackney no diphtheria cases could be traced as being due to him.

Two other cases have occurred in Ilford:—

A girl, aged 3½ years, admitted to the Isolation Hospital in June, 1928, with an unilateral nasal discharge of two months' duration. Morphological diphtheria bacilli were found in the culture from the nasal swab. A pea was removed from the right nostril. The nasal discharge ceased and two further nasal swabs proved to be negative, but a Schick test was not carried out in this case, nor was an investigation made of the virulence of the organisms.

A boy admitted to the Isolation Hospital in 1914 suffering from a nasal discharge containing morphological diphtheria bacilli. A shoe button was extruded from the right nostril after a period of seven months, but a Schick test was not carried out in this case nor was the virulence of the organisms tested. A brother of the boy was, however, admitted to hospital at the same time with a sharp attack of faucial diphtheria, and it is probable that the boy with the foreign body and nasal discharge was a carrier of diphtheria bacilli and infected his brother.

The case which we have recorded in some detail is of interest, as the question arises as to whether the boy was Schick negative because he had immunised himself by infecting his nose with diphtheria bacilli from the foreign body, and so administered to himself small doses of toxin.

Immunisation through the Mucosa.

De Stella,[5] in 1903, showed by experiments on animals that the nasal mucous membrane in diphtheritic rhinitis secretes an antitoxin which neutralises the diphtheritic toxin, and so prevented toxic symptoms resulting. This is probably what happened in the case described. If this is so, a further interesting question arises as to whether it would not be practicable to immunise persons against diphtheria through the nasal mucous membrane instead of by subcutaneous injections.

Peters and Allison[6] have experimented with intranasal immunisation against scarlet fever by spraying the nose every other day with scarlet fever toxin, with the result that a number of Dick-positive persons became Dick negative, while in others the Dick-positive reaction was much reduced in area. It seems theoretically possible to devise a method of intranasal immunisation against diphtheria which would give still more satisfactory results.

If immunisation against diphtheria could be effected through the nasal mucous membrane it would also throw some light on the hypothetical latent immunisation by which natural acquired immunity is supposed to be obtained, for it would appear probable that it is through the nose that such immunity is acquired. It can be supposed that most persons on few or many occasions inhale diphtheria bacilli which produce sufficient toxin in the nose to cause, by repeated doses, immunity to develop, but not enough to cause an attack of diphtheria.

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ORBITAL ABSCESS FOLLOWING REMOVAL OF TONSILS AND ADENOIDS.

BY G. NORMAN CLARK, M.B. ABERD.,
HOUSE SURGEON, BELGRAVE HOSPITAL FOR CHILDREN, LONDON.

A GIRL, aged 4 years and 7 months, had her tonsils guillotined and adenoids curetted, and was discharged from hospital the next day. Four days after the operation she was brought up again looking very ill with a temperature of 102·8° F., marked swelling of the right eyelids, proptosis, and restriction of the movements of the eyeball in all directions. On the following day some swelling of the left eye appeared. A deep incision was made below the right supraorbital border, but no pus was found. Two days later there was no improvement in the condition, the eyeball was displaced markedly outwards, movements were very limited, and there was much swelling of the orbital tissues and injection of the conjunctiva. The incision was deepened inwards, and on introducing a sinus forceps pus was found lying deeply outside the lamina papyracea of the ethmoid, the bone here being bare. The patient had an uneventful convalescence. On discharge the movements of the eye were full, there being only slight ptosis. The *Staphylococcus aureus* and the Friedländer's bacillus were cultured from the pus.

I have to thank Mr. Cecil Wakeley for permission to publish this case.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS.

AT the meeting of this Section on Nov. 1st, with Dr. ASHLEY DALY in the chair, the subject of discussion was

AVERTIN ANÆSTHESIA.

Dr. JOSEPH BLOMFIELD said that avertin was a tri-bromine-ethyl-alcohol, a white crystalline substance which dissolved in water only with difficulty up to 3·5 per cent. The makers had now produced it in a fluid form, in which every cubic centimetre contained 1 gramme. The dose recommended was 0·1 g. of avertin per kg. of body-weight (or two-thirds of a gramme per stone weight). The technique of injection was simple; the solution was run slowly into the rectum by means of a soft tube, which should be passed for four inches; owing to the varying reaction of different patients to anæsthetic drugs it was important that the anæsthetist should be present when the solution was introduced. When a patient had had no more than 4·0 g. he might be unconscious enough to go to the operating theatre. The need for care in dosage was emphasised by a reported case which occurred in this country. A man, aged 25, was prepared for the operation of radical cure of inguinal hernia. Before the avertin he had morphia gr. ¼. The degree of anæsthesia induced by the avertin was not sufficient for the operation, and he was given gas and oxygen. The operation was duly carried out, and he left the theatre apparently in a normal state; yet he never recovered consciousness, and he died eight hours later. The dose given was a safe one, and the autopsy revealed no reason for the death. Dr. Blomfield thought that some undetected error must have been made in the case; nothing comparable to this fatal unconsciousness had come within his own experience.

The induction of unconsciousness following avertin was extraordinarily satisfactory, continued Dr. Blomfield; it seemed to be as pleasant a way of going to sleep as could well be imagined. He had not seen any accompanying excitement. One nervy young man said he felt a strong temptation to try to expel the tube from his rectum; but he was not a good subject for any anæsthetic, since on several occasions he had had ether which he disliked very much, and which made him vomit. Usually respiration became somewhat depressed—i.e., rather shallower and slower—and the condition was not unlike sleep, except that there was somewhat less colour in the face, and stertor easily developed. The blood pressure fell by 10 to 15 mm. of mercury. Often when a patient had avertin unconsciousness the corneal reflex was absent, and yet, if a painful stimulus were applied, a reflex movement occurred, and this would be repeated on the first cut with the knife. The speaker therefore did not rely on absence of the corneal reflex. The best means of knowing that the patient did not need any more anæsthetic was to give strong ether vapour to inhale; if this was taken quietly, without holding of the breath, it was safe to begin the operation. The muscles were relaxed, the breathing was quiet, the circulation was quiet, and the blood pressure was only slightly lowered. Of his own cases, only about a quarter had had a satisfactory anæsthesia with avertin only. Much depended on the patient and the operation. The kind of patient who had given him greatest satisfaction with avertin was the feeble elderly person who was having some such operation as gastrostomy—the kind of patient who sometimes failed to recover after inhalation anæsthesia. Often these old subjects required no other anæsthetic than the avertin. The next satisfactory class were cases of exophthalmic goitre. On the average, patients who had avertin could be assured of two to four hours' unconsciousness, which was not so deep that it need deter one from using avertin in cases where there was likely to be blood in the air passages. The coma was not so deep as after paraldehyde. He had used avertin for dissection of tonsils, and in other cases where there was sure to be blood in the mouth, and he never had any anxiety on that score.

Summing up, Dr. Blomfield described avertin as a very valuable addition to the drugs available for the anæsthetist. But he thought no attempt should be made to use it as a routine anæsthetic, especially as it was desirable for the anæsthetist to see it actually administered. It gave a very pleasant induction of anæsthesia, and was especially valuable for patients who had had trouble with, or intensely disliked, every other anæsthetic. Also, it added enormously to the safety of such operations as those for exophthalmic goitre.

A Series of 106 Cases.

Sir FRANCIS SHIPWAY said that in the first four or five cases he had anæsthetised with avertin he had used the solid form, while in the remainder of his 106 cases the fluid preparation was employed. He had found that a strength of 2·5 per cent. gave a more even absorption and a more gradual induction than a 3 per cent. solution; also excitement was less likely—though so far he had never seen excitement in any case in which the drug was used. Children might well be given 3 per cent. strength, since they did not retain it as long as adults. Sixty-six of his patients were males, ranging in age from 12 to 72; the ages of the 48 females were from 15 to 66. The patients had also been given morphine and atropine, or morphine gr. ¼ and scopolamine gr. 1/150. Sir Francis thought that body-weight was an unscientific guide to dosage; habits, occupation, and environment must all be taken into account. The alcoholic, the active, and the highly-strung person reacted relatively badly. He had used avertin in 17 abdominal operations, including gastrostomy, and in 20 of his cases it had sufficed by itself. In 91 cases gas and oxygen was used in addition, and in 10 other was added to the gas and oxygen; 3 received chloroform and ether; and 1 was given chloroform for removal of a growth of the tongue by diathermy. Induction he had found to be quiet and smooth, and usually rapid—so rapid, in fact, that unconsciousness sometimes came on in the middle of a sentence. The patient was placed on his side, as a precaution against obstructed breathing. Patients were always of a good colour with avertin, and he had not had need of any respiratory stimulant. If one should be needed, he thought carbon dioxide the best. After avertin the pulse-rate was slightly increased, and the blood pressure fell by about 10 mm.; the maximum fall he had so far observed was 30 mm. The corneal reflex was usually just present, but in ten cases it had been absent altogether. Among tests of the depth of anæsthesia were the application of picric acid or iodine to the operation area, the application of towel clips to the skin, and depression of the lower jaw. Analysis of the urine of these patients revealed no albumin or blood. One man who had his inguinal hernia operated upon developed bronchitis; he had been given gas and oxygen in addition. On three occasions the avertin to be used was found to be unsatisfactory; it was decomposing. After induction of anæsthesia with avertin the rectum was not washed out. The patient could be aroused for any purpose—e.g., to take fluid—and thereafter relapsed into sleep, sometimes for as long as 12 hours. Fatal cases in which the drug was used showed fatty heart muscle and cirrhosis of the liver.

Sir Francis regarded avertin as a safe means of induction, providing an excellent basis for anæsthesia and especially free from after-effects. It was contra-indicated for patients having a rapid fall of blood pressure, and for people with renal disease. Otherwise it was the most delightful and excellent method of anæsthesia induction he had seen.

Discussion.

Dr. JAMES YOUNG (Edinburgh) said that the impressions he received concerning avertin in 150 cases conformed with those already expressed at the meeting. He noted particularly the ease of induction and the comfort of the patient. The method seemed peculiarly suitable for gynæcological cases, because there was no post-operative sickness. After operations on the pelvic floor vomiting was very liable to burst the stitches. In a series of 154 cases under his observation there were two deaths, but in neither could the avertin be held responsible. He had now reduced the preliminary dose of morphia to gr. ¼, and this had proved an advantage, though the patient required more inhalation anæsthesia.

Dr. I. N. LEWIS referred to his use of avertin in 28 cases. It was most effective in the case of patients whom he could classify as soft thyroids. Possibly a stimulus to the patient's metabolism might hasten excretion of the drug. Hypothyroid cases recovered from avertin more quickly than others. He had had no unpleasant incidents in his cases.

Dr. H. E. G. BOYLE said he had not had any experience with avertin, but he would have thought that giving patients heavy doses of morphia and scopolamine beforehand put them in a position of danger. He suggested that a much smaller dose of avertin than what was now prescribed might be used as a means of premedication.

Dr. COUX said that a drawback to the use of avertin alone was the length of time it had to be given before the operation. In nearly all his cases he had to use some supplementary anæsthetic.

Dr. C. F. HADFIELD commended the method by which avertin was introduced to the profession in this country by the makers, who recognised its danger unless under expert control.

Dr. R. A. RAMSAY spoke of the efficacy of carbon dioxide as a restorative when a case seemed to be doing badly.

Dr. Z. MENNELL said he had not any great experience of the method, but it was one which he disliked for the ordinary healthy person. The cyanosis which occurred with it meant that attention had to be given to the airway, and certainly administration of the drug should not be left to nurses. He did not think the corneal reflex was a guide to the depth of anæsthesia, any more than it was in the case of hedonal. It would be wrong to use avertin as a routine anæsthetic, and also, he thought, for tonsil and adenoid removals, and for big operations on the mouth.

Mr. C. HOPE CARLTON asked whether in Graves's disease the bromine in the avertin compensated for the absence of iodine in the patient.

Dr. HUGH PHILLIPS spoke of the possibility of employing avertin in association with spinal anæsthesia.

Mr. GEOFFREY KEYNES said that avertin had been used in many of his cases, and he had hoped it would enable other anæsthesia to be dispensed with, especially in abdominal operations. In a case of gastrectomy the avertin was combined with a local infiltration of the abdominal wall, and in a dose of only 0·08 g. per kg. of body-weight it proved so satisfactory that it seemed to be an ideal form of anæsthesia. He had long felt that for gastrostomy nothing but a local anæsthetic was needed.

SECTION OF OTOLOGY.

HISTORY OF THE MASTOID OPERATION.

IN his presidential address to the Section of Otology on Nov. 1st Mr. W. M. MOLLISON traced the history of the mastoid operation from the seventeenth century to modern times. The first reference in the literature was in 1649 when Johannes Riolanus wrote recommending the trephining of the mastoid process. In its earliest days the operation was performed for the relief of tinnitus, or in order to make a new Eustachian tube. The first operation on the mastoid designed to promote the evacuation of pus was carried out in 1740 by Petit, who used a trephine. In 1776 Jasser operated for suppuration by boring a hole in the bone, through which he forced lotion in order to drive out the pus; this procedure he repeated on 12 succeeding days. The operation fell into disrepute after it had been performed on the Danish Court physician, Berger, for tinnitus and deafness, with a fatal result. It took centuries to evolve a satisfactory method of opening the mastoid process for the release of pus. The radical mastoid operation dated from about 1889, when Zaufal published the operation generally known as Stacke's operation. In the light of present-day knowledge it was clear that at first many patients were subjected to the radical operation quite unjustifiably, and that the total amount of hearing lost because of these initial errors was incalculable. Fortunately, however, this dark period did not last longer than about seven years. The last phase, dating from 1897, was a conservative one, since the aim of modern surgeons was to save the ossicles and thus to preserve the hearing. Mr. Mollison pointed out that there were many different methods of performing the conservative mastoid operation. The bone was removed from the posterior wall far enough to allow of meatal flaps; the outer attic wall was removed to drain the attic and observe the presence of cholesteatoma and the condition of the ossicles; some removed a bridge; others left just enough to support the membrane. If the attic wall was not removed the aditus was exposed and the condition of the incus investigated; if necrosed the incus was removed. The position of the perforation and the amount of hearing were determining factors in the choice of operation. A number of suggestions had been made with the object of facilitating the healing of the wound left by the operation. The wound could be left open and allowed to granulate; it could be allowed to fill with blood clot. Some flushed it by means of the Carrel-Dakin apparatus and others closed it by secondary suture or filled it with bismuth and iodoform paste before suture. Bone-grafts had been used after irrigation with Carrel-Dakin fluid, and zinc ionisation was yet another method of after-treatment. The main object should be borne in mind, and this was to secure a thorough opening of all accessible cells.

In conclusion, Mr. Mollison said that the real triumph of the mastoid operation would lie in the successful treatment of all cases of acute otitis media, if need be by the Schwartze operation, thus eliminating chronic suppuration. In the future the need for a radical mastoid operation in any case would be regarded as an indication of failure.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT a meeting held at Liverpool on Oct. 25th, with Dr. G. W. FITZGERALD in the chair, a paper on

TUBERCULOSIS AND PREGNANCY.

was read by Mr. LEYLAND ROBINSON. It was based, he said, upon the answers to a questionaire submitted to experts in tuberculosis, 200 of whom sent replies. This questionaire dealt with the effect of pregnancy on latent, quiescent, and active types of disease, and discussed the treatment, special attention being paid to the value of therapeutic abortion. The main conclusions were as follows: (1) childbirth is always a danger to the phthisical woman; (2) all forms of pulmonary tuberculosis are affected by parturition—latent, arrested, or otherwise; (3) in the interests of the individual it is desirable that reproduction by phthisical patients should be regulated —sterilisation is neither desirable nor probable; (4) special supervision ought to be made for the treatment of pregnant women with tuberculosis in sanatoriums and adequate accommodation provided for labour and the lying-in period, (5) phthisical women who are pregnant should receive the ordinary sanatorium treatment, including artificial pneumothorax; (6) therapeutic abortion has a limited field of usefulness and should be restricted to special cases of early disease in early pregnancy; (7) special antenatal supervision by a skilled obstetrician is an essential part of the routine treatment; (8) the child must be isolated; (9) lactation must be forbidden.

The PRESIDENT said that his impression was that tuberculous women improved during pregnancy but rapidly grew worse in the puerperium.

Dr. C. R. SCHOFIELD (Southport) spoke of the difficulty of getting a pregnant tuberculous woman looked after. He had just had a case of a young girl who developed acute pulmonary tuberculosis and a tuberculous larynx within a month of term. Eventually he did an induction for her but she was dead in three months. He had seen some tuberculous mothers improve during and between pregnancies and others killed by pregnancy. Much seemed to depend on the stage of the disease.

Dr. J. E. GEMMELL (Liverpool) recalled a case of a woman who showed evidence of phthisis after a miscarriage. After years of treatment she was declared cured (physical signs and X rays) and allowed to become pregnant. At the sixth month the disease reappeared and the patient was dead in two months.

Dr. W. W. KING (Sheffield) mentioned a case which improved during pregnancy and rapidly went downhill after delivery. He urged that the diversity of tuberculous disease be remembered. He quoted statistics from an American hospital showing that in comparable cases under comparable conditions only 3–4 per cent. more pregnant than non-pregnant women showed advance in the disease.

Dr. F. H. LACEY (Manchester) quoted figures from the literature showing that the mortality was very little higher in pregnant than in non-pregnant women, but that it was in the first six months after delivery that the prognosis was worst. He thought that tuberculous disease of the larynx or the presence of toxæmia made the prognosis very serious.—Dr. J. W. BURNS quoted a case of marked improvement during pregnancy under sanatorium treatment.—Dr. PERCY MALPAS said that in a recent German symposium the consensus of opinion was against induction of abortion in all three stages of the disease.—Dr. J. H. WILLETT had interrupted a pregnancy early where it occurred in a healed case.—Prof. DANIEL DOUGAL (Manchester) thought Mr. Robinson's paper would become the standard one on the subject. He added that Rist held that pregnancy was inimical to phthisis and thought that this was due to hyperthyroidism asociated with pregnancy. Rist thought highly of artificial pneumothorax and allowed marriage if sputum was free from organisms two years after operation.

Mrs. DOBBIN CRAWFORD read a note entitled

A Useful Perineal Dressing.

After trying many dressings for perineorrhaphy and colporrhaphy wounds, she had come to use the following emulsion of acriflavine: acriflavine, 0·10; liquid paraffin, 76·65; white wax, 3·25; distilled water 20·00. An interval of 24 to 48 hours was allowed to elapse, and at the latest on the third day—the day on which the aperient was given and before the bowels were opened—dressing was begun with a narrow strip of gauze about three inches long soaked in the emulsion, and by means of forceps laid upon the colpo-perineorrhaphy wound. The dressing was renewed after each micturition, and the results had been satisfactory. The dressing had also proved itself of value after confinements in which there had been great bruising of the vulva. Mrs. Crawford had found the emulsion an ideal perineal dressing. The paraffin kept the perineum dry, the flavine kept it clean or cleared up any incipient infection, while the whole was soothing to the patient.—Dr. BURNS agreed about the value of acriflavine. He had found a 1–1000 watery solution useful for swabbing out an infected pelvis and had noted that it had a considerable hæmostatic effect on an oozing surface.

Mrs. CRAWFORD also showed a uterine tumour for diagnosis; Dr. J. W. BRIDE (Manchester) reported a case of hydatid of the broad ligament; and Mr. A. MCMURRAY described a hydatid in the pelvis.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING IN MANCHESTER.

(Concluded from p. 929.)

SECTION OF VENEREAL DISEASES.

DIAGNOSTIC AND OTHER ERRORS IN QUESTIONS OF VENEREAL DISEASE.

Colonel L. W. HARRISON said that a young wife had developed a Bartholin's abscess. The husband had previously been cured of gonorrhœa; nevertheless, he was informed that he had infected his wife. Careful investigation showed that the causative organism of the Bartholin's abscess was *B. coli*. Had this investigation not been carried out the case would have had all the makings of a marriage wreck. The subject of his paper had been suggested to him by the consideration of errors of which he quoted a typical example. Ordinary balanitis was sometimes diagnosed as gonorrhœa, and he knew of a case where a mother had been requested to remove her son from a public school because of such a mistake. Dislike of examining the penis at close quarters accounted for many cases where a syphilitic chancre at the meatus or within the fossa had been diagnosed as gonorrhœa; it was common to see cases of tertiary syphilis where the patient denied having had a sore but admitted gonorrhœa, and it was reasonable to suppose that the discharge had been due to an intra-urethral chancre. Omission of microscopical examination led to many cases of simple urethritis being treated as gonorrhœa. A vaginal discharge was often due to other causes than the gonococcus. A diagnosis should not be made on the strength of a naked-eye examination nor on a single microscopic test. A urethral discharge was sometimes due to the breaking down of a prostatic abscess, and this had at times been diagnosed as gonorrhœa on the appearance of the discharge or on the faulty staining of microscopical specimens. Epididymitis, especially if accompanied by a urethral discharge, often suggested gonorrhœa to the practitioner to the exclusion of infections with *B. coli* or *B. tuberculosis*. He had known some cases of right-sided gonococcal epididymitis diagnosed as appendicitis; the absence of rigidity of the rectus and tenderness of the cord at the ischio-pubic ramus should have indicated the nature of the lesion. Colonel Harrison emphasised the value of the microscope, a culture tube with properly made medium, and the complement-fixation test as aids to diagnosis, but pointed out that they did not make unnecessary a careful clinical examination. He thought that innocent prostates and seminal vesicles were often condemned for trouble which lay in the anterior urethra. Proper cleansing of the urethra was an essential preliminary to expression of the prostatic secretion for microscopical examination, as otherwise this might become mixed with pus cells derived from the anterior urethra. In syphilitic infections he deplored the pernicious practice of commencing treatment of early cases on a mere suspicion. Promptitude in commencing treatment was certainly important, but not so important as certainty of diagnosis. He quoted an article by Dr. J. H. Mitchell entitled Menace of the Slightly Positive Wassermann Reaction, where this author related cases in which a faulty diagnosis had been made on a weakly positive W.R. alone, or in conjunction with non-specific dermatoses, the result being the firm establishment of that intractable disease "syphilophobia." He had always taught that if a report of a serum reaction as positive was not supported by the clinical data, another specimen of blood should be examined. Extragenital chancres, he pointed out, were a common source of error. He remembered the case of a chancre of the tonsil being enucleated, which was later sent to hospital as a case of measles, the true diagnosis being reached only when the eruption did not clear up in the time usual for measles. A frequent mistake was to assume that all abnormalities were syphilitic in patients with a positive W.R. Tertiary syphilis of the tongue had led to many epitheliomata being overlooked; on the other hand, gummata of the testicle had been removed under the impression that they were new growths. The tendency in nervous diseases was to think of syphilis and in cardiovascular disease to forget it. In skin rashes occurring during syphilitic treatment the greatest caution had to be exercised; one must consider most seriously whether the rash was not due to the arsenic and on no account continue with the arsenical treatment until it had been clearly established that arsenic was not the cause; neglect to adopt this precaution might easily lead to the death of the patient. Bismuth also, it must be remembered, might cause a troublesome dermatitis. In venereal diseases one must look for and gather all the evidence, and then sift it with judgment and with common sense.

Discussion.

Dr. DAVID LEES said that Colonel Harrison emphasised chiefly the type of case in which venereal disease was wrongly diagnosed rather than that where the diagnosis of venereal disease was overlooked. In any class of patient the medical attendant hesitated to consider such a diagnosis, and still less to suggest it to the patient; his mind was blurred by the moral issue involved. He cited the case of a boy of 8 years with marked synovitis of both knee-joints where the doctor had negatived the diagnosis of inherited syphilis on the high moral standing of the parents; it eventually transpired, however, that the child had been adopted. A common diagnostic error was made in ulceration of the leg; any lesion of this type which was not associated with definite varicosity of the veins, with an atrophic skin, or depressed circulation with trauma, or, in women, with a history of uterine sepsis, must always be suspect. There were many subjects of inherited syphilis who showed few, if any, of the classical stigmata. He quoted a case where a wrong diagnosis of osseous sarcoma was corrected by tracing the family history of the patient's mother, who had a syphilitic ulcer of the leg. He also deprecated the practice of commencing treatment of syphilis on mere suspicion. It was little short of malpraxis to treat the diagnosis of syphilis lightly. Clinical, bacteriological, and serological methods of diagnosis were now so accurate that their intelligent use should make a diagnosis possible in nearly every case. The most difficult ones were perhaps those of herpes genitalis, especially after treatment by strong antiseptics. He deprecated the therapeutic test as a method of diagnosis, and in particular the use of the provocative injection until the end of the fourth week. He noted the frequency with which tuberculous lesions manifesting themselves after an attack of gonorrhœa were diagnosed as sequelæ of gonorrhœa, and quoted instances where the urethroscope was an essential aid to diagnosis.

Dr. MARGARET RORKE said that she had frequently encountered a *B. coli* infection simulating gonorrhœa, especially in the young bride and where there had been brutal coitus. She pointed out that a salpingitis, accompanied by gonococcal urethritis, was not necessarily gonorrhœal; she had seen many cases where the infection was tuberculous. She deprecated the use of the term "weakly positive Wassermann," recommending that the term "doubtful" should be used instead. A patient either had or had not syphilis; treatment should not be administered until the diagnosis was established.

Sir ROBERT BOLAM suggested difficulties in diagnosis presented in lichen planus and in Bazin's disease. A venerealogist should be a fine physician with a broad outlook.

Dr. GORDON WHITEHEAD cited a case of carcinoma of the penis simulating a primary sore. He emphasised the importance of examining the marriage partner in cases of discharge where the gonococcus could not be demonstrated. The lesson of this discussion was that a thorough and complete examination of every patient was imperative.

Dr. A. C. **Roxburgh** described a series of cases where the diagnosis was not obvious, including indurated herpes simulating a primary sore, and a syphilitic rash mistaken for eczema.

Dr. **Wheeler Hart** recalled cases of discharge from the use of too strong antiseptics, and endorsed all that had been said about early and complete treatment.

Preparations of Bismuth in Therapy of Syphilis.

Dr. **Svend Lomholt** (Copenhagen), who opened this discussion, said that bismuth was now adopted by practically all syphilologists throughout the world as a substitute for mercury. It was more efficient and less toxic than the older remedy. Bismuth could be administered only by muscular injection, since it was but slightly absorbed through the skin and intestines. The number of preparations now on the market made it difficult for the doctor to make a right choice. Very little was known with regard to the effects of bismuth on the syphilitic organism and the syphilitic infection itself. The bismuth content of the blood at any time during treatment was always small; therefore bismuth did not act directly on the spirochætes. Dr. Lomholt quoted Levaditi's theory of the formation of a compound of bismuth with protein substances, this compound being toxic to spirochætc. In Dr. Lomholt's experience the best effect in treatment is obtained when large quantities of bismuth are introduced, producing in the organism a high bismuth concentration, which should never, however, reach the point of intoxication. This concentration should be maintained over a long period, but care must be taken that the organism does not become oversaturated with the drug. The essential thing is to obtain a regular and uniform absorption. In intravenous injections the absorption is rapid and regular, but clinical experience proves it to be dangerous. Moreover, the bismuth is rapidly eliminated and therefore daily injections are necessary, a factor which makes the treatment rather troublesome. Subcutaneous injections cannot be recommended; they cause greater pain than the intramuscular method and absorption is slow and more irregular. Intramuscular injection thus is the treatment of election. If a certain amount of bismuth is injected into a muscle and is not immediately absorbed, it becomes encapsuled and the rate of absorption decreases, with impairment of the therapeutic effect. X ray photographs of the nates sometimes demonstrate these encapsuled deposits. The most rapidly and regularly absorbed solution of bismuth is the watery solution. Even small doses, however, cause pain and therefore solutions of bismuth compounds in oil have been employed. Injection of these preparations is less painful, but the absorption of the bismuth is rather slow and irregular. He thought that possibly too much stress was laid by manufacturers and physicians on the production of a painless preparation.

Rates of Absorption and Elimination.

Dr. Lomholt discussed the rates of absorption and elimination of the various compounds of bismuth. He said that the slow and irregular absorption of the oily suspensions is least marked with potassium-sodium-bismuth-tartrate, iodoquinate of bismuth, and bismuth salicylate. The tartrate has the drawback of a varying composition and content of bismuth metal, the iodoquinate has a rather low bismuth percentage, and is rather irritant; but the salicylate has no such drawbacks, and in his view is the most suitable for use in an oily suspension. Of the watery solutions, preference should be given to compounds of restricted solubility. The oxychloride is pure and stable, and therefore makes a good preparation. The daily dose of bismuth metal may be fixed at about 0·5 mg. per kilo of body-weight, higher doses being required with remedies of a slow and incomplete absorption. After four or five injections a thin blue line is generally seen along the edge of the gums; this sign is seen with all intensive treatment and is a sign of strong saturation. The injections should be given in the usual place and manner, but the needle should be retracted slightly during the injection to limit the risk of forcing the fluid into a vein or artery. Should the fluid pass into an artery a serious infarct of muscle and skin may ensue.

No treatment of syphilis should be given, he said, as a mere routine; each single case should be considered by itself. Dr. Lomholt concluded his address by showing tables illustrating the absorption, storage, and elimination of bismuth in a number of animal experiments.

The Fate of the Bismuth.

Mr. V. E. **Lloyd** said that it was essential to possess an accurate knowledge of the fate of the bismuth used. It was clear from Dr. Lomholt's address that there was considerable variation in absorption, which was dependent mostly on solubility. Well-defined deposits had been seen by X rays 12 to 15 months after cessation of treatment. He asked whether encapsulation had taken place in these cases, and whether the presence of an unabsorbed focus was a counter-indication to further bismuth therapy. If so, what methods could be adopted to promote absorption? He believed that pain varied with the anatomical site and the bulk of the injection. As to intoxication this might perhaps be avoided by giving a rapidly absorbed solution in the early stages and a more slowly absorbed one later. It seemed from Dr. Lomholt's tables that most of the bismuth was found in the organs of elimination and detoxication—viz., the liver, kidneys, and intestines.

Dr. **Morna Rawlins** asked what constituted the toxic point of bismuth therapy. In her opinion the blue line was always associated with pyorrhœa; she herself had never found it in edentulous adults, and rarely in children. Pain was rarely complained of in women and children, and in her view was due more to faulty technique than to the type of preparation used. She asked whether Dr. Lomholt considered that absorption was diminished when the body was saturated with bismuth.

Dr. **David Lees** asked whether the results of animal experimentation were applicable to human beings. He had yet to see a stomatitis from bismuth in a young child with good teeth or in the edentulous. He also attributed pain largely to faulty technique. Massage was of great value in its elimination. He was not prepared yet to accept bismuth as a substitute for arsenobenzol.

Colonel L. W. **Harrison** said he had had difficulty in reconciling the findings of different investigators; he attributed the discrepancies to the use of different animals for experimentation. The blue line was one sign of toxicity, but more attention should be paid to the kidney. It was desirable to know the maximum dose that could safely be given; the tendency was to give too little. Dr. Lomholt had advised against the deep subcutaneous method, but Colonel Harrison had not found this to be painful with the oxychloride, the metal, or the salicylate in oil. There was less danger of intravascular injections if the deep subcutaneous method was used. It had been observed that with massage bismuth appeared in the blood two to three hours after injection; without massage it did not appear for 24 hours. Massage should produce more regularity in absorption.

Dr. **Tytler Burke** suggested that a false premise had been involved; neither arsenic nor bismuth by themselves were direct spirochæticides. He would like to know what Dr. Lomholt's experience of the use of metallic bismuth had been. He himself believed the blue line to be due to the presence of sepsis. In his experience children tolerated bismuth cream better than mercurial cream.

Reply.

Dr. Lomholt said that it was risky to draw too definite a conclusion from the results of animal experimentation, but mercury experiments with rabbits and with man gave very parallel results. He agreed that faulty technique might cause pain, but there was no doubt that there was a great difference in pain production between the different preparations. In his experience the therapeutic value of colloidal preparations was markedly inferior, although more could be given. Intoxication by bismuth was much rarer than by mercury. Bismuth-treated patients commonly showed the blue line even when they had well-kept mouths; but he agreed that in the absence of oral hygiene the blue line would be found still more frequently. The cause was, of course, the H_2S precipitating the sulphide of bismuth in the gums. It was his definite opinion that, even with perfect hygiene, all people would show the blue line after a course of 10 to 12 injections of an ordinary volume of bismuth. He did not recommend the use of quickly absorbable preparations at first, followed by the more slowly absorbable; he preferred a regular absorptive rate. The amount of bismuth stored in the tissues was only half that of mercury, indicating a more rapid elimination. He would rather make the intervals between the injections shorter, especially as intoxication was less easily reached with bismuth than with mercury. With regard to the correlation of the findings of different experimenters using different animals, he had found that guinea-pigs did not tolerate the injections as well as rabbits; elimination appeared to be constant, however, for all metals with all the animals used. The highest safe dose could not be determined for man from animal experimentation. He was inclined to regard up to 25 mg. per day as a safe dose. It should be remembered that bismuth was given in doses three to four times as big as those of mercury, and often in greater dilution; their relative toxicity could not therefore be fairly contrasted. He had not investigated the deep subcutaneous method with bismuth, and was not aware that it was being used. A Swedish investigator had found that mercury given by this method was painful, and the rate of absorption slower. He had had no personal experience of the use of metallic bismuth; he knew that one form was used in the early days, but had been given up since it caused necrosis. Suspended in oil it was very slowly absorbed. As for percutaneous administration absorption was very very slow.

THE LONDON MEDICAL EXHIBITION.

(*Concluded from p. 940.*)

Surgical Instruments.

Allen and Hanburys, Ltd. (Bethnal Green, London, E.), had an attractive selection of surgical instruments of every description and made a special feature of Statham's Improved Tubal Injection Syringe for injecting lipiodol under control of the X ray screen, with a luminous dial to the pressure gauge, allowing it to be read in the X ray dark room. Attention was also drawn to instruments for the introduction of radium needles and radon seeds and to the St. Bartholomew's Hospital Operation Table with new patent self-locking device for obtaining the Trendelenburg position.—Down Bros., Ltd. (21 and 23, St. Thomas's-street, London, S.E.), presented a large selection of surgical instruments and appliances, prominent among which were Ivan Magill's Portable Intratracheal Apparatus for chloroform, Lane Joynt's skin-grafting instruments for large grafts, and sets of diagnostic instruments fitted with electric light. Putti's orthopædic operation table, for which Down Bros. are the sole agents, also received attention.—Mayer and Phelps, Chiron House (59–61, New Cavendish-street, London, W.). The high standard of surgical instruments made by this firm is well maintained, and among notable instruments to be seen were Rowbotham's Tracheal Intubation Apparatus for use via the mouth or nose, allowing a constant positive pressure and preventing the possibility of aspirating fluids into the lungs, Forceps for the introduction of radium capsules as made for the Radium Institute, and Pepper's Hæmostatic Guillotine for bloodless tonsil enucleation.—Arnold and Sons (Savory and Moore (1928)) (50–52, Wigmore-street, London, W.) made a feature of their improved and inexpensive pedestal operation table on oil pump base, while attention was called to their "Clearlite" forehead lamp and to their anæsthetic apparatus and blood pressure instruments. A notable exhibit was the rubber sponge cushions for use on anæsthetic stools.—The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, Holborn Circus, London, E.C.), displayed a large variety of chrome-plated surgical instruments and their Holborn pedestal operation table attracted much attention—mounted on an oil pump it has a chrome-plate top which tilts to any angle and if required the table can, in addition, be fitted with a lateral movement.—Subaqueous Intestinal Bath Apparatus (Agent: F. Rossendale, The Manor Cottage, Gerrards Cross, Bucks). Demonstrations of this apparatus were given, its merit being the ease with which it can be adjusted to the patient, the facility with which the returning liquids and solids are disposed of, and the prevention of obnoxious smell.—Philips Lamps, Ltd. (145, Charing Cross-road, London, W.C.). The Metalix-Portable X ray outfit exhibited by this firm attracted a continuous stream of inquirers, for the apparatus can be erected in a few minutes and after attachment to any convenient light socket radiograms can be taken by simply pressing a button. The two packages in which the complete outfit is contained can be carried wherever required. The apparatus is so insulated that there is no danger from electric shock. A wide range of X ray tubes was also included in this exhibit.—Mr. R. H. Dent (309, Oxford-street, London, W.) showed a wide range of "Ardente" appliances for the deaf suitable for many and varied cases. Some of the appliances are inconspicuous, and all of them give good tonal results.—Bruce and Evelyn, Surgical Corsetières (47, Wigmore-street, London, W.), had an interesting display of corset belts, and belts for all kinds of surgical conditions, special attention being paid to lightness and efficiency.—Domen Belts Co., Ltd. (456, Strand, Charing Cross, London), presented a wide selection of belts, based on physiological and anatomical considerations, for pregnancy, accouchement, and general support, for hypogastric and gastroptosis, for floating kidney, as well as an umbilical hernia belt.—The Scholl Mfg. Co., Ltd. (Granville-square, London, W.C.), showed a wide selection of appliances constructed on anatomical principles for the relief and correction of acquired foot troubles.—Short and Mason, Ltd., "Tycos" (Aneroid Works, Macdonald-road, London, E., and at Atlantic House, Holborn Viaduct) exhibited their well-known sphygmomanometers and clinical thermometers as well as an extremely sensitive recording barometer. All these instruments are of excellent quality.—Bruce, Green and Co., Ltd. (14, 16, 18, Bloomsbury-street, London, E.C.), presented a variety of well-made optical and electrical apparatus, including ophthalmoscopes and retinoscopes, optical trial sets, and sets electrically illuminated for the examination of the ear, nose, and throat.—Kodak, Ltd. (Kingsway, London, W.C.), made an effective display of their clinical cameras, lantern slides, films, intensifying screens, developing tanks, and accessories for X ray dark rooms, and photographic materials for still and moving pictures of medical subjects.

Milk and Foods.

Glaxo Laboratories (56, Osnaburgh-street, London, N.W.). The various forms of dried milk exhibited by this firm included Sunshine Glaxo or humanised milk with added Ostelin, a physiologically standardised concentrate of vitamin D, prepared by irradiation; Standard Glaxo, a full-cream milk; Glaxo Malted Milk; and Glax-Ovo, described as a food drink. Ostelin is available in many forms including colloidal calcium with "Ostelin" Vitamin D ampoules for subcutaneous injection, tablets, and in emulsion with vegetable oil and pure calcium glycerophosphate.—**Libby, McNeill, and Libby, Ltd.** (8, Great Tower-street, London, E.C.). The merits of Libby's evaporated milk were demonstrated at this stall, and extracts from scientific literature were distributed showing that the vitamin content of evaporated milk is as satisfactory as that of raw milk. It was also pointed out that the vitamins A, B, and D were not lost in Libby milk, but that orange-juice or tomato-juice should be given in conjunction with it to supply vitamin C.—**Trufood, Ltd.** (Wrenbury, Cheshire, and Lever House, Blackfriars, London), displayed their various pure milk products, calling special attention to Trufood full cream which can be used from 9 months onwards and for general purposes, pointing out that it is particularly useful to follow breast feeding or Humanised Trufood. Seeway, a pure sweet whey in powder form, also received much attention.—**Cow and Gate, Ltd.** (Guildford, Surrey), attracted attention with their display of Cow and Gate milk prepared by a special roller process under the most scientifically controlled conditions and the claim is made that the milk is adjustable to any infant condition. Prominence was given to Lacidac, which is the dried milk to which lactic acid has been added. This is prepared for use by the addition of hot, boiled water and is recommended in convalescence from acute infections, marasmus, eczema, and in diarrhœa and vomiting.—**Nestlé and Anglo-Swiss Condensed Milk Co.** (6, 8, Eastcheap, London, E.C.), in addition to their full-cream condensed milk, in which the vitamins and milk salts are retained, showed milk food in powder form prepared from full-cream milk, malted wheat products, and tasteless principles of cod-liver oil. Lactogen, made from dried milk with the addition of lactose and approximating to mother's milk, also received marked attention.—**Bovril, Ltd.** (148–160, Old-street, London, E.C.). Bovril, which was effectively displayed both in the form for general use and the unseasoned Invalid Bovril, is too well known to need any description.—**Hovis, Ltd.** (London, Macclesfield, Manchester, and Bristol), had an exhibit showing the superiority of Hovis Bread in regard to vitamin B content, and demonstrated that one slice of their bread weighing 1 oz. contains as much vitamin as 2 oz. of wholemeal and as 5 to 6 g. of fresh yeast.—**Bengers Foods, Ltd.** (Otter Works, Strange ways, Manchester), in addition to their well-known food, displayed Liquor Pancreaticus, Liquor Pepticus, Liquor Thyroididin, Pancreatised Lentil Flour, and other digestive preparations.—**Brand and Co., Ltd.** Mayfair Works, Vauxhall, London, S.W.), presented their preparations which are made under hygienic conditions, and include Essence of Beef and Chicken, Meat Juice, Liquid Peptone, and Ferrocarnis, a pleasantly flavoured solution of iron in organic combination with concentrated meat juice.—**Cadbury Bros., Ltd.** (Bournville), exhibited samples of their well-known chocolate and cocoa.—**Frank Cooper, Ltd.** (Victoria Works, Oxford), had an attractive display of their popular "Oxford" Marmalade, which has a distinct flavour of the Seville orange and is made under strictly hygienic conditions, while every process is done by hand and no preservative or colouring matter is used. In it all the essential properties of the orange are preserved in a high degree. Horsedish Cream, made from freshly grown horse-radish and the best dairy cream without preservatives, as well as an appetising fresh mint jelly, also received much attention.—**H. A. G. Coffee Co., Ltd.** (40, Theobald's-road, London, E.C.), had an interesting exhibit, showing by models and pictures the action of caffein on the human system and of their coffee from which the caffein has been removed. This pure coffee is not affected either in flavour or aroma, as the sample cups offered to visitors demonstrated.—**W. Gaymer and Son, Ltd.** (Attleborough and London), whose exhibit at this exhibition is the first since 1912, are cyder makers to the King, and they specialise in dry cyders for medical requirements. The cyder, which is made from English apples only, is pleasing to the palate and was much appreciated by the many inquirers at the stall.

MISCELLANEOUS.

Kolynos Incorporated (Chenies-street, London, W.C.) showed their well-known preparations, including dental cream which is antiseptic and does not in any way injure the enamel of the teeth; liquid Kolynos, which can be used as a mouth-wash, gargle, or spray; a denture powder, a new preparation for thoroughly cleansing artificial teeth and dental plates; as well as a delicately scented skin soap.—**J. C. Eno, Ltd.** (Fruit Salt Works, Pomeroy-street, London, S.E.), displayed their useful saline laxative; and **The Thermogene Co., Ltd.** (160, Piccadilly, London, W.), the scientifically prepared cotton-wool sold under the trade name, which stimulates the circulation in the affected part of the body to which it is applied and relieves congestion and inflammation.—**United Water Softeners, Ltd.** (Aldwych House, London, W.C.), demonstrated their "Permutit" household water softeners which do not impair the palatability of the water. Plants suitable for softening water on a larger scale were also shown.—**Keen, Robinson and Co.** (Carrow Works, Norwich), among other exhibits, showed Almata, described as a food for infants, a galactagogue, and a supplementary diet for invalids: and Keen's Mustard Ointment.—**The Medical Sickness, Annuity, and Life Assurance Society, Ltd.** (330, High Holborn, W.C.). This mutual Society of medical and dental practitioners, which was founded in 1884 for the purpose of enabling doctors and dentists to obtain sickness, accident, and life insurance on more advantageous terms than those offered by proprietary companies, was well represented, and members of the staff were constantly in attendance to demonstrate the advantages of insuring with a professional society.—**The Medical Agency** (William H. Grant, Watergate House, 15, York-buildings, Adelphi, London), which undertakes all forms of medical accountancy and obtains capital for medical practices through banking channels, in addition to negotiating for medical and dental practices, and effecting all forms of insurance, demonstrated to medical men the services offered by the firm.

SPAS AND MEDICINAL WATERS.

In addition to the interesting displays of photographs and literature by the English spas of Bath, Buxton, Harrogate, and Torquay, **Ingram and Royle, Ltd.** (Bangor Wharf, 45, Belvedere-road, London, S.E.), made an imposing show of mineral waters, salts, and pastilles, including Carlsbad Water, Hunjadi János, Vichy-Célestins, and Contrèxeville-Pavillon.

MEDICAL AND SCIENTIFIC PUBLISHERS.

Baillière, Tindall and Cox (7 and 8, Henrietta-street, London, W.C.) exhibited a large number of books published by their own and other firms, and **William Heinemann, Ltd.** (99, Great Russell-street, London), also showed a large number of the latest medical and surgical works, while **H. K. Lewis and Co., Ltd.** (136 and 140, Gower-street, and at Gower-place, London, W.C.), in addition to medical books published by the firm, called attention to their medical and scientific library. Notable exhibits at this stall, which provoked many inquiries, were the Register Doctors' Cabinet for holding index system cards and the Roll-Top Cabinet made specially to hold panel cards and envelopes issued by the Ministry of Health. These cabinets are soundly constructed in oak and are very convenient fitments for the surgery.

Reviews and Notices of Books.

ENDOCRINE DISORDERS.

By Prof. HANS CURSCHMANN, M.D., D.Ph., Director of the Medical Clinic, University of Bostock. London: Humphrey Milford, Oxford University Press. 1929. Pp. 168. 12*s.* 6*d.*

"Endocrine Disorders," by Prof. Hans Curschmann, has recently been added to the series of Oxford Medical Publications, and is a thoroughly clinical and practical monograph. Endocrinology has advanced so rapidly during the last 50 years that the standard text-books of medicine have scarcely succeeded in keeping pace with it. The sections devoted to endocrine subjects are meagre compared with those which bear such established headings as circulatory or alimentary disorders. On the other hand, the special monographs on endocrinology tend to supply the practitioner with a mass of anatomical, physiological, and experimental data which he does not require. This book is compact, and gives a clear account of the various glandular syndromes in under 200 pages. The author has drawn largely from the *work of the mid-European authorities and from* his own wide personal experience. The chapters on disorders of the thyroid and parathyroid deserve special praise. The author discusses the various forms of Graves's disease, pointing out that the metabolic, circulatory, and other symptoms of these syndromes are essentially the same, and that there is a ready transition between the different types. The factors concerned in hypoparathyroidism, tetany, calcium deficiency, and spasmophilia are clearly defined. In the chapter on pituitary disorders there are one or two notable omissions. No reference is made to the suprapituitary craniopharyngeal pouch cysts and their symptoms, or to the syndrome associated with the chromophobe adenomata. On the other hand, the accounts of acromegaly and of diabetes insipidus are admirable. This chapter also includes an interesting general discussion on the ætiology of endogenous obesity and emaciation. Dr. F. Prange coöperates in the chapter on gonad dysfunctions. In the remaining chapters *the arrangement* of the subject matter, in itself very complete, is not wholly satisfactory. One finds, for instance, scant mention of the sex disturbances associated with tumours of the adrenal cortex in the adrenal chapter, but a good account in that dealing with the pineal gland. Here also a considerable amount of space is devoted to a discussion of the various types of infantilism, though there is, of course, no suggestion in the text that the pineal is an ætiological factor in any of them. As a supplement to the standard text-books of medicine the monograph can be recommended both to students and practitioners.

DISEASES OF THE MOUTH.

Third edition. By STERLING V. MEAD, D.D.S., Professor of Oral Surgery and Diseases of the Mouth, Georgetown Dental School. London: Henry Kimpton. With 330 illustrations and 43 colour plates. Pp. 727. 42*s.*

NOT many years ago a volume of over 700 pages *would have been considered a liberal allowance for* an account of the whole of dentistry. But the last few years have seen the appearance of many large volumes devoted to various aspects of odontology. We are constrained to admire the industry of the writers, chiefly trans-Atlantic, who produce these massive tomes, the enterprise of the dentists who purchase them, and the advances of such a comparative young and limited branch of medicine which have produced such an extensive literature. There remains some doubt, however, whether so vast a literature is really justified by the growth of our knowledge, and whether books on dentistry could not be made more concise without detriment.

The fact that three editions of this work have been called for in less than a year is a tribute to its worth which is on the whole merited. It represents an attempt to include in one work all the diseases of the mouth, both those connected with the teeth and those arising from other sources. Such strictly dental conditions as periodontal infections, diseases of the dental pulp, malformations of the teeth, malocclusion, and impacted teeth are dealt with, and in addition there are accounts of tumours innocent and malignant, of specific infectious diseases such as syphilis and tubercle, diseases of the blood system as they may affect the mouth, diseases of the mucous membranes, and so forth. Its appeal is thus to dentist and to doctor. The convenience of a book which covers the whole range of stomatology cannot be denied. The strictly dental section is sometimes disappointing, as if the author had included it only for the sake of completeness and without conviction that it would be helpful. The five pages devoted to diseases of the dental pulp are inadequate, and so are the three or four on malocclusion. On the other hand, the accounts of the various disorders of the mucous membrane are excellent and give the dental reader a good idea of common conditions which his hospital training tends to leave out of account. The chapters on tumours are also good, though the account of the odontomas ignores much valuable work done in this country. In the description of salivary calculus there is no mention of the work of A. Bulleid on the rôle of the leptothrix in its formation.

There are inaccuracies and omissions, and in some ways this voluminous work seems to give a curiously scrappy effect. But on the whole it is a very sound and informing book. The bibliographies are full and international, while the illustrations, especially the coloured plates, are excellent. Its rapid popularity is not surprising.

PREVENTION OF HUMAN TUBERCULOSIS OF BOVINE ORIGIN.

By WILLIAM G. SAVAGE, B.Sc., M.D. Lond., D.P.H., County Medical Officer of Health, Somerset. London: Macmillan and Co., Ltd. 1929. Pp. 195. 10*s.* 6*d.*

Dr. Savage calculates that the number of deaths due to tuberculosis of bovine origin in this country was, in 1927, 1945. The table from which this figure is quoted was prepared on the assumption that 1 per cent. of the respiratory and 23 per cent. of the non-respiratory tuberculosis in each year is of bovine origin. The total deaths calculated on this basis have fallen from 3382 in 1918 to the figure quoted above. Dr. Savage admits that the method employed for determining these figures may be open to question, but it would be difficult to devise a more satisfactory method of arriving at statistics without a very elaborate bacteriological investigation of fatal cases. The number of cases of bovine origin which recover cannot be ascertained, since the notification statistics are not informative on this point.

On the prevalence of tuberculosis in cattle the author gives various methods of arriving at reliable data. Unfortunately, none of these methods is free from difficulties, but the various figures quoted from numbers of counties and county boroughs show that the percentage of tubercle-positive milk samples *examined varies from 0 to 13·2 per cent.* Dr. Savage also examines, with great care, the various methods which have been suggested, and those which are in actual use for the prevention of bovine tuberculosis. A detailed investigation of these points occupies the greater part of the second half of the book. The author deprecates attempts to tackle the reduction of bovine tuberculosis in a piecemeal fashion. If anything of value is to be done a large and comprehensive scheme must be evolved, including all sides of the question, bacteriological, veterinary, and agricultural. The production of an artificial immunity against the tubercle bacillus and the rearing of resistant herds are methods still in the experimental stage. Dr. Savage discusses Prof. Calmette's work with B C G in detail, and leaves us with the impression that he is not hopeful of its ultimate prospects. He also deals at length with the theory held in some quarters that the bovine tubercle bacillus is of lower virulence than the human: he finds that the evidence to substantiate the theory is inadequate. On the question of the immunising value of tuberculous milk Dr. Savage is quite definite—it is, he says, "a procedure so unwarranted that I feel its advocates cannot have realised its full implications."

Every public health worker and every bacteriologist specially concerned with the tuberculosis problem will be glad to keep this book upon his shelves as a large source of unbiased information. In his preface the author states that the literature of his subject reveals neither unanimity on the remedies nor agreement on the facts. He himself has gone far towards clearing the ground.

THE NERVOUS CHILD.

Fourth edition. By H. C. CAMERON, M.D., F.R.C.P., Physician in Charge of the Children's Department, Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1929. Pp. 240. *7s. 6d.*

THE greater part of this popular book is unaltered, but it has been enriched by a new chapter on the underlying disturbances of metabolism in the nervous child. Here Dr. Cameron has set out in a lucid and persuasive manner the views to which he has from time to time given expression on the relation of ketogenesis to the various manifestations of neurosis in childhood. The sudden disturbances of health to which certain children are liable, varying in their form but typified by cyclic vomiting, are associated with a failure to mobilise sufficient carbohydrate to achieve the complete metabolism of the fat which has been absorbed. It is here suggested that this metabolic disturbance may be dependent on a temporary functional impairment of the suprarenal glands, the acidosis itself producing secondary results such as catarrh of mucous surfaces and attacks of bronchial asthma. Dr. Cameron does not pursue further the ætiology of the suprarenal insufficiency, but he implies that a diet too rich in fat may be a contributory factor; he stresses the fact that the symptoms are seen more often among the children of the well-to-do than in hospital practice. The principal lines on which these disorders may be combated are an adjustment of the diet (for which full details are given) and the administration of alkali and of glucose. This chapter adds considerably to the interest of the book; it also, however, introduces into it material which is somewhat more contentious than the original chapters. It will appeal to the reader as a brilliant exposition of one view of a question on which unanimity has not yet been reached.

USE OF SYMPTOMS IN DIAGNOSIS OF DISEASE.

Ninth edition, thoroughly revised. By HOBART AMORY HARE, B.Sc., M.D., LL.D., Professor of Therapeutics and Diagnosis in the Jefferson Medical College of Philadelphia. London: Henry Kimpton. Pp. 528. 30*s.*

IN the present preface to this familiar book Prof. Hare quotes Dr. Maitland Ramsay's words: "At the present day the purely clinical side of medicine is spoken with a certain condescension and is apt to be undervalued. . . . There is too little study of what used to be called the face and mind of disease." This book has been designed according to the plan which is actually followed in practice—namely, to build up a diagnosis by grouping the symptoms. For instance, instead of describing locomotor ataxia, the author provides a section on the various forms of loss of power in the legs in which ample data for differential diagnosis between various nervous diseases will be found. Similarly, the short but excellent chapter on coma covers a great variety of diseases, all producing this important symptom.

The plan adopted implies, consequently, the power of the author to pass on to his reader his experience of symptoms in practice in such a way that they may be readily assimilated and correlated with the general experience of medical men. The chapter headings give a key to the arrangement of the work. The face includes expression, colour, deformity, paralysis, and spasm; the skin—its colour, eruptions, scars, moisture, dryness, anæsthesia, hyperæsthesia, and paræsthesia; and the tongue (to take a third example), general appearance, coating, fissures, ulcers, eruptions, atrophy, hypertrophy, paralysis, tremor, and spasm. There are excellent chapters on abdominal disease, on the nature of the fæces, on vomiting, and on the thorax and its viscera, each built up on the symptomatic plan. The chapter on the eye deserves special mention on account of its admirable illustrations and its explanation of the art of diagnosis in plentiful supply throughout the whole volume.

This book has been and will be widely read by all and especially by those who have felt that in recent years the scientific aspect has unduly overshadowed the art of medicine.

JOURNALS.

LIVERPOOL MEDICO-CHIRURGICAL JOURNAL.—Efforts to restart this journal, the organ of the Liverpool Medical Institution, which ceased to appear during the late war, have been successful, and the thirty-seventh volume appears this month. It contains a number of interesting papers, the first of which is the inaugural address on Harvey delivered by Prof. John Hay, at the opening of the ninetieth session of the Institution. Dr. C. O. Stallybrass, assistant medical officer of health, writes on acquired immunity in human populations, Mr. Watson Jones on the treatment of fractures by intramedullary pegging, and Mr. Howel Evans on some hæmorrhagic conditions. Dr. I. Harris publishes an article on the diagnosis of chronic myocarditis by means of the electrocardiograph, and Dr. M. Datnow discusses the effect of lead on the tissues. Dr. Stuart McAusland advocates the treatment of varicose veins by injection, and Dr. Alston Hughes discourses on "Vision and Vocation." The journal includes the transactions of the Institution and reviews. As the foreword observes, a scientific society without transactions is as imperfect as a man without a shadow, and we congratulate the journal on its renaissance.

DISEASES OF THE PITUITARY BODY.—Dr. O. Leyton writes that our reporter misunderstood his words at the meeting of the Royal Society of Medicine on Oct. 22nd (THE LANCET, Oct. 26th, p. 877). "I described," he says, "some observations which I had made years ago showing that the antidiuretic potency of an extract of pituitary gland did not depend upon its oxytocic content and then said these observations were confirmed by the separation of vasopressin and oxytocin. I did not claim that my observations had anything to do with the separation of these two bodies. I then went on to give evidence which I thought tended to prove that, although vasopressin controlled diuresis, nevertheless it was not the actual antidiuretic body. Of this I had not absolute proof because the observations were too few and a vital factor was the accuracy with which the vasopressin content in a solution was estimated."

ROYAL VICTORIA HOSPITAL, BELFAST.—Dr. J. E. MacIlwaine has resigned from his position of physician to the hospital; he has been elected a consulting physician with special charge of the electrocardiographic department. Dr. S. B. B. Campbell has been promoted to the rank of physician, and Dr. J. T. Lewis elected to the post of assistant physician thus rendered vacant.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 9, 1929.

TANNIC ACID AND SECONDARY SHOCK.

HOSPITAL registers show for the last 25 years a striking reduction not only in the number of cases of burns admitted, but in the extent of the lesions, the mortality, and the ratio of children to adults. At the London Hospital, for example, admissions of burns in children under 12 have fallen from 150 in 1904 to 38 in 1928 and the mortality percentage from 26·5 to 6·3. The decrease has been steady. Improved living conditions, the substitution of electricity for oil lamps and gas as a source of light, factory and workshop regulations, and the Children Act of 1908 have all contributed to the change. This Act, which makes it an offence to leave a child alone in a room with an open fire, has been effective beyond its immediate application by drawing the attention of parents to the gross dangers of burning and scalding accidents.

Most deaths from burns occur in the period of secondary shock. This manifests itself at a varied interval after the accident, usually on the second or third day, and is marked by the clinical picture of an acute toxæmia. The symptoms are now generally attributed to the absorption of toxins from damaged tissues; the toxins have not been isolated but are probably derived from lysis of the skin proteins. Excision of the whole damaged area therefore should have had, and has had, excellent results, but its limitations are obvious. Dr. E. C. DAVIDSON, of Detroit, therefore sought a means of fixing the toxins before their absorption. In 1925 he published a method of treating burned areas with an aqueous solution of tannic acid, thereby producing a dry brown scab which seems to imprison the toxins. Underneath the scab the reparative processes proceed naturally. Many of those in charge of hospital clinics in this country have adopted this method of treatment with enthusiasm, others have given it but lukewarm praise, while some have not tried it. In view of the important practical and theoretical considerations involved, the Medical Research Council invited Mr. W. C. WILSON, who is working in the department of surgery of the University of Edinburgh under Prof. D. P. D. WILKIE, to put together and publish the results of this mode of treatment obtained at the Royal Hospital for Sick Children, Edinburgh. His report was summarised in THE LANCET last week, and in our present issue we set out instructions for first-aid treatment by tannic acid. Mr. WILSON confirms the high claims made by Dr. DAVIDSON. His assurance that the mortality in hospital cases of children under 10 years has been reduced from 38·7 to 10·5 per cent. must be assessed in relation to the lowered mortality following burns in other hospitals; far more convincing is the statement that deaths during the period of secondary shock or acute toxæmia have fallen from 80 to 23 per cent. and that the area of skin involved, on which prognosis has usually been based, can be larger without danger to life if this treatment is followed. The involvement of 30 per cent. of the total body surface in adults, and of 11 or 12 per cent. in children under 10, has been regarded as almost certain to prove fatal. In Mr. WILSON'S series, 35 children were burnt to the extent of 12 per cent. or more of the body surface, and of these 27 recovered. These figures furnish strong evidence of the efficacy of tannic acid, and if we add the alleviation of pain and the escape from frequent dressings which the method provides we are surely in a position to welcome a notable advance in therapeutics. It would be interesting to have figures from other institutions in this country; the Edinburgh mortality figures appear to us exceptionally high. Hospitals in cities where the number of severe burns admitted is comparatively small may not yet have been stimulated to try the method. It is essential to remember that unless the technique is studied and applied in detail, the method is not likely to give the best results. All loose epithelium must be separated and the surface carefully cleaned, for the problem of sepsis, should it arise, is certainly not diminished by the tanned pellicle. Fomentations and other moist applications may not be used over the scab since they seem to liberate the toxins.

Although most suited for use in hospitals since it entails anæsthesia, thorough cleaning, hourly spraying till the tan forms, drying appliances, and protective cradles, this treatment may also have a wide scope where circumstances do not favour such a complicated technique. The provisional scheme of first-aid treatment drawn up by Mr. WILSON for use in mines and other places where burning injuries are not uncommon involves the use of compresses soaked in the tannic acid solution. The drawback may be sepsis, for it is noteworthy that in Mr. WILSON'S experience the deaths from this cause are not noticeably diminished. It is thus of prime importance that better prevention and control of infection should be attained and investigations in this direction are being pursued. There is no suggestion that tannic acid is an emergency measure of choice which should be kept in the home and used for the routine treatment of all burns. In fact, as Dr. D. A. COLES points out in our correspondence columns, for the present it is best used only under medical supervision. Small superficial burns of the first degree are likely to heal quicker when treated with some simple dressing than when exposed to the astringent action of tannic acid, while those of the second degree are no less likely to become septic. A safe rule at present is to attempt this treatment when the burn is severe enough for secondary shock to be anticipated, for there is ample evidence that the shock will be considerably diminished by its use.

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THE LAW OF WATER-SUPPLY.

THE Advisory Committee on Water has just published[1] the Second Report of its Legislative Sub-committee. The First Report dealt with the law of underground water; the Second Report proposes detailed reform of the law of water-supply. More than 80 years ago Mr. BOOTH, Counsel to the Speaker, framed a series of Clauses Consolidation Acts, dealing with railways, companies, land acquisition, gasworks, and so on, which collected the sections most frequently recurring in local Acts, and thus, by making available a code for incorporation in the special Act governing an individual undertaking, brought great advantages of brevity and uniformity to local legislation. One Act of this series was the Waterworks Clauses Act of

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[1] H.M. Stationery Office. Pp. 82. 9d.

1847, a general code which, though amended in 1863, hardly satisfies the needs of to-day. In inquiring into existing legislation the Subcommittee has closely examined this Act of 1847 and also the successive provisions of the Public Health Acts, the Model Bills and Clauses of the House of Lords, and the precedents introduced into local Acts on the initiative of progressive bodies. Everywhere the Subcommittee finds different powers and different procedure; it considers that the time has come for a fresh consolidation of the law, a new Waterworks Clauses Act for uniform incorporation by undertakers, and a general amending and equalising statute which will advance the position all along the line.

It was hardly to be expected that a code fashioned 80 years ago should keep pace with the growth of greater efficiency in water-supply and the extended requirements of modern sanitation. Thus among other anachronisms is the notion that baths and water-closets are exceptional luxuries outside the normal range of "domestic supplies" and justifying additional water charges. Parliament nowadays stipulates for the condition that no extra payment be demanded in respect of the first water-closet in a house. The Report proposes a definition of domestic supplies which will cover supplies for water-closets and for "baths of capacity not exceeding the prescribed number of gallons." Though the Subcommittee has drafted a permissive clause enabling the supply of water by meter for domestic purposes if the consumer so prefers, it does not recommend the compulsory metering of domestic supplies. Economy in the use of water may be an enemy of public health. Waste naturally affects finance. Gas companies (as CLIFFORD observed in his "History of Private Bill Legislation") have made better profits than water undertakings, although they sell an article which usually costs more to produce. But gas companies have the benefit of a metering system which checks waste and—charges not being based on rateable value—causes rich and poor alike to pay for what they consume. Metering might promote economy of water consumption in areas where shortage is possible, but there are other ways of preventing waste. Thus the Subcommittee advocates fuller provisions for penalising waste, misuse, or contamination of water, better powers of making and enforcing by-laws, closer attention to maintenance and repair of fittings, and the fixing of meters on service pipes and mains and stop-cocks on supply pipes. This last suggestion not only helps the detection of waste and the cutting off of supply where water is misused; it also avoids unnecessary disturbance of the roadway surface now so elaborately constructed and so heavily used by traffic. Another recommendation is that supply pipes under highways, connecting water mains with private premises, should no longer belong to private owners but should be handed over to the water undertaking with the liability for upkeep at the latter's expense. Further proposed reforms affect finance—e.g., the relation of reserve and contingency funds; some such revision of the law was carried out for gas undertakings last May. There is mention, too, of superannuation arrangements, the power to furnish or purchase bulk supplies and the need of ensuring proper construction of reservoirs. This last point, which recalls the Dolgarrog disaster of 1925, seems to be dealt with by the Government's new Reservoirs (Safety Provisions) Bill. It is recommended also that Section 70 of the Public Health Act of 1875 should be extended; at present the local authority can ask a court to order the closing of a well, tank, or cistern if the water is likely to be used for human consumption and is so polluted as to be injurious to health; it is advocated that the local authority be enabled to act without waiting for actual pollution to occur.

Other proposed reforms appear equally sound and deserving of support. One difficulty ahead is the devising of machinery whereby the new uniformity may be substituted for the old variety in the multitude of enactments governing individual undertakings. Undertakers will naturally be reluctant to incur the expense of a new local Act to bring each concern's position into line. Not anticipating serious opposition to the necessary changes, the Subcommittee advocates giving the Minister of Health power to alter the law in particular cases by departmental order. There are ample precedents for such a method, but the vigilance of Lord HEWART may hinder their extension.

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THE LIFE OF FOOD.

SCIENTIFIC inquiry is a species of human activity which may be initiated by a variety of motives. Its pursuit is found to be peculiarly satisfying to the increasing numbers of men who devote their main energies to it, and for such men the very fact that they are endeavouring to increase the sum total of human knowledge may be a sufficient reward for their labours. Other less detached individuals may be no less anxious to inquire into the truth concerning the mechanism of natural phenomena, but prefer, or are compelled by circumstances, to select for solution problems which have a more or less direct bearing on the every-day life of the community. There is no essential distinction between these two classes of investigators. The fundamental principles enunciated by the former are frequently applied to practical inventions which may influence profoundly the life of humanity at large, while the attempts to solve some practical question affecting the ordinary life of man may often lead to the discovery of basic principles which are primarily of academic value.

A good illustration of this thesis is to be found in the annual review of the work of the Food Investigation Board.[1] The work is avowedly utilitarian, and is concerned essentially with devising means of storing and transporting food, so that it shall reach the consumer in the best possible condition with the minimum risk of wastage. The practical results already obtained are of very considerable economic importance, but, in addition, conclusions have been reached in certain directions which may prove of considerable significance in the realms of pure animal and plant physiology. Among the subjects of current investigation are the changes undergone by meat during freezing, cold storage, and thawing; important practical recommendations have already followed the work accomplished in this field. In the course of this work it has been found that there is a zone of low temperature within which lactic acid can still be produced, although the machinery for its destruction has been destroyed, an observation which may have an important bearing on the physiology of muscle contraction. The current methods of handling fish on trawling vessels have been the subject of special inquiries, and it has been found that without increasing the running costs of the vessels it is possible to extend the time during which fish can be landed in a fresh condition from 6–7 up to 10–11 days. Most interesting, perhaps, are the observations on the storage of fruit. Not many years have passed since the purchase of fruit in this country during the winter and spring months was almost impossible. Now there is a plentiful supply of apples, oranges, and tomatoes, not to mention other varieties, all the year round. The prices are often high, it is true, but this is in part owing to wastage occurring during storing and handling. It has been one of the tasks of the Board to investigate the causes of this wastage, an inquiry which has involved a study of the fundamental biological processes that occur in fruit during the various stages of its career. The conception of an apple (for instance) as a living structure that is continually respiring and producing measurable quantities of heat has been borne in mind; it has been shown that the apple, after passing through the phase of immaturity, reaches a period which has been called the climacteric, during which there is a marked increase in the rate of respiration, and an alteration in the respiratory quotient which are apparently associated with the production of those chemical substances which confer upon the fruit its characteristic flavour and aroma. This period is followed sooner or later by senescence, which must terminate the useful life of the apple as far as consumption by man is concerned. It is obviously desirable that the factors which control the time of appearance of the climacteric and the subsequent length of the useful life of the fruit should be determined, and with this end in view a large amount of work has been carried out on the influence of the state of maturity at the time of picking, and the temperature, humidity, and composition of the surrounding atmosphere during storage.

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[1] Report of the Food Investigation Board for the Year 1928. London: H.M. Stationery Office. 1929. 3s. 6d. Copies may be obtained in America from the British Library of Information, French Buildings, 5, East Forty-fifth-street, New York.

This work has not yet been completed, and is being carried on side by side with other important investigations concerning the influence of various types of fungal invasion on the metabolic processes of the apple. It is clear that results of vital importance have already been obtained by such investigation, and we may confidently look forward to a time in the near future when our supplies of food will be improved in regard both to quality and variety, and one may well hope, lowered in price, as the result of the activities of the Food Investigation Board.

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THE NOBEL PRIZEMEN.

EVERYONE will be glad that a Nobel prize—at any rate, half of one—has been awarded to Prof. Sir **FREDERICK GOWLAND HOPKINS**, if only because it gives us an opportunity of expressing our affectionate admiration of what he has done, and what he has been, and is, in English biochemistry. His laboratory career has been spattered with the results of his peculiar flair for seeing where the explanations of things lie; the pigments of white butterflies and a method of estimating uric acid are in the early years, the efficacy of milk as a food and glutathione (very frankly qualified the other day) are more mature products. And in between he has been the activating inspiration of a great number of young people. Their experience we envy, and it is not surprising that they flock so abundantly to the "Museum Hoppianum" in Tennis Court-road in Cambridge. **HOPKINS** did not, of course, "discover" vitamins; it is very doubtful, indeed, whether anyone really "discovers" anything in the ordinary sense; they put links into a chain. But the link which **HOPKINS** put into the process of finding out about the fat-soluble vitamins was important, and it came just at the right time, and it is, we suppose, with this particular activity of his in mind that the Nobel electors have joined with him Prof. **CHRISTIAAN EIJKMAN** of Utrecht who, a quarter of a century ago, made quite clear the connexion of beri-beri with diet through his convincing experiments with whole and decorticated rice in relation to the polyneuritis of birds. **EIJKMAN**, too, has not been a man of one idea. He has had a long career of fruitful activity in bacteriology, has devised good practical methods of growing the colon bacillus, and has involved himself in the philosophy of the theory of disinfection. Though "vitamins" is the obvious word which occurs to one's mind on reading the announcement in the papers, it is well to reflect how the many-sidedness of both men has given substance and comprehensiveness to their specialised investigations. And perhaps some of those who work at vitamins now would make better progress if they were not so exclusive in their interests.

Annotations.

"Ne quid nimis."

PARTNERSHIP IN INDUSTRIAL HEALTH.

A BRIEF account appears in another column of a social meeting in connexion with the Industrial Health Education Society. At the luncheon given by Lord Melchett to a representative group of persons directly or indirectly interested in the objects of the Society the need for explaining in detail what had been done and what was being done did not arise because so many in the room were familiar with what might have been said. But it is probable that such knowledge is not at all general or shared by many of the medical profession, who may not know what is the actual work of the Industrial Health Education Society. This Society, first, is the only voluntary society concerned with occupational disease, and its work is directed towards securing one great object—namely, the information of industrial workers as to the diseases and disabilities to which they in their particular trade are liable, so that, at any rate during working hours, certain perils may be avoided. The instruction is given in the form of health talks by medical men and dental surgeons, and on the invitation of the workers themselves—that is to say, the subjects of the health talks are chosen by the workers and the occasions for them are determined by the workers, the meetings being organised in their own clubs and canteens. In this way the presence is secured of workers who certainly would not usually assist at lectures on health where general questions of hygiene, environment, nutrition, and welfare were to be discussed. Yet these are the men who are deeply interested in a practical way in the incidence of occupational disease and accidents, and through the medium of the Society they are asking for instruction along definite lines, and they obtain it as much from the results of the cross-examination to which they are urged to submit the lecturer as from any set delivery of his. The fact that the initiative comes from the workers is of great importance, for the knowledge that the employers are not at the back of the lecturer removes a suspicion which has had malign influence in the United States, where the scientific management associated with the name of Frederick W. Taylor came to be regarded as a new form of oppression under the eponym of "Taylorism." The statistics which have appeared in the United States from many quarters, illustrating the increased efficiency of operatives who are maintained during their work in good health, have been collated with equally interesting figures as to the increased output from factories where sanitary environment is provided. The result has been that the cynical feeling has often been expressed across the Atlantic that the interest shown by employers in the hygienic conditions of the workshop may have its in a commercial intent to get more work out of the men. This is an avenue of distrust which the words used at Lord Melchett's luncheon by the host, by Sir William Milligan, and by Mr. Ben Tillett should close. While the physical suffering is borne by the workers, they share also in the evils associated with trade depressions. The education in the factors of physical amelioration will enable the workers to demand from the employers conditions valuable to both parties, while the employers will have to obtain the knowledge which is being placed at the disposal of the employed, so that they may deal fairly with such demands. Put briefly, the health of the industrial workers is not a matter for parties at all, but for partners.

CEREBRAL INFECTION FROM THE NASAL CAVITIES.

In 1926 the Minister of Health appointed a committee to inquire into the improvements possible in the process of vaccination. The committee, having examined the evidence, reported that in their opinion some light might be thrown on the nature and origin of the nervous complications by a knowledge of the channels by which infection might pass from the nasal cavities to the brain. Prof. le Gros Clark was therefore asked to investigate this problem, and the results of his work have now been published[1] in a pamphlet. Reviewing previous experiments, he points out that the injection of coloured dyes into dead subjects may easily lead to fallacious results, but a connexion between the subarachnoid space and the nasal cavity along the perineural spaces of the olfactory nerve has been repeatedly established. After experimenting with carbon suspension and trypan-blue, he came to the conclusion that the best material was a solution of potassium ferrocyanide and iron ammonium citrate in equal parts, made up to a strength of 1 per cent. This solution is practically isotonic with the body fluids. It was dropped, by Dr. Mervyn Gordon's technique, into the nasal cavity of rabbits and after the death of the animal the tissues were placed in 10 per cent. formalin, with 5 per cent. hydrochloric acid to precipitate granules of Prussian blue. These granules are not diffusible in the preserved tissues after death. When the mucous membrane of the nasal septum was dehydrated, cleared in xylol-phenol or oil of wintergreen and mounted in balsam, the olfactory nerve bundles were found to be strikingly outlined by a deposit of granules along the nerve-sheaths, strewn around in the intercellular spaces of the perineural sheath. Occasionally a few granules were seen in the substance of the bundles among the nerve-fibres, and often the individual sheaths were linked up by intercommunicating strands of blue granules running in among the follicles of the serous glands and forming a sort of plexus. The granules seemed to lie in the connective tissue spaces rather than in endothelial tubes, while the plexus connected up here and there with larger vessels in which the endothelial lining was distinctly visible. Few granules were found in the submucosa of the respiratory part of the mucous membrane, although a deposit of blue might be found on the surface. The sections provided abundant evidence that the solution had been absorbed into the submucous tissues through the olfactory mucous membrane and that absorption could occur within one hour of dropping the solution up the nose.

The granules showed a marked tendency to infiltrate the periosteum and perichondrium covering the turbinate system, and in the region of the cribriform plate there was convincing proof that they entered the cranial cavity. The subarachnoid space becomes continuous through the cribriform openings with the delicate trabecular sheaths of the olfactory nerves, and it was principally along this path—though also partly along the small blood-vessels and by extension along the periosteum—that granules made their way into the skull. The great absorptive property of the olfactory mucous membrane (contrasted with the poor permeability of the respiratory portion which absorbed very small amounts) is probably connected with the sense of smell. From the disposition of the granules it was reasonable to postulate a continuous stream of absorbed fluid passing centripetally along the nerve-fibres from the epithelium to the brain; a current must normally run in this direction. The absorbed solution is partly drained away by the ordinary lymphatic channels, but no evidence was obtained of a communication between the perineural sheath spaces and the lymphatics, or between the subarachnoid space and the nasal lymphatics. There was abundant evidence that the solution was absorbed into the blood capillaries and in a few cases conveyed by minute vessels through the cribriform plate; these vessels theoretically provide a route for pyogenic and thrombotic infections but cannot otherwise play a very important part in disease. Material can also pass to a certain extent into the cranial cavity, though not, of course, into the subarachnoid space, by penetrating the periosteum or perichondrium or passing through the bone of the ethmoid. Infection might thus spread to the extradural spaces. Goodpasture has suggested that the herpetic virus may reach the central nervous system via the axis cylinders of the olfactory nerves. This would depend probably on a peculiar affinity between a specific virus and the physico-chemical nature of the neurone, and was not considered susceptible to anatomical investigation.

While these experiments relate to rabbits, there is one case on record which suggests their applicability to human beings. A man suffering from epistaxis had his nose plugged with a tampon soaked in perchloride of iron. He died a few days later from meningitis, and at autopsy his olfactory bulbs were found to contain iron. The investigations provide an unimpeachable anatomical basis for the theory that certain droplet infections reaching the body through the nasal cavities can obtain direct and rapid access to the subarachnoid space. The brain has usually been regarded as a closed system, marvellously protected from the outer world. The news that fine granules can reach it, by a direct route, within an hour of their impact on the outside of the body offers a wide field for speculation.

HEALTH OF THE R.A.F.

In his latest report[1] on the Health of the Royal Air Force, Air Vice-Marshal David Munro, the Director of Medical Services, is able to give a satisfactory account of the year 1928, and says that 88 per cent. of the officers called upon to fly were found fit for all flying duties. The average strength of the Force was 30,470 men and the admissions to hospital or sick quarters fell to 430·1 per 1000 (467·8 last year) with a considerable reduction in those for "sandfly, malaria, and influenza." Flying units have relatively fewer cases of disease, but of course, far more injuries than the others. Deaths from disease numbered 40 including 5 each from tubercle and enteric. As a result of injury there were 97, of which 65 (an increase of 13) were by flying casualties on duty. The relation of such casualties to the total hours flown is not mentioned this year. The chief causes of invaliding were psychoneurosis (28) and tubercle (22). A joint committee of the three Services has studied the incidence of tubercle, and a new table appears, showing that in the R.A.F. there was a relatively high incidence of tubercle before 25 and after 45 years of age, and between five and nine years' service. The prevalence of venereal disease slightly increased at home. Diphtheria cases were fewer; it is not stated whether this has any relation to the testing and immunisation of last year. Two kinds of influenza vaccine were tried among a total of 960 men; in both groups a third were later attacked by influenza, while in a control group of 1041 men the incidence was much the same. Dysentery on all stations abroad is mostly bacillary. Malaria has been reduced by a half during the year and for this reduction mosquito-proofing of barracks is given most thanks though Paris green is also mentioned. An interesting account is given of the difficulties of a force on active service in Iraq. In peace-time the great trouble in that country is to find amusement for the men in the evening to protect them from malaria and other diseases. Great attention is paid to hygiene in the training of the Force, and the orderlies, being themselves craftsmen, like all in the R.A.F., spend much of their spare time in making instructional models. Wounded and sick are now carried by air in service types of aircraft, not in flying ambulances, and this is found to be both comfortable and economical.

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[1] Reports on Public Health and Medical Subjects, No. 54. H.M. Stationery Office. 1929. Pp. 27. 1s.

[1] Report on Health of Royal Air Force during 1928. H.M. Stationery Office. 1929. 4s.

This report appears 11 months after the one for 1927.

BLOOD-GROUPS IN PUERPERAL AND NEONATAL DISORDERS.

THE blood of mother and fœtus may differ from one another in group constitution, and from time to time it has been suggested that an incompatibility in respect of iso-agglutinins and agglutinogens has some bearing upon disorders of the puerperium and of the first few days of life. In a series of 152 observations on mothers and their newly-born children, E. Bansillon,[1] of Lyons, found 30 cases in which the red cells of the child were agglutinated by the serum of the mother. In 20 (about 55 per cent.) of these the pregnancy had been characterised by severe vomiting beyond the third month, albuminuria, headache, and other so-called eclamptic symptoms. In a parallel series of 121 cases in which the maternal serum was incapable of agglutinating the fœtal red cells these symptoms only appeared in 16 (about 13 per cent.), though in one of them the symptoms were "graves avec eclampsisme." The converse case of agglutination of the maternal red cells by the fœtal serum was investigated with special reference to its possible relation to icterus neonatorum. In a series of 155 observations, 22 cases were found in which the fœtal serum was capable of agglutinating the maternal red cells. In 15 (or nearly 69 per cent.) of these the child showed marked jaundice during the first three days of life. Among 133 children whose serum was incapable of agglutinating the maternal red cells, icterus showed itself in only 10 (about 7 per cent.). Despite his suggestive findings, Bansillon remains sceptical about the possibility of a relationship between "eclampsisme" and incompatibility of maternal and fœtal blood. But at any rate he seems to have made out a case for further inquiry into the possible relationship between icterus neonatorum and agglutinability of the maternal red cells by the fœtal serum.

RECONSTRUCTION OF THE ROYAL VETERINARY COLLEGE.

THE importance to the State in an agricultural country of an efficient veterinary service is so obvious that it is not surprising that the Royal Veterinary College, four years after its foundation in 1791, became the recipient of a grant from Parliament of £1500 yearly. What is far more remarkable is the fact that after the year 1815 the grant was withdrawn, and that since then the College has been maintained only by donations and the relatively small sums represented by the fees of the students. The Development Fund gave a sum a few years ago for the erection of a Research Institute, and annual grants have been received from the Ministry of Agriculture and Fisheries for the maintenance of this department; but the school itself has meanwhile fallen into so serious a state of dilapidation that it is in danger of closure from lack of funds. It is scarcely a reasonable policy to encourage research while so vigorously discouraging the coming generation of research workers. Some of the educational buildings have already been condemned as unsafe, while the annual expenditure on repairs is a formidable drain on the straitened resources of the College. In the appeal for funds made three years ago by the Royal Veterinary College it was noted that in France and Germany the maintenance grants for the veterinary colleges in a single year before the war exceeded the total amount given by successive governments for veterinary education in England and Wales during the last 100 years.

In a recent report[1] on the Reconstruction of the Royal Veterinary College the Departmental Committee of the Ministry of Agriculture and Fisheries comment on the unselfish work, under deplorable conditions, of the members of the teaching staff and advises complete reconstruction and reorganisation as the only means of ensuring the continued existence of the College. The report deals comprehensively with the factors to be considered in the construction of the proposed new college, with special attention to site, accommodation, curriculum, staff, and government. The present buildings at Camden Town suffer from constriction and noise of traffic, but have the advantages of a central position and proximity to Islington Cattle Market, University College, and the London School of Tropical Hygiene. A town site, the committee consider, is preferable to a site in the country, since larger numbers of cases pass through the College for treatment, and though these are mainly cats and dogs and horses the experience of students in the treatment of farm animals can be supplemented by residence with practising veterinary surgeons and farmers during the vacation. It is doubtful whether a country site would command a greater number of farm animals than may be brought to a town clinic by motor ambulance, while a decrease in the numbers of small domestic animals would be inevitable. Familiarity with large numbers of sick animals is essential to the student, and can clearly be best obtained in towns. Another advantage of the present site lies in the fact that the College will probably become affiliated to the University of London, when the opportunities for recreation and social intercourse among the students would be much increased. It is proposed to provide for an annual entry of 75 students, including women, who were only admitted to the College in 1927—with total accommodation for 250; and to offer a four-year course, as at present, in preparation for the Diploma of the Royal College of Veterinary Surgeons. The report emphasises the desirability of a close connexion between the educational and the research departments of the institute, and the architectural construction of the new buildings would be designed to encourage this. A considerable increase in the staff is strongly advised with corresponding additions to equipment and maintenance; the new buildings are intended to provide ample laboratory and class-room accommodation with space for wards, operating theatres, and X ray apparatus. The estimated approximate cost of the new building, including equipment, is £280,000—or £300,000 if the freehold of the present site and certain neighbouring land can be obtained. The cost of maintaining the new College is estimated at £21,000 per annum, and an increase in the grant to the Research Institute from £5000 to £25,000 per annum is advised, with a view to providing a field station near London for experimental work on larger animals.

The response to the appeal for funds made by the governing body during the last three years has been disappointing, only £30,000 having been collected, and though the Treasury have sanctioned a grant of a sum not exceeding £35,000 for erecting new buildings, this grant is subject to the condition that the governors must provide an equal sum for every £1 received.

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[1] Jour. de Méd. de Lyon, Oct. 5th, 1929, p. 637.

[1] London: H.M. Stationery Office. 1929. Pp. 26. 1s. 3d.

Even so the funds at present fall lamentably short of the advised outlay. Those who have had the opportunity of inspecting the magnificent veterinary institutes subsidised by the State in other parts of the Empire—for example, that organised at Onderstepoort, Pretoria, by Sir Arnold Theiler—will support the demand for an adequately equipped and staffed College in this country, where the lack of proper facilities for training reacts on the status of the veterinary surgeon.

AN ENGINEER ON INDIAN SANITATION.

In tropical countries especially medicine has frequently to call in the aid of the engineer, and the views of an Indian sanitary engineer of outstanding experience are, therefore, of considerable interest to all medical men who practise in warm climates. Mr. G. Bransby Williams, formerly chief engineer of the Public Health Department of Bengal, has on two occasions addressed the Rotary Club of Calcutta on the subject of public health in India, and his last address, delivered in June of this year, contains a great deal to provoke thought. It is not difficult, in most parts of India, to produce vital statistics, which, from a European standpoint, are appalling, and Calcutta maintains an unenviable lead in this respect. The advantages of improved hygienic conditions may be worked out in terms of rupees, as well as of physical and moral advancement; this has been frequently done, and we need not elaborate that side of Mr. Williams's address, but other aspects are worthy of study. He begins by referring to the stupid as well as rather brutal attitude of a certain type of pseudo-philosopher, who turns down attempts at social and hygienic betterment, with the argument that to interfere in these matters is to disturb the balance of nature, and that as India is over-populated, it is unwise to take steps to lower the death-rate. It may be true, as David Harum held, that a moderate amount of fleas are good for a dog, inasmuch as they keep him from brooding over being a dog, but a laissez-faire attitude should not prevent us from trying to envisage an India which is not only more healthy, but better fed, better housed, better educated, and more generally prosperous than at present.

Mr. Williams tilts against official inertia in sanitary matters. He points out that the expenditure on water-supply, antimalarial measures, and public health generally in India is ridiculously small, and he adduces instances of gross neglect by responsible official bodies. The drainage outfall of Calcutta, it appears, is being allowed gradually to silt up, without any serious effort being made to keep it open. The neighbouring town of Howrah, with 200,000 inhabitants, has been permitted to develop on village lines, with no proper sanitation at all. Calcutta itself is growing increasingly unhealthy, as shown by the mortality figures, and it is to be feared that the same is true of some other large centres. On these and similar grounds Mr. Williams comes to his main thesis, which is that, as regards any serious improvement in the health of the inhabitants, the results of the British administration have been to a great extent a failure, no advance having been made comparable to that in Great Britain and other western countries. The fault, he admits, lies largely with local authorities, and unless a new atmosphere can be created, he believes that conditions are likely to get worse than better, with a further broadening of popular control. As a start he advocates the institution of large-scale experiments by public health and engineering authorities in specially insanitary areas, with a view to prophylaxis of disease.

There is, of course, another side to the picture which Mr. Williams draws. Small-pox has been definitely controlled, cholera has been checked in many of its worst manifestations, and the resources of modern science have been made available for anyone who has the initiative to use them in regard to malaria, tuberculosis, kala-azar, diphtheria, and other diseases. The path to general sanitary improvement has been indicated, and the influence of the British administration has always been exerted in favour of medical and public health reforms. More advanced communities, such as the Parsis of Bombay, have availed themselves largely of the opportunities provided, with immense profit to their section of the population. Large scale demonstrations of modern sanitation do exist in cantonments and the larger urban centres, and in some rural districts in the form of tea and rubber plantations, many of which are models of sanitary, as well as industrial, organisation. Such examples might with advantage be multiplied many times over, but the root of the whole question is, of course, education, not merely school and university education, but simple instruction in the homes of the people, and more particularly in the quarters of the women. In Gurgaon Mr. Brayne has shown what can be done by appropriate propaganda. "When you lose your way in Gurgaon district you find your way by your nose. The greater the stink the nearer the village. Even the animals clean their young, and do not foul their nests by insanitary habits. Why are Gurgaon villagers worse than animals?" By means of such simple home-truths has the deputy commissioner of Gurgaon appealed to his flock, who have shown themselves not devoid of humorous appreciation, and have responded in practical fashion.

A LABORATORY TEST FOR SMALL-POX.

Diagnosis of the mild small-pox prevalent in this country is sometimes difficult, especially at the beginning of an epidemic when there have been no previous cases to make the practitioner suspicious. A laboratory test of proved diagnostic worth would be very useful in the diagnosis of atypical cases and therefore of great help in the control of epidemics.

In 1925 M. H. Gordon demonstrated that the virus of small-pox gave both specific complement fixation and flocculation with an antivariola serum. His evidence was convincing and its practical application is now forthcoming in a report[1] by Dr. W. L. Burgess, Dr. James Craigie, and Prof. W. J. Tulloch on the application of the flocculation test to the diagnosis of small-pox. The reaction is carried out with a suspension of the crusts from a suspected case and a specific flocculating serum prepared in the rabbit. The material was obtained from 93 cases coming from three different localities, Dundee, Arbroath, and South Shields. Fifty-three of these were cases of small-pox, which with one exception were of the mild type, and many of them presented considerable difficulty in clinical diagnosis. The remaining 40 constituted the control material and consisted of 11 cases of vaccinia (bovine 4, rabbit 5, human 2), 27 cases of chicken-pox, 1 case of impetigo, and 1 of septic rash. The results of the flocculation test were correlated with the clinical and epidemiological evidence, and the authors of the report conclude that the reaction is specific and of diagnostic value. In this they seem to be entirely justified and they are to be congratulated on an eminently satisfactory piece of work. But the importance of this investigation is not only a practical one, for it throws light on the mechanism of the immunity reactions of filtrable viruses. From his work with the viruses of vaccinia and variola Gordon claims that the immune reactions of bacteria and filtrable viruses are fundamentally the same and in this he does not stand alone. His position has been assailed, however, by certain investigators—notably Schultz and his co-workers in the United States and C. H. Andrewes in this country. Schultz and his colleagues fail to find any specificity in the complement-fixation and agglutination reactions obtained with viruses and their antisera, and they think that these reactions are attributable to contaminating bacteria present in the virus suspensions. Burgess, Craigie, and Tulloch have done control experiments with sera prepared against the bacteria found as contaminants in their virus material and their results do not support Schultz's contention.

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[1] Diagnostic Value of the "Vaccinia Variola" Flocculation Test. Medical Research Council Special Report Series, No. 143

This report is a valuable contribution to the literature of filtrable viruses and, as the Medical Research Council points out in the preface, it demonstrates the value of investigations carried out in the field by a medical officer of health in close coöperation with laboratory workers.

THE PREPARATION OF CATGUT.

CATGUT, to the preparation of which for surgical use the Medical Research Council have devoted a special report,[1] was certainly used by Galen for sutures, and, during the Middle Ages, by a number of surgeons; but it was not until the 'sixties of last century, when antiseptic surgery was devised by Lister, that it became an important material in surgical practice. It was then recognised that the elastic layer of the small intestine of sheep (for cat denotes not the source of the gut but the use to which it was first put, if it derives from an old word for fiddle) possessed many of the qualities which are desired for ligatures and sutures. First of these is a tensile strength commensurate with its gauge, a measure of elasticity, and the retention of these qualities for a long time. Its absorbability has a value which varies with the purpose to which it is put. Its great drawback is the difficulty of rendering it sterile, many of the methods which have been invented for the purpose having proved ineffective. From its place of origin catgut is obviously apt to be contaminated with many germs, some of which may be harmless while others may lead to serious infection. It is clear from the report that the large majority of the methods hitherto employed do not produce an absolutely aseptic gut, whether the test is made for germs naturally present in the gut or for specially virulent organisms introduced by intention. Nevertheless, it is a fact that surgeons have been able nearly always to obtain perfect results without any wound infection by the use of these methods, the tissues being capable of dealing effectively with a slight degree of infection, just as in pre-antiseptic days suppuration did not necessarily follow operation, even when unsterilised ligatures and sutures were buried. But at the present time no surgeon should be satisfied with suture material which can possibly contain living germs. The earliest attempt to destroy the organisms completely was made by Lister, who steeped catgut for some hours in a solution of carbolic acid, with perfect results from the surgical point of view; later he employed a mixture of dilute carbolic acid and olive oil; mercuric salts were soon substituted, and it will be news to many to learn that of these the biniodide is decidedly less powerful than the perchloride. Chromic acid was next tried, then various compounds of silver, turpentine, sundry essential oils, and other substances. Finally came iodine, which in one form or another has received the greatest measure of support. With nearly all these substances the test of efficiency was clinical; one and all produced a catgut which, in the great majority of operations, allowed the wound to heal without suppuration or any other sign of infection. The bacteriologist can, however, find infective germs in the gut every time. An essential difficulty in examining the claims of a particular antiseptic resides in the fact that, before the test can be applied, every trace of the chemical must be removed from the gut, for otherwise it may inhibit the growth of some germ which is actually present. No amount of washing with water will effect this, a point in which many investigators have failed. After an exhaustive survey the authors of the report give their adherence to iodine as a sterilising agent, combined with meticulous care at every stage of the process, from the earliest. If immersed for nine days in a solution of iodine of suitable strength at an early stage of preparation, catgut will absorb 12 per cent. of its own weight of oidine. If the iodine is in excess the gut becomes brittle, and it is necessary to remove some of it from the ligature after it has been sterilised. Flexibility is enhanced by adding glycerin to the iodine solution. All who prepare catgut ligatures and all who use them will need to pay attention to the conclusions reached in the report.

THE ADMINISTRATION OF NATIONAL RADIUM.

THE Radium Commission has decided, for the present, to recognise as national radium centres only such places as possess medical schools with complete clinical courses and the necessary facilities for instructing students and post-graduates in the principles and practice of radium therapy. In the view of the Commission, the need for more trained and qualified workers in the use of radium is even more urgent than the supply of radium itself. The Commission has further decided to initiate all negotiations for the constitution and equipment of national radium centres through the medical faculties of the local Universities concerned, and this procedure is now being followed. When the claims and requirements of these centres have been considered and assessed by the Commission, the allocation of national radium will be commenced. About 8 g. should be available for distribution, on loan, by the end of this year, and another 7 g. before the autumn of 1930. It is estimated by the Commission that practically all the radium which can be purchased by the Trust with the funds already subscribed will be required for the equipment of the national radium centres, and it is regarded as unlikely that any of this national radium will be available for allocation to other hospitals or institutions.

The radium for the "4-g. bomb" has been received from Belgium, measured and tested by the National Physical Laboratory, and handed over to the authorities of Westminster Hospital, where it has been installed. If, after three months, the radium is purchased, it will be entrusted for a further period of three years (at a rental of £410 per annum) to this hospital, which will maintain a continuous day and night service with the bomb, in the pursuit of certain clinical objectives prescribed by the Commission. A radon plant is to be installed at the National Physical Laboratory for the purpose of supplying radium emanation to institutions which otherwise could receive no direct assistance from the Commission in connexion with radium therapy. Questionaires relating to this service are being framed.

TUFFIER.

THE death in Paris last week of Sir Théodore Tuffier at the age of 72 years has removed from us one who upheld a great surgical tradition and who has been described in the *Siècle Médical* as worthy of the title "A Prince of Science." Tuffier had been for more than 40 years surgeon to Paris hospitals, but his name and fame were attached especially to the Hôpital Beaujon and the Hôpital de la Cité du Midi. There was hardly a province of surgery in which he did not do pioneer work; the development of spinal anæsthesia was perhaps the major interest of his life, with the surgery of the lung coming scarcely second. His published works on renal tuberculosis, on uterine fibroids, and on the treatment of inoperable cancer commanded general attention. He was a great traveller and was familiar at first hand with surgical practice all over the world. Conversely his own surgical clinic at the Cité became a centre of attraction for surgeons of all nationalities. Early in the Great War Tuffier was brought into intimate relations with the surgeons of the British Expeditionary Force, of which we have personal testimony from Sir George Makins, who was senior consulting surgeon to the Force. When at the suggestion of Mr. Lloyd George the Conférence Interalliée was instituted to discuss the methods of surgical treatment in favour amongst surgeons of the allied armies, it was arranged that the meetings should take place in Paris, and Tuffier was elected president. Into the organisation of these meetings he entered with great enthusiasm and he made an effort to keep the work alive between the official meetings by monthly gatherings at his own house. There can be no doubt, Sir George Makins, writes, that these discussions had an important influence not only on the diffusion of experience gained in the different armies, but also on methods of treatment, hospital organisation, and the transport of patients. Tuffier himself was so impressed by the value of these international meetings that he made efforts to continue similar conferences after the war, and in fact the fifth of such meetings was held in London this year. Tuffier was an early and ardent adherent of the method of treatment of wounds devised by Carrel and Dakin, and speedily introduced it into the French hospitals. Always eager to adopt new ideas, he was the first surgeon to transport a patient by aeroplane, and thus brought a man wounded in the chest over the lines of the enemy to a base hospital in North Africa. A man of great personal charm, of high culture, a good linguist and conversationalist, Tuffier was also most hospitable. Many British surgeons in Paris during 1914–18 remember with pleasure visits to his home, where he had accumulated a wonderful collection of pictures and objects of vertu of all kinds. For over 25 years Tuffier was associated with the work of the Hertford British Hospital in Paris, first as surgeon and later as chairman of committee. The British Government recognised his services uring the war by creating him a Knight of the British Empire and a Companion of the Bath. His eminence as a surgeon had already been recognised by his colleagues by his election in 1913 as an honorary Fellow of the Royal College of Surgeons of England.

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[1] See THE LANCET, Nov. 2nd, p. 946.

MEDICAL TREATMENT OF EXOPHTHALMIC GOITRE.

OF late years a mass of reports on the successful use of surgery in long series of cases of exophthalmic goitre has overshadowed other methods of dealing with this disease. But operative treatment, although it produces a certain benefit in a certain time, is admitted to be unsound at bottom, and we turn with interest to an account of the end-results of medical measures in 2000 cases studied during a period of 19 years, and now described by Israel Bram.[1] In this series care was taken to differentiate between, on the one hand, toxic adenoma with secondary Graves's disease, which was treated surgically, and, on the other, true Graves's disease, which was treated medically. The medical treatment was on the following lines. Rest was deemed important, but unless there were serious cardiac lesions the patient was allowed to get up for three hours in the morning and also in the afternoon. Special attention was paid to home environment, and when harmony was lacking sanatorium treatment was given. A properly equipped sanatorium, at a moderate altitude, where dietetic, sociological, psychological, and medical supervision can be suited to individual needs is next best, says Bram, to a congenial home. The diet was ample—about twice as much as for normal people—but low in animal protein. Drug treatment was mainly symptomatic; quinine salts, ovarian products, suprarenal cortex, and mild sedatives were found useful, whilst care was taken to avoid the use of thyroid extract, the opiates, iodides, and digitalis. Psychotherapy was regarded as a vital part of the treatment, and every effort was made to clear up conflicts of internal or external origin. The patients were discharged from active treatment in from 2 to 18 months, the average for all cases being 8 months. Those who were able to relax properly made much more rapid recovery than those who were weighed down with household or other duties. In 20 per cent. of the series surgical treatment had been resorted to months or years previously. Some of these had derived temporary benefit from partial thyroidectomy and others had not improved. It was found (contrary to general opinion) that post-operative cases with myxœdema tolerated thyroid extract almost as badly as those without any such signs of insufficiency, the only effect of the thyroid extract being to cause a flare-up of the still persisting symptoms of Graves's disease. The cases were followed for from three to ten years, and in recording the results the verdict of complete recovery was accorded to patients whose pulse-rate, basal metabolic rate, and weight were normal, who had no tremor, no exophthalmos, and no enlargement of the thyroid, and who had a feeling of perfect well-being and a normal endurance for social and economic purposes. It is stated that according to these criteria recovery took place in 91 per cent. of the 2000 cases, whilst 3 per cent. were completely cured but for slight persistence of the exophthalmos, 3 per cent. had residual enlargement of the heart without subjective symptoms, and 3 per cent. had signs of myxœdema with or without cardiac enlargement. The latter were cases in which thyroidectomy had been done months or years before regular medical treatment was started. Recurrence of the disease months or years after the patient was considered cured was unknown in the series, and Bram thinks that with treatment on these lines a patient "instructed in the art of relative simplicity of mental and physical existence" is unlikely to develop the disease again in later life. He holds that the main cause of failure in medical treatment is insufficient study of the individual as a whole, and the spirit of haste in which medical treatment is only too often carried out.

OUR MEDICAL LAUREATE.

Dr. Bridges, having appealed, in the words of Virgil, for the support of his adored Muses, testifies in this earnest difficult poem[1] to a life-long love of beauty, seeing that with the world's attainment of accumulated knowledge new orders of beauty arise; but a devotion to Greek culture compels him to regret that man's faculties have not developed in a comparable manner, so that there is "now no higher intellect to brighten the world than little Hellas own'd." The poet's deep religious feeling, however, and, wittingly or unwittingly, the humanism pertaining to his profession, lead him to point out the limitations to the Greek ideals. From this introduction the poet, in a second book, goes on to review the war history of the world, finding it an expression of the "Autarchy of Selfhood . . . by Reason denounced"; while in a third book he considers Breed, the second and "younger of the two arch-instincts of man's nature." Here medical knowledge is freely used in thought and word, and a similar ability to employ correctly the vocabulary and reasoning of the physiologist and the psychologist will be found in Ethick, the closing book.

We have here a religious appeal written in austere and beautiful language, with an effective disregard for the rules which used to govern the making of Alexandrines. Perhaps prosody as much as poetry lies without our proper sphere of criticism, but upon orthography we may express opinion. The approach to a simplified spelling employed by the poet in his text does not follow a logical pattern.

THE next session of the General Medical Council will begin at 2 P.M. on Tuesday, Nov. 26th, when Sir Donald MacAlister, the President, will take the chair and give an address.

THE Lloyd Roberts memorial lecture will be delivered at the Royal College of Physicians of London at 5 P.M. on Thursday next, Nov. 14th, by Mr. H. A. L. Fisher. The subject is An Oxford Movement.

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[1] Med. Jour. and Record, Sept. 4th, 1929, p. 248.

[1] The Testament of Beauty. By Robert Bridges. Oxford: The Clarendon Press. 1929. Pp. 192. 7*s.* 6*d.*

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LI.

THE INTERPRETATION OF TESTS OF STERILITY AND FERTILITY IN THE MALE.

UNTIL recently the only test to which the male has been subjected in cases of childlessness in marriage has been the examination of the semen for the presence of living spermatozoa. If these were found in what appeared to be reasonable numbers the result was considered satisfactory, and on the female partner in the marriage was placed the responsibility for the absence of children. But of recent years this method of dividing males into two classes of sterile and fertile has been found to be insufficient. It has been realised that a failure to conceive may be the result of a relative as opposed to an absolute sterility on the part of one or both of the partners in marriage. Even a minor degree of impairment of fertility in the male may, if he be united with an unfertile partner, become of supreme importance. Childlessness is, in fact, the result of the sum of the impaired fertility of husband and wife. This being so, a report on the husband should, if possible, furnish information as to his relative fertility, as well as the mere statement whether the semen contains active spermatozoa or not.

Examination of a Condom Specimen of Semen.

The quantity of semen emitted at a single coitus varies in different individuals, and at different times, and oligospermia is only of importance if of marked degree, and if it is known that a week's abstinence has been observed prior to the taking of the specimen. Oligospermia is physiological in old age. In a younger man it suggests suppression of prostatic secretion, and indicates the necessity for a careful examination of that organ. If in addition to oligospermia pus cells are found in the semen, an old-standing chronic prostatitis is a possible explanation. Finally, it should be borne in mind that the wearing of a rubber sheath may interfere with coitus in a nervous male and be responsible for the scanty emission. For this reason two or three specimens should be examined before oligospermia is reported.

Hæmospermia.

Hæmospermia suggests the presence of a chronic inflammation or congestion somewhere in the seminal tract, and more especially in the vesicles. It has also been found in cases of prostatic enlargement and in association with certain blood diseases, such as scurvy. If the blood is uniformly mixed with the semen, the vesicles are more likely to be implicated; if less completely mixed, the posterior urethra. In many cases of hæmospermia no lesion of the genital tract can be found, even after a searching examination.

Pyospermia.

The presence of pus points to an infection of the seminal tract. The same deductions may be made from the mixing of the pus in the semen as in the case of blood. In the presence of pus spermatozoa commonly lose their mobility and die. But the action of pus on the spermatozoa is very variable, and sometimes pus is found in the semen of fertile men. It is indeed probable that it is not the pus itself which is harmful, but that the pus is evidence of an inflammation which renders the secretions unfavourable to the life of the spermatozoa.

Necrozoöspermia.

The length of time that spermatozoa remain active and living after emission is affected by numerous factors. Some of these depend on the nature of the secretions surrounding the spermatozoa and some on the care taken to maintain the specimen at a uniform body temperature. The duration of life after emission may, however, be taken as a measure of the vitality of the spermatozoa. It can be studied by putting a drop on a slide under the microscope without any attempt being made to keep it warm, or else by placing the whole specimen in an incubator at body temperature and examining a drop from time to time. The presence of various types of deformed spermatozoa in a specimen is usually indicative of a hostile prostatic or vesicular fluid. If only dead spermatozoa are found at the first examination a fresher specimen should be obtained in order to discover whether the spermatozoa are dead at the time of ejaculation or whether they have died rapidly on account of unfavourable surroundings. The presence of blood, pus, and especially of micro-organisms in the semen, often explains a poor viability, especially if its reaction is found to be acid. In any case, necrozoöspermia is an indication for the need of a careful overhauling of the seminal tract for signs of inflammation.

Oligozoöspermia.

It is in richness in spermatozoa that the greatest number of variations are found when different specimens of semen are examined. Up till recently only large deviations from what was roughly considered the normal have been considered. Recently, however, Drs. Donald Comber and Morris Sanders have devised a method of spermatozoa counts, which expresses numerically the relative fertility of the male. These observers found that the average count in a healthy male is 100,000,000 spermatozoa per cubic centimetre. This figure remains fairly constant for the same individual at different emissions. It is diminished after sexual excesses or as the result of severe illness. It is lower in elderly men than in those still in their physical prime. As a general rule it is higher in those with large, well-developed testes than in those with small testes.

Anything that interferes with the formation of spermatozoa, or with their passage into the urethra, may produce an oligozoöspermia. The discovery of a low count in a young man should lead to a very careful examination, not only of the genital tract, but of the body as a whole. The testis is extraordinarily sensitive to changes elsewhere in the body, and treatment of any abnormality, be it a glandular defect or a septic focus, may have as a result an improvement in the spermatozoa count. The importance of oligozoöspermia as a factor in childlessness may be gauged by the fact that in only four of the 294 cases examined by the above quoted investigators did conception occur when the count was under 60,000,000.

Azoöspermia, or the complete absence of spermatozoa in the semen, may be explained either by a complete aspermatogenesis or else by a failure on the part of the spermatozoa to reach the urethra. The crucial test by means of which these two conditions may be distinguished is puncture of the testes and examination of the aspirated testicular fluid. This may be done under local anæsthesia. If no spermatozoa are found in the testicular fluid a search should be made for some constitutional defect, special attention being paid to the endocrine glands. If spermatozoa are found, the obstacle to their egress must be located by posterior urethroscopy and tests of patency of the ejaculatory ducts. This may be conveniently done by injecting a dye such as methylene-blue into the vasa at the neck of the scrotum and noting whether it appears in the urethra.

Statistics show that gonorrhœa is generally responsible for these cases of azoöspermia due to obstruction. Especially is this likely to follow bilateral epididymitis, as is shown by H. Benzer's observations on the after-history of German soldiers who had suffered from gonorrhœa and had been married for three or more years. He found that of those who had previously had unilateral epididymitis

23·4 per cent. were childless, and of those who had had bilateral trouble 41·7 per cent. In view of this risk of sterility it would be wise for all men who have suffered from bilateral epididymitis to submit a specimen of semen for examination before marriage. An azoöspermia of this nature is more likely than not to be incurable and a woman who marries a man in the hope that she may have children and discovers later that she can never be a mother may well have grounds for complaint if her husband, knowing the risk of sterility, has never submitted himself to examination. The same precautions should be advised where there is a history of epididymitis from other causes than gonorrhœa, or of orchitis following mumps.

General Consideration.

It must be remembered that in the case of the childless marriage multiple causes are the rule rather than the exception. The examination of the semen, therefore, although it is of great assistance in assessing the fertility of the male, is not the sole test to which he should be subjected. Constitutional factors that depress his fertility must be sought for. According to S. R. Meaken, the incidence of these constitutional faults is even greater in the male than than it is in the case of the female. Any examination, therefore, which helps us to assess the general physical health of a husband, for example a Wassermann, may be regarded as a test of fertility, although in this article only the examination of the semen has been considered.

KENNETH WALKER, F.R.C.S.,
Genito-urinary Surgeon to the Royal Northern Hospital and St. Paul's Hospital.

Special Articles.

REPORT ON AN OUTBREAK OF SICKNESS DUE TO CONTAMINATED MILK.

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THE outbreak occurred in the Roundhay and Moortown districts of Leeds on Sept. 30th last. There were involved 83 children, all of whom were under ten years of age. Of those affected, 78 were pupils at two elementary schools, A and B, in the city. The remaining 5 cases were children under school age of private families in receipt of milk from the same source as the two schools in question. The schools concerned, in common with the other Leeds elementary schools, receive a daily supply of milk in accordance with the scheme recently adopted by the Leeds Education Committee, which scheme commenced to operate on Sept. 9th last. Under the scheme, milk is provided to the schools by various purveyors according to district, and at the present time some 7000 gallons per diem are supplied in this way. One of the affected schools (A) receives 3 gallons, and the other (B) 1½ gallons per day. The milk is delivered to the schools each morning in capped bottles of one-third of a pint capacity, and straws are provided. The modus operandi is that the straw is thrust through a central thin portion of the cap and the milk is drunk through the straw. The milk supplied is non-graded and unpasteurised. The bulk quantity required under the scheme is such that much of the milk has perforce to be brought from without the city.

Source of Production.

At the time of the outbreak the affected schools were supplied with milk by a duly registered retail purveyor X, whose premises are situate within the city. The source of production was a farm outside the Leeds boundary occupied by Y. The milk was brought in churns from farm to dairy, bottled at the latter place, and finally delivered at the schools between 9 A.M. and 10 A.M. X had supplied the two schools in question (no others) since Sept. 16th, but it is to be noted that the day of the outbreak, the 30th, was the first on which milk from Y's farm was delivered at the schools. Prior to Sept. 29th, X had obtained his milk elsewhere, and there had been no untoward incident. On the 29th X obtained his first supply from Y. The day being Sunday, and the schools closed, the milk was delivered loose to private customers only. On Monday morning, before the school outbreak occurred, X learned that three young children on his round had the previous day suffered sickness which their parents attributed to the milk. The same day X delivered milk in bottles to the schools and loose to his private customers. There followed the school outbreak, and at least two cases of sickness in children on his private round.

On Sept. 30th at (A) school, 77 children partook of the milk; of these, as far as could be ascertained, 71 were affected, of whom it is certain 55 suffered severe vomiting. Six only of those who had taken milk were quite unaffected. None of the children who had not taken the milk was affected. At (B) school 39 children drank milk, 7 of whom suffered subsequent vomiting. At this school it was not possible to ascertain the number of children who drank milk and suffered consequent indisposition other than vomiting. Again there was no sickness among those who had not partaken of milk.

Characters of the Illness.

In both schools the milk was consumed at 11 A.M., and in the large majority of cases the sickness commenced about 1.30 P.M. Persistent vomiting was the most prominent feature, while mild diarrhœa and abdominal pain occurred in a few cases. Prostration was marked in isolated instances, necessitating the removal of the children from school to their homes by motor-car. The symptomatology indicated a condition of severe irritation in the upper alimentary tract.

On Oct. 1st the houses of 50 of the cases were visited by officers of the Leeds Public Health Department. It was elicited that, of these 50 children, 14 had stated that the milk tasted "funny" or "a bit sour," while all others had said that they had noticed nothing amiss. All concurred as to the normal appearance of the milk. Of the 50 cases, 6 commenced to be ill 2¼ hours after taking the milk, 30 2½ hours after, and 5 three hours after. According to the histories given by parents or children concerned, in 5 cases the illness lasted two hours, in 6 cases three hours, in 26 cases four hours, in 4 cases six hours, and in 9 cases seven hours. Howbeit all were fully recovered by the next morning. The comparatively short lapse of time between the ingestion of the milk and the appearance of symptoms suggested the action of a chemical poison, or of bacterial toxins already present in the milk at the time of consumption. The limited duration of the resultant illness was probably due largely to the rapid onset of severe vomiting which allowed of more or less prompt evacuation of the offending material.

Of the milk delivered to the affected schools on Sept. 30th all was consumed with the exception of the contents of one bottle. The available sample was divided into two parts, one of which was submitted for investigation to the Leeds city bacteriologist, and the other to the city analyst for chemical examination. The results of these inquiries are given below.

Conditions of Dairy and Farm.

The dairy through which the offending milk was supplied is a well-constructed brick building of 18 by 12 by 10 feet internal dimensions. The walls are of plaster and limewashed, the floor is of concrete, lighting and ventilation are adequate. Town's water is laid on. The sink is trapped and cut off, the waste-pipe discharging on to an outside gully. The dairy is fitted with a gas-heated hot water boiler for treatment of bottles and utensils. The bottles for school milk are brought from the school about noon each day (there is no duplicate set). They are thereupon rinsed and placed in cold water to soak. They are subsequently washed and brushed out with hot water, rinsed in cold water, and finally placed neck downwards in suitable racks to drain and dry. There has been no actual sterilisation by boiling or by steam. No chemical is employed in the cleansing process. The dairy fittings and utensils were found in a satisfactorily clean condition, which is in accord with previous findings.

The farm, which constituted the source of supply of the milk in question, had been occupied by Y for some few months only. The farmer had but commenced to produce and sell milk on Sept. 20th, having purchased the necessary herd of cows within the previous week. He was not at the time registered with the appropriate local authority as a milk producer. The cowsheds at the farm are two in number, and both were found extremely dirty. The larger shed has recently been reconstructed, and in that respect is satisfactory. The smaller requires improvement in paving and lighting. The farmyard was dirty and muddy, but no manure was present. The water-supply is derived by pumping from a deep well, and the supply is described as abundant, and has since been found to be of good quality. There is no milk room and no cooler. The farmer stated that his practice was to stand the filled churns in a trough of water. The milk produced on the evening of Sept. 29th (that which was supplied, through X, to the schools on the following morning) was cooled in this primitive way. As far as could be ascertained, the churns, while so standing in the water trough, had had their lids properly in position. The churns seen at the farm were of the approved pattern. The churns and utensils are cleansed in the yard near the house by water from the well. It was ascertained that the cows were being fed on certain proprietary "dairy cakes." The farmer stated that all the cows had behaved normally with the exception of one which had arrived at the farm on Sept. 27th, and which had had slight diarrhœa which was promptly checked by modification of diet. The cows are milked by the farmer himself, with the assistance of one cowman. Both milkers were found to be in a healthy condition. It was apparent, however, that no precautions were taken by the milkers in regard to cleansing of hands and udders. The cows at the farm are 15 in number. They were duly examined on the morning of Oct. 1st, and the following are the chief points from the report of Mr. J. A. Dixon, the chief veterinary officer to the Leeds Corporation, viz. :—

Fifteen cows were examined, all of which were rather dirty about their udders and teats. The farmer stated that four of these cows had calved during the past week, whilst a further five had calved during the week before. The majority of the cows bear on their teats small scars, the sequelæ of variola. One red cow which calved about a fortnight ago still retains her fœtal membranes, and is discharging a purulent fluid per vulva. She is also affected with chronic suppurative mastitis in the right forequarter, and acute suppurative mastitis in the left forequarter, but her hind quarters are apparently healthy and the cow has a normal temperature. The farmer stated that the milk of this cow has not been put in the churns, but has been fed to the pigs since she calved. With these exceptions all the cows appear healthy.

In view of the conditions found at the farm, steps were taken to ensure an immediate cessation of the milk-supply therefrom into Leeds, until such time as an assurance was forthcoming from the appropriate county authority that the provisions of the Milk and Dairies Order with regard to the methods of production and handling had been complied with.

Bacteriological and Chemical Reports.

On Oct. 2nd Prof. J. W. McLeod, the Leeds city bacteriologist, reported on the sample of milk as follows :—

"Milk contained 23 million bacteria per c.cm. There are colon bacilli present in 1/100 c.cm., but there are masked by another bacterium which probably belongs to the coliform group, but has very slight fermentative activities. This last bacterium is the predominant micro-organism in the milk. It does not correspond to any of the known pathogenic types."

The result of the city analyst's (Mr. C. H. Manley) investigation, which came to hand on Oct. 3rd, reads as follows :—

Composition.

Non-fatty solids ..	9·12 per cent.		Ash	0·74 per cent.
Fat	4·10	,,		
Total solids..	13·22	,,		

"The sample was uncurdled when received, and had not been heated. My examination has proved the absence of preservatives, metallic poisons and alkaloids. Tests were also made for tyrotoxicon (diazobenzol) with negative results. This substance, which may cause sickness and diarrhœa, is liable to be formed in milk and milk products in the summer time. The normal figure for the ash supports my findings as regards the absence of the non-volatile poisons. The chemical composition of the milk is distinctly above the average. With the observation of the proper precautions governing its production, this milk should compare extremely favourably with others on sale in the district."

Summary and Conclusions.

The outbreak of sickness, although of alarming extent, was short-lived, and complete recovery within 24 hours occurred in all the 83 cases.

Milk was the only common factor in the ætiology, and there can be no doubt that it was causative. The milk was found to contain no metallic poison, no alkaloids, no tyrotoxicon, and no preservative. It was rich in fat, due largely to the fact that it came from a herd of cows, nine of which had calved within the previous fortnight. There is no reason to believe, however, that the chemical composition of the milk was in any way responsible for the outbreak. The bacteriological investigation showed the milk to be grossly contaminated. The bacterial content proved remarkably high, which, per se, would render the milk injurious to young children. The predominating organism did not admit of classification according to known types. The evidence points to bacterial toxins in the milk as the cause of the sickness.

A survey of the evidence, in the attempt to decide between dairy and farm as the source of contamination, would appear to indicate the farm. The conditions there were quite unsatisfactory, and it is evident that the farmer in question took on a contract to supply milk before he was prepared as regards premises and equipment to produce under proper conditions. It is significant that the outbreak occurred on the very first day on which X supplied Y's milk to the schools. X had previously supplied the schools with bottled milk from another source without untoward result. The fact that five cases of sickness occurred in children of X's private customers, to whom the milk was delivered loose, would appear to exonerate the bottles and the process of bottling.

Briefly the outbreak appears to have owed its origin to the fortuitous circumstances of a farmer who supplied milk into the city before he was registered with his local authority, and consequently before the inspectorate concerned had had the opportunity of inspecting his premises and methods of production. Such a contingency is very unlikely to recur.

I tender my thanks to Prof. J. Johnstone Jervis, medical officer of health for Leeds, for permission to publish the above extracts from my official report.

PAYING PATIENTS AT READING.—A nursing home for paying patients has been opened in connexion with the Royal Berkshire Hospital at Reading. A large private house adjoining the hospital has been purchased and so adapted that the rooms occupied by patients look out upon timbered lawns. The home will accommodate 15 patients, eight in double-bedded rooms and seven in separate rooms. The stables have been converted into a massage department.

too long, or appeared before they were due, were the old seven deadly sins, to which must be added fear. People should be taught the dangers inherent in indulgence in certain basic emotions. The same principle of unity applied to thinking: one thought at a time, and that a pure thought, uncoloured by desires or fears. Clear feeling and clear thinking must depend on good habit-formation in early life. This needed concentration and interest, regularity and persistence on the part of the mother, as well as constant watch against relapse. The will would be effectively exercised only through the stimulus of interest, which in the infant was largely vicarious and exercised on its behalf by the mother. Factors endangering the child's growing active interest were fear, lack of love, physical ill-health, fatigue, over-stimulation, and irregularity in household routine. These would distract from habit-formation, and give an appearance of irritability, indecision, and lack of purpose. Later in childhood arose the danger of excessive or too prolonged preoccupation with a habit once formed, so that the child was unwilling to pass on to the next. Preoccupation might occur in the unconscious mind as well as in the conscious if a feeling impinged on a mind unprepared to deal with it. The cure of unconscious preoccupation was the province of the psychiatrist, but its prevention lay in good habit-formation; the feeling had originally been put aside instead of faced, because of laziness or cowardice of mind. To avert the catastrophe, the individual must have an alert courage; its absence was a pointer suggesting dangerous weakness in the mental make-up. Preoccupation, conscious or unconscious, caused a poor response, with insensitiveness of feeling, flabbiness of thought and bodily tone, apathy, lack of decision, and lack of interest in the external world, save in matters related to the points producing the preoccupation; to these the individual yielded too strong and uncontrolled a response. This was an adverse factor in the mental health of those around him, as well as in his own. The key-words of mental health were interest, effort, regularity, concentration, and a capacity to terminate concentration, and intellectual and emotional honesty.

Miss **Hester Viney** spoke from the point of view of the public health nurse, than whom, she said, there was no more zealous, devoted, and effective champion of the cause of mental health. She was in a position to deal effectively with the educational side of this question. Miss Viney regarded the constant calling forth of fear as one of the most important causes of mental troubles, and suggested as constructive measures gardens and play enclosures free from noise and traffic, nursery schools, and safe balconies to all tenement rooms. The principles of mental health should be taught in season and out of season, as those of physical health had been taught.

A paper by Miss E. M. **Lawrence** (Chief Social Worker at the Child Guidance Clinic) was read in her absence. She dealt with the place of the social worker in mental hygiene, and remarked that to many people behaviour was causeless, and had to be taken as it came, and fought against blindly until their difficulties became so serious that some help must be sought. The kind of help they got was critical; the ill-advised went to all kinds of quacks and necromancers; the well-advised went to doctors, but did they always get what they ought to get, even there? The worst-served class were the borderline cases who remained in the community, competing with better people, and bound to be defeated.

The Child and the Parent.

The chair at this meeting was taken by Dr. **Cyril Norwood** (Headmaster of Harrow), who observed that to become a parent was easy, but to get out of it without disgrace was difficult. The relationship between parent and child was largely one of give and take, and a great deal depended on the kind of parent and the kind of child; modern psychology tended always to blame the parent. He mentioned the great importance of the education of the child by other children.

The Rev. L. W. **Grensted** pleaded for greater leisure and quiet, without which the right parental relationship was impossible. We must simplify home life, and limitation of families might in many cases be the only way of securing full and adequate family life. The medical aspects of conception control had been well thought out; the theological aspects had been only too prominent, but the psychological—the most important aspect which would eventually turn the scale—had not received nearly enough attention. He pleaded also for the improvement of children's literature, although it was already much better than specimens like the "Fairchild Family." He referred to the desire of parents to keep their children for ever children, like the dreadful and ominous figure of Peter Pan, the most sinister form the mind of man had created.

Dr. **Helen Boyle** emphasised the value of training a child in adaptability, and the lack of necessity for perfection in parents. Many people, she said, wore themselves to fiddle-strings by trying to be resigned, when a little kicking would do a world of good. The enormous number of suicides suggested that we were not giving our children that faith that can move mountains. Training in adaptability could begin very early, and a healthy baby ought to be taught to sleep under any conditions of noise or light. Children were largely preoccupied by feeling their personal contacts with life and experimenting with happiness, and it was possible to safeguard them too much from the discoveries they ought to make. It did a healthy child no harm to over-eat itself and be sick, and the child thereby learned valuable lessons. A perfectly organised childhood did not produce an adaptable adult. "Of nothing too much" was a safe motto for the upbringing of children. Parents should strive for a large peace of mind; the child also made mistakes—often by trusting too much, becoming disillusioned, and then doubting too much—and most people thought much too badly of themselves, and then compensated by swelled head.

In the course of the subsequent discussion Sir **Maurice Craig** maintained that the ability to sleep under disturbing conditions was an idiosyncrasy, and not merely a matter of training. He congratulated the Middlesex Hospital on its advance in ceasing to wake the patients at 5 A.M., and spoke of the appalling results of mixing big and small boys in dormitories, so that the youngsters were awakened when their elders went to bed. To those who advised "leaving it to Nature," he recommended a study of the garden left to Nature for six months. Dr. **Margaret Lowenfeld** pleaded for more directed attention to play.

The Problem Child.

At this session the chair was taken by Dr. R. H. **Crowley** (Senior Medical Officer, Board of Education), who said that the child's life must be integrated in some way, and that a policy of coöperation between the home and the school was needed.

Miss E. M. **Nevill** (Psychologist to the Children's House, Bow), distinguished three outstanding groups of problem children: disturbers of the peace, reality shirkers—the apathetic, timid, nervous and dreamy—and moral offenders. Adler had suggested three causes: that the child felt himself unloved, or inferior, or that he was spoilt. If with "unloved" one included "misunderstood," and with "inferior," "superior," this would cover most cases, but there was a difficult temperament to begin with, and certain illnesses might play a part. She gave examples of real children, showing how serious trouble might arise from very simple things which could have been easily settled by a little common sense. Much psychology was commonsense. She made a plea for the outstandingly clever child, for whom so little had been done; brilliant children were misfits, even more than dull children. The trouble should be discussed openly and frankly, without emotion, in order to find the cause. The part of the father in the child's life must not be forgotten.

Dr. E. A. HAMILTON-PEARSON said that whether or not a child would become a problem child depended largely, if not wholly, upon its attitude to life, the product of its whole practical experience at any given moment. Attitude, moreover, determined almost exactly the experience of the immediately ensuing period; it caused the results of future experience to be similar to those of the past. Character was the outcome of recurring experience; therefore, if a child was to be able to form a strong character, it must start with a right attitude to life, and for this it must be able to learn right values for its thoughts and actions. An important environmental factor in the causation of wrong attitude was the lack of right, understanding discipline. Parents were too apt to allow children to make decisions for the making of which they had neither the data nor the mental apparatus for fear of repressing their personality. This was a chase after a false ideal; real freedom could only be a psychological state. Stable discipline implied complete freedom between known limits imposed for the good of the majority. The child produced by complete freedom of expression overvalued the importance of its own desires, and the restriction of school life bewildered it, so that often the seeds of neurosis were sown. The educational system created problem children by confining the eager, urgent, and turbulent interest of the young within a rigid and monotonous system, so that work came to be regarded as something unpleasing and to be avoided as much as possible. A rigid contrasting distinction between work and pleasure was a bad attitude for life. The educational system also created problem children by its adherence to a purely intellectual ideal in education. There were several types of mind, and each group of types required a different educational approach. Under the uniform system many children were committed to a dull routine, which daily emphasised their inferiority; they lost resolution, initiative, and confidence, and became the drifters in life. Adequately stimulated interests were the vitamins of the mind: if mental scurvy were to be prevented, the whole educational system must be recast. The refusal of the budding adolescent to grow up was becoming more and more common. Before the war there had been a sharp line between childhood, with its occasional treats and strict obedience, and adulthood with its relatively boundless freedom of action and conduct. It had been worth while to grow up. The average child of to-day had the same amusements as the average adult, and relatively greater freedom. Personally or vicariously—through the cinema—it experienced practically all that would be possible for it, and adulthood had few additional pleasures to offer in compensation for its greater responsibility. There was little in the conditions of modern industry to capture the imagination of a boy. Children who at this period became problem children nearly all suffered from atrophy of the sense of adventure, a sense which could be kept alive only if the child's lines of interest were kept clear.

INDUSTRIAL HEALTH EDUCATION SOCIETY.

A LUNCHEON was given by Lord Melchett at the Carlton Hotel on Thursday, Oct. 31st, to afford an opportunity to those interested in the objects of this Society to meet and to hear an exposition of the aims and position of the movement. Lord Melchett, who was supported by Sir Humphry Rolleston (hon. president of the Society), Lord Dawson of Penn, Sir John Rose Bradford, and Sir Arbuthnot Lane, in a brief speech welcomed a representative group of industrial employers and medical men. He pointed out that splendid work had already been done among industrial populations by the medical profession, but that much remained to be done owing to the fundamental ignorance of the bulk of the operatives and of no inconsiderable number of their employers. In regard to pit-head baths, he said, England, Wales, and Scotland were far behind the Continent and the United States, in which latter country the workman, after hours, was never seen in his work-soiled clothes, having had opportunity for washing and changing.

Sir William Milligan then described the great services rendered to public health by the Industrial Health Society, under whose auspices a number of indefatigable lecturers had submitted to varied and interested audiences the methods for the prevention and remedy of accidents incidental to their employment. The Society was formed in 1925, during which year 118 health-talks were delivered; in the following year the number increased to nearly 200, in 1927 to nearly 300, in 1928 to practically 400, while in the first three-quarters of the current year more than that number had already been given. He concluded by pointing out that the pecuniary resources of the Society had been strained to the utmost by the work which they had already undertaken and this at the time when openings for the development of that work were obvious. All the organisations of operatives in England, Wales, and Scotland had shown willingness to coöperate, recognising the obvious importance of the movement. He quoted figures to show that in 1928 the work of over half a million weeks was lost in England and Wales through sickness and invalidity, while the approved societies during that period paid out £15,000,000 in sickness and disablement benefits. While the Society, he said, had as yet made no appeal to the employers of labour for assistance, the time had come when it must be pointed out that more funds were required if the work was to go on, and he hoped that the whole movement would receive sympathetic consideration from those around him who directed important industrial businesses, and also from insurance companies.

Mr. Ben Tillett, M.P., proposed Lord Melchett's health in eloquent terms from personal knowledge of the chairman's qualities of leadership and generosity. He went on to point out that education on health matters in connexion with particular industries should be directed as much to the employers as to the employed, as the last thing the average employer thought about was the sanitary convenience and the necessities of human workers. He spoke as a non-party man, and with a real desire to see among the British an appreciation of the factor of efficiency in the matter of health. He held that the employing class had not considered with proper care the working of the finest machine they possessed—namely, that made by God Almighty.

Lord Melchett briefly replied.

GENERAL MEDICAL COUNCIL.

ELECTION OF TWO DIRECT REPRESENTATIVES FOR ENGLAND AND WALES.

Two names were selected last July by English and Welsh deputies at the annual meeting of the British Medical Association for nomination on behalf of the Association as Direct Representatives of the registered medical practitioners of England and Wales on the General Medical Council. These were Dr. H. B. Brackenbury, who has already served on the Council, and Mr. N. Bishop Harman. On their behalf the following election address has been circulated:—

> We offer ourselves as candidates for election to the General Medical Council as direct representatives of the registered medical practitioners of England and Wales. One of us has been such a representative for the past five years and, as a member of the Education and Public Health Committees of the Council, has taken an intimate part in that review of medical education and of the needs of the public health service in which the Council has recently been engaged and which is not yet concluded.

We regard it as of great importance that advantage should be taken of the method of direct representation to secure the presence on the *Council of additional* members who have considerable experience of private practice (including special as well as general and insurance practice) in order that the conditions of such practice may be fully weighed in connexion with any disciplinary proceedings. In this regard, one of us has been in active general practice and insurance practice for many years, while the other, in addition to a long experience in private practice and as a member of a hospital staff, has held for a considerable period an important office in the School Medical Service of the London County Council. Both of us have been members of the Hospitals Committee of the British Medical Association and of the Insurance Acts Committee for a number of years, and so are familiar with those hospital problems which are so important at the present time and with the special conditions attached to insurance practice. Each of us has been, and is, in a position which brings him into contact with all varieties of medical practice and enables him to familiarise himself with general professional opinion; and we may claim in this way to be able to appreciate and to voice that opinion to an altogether exceptional degree.

In connexion with medical education it is important, we think, that the point of view of those who are the taught and the examined should be prominently considered along with the point of view of the teacher and examiner. The conditions of actual practice, general or special, are not always as prominent in the mind of the teacher as they well might be. The position of special branches of practice should not be lost sight of in prescribing the medical curriculum or in regulating training and examination—whether such special practice be followed exclusively or cultivated in association with a more general practice, especially perhaps in relation to extended or additional insurance benefits and to the clinical services of local authorities. In the administrative and legislative aspects of these matters as well as in their educational aspects, the position of the General Medical Council is one of increasing influence and importance. In our opinion such influence should be exercised in the direction of maintaining the best traditions and methods of private practice, and we claim that our familiarity with such administration and its problems will be a valuable qualification for such service as we may be able to render should our candidature be successful.

If opportunity should arise we should strongly advocate and support an increase in the number of direct representatives on the Council.

H. B. BRACKENBURY, LL.D., M.R.C.S., L.R.C.P.
N. BISHOP HARMAN, M.A., M.B., F.R.C.S.

As an independent candidate for one of the two vacant places, Dr. Arthur Haydon offers himself for election. His address is as follows:—

I offer myself as a candidate for election to the General Medical Council as a direct representative of the registered medical practitioners of England and Wales.

In 1911 I was a candidate for election to the General Medical Council, while in practice at Henrietta-street, W., and was fortunate in receiving 1000 votes, though I was not elected on that occasion. As a proof of my interest in education, I may say that I have been president and secretary of the Brussels University Medical Graduates Association for 21 years, during which time, I was in constant communication with candidates for the scientific degree all over the world. I have travelled, both professionally and otherwise, more than 65,000 miles in many parts of the world, and have studied medical practice in all climates and under all conditions. If within the province of the General Medical Council, taking the excellent example from the Dominions, I would recommend that a Bill might be promoted before Parliament to secure the complete abolition of unqualified practice, which is undermining legitimate medical practice, and making it nearly impossible for newcomers into the profession to make a living. If my candidature should be successful, it will be my endeavour to adopt a progressive policy, and to urge revision of the formula whereby medical practitioners are penalised for so-called infamous conduct in a professional sense, and perhaps to be able to modify any undue severity on the part of the General Medical Council in a disciplinary sentence on medical practitioners for trivial offences. I am not in favour of the nationalisation of hospitals. I should also be strongly in favour of an increase in the number of direct representatives on the Council, as I consider the number at present to be quite inadequate.

ARTHUR HAYDON, M.D., M.R.C.S., F.R.G.S.

CLATTERBRIDGE ISOLATION HOSPITAL.—A new wing of this hospital, erected under the auspices of the Wirral (Cheshire) Joint Hospital Board, has recently been opened. It contains a large ward for women and children, a smaller one for men, and two private wards, with a total of 22 beds.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of four cathedral cities, three boroughs, and one urban district:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Ealing, B. .. (98,660)	14·9	10·5	0·77	1·49	1·3	1·9	41/22	—	5·5
York, C. .. (85,410)	18·1	11·7	0·99	1·27	1·7	2·2	59/28	23	4·4
Lincoln, C. .. (65,550)	14·8	12·3	1·11	1·50	1·9	2·3	58/33	23	3·1
Carlisle, C. .. (56,380)	19·6	13·0	1·08	1·48	1·6	2·0	73/46	22	0·0
Chester, C. .. (40,830)	17·0	11·2	0·95	1·44	2·0	1·9	50/24	34	7·1
Shrewsbury, B. (31,870)	16·9	12·3	0·78	1·50	1·5	3·0	56/32	22	3·6
Eccles, B. .. (45,200)	16·4	11·0	0·68	1·42	1·8	1·6	66/28	24	5·4
Billingham, U.D. (11,690)	24·1	10·7	0·68	0·86	2·8	1·2	89/—	25	10·6

The proportions of stillbirths notified per 100 live births, were: York, 2·6; Lincoln, 5·5; Carlisle, 4·8; Chester, 5·0; and Shrewsbury, 2·9.

Ealing.

Dr. Thomas Orr gives the population as 100,250 at the end of the year, after the inclusion of Northolt, when the area of the borough became 9135 acres and the density 11 persons per acre. The extension has brought many problems. The Greenford and Northolt wards get their water from the Rickmansworth and Uxbridge Company, and many new mains are needed. The rest of the area is supplied by the Metropolitan Water Board. The stream through Greenford, which caused a nuisance, is now reasonably pure. Many cesspools in the added area need abolition, involving the laying of new sewers. Of the five sewage works, two are efficient. A sludge-pressing plant is being installed at Hanwell, and chlorine treatment has kept in abeyance the nuisance from the Greenford works. Greenford and Northolt are scavenged by private contract, and are to be brought into the general scheme. New maternity and child welfare centres are being provided for the added area, and the latest school is to be of the Derbyshire type, a true open-air school, in which the class-rooms can be kept open in winter and summer; yet sheltered from the wind and adequately warmed.

Ealing applied to the Middlesex County Council for delegated powers for the supervision of maternity and nursing homes, but was refused, and the application is to be reconsidered by the Ministry under the Local Government Act, 1929. Successful proceedings were taken against a retail milk purveyor for trading without being registered, against a milk man for filling bottles not in registered premises, and against a retail milk purveyor for selling designated milk without a licence. Many dairy premises have been improved, and an incentive to this result has been provided by the greater interest taken by the public in the source of their milk-supply. Of 12 samples of ordinary milk, three were found to be tuberculous, and in two of the three cases the Middlesex County Council was successful in finding and condemning the offending cow. There were 68 notifications of diphtheria, with a 10 per cent. case fatality, and Dr. Orr comments on the delay in using antitoxin. There were 12 cases of typhoid fever, with four deaths, and 14 cases of puerperal fever and pyrexia, with two deaths. Dr. Edna Langston has been appointed to investigate maternal deaths from childbirth as desired by the Ministry. The percentage of school "leavers" with sound teeth has increased from about 30 in 1915–16 to 67 in 1927–28. By routine and special inspections, 27 children with organic, and 87 with functional heart disease were discovered, and will be specially supervised.

York.

Dr. P. R. McNaught says York is not described as an industrial town, but that in addition to being an ecclesiastical and military centre, it is an important railway centre, employs about 10 per cent. of those engaged in the cocoa, chocolate, and confectionery industry, and has beet-sugar works. None of the industries is thought to be harmful to health. There are many voluntary health societies. The diocesan home for unmarried mothers admitted 28 expectant mothers, and 27 mothers with infants, and receives a grant of £100 from the corporation. In the case of the seven maternal deaths, investigation revealed that delivery was spontaneous in four cases and by Cæsarean section in one, and that in two cases delivery did not take place, one dying from cardiac failure and the other from hæmorrhage and placenta prævia. Of 45 neonatal deaths investigated 32 were attributed to prematurity, 2 to syphilis, and 3 were "born before arrival." There appears to be no orthopædic scheme, but arrangements have been made for the admission of crippled children to the Yorkshire hospital at Kirbymoorside. There is a shortage of houses, and 1600 applicants are on the waiting-list for houses on the Tang Hall estate, where the corporation have built 1272 houses, and had 210 more in course of erection at the end of the year. One unhealthy area with a population of 805 is being dealt with, and about 750 houses are waiting for demolition or renovation when the shortage is relieved. The York House Improvement Society has been formed for the purpose of purchasing houses in need of repair, renovating them, and letting them at weekly rentals of from 3*s.* 6*d.* to 6*s.* 6*d.*, with collection and management on Octavia Hill lines. Another voluntary committee, "Tuberculosis Crusade," in its 1928 report (included), considers the housing problem the greatest barrier to their progress, and that for the great mass of slum-dwellers post-war Housing Acts have accomplished nothing. They favour the "children's rental allowance system" recommended by Mr. E. D. Simon. Out of 57 samples of milk examined, five were found to contain tubercle bacilli.

Lincoln.

Dr. D. C. Lamont, who took over the duties on June 18th, states that the small-pox epidemic, which began in November, 1927, and accounted for 71 cases in that year continued until June, 1928, causing 107 additional cases. There were no deaths. The notifications of diphtheria, 183, were higher than in any of the previous 10 years. There were seven deaths, and Dr. Lamont, in recommending an immunisation scheme, mentions that the Paris Education Authority has taken this up energetically, with the result that 47,000 children were inoculated there in the second half of 1928. The new isolation block of 10 beds, built on the cubicle system, has proved a success, and at one time housed seven different diseases. The orthopædic scheme of the Education Committee began in June, 1928, and was extended at the end of the year to include children under five years and tuberculous cripples of any age. The total births numbered 980. The antenatal clinic was attended by 402 expectant mothers, of whom 227 had booked for the maternity home and 175 had engaged a municipal district midwife. A fourth municipal midwife is to be appointed. There are only two midwives in private practice in Lincoln, one of whom is a "bona fide," and the other only acts as a maternity nurse. Systematic antenatal supervision by the municipal midwives has, to a large extent, abolished the unwillingness of mothers to undergo examination during pregnancy. A nuisance has arisen owing to the discharge of excreta from house-boats into the rivers and dykes, the current being very sluggish, and endeavours are being made to combat it. A voluntary slum clearance committee has been formed with the object of providing low-rented houses for necessitous tenants. The immediate aim is to subsidise 100 houses with £70 each, and to let them at 6*s.* 6*d.* per week, inclusive of rates. The inclusive rental of municipal houses is 15*s.* 4½*d.* for the parlour, and 13*s.* 2*d.* for the non-parlour type.

Carlisle.

Dr. Joseph Beard reports that 29 samples of fresh cow's milk were examined for tubercle, that two were found positive, and that as a result the veterinary inspector of the Cumberland County Council eliminated two milch cows from herds in his area. The corporation maintains a well-equipped slaughter-house. Meat stalls are only permitted in the covered public market, and all butchers' shops are fitted with windows. Dr. Beard complains that, in too many instances, patients are not notified as suffering from tuberculosis of the lungs until, frequently as the result of repeated bacteriological examinations, tubercle bacilli are found in the sputum. The births numbered 1100, and 174 confinements took place in the municipal maternity home. This home has now trained 24 pupil midwives, and all of them passed the C.M.B. examination at the first attempt. The antenatal clinic was attended by 201 expectant mothers. Of the 122 infant deaths, 51 occurred before the age of one month, 42 before the age of one week, and 29 before the end of one day. Dr. Beard expresses his disappointment at this result, seeing that in 1927 Carlisle won third prize among the towns with populations from 50,000 to 100,000 in a competition as to the greatest reduction achieved in neonatal mortality. Thus, in 1927 6 children died in the first day, 14 in the first week, and 25 in the first month, whilst the figures for 1928 were 29, 42, and 51 respectively. For a long time statistics have been kept as to the aid to survival of breast-feeding as compared with bottle-feeding. A table shows that in 1928 the mortality-rate per 1000 of 754 breast-fed infants was 25, and of 195 bottle-fed infants was 50, but also gives the curious result that the mortality-rate of 123 infants, partly breast- and partly bottle-fed, was 81. The lessening mortality among bottle-fed infants yearly indicates increased skill on the part of the mothers. Forty-two debilitated infants, who were practically unable to be fed (presumably those who died in the first week), were not put in any of the classes mentioned. The clearing of one slum area and the rehousing of the tenants is in progress. Forty-one of the evicted tenants were induced to take new corporation houses, while 13 others secured better houses by conceding their claim to a new house to other householders.

Chester.

Dr. D. Rennet reports that the maternity hospital
is a voluntary institution, and that the [illegible]
paid for 10 of the 120 city patients admitted to [illegible]
during the year. The hospital also admits pati[illegible]
from outside the [illegible] an extensive ext[illegible]
department [illegible] clinic, which
attended in 1[illegible] [illegible]ant mothers.
Rennet empha[illegible] institutional [illegible]
ment for [illegible] [illegible]pes that pr[illegible]
will now be [illegible] of the Ch[illegible]
joint board. [illegible] the water
begun in [illegible], appears
satisfactory [illegible] the water [illegible]
will provi[illegible] and storage
mo[illegible] [illegible]ts were
the un[illegible] and

improvement is claimed in debility and early rickets, considerable benefit in some forms of non-pulmonary tuberculosis, but only qualified improvement in lupus.

The new municipal houses numbered 141 and private enterprise completed 35. Closing orders were made for 28 houses, so that the net gain of new houses was 148. The dairy herds are inspected by the veterinary officer but only twice a year. As the result of 17 biological examinations, one tuberculous cow was found and another was discovered by microscopical examination of the milk. The public analyst reports that the milk fat in eight samples of ice-cream examined varied from 1 per cent. to 14 per cent., and suggests a standard of 12 per cent. as reasonable.

Shrewsbury.

Dr. A. D. Symons expresses his emphatic approval of the new health department premises. He gives an interesting quotation from the report of 1878, in which the medical officer expresses the opinion that with its advantages Shrewsbury might attain a rate of 16 per thousand, but thought an average a little over 17 more within the bounds of probability. In 1878 there were 250 cases of typhoid fever with 20 deaths, and the then medical officer was right in believing this "to be absolutely and completely removable." Dr. Symons thinks his predecessor would be surprised to learn that in 1928 the birth-rate was 16·9, the death-rate 12·3, and the infant mortality-rate 56, as compared with a birth-rate of 32·2, a death-rate of 22·2, and an infant mortality-rate of 140, in the year of which he wrote. The infant mortality-rate of 1928 was increased in comparison with the previous year (43) largely owing to an unusual number of twin births. There were 13 sets of twins amongst the 552 births. In the five preceding years the sets of twins numbered 4, 6, 7, 2, and 4, respectively, and of the 31 infant deaths in 1928, 8 were those of twin babies. Dr. Symons, after investigation, divides the 31 infant deaths into 8 unpreventable, 13 possibly preventable, and 10 preventable, and sees no reason why the rate of Shrewsbury should not be between 20 and 30, even with our present knowledge. The dual system of water-supply, consisting of drinking water supplied by means of self-closing water pillars in the streets and treated river water laid on in the houses for domestic purposes, has given no anxiety as regards quantity or quality during the year. Hitherto, in the housing schemes preference has been given to tenants (*a*) who had children, or (*b*) who could afford the rent. The majority of those selected respond to the uplift, but there are many who fail to carry out their agreement, and who show that they are incapable of, or indifferent to, cleanliness and better habits. Dr. Symons thinks it is unfair to rehouse bad tenants next door to good ones, and his remedy is a separate colony, managed on Octavia Hill lines, from which families who showed a desire to rise could be ultimately transferred to a different housing estate.

Eccles.

Dr. J. E. Spence reports that measles and whooping-cough were both epidemic during the year. During the past 15 years the mortality from these two diseases has been more than three times as great as that from scarlet fever and diphtheria combined. Measles has been notifiable in Eccles since 1920 and whooping-cough since 1924, so that it is now possible to give figures for the case fatality of these diseases. During the first year of life 1 patient out of every 21 dies from whooping-cough and 1 out of every 31 from measles. During the second year 1 out of 36 dies from whooping-cough and 1 out of 35 from measles. During the third year 1 out of 43 dies from whooping-cough and 1 out of 38 from measles. After three years old the fatality of these diseases becomes almost negligible, as at all ages over three 1 out of 880 patients dies from whooping-cough and 1 out of 396 from measles. If these facts could be brought home to parents, says Dr. Spence, the fatalistic attitude might be abandoned, and a greater effort made to protect the younger children from infection. Out of 12 samples of milk examined two were found to be tuberculous. The first came from a borough farm. All the cows were examined by the veterinary surgeon. A sample of milk was taken from a suspicious cow, and the remainder were divided into four groups of five for sampling purposes. The separate sample proved negative. One of the four groups gave a positive result, but a cow from this group was sold shortly after the original sample was taken, and the milk from the remaining four proved negative. Doubtless the cow sold was the offender. The first sample was taken on August 14th, and on Oct. 24th six pigs from this dairy farm which had been fed on skimmed milk were found at one of the slaughter-houses to have tuberculosis of the mesenteric glands and liver. Dr. Spence cites this as an effective demonstration of the risk which young children run. After a demonstration of the use of a solid smokeless fuel in the public health offices, the trader, who held the local agency, found that the demand exceeded the supply. This fuel is also being tested for the heating of the public central library.

Billingham.

Dr. T. J. Kirk submits the report for this rapidly growing industrial town, which is being tacked on to the Durham village of Billingham and the older district of Port Clarence. The new houses in 1928 numbered 502. The staff of district nurses has been increased and the two child welfare clinics are well attended. Other problems are being energetically tackled. For example, the privies at Port Clarence are being converted to w.c.'s, the collection of refuse and tipping methods are being reorganised, and the "Bendy," a large sheet of filthy stagnant water, has been abolished by drainage and filling in with clean earth. The three butchers have adopted the Cash captive bolt pistol. The main problem of the district, however, is atmospheric pollution, rather than smoke abatement, owing to the emission of dust and grit by three of the most important works in the area. Synthetic Ammonia and Nitrates, Ltd., cause a serious nuisance by the emission of fine grit and dust from their method of steam raising by pulverised coal. It is hoped that the fitting of water sprays into the chimney stacks may be an effective remedy. Casebourne's Cement Co., Ltd., give off a fine yellowish-grey powder, which, under certain weather conditions, covers the whole of the property within a considerable area. An experimental dust arrester proved a failure, but further experiments are in progress. The nuisance caused by the North Tees Power Co. is a much smaller evil and more local, and affects fewer dwelling-houses. In this case steam is raised on the chain grate system, and grit is only emitted at intervals, when soot-blowing is in operation. One dust arrester has been fixed by this company, and it is expected that a similar apparatus will be fixed to each chimney stack. Finally, it can be said that all the firms mentioned are making every effort to find a complete solution to their respective problems.

MENTAL HOSPITAL REPORTS.

THERE were 900 patients in the *Dorset Mental Hospital* on Dec. 31st, 1928, an increase of 20 during the year, and there is still danger of overcrowding. A scheme is under consideration to hand over the north male block to the female side, and to build a new dormitory on to the old recreation hall to provide additional accommodation for the men. The recovery-rate was 39·56 per cent. and the death-rate 5·68 per cent. Apart from six patients suffering from phthisis, and six women known to be carriers of typhoid, the patients had extremely good health and suffered from no epidemics. A dentist visited fortnightly and saw 372 patients. A dormitory is to be enlarged in order to free a room for handicrafts, and an instructress from the Occupation Therapy Association has initiated the work by giving a course to patients and staff. Two male wards are administered on the open-door system, and 84 men and three women are allowed on parole beyond the estate. The laboratory is well equipped, and research is carried on as well as extensive routine investigations. The number of examinations at the bedside and in the laboratory reached 2425 during the year. The discovery of a hydatid cyst of the liver infected with the typhoid bacillus led to a routine search for typhoid carriers by the method of Wilson and Clair. The Meinicke micro-reaction has been carried out on all new admissions, but has not been found to parallel the Wassermann reaction closely enough for it to be relied upon. A leucocyte study is being continued, and the importance of frequent systematic leucocyte examination in mental disease is emphasised in the report. Buscaino's black reaction is done as a routine, and its relationship to Scheiner's reaction is to be worked out. The colloidal reaction of Takata-Ara is being investigated. Patients with general paralysis are treated with tryparsamide; three out of nine developed a negative or weakly positive Wassermann reaction. The out-patient clinic is held weekly at the Dorset County Hospital. Five nurses and two attendants passed the final R.M.P.A. examination, so that about one-third of the nursing staff are now certificated or registered.

The *City of Leicester Mental Hospital* at *West Humberstone* had 955 patients on its books on March 31st last. The recovery-rate was 53·64 per cent. and the death-rate 5·88 per cent. Cause of death was verified by autopsy in 92 per cent. of cases. A systematic investigation revealed two typhoid carriers, one of which has cleared up under treatment, while the other remains a source of infection. General paralytics are being received from a neighbouring mental hospital for malarial treatment, and ten cases have had pyrexial attacks induced during the year. There was one death unassociated with malaria, three patients were slightly improved, and three were discharged. Leave of absence was granted 2448 times to men, and 1250 times to women during the year, and the number of week-ends allowed has increased. Of the male patients 53 per cent., and of the female 37 per cent. are on full or limited parole; 14 men on parole escaped during the year. Useful employment was found for 77 per cent. of the patients. Cinematograph entertainments are given regularly in the hospital, and small parties of women go regularly to local cinemas and for motor drives. The routine work of the laboratory continues to increase. A small outbreak and a couple of isolated cases of Sonne's dysentery occurred during the year, but responded readily to treatment. The visiting dentist inspected all new cases and 91 old inmates, and performed 339 operations. A new nurses' home is proposed, and the old superintendent's house has been adapted as a unit for 332 women patients. A Vermes photometer has been installed. Two nurses obtained the qualifications of the General Nursing Council.

The *Stafford Mental Hospital* had 1022 patients in residence on Dec. 31st, 1928, an increase of 19, despite the removal of 30 men to the East Riding Mental Hospital. There was a deficiency of 78 beds, although the isolation hospital, with 20 beds, is still occupied by male convalescents. The new reception hospital, now being built, will relieve but will not cure the situation. The recovery-rate was 25·60 per cent. and the death-rate 6·80 per cent. Autopsies were held in every case where permission was given. Sixty-three patients were allowed out on trial before discharge, but only one was given money allowance. Two men have parole beyond the estate, and 83 men and two women are free within the grounds. One ward on each side and the male convalescent block are administered on the open-door principle. There are 11 male and eight female patients suffering from tuberculosis, but there has been no epidemic disease. Forty-eight attendants and eight nurses are certificated or registered. At *Burntwood*, the second of the three Staffordshire mental hospitals, there were 924 patients on Dec. 31st, 1928, a decrease of 19, which is almost entirely due to transfers of men under contract. On the female side the hospital is overcrowded, and the vacant male beds are rapidly being filled. The isolation block is still occupied by male patients, and isolation has to be provided in the main building. The recovery-rate was 28·2 per cent., the rather low figure being the result of a serious outbreak of Flexner dysentery which accounted for 22 deaths. At the time the sewers of the sanitary spurs at the back of the female ward were being excavated for replacement, and infection was probably carried on the boots of men engaged on the work and women coming from the laundry. There was also an outbreak of typhoid fever on the female side, and six patients died. The South Staffordshire Company's water was being supplied to all parts of the hospital except the female division, which was served by private well-water. This water was found to have a high *Bacillus coli* count. The connexion of the female wards with the company's water-supply was carried out as rapidly as possible, and the well was reconditioned. Vaccine was given to as many contacts as possible, and there was no recurrence of either infection. There were 81 cases of influenza with one death. Four cases of general paralysis were treated with malaria; two improved, and two—both older cases—died. Of the patients discharged during the year, 49, or 65 per cent., were given preliminary periods of trial, 20 of them with money allowances. A thermal bath has been provided in both male and female divisions, and electric light has been extended in the male wards. Since the appointment of a cowman the milk-supply from the farm has increased by 3727 gallons during the last year. Condensed milk is not now used, but butter is only given to undernourished patients. An ultra-violet ray apparatus has been installed, and two female solaria have been fitted with "Vita-glass." Four attendants and one nurse passed their final examination. The third Staffordshire hospital at *Cheddleton* had 1107 patients in residence on Dec. 31st, 1928, a reduction of 27, due to boarding out under contract. There are 20 more women than the statutory number, but 21 male vacancies. Patients boarded out included many of the best workers, so that Cheddleton work has suffered. The medical superintendent points out that the provision of colonies for chronic cases, and the early discharge of convalescents, will materially increase the cost of running a mental hospital. General paralysis was treated by malaria, and four cases were discharged during the year. Five patients were known to be suffering from tuberculosis on admission. There were 38 cases of dysentery, three more than last year, but fewer of them were unexplained. Only three cases of encephalitis lethargica were admitted during 1928, bringing the total in residence to 26. Ten cases were treated, without benefit, with malarial blood, and ten were given tincture of stramonium, which gave temporary improvement in all cases. A ward has been arranged for training lads who have got beyond the control of nurses. They are taught tailoring, cobbling, gardening, drilling, handicrafts, and games, and the experiment seems likely to be very successful. The orthopædic department has been very successful in improving the deformities and habits of low-grade congenital cases. The usual statistics are not supplied in this report. In March, 1928, the visiting commissioners found 56 men and 36 women on parole beyond the estate, 30 men and four women on more limited parole, and three wards administered on the open-door system. They note that 20 per cent. of the female and 60 per cent. of the male nurses are certificated or registered; an orthopædic sister attends twice a week, an electrotherapeutic sister attends regularly, and a schoolmistress teaches the children for four hours daily.

At *Winson Green* there were 812 patients on Dec. 31st, 1928. The recovery-rate was 45·2 per cent., and 44 of the 83 patients discharged had a month's preliminary trial, 33 of them with financial assistance. The death-rate was 7·7 per cent., and post-mortem examinations were made in 95 per cent. The general health was good; there was no infectious disease, except two cases of erysipelas and three of tuberculosis. The treatment of focal sepsis gave most encouraging results. Protein therapy was found beneficial, especially after operation had converted a closed sepsis into an open one. Eight male and two female general paralytics were treated by induced malaria. One man and one woman were discharged apparently in normal health, and one man died. Six dementia præcox patients were inoculated without benefit. Weekly entertainments are given, and every ward has a gramophone, and is being fitted with a loud speaker. Both male and female reception wards have been fitted with verandahs. The R.M.P.A certificate is now held by 78·1 per cent. of the attendants and 41 per cent. of the nurses.

At *Rubery Hill and Hollymoor* there were 1800 patients on Dec. 31st, 1928. The recovery-rate was 42·2 per cent. and the death-rate 6·44 per cent. Autopsies were carried out in 59·2 per cent. of the cases. General paralysis was treated by induced malaria, typhoid-paratyphoid vaccine, and chemotherapy, including tryparsamide, and three cases have been discharged recovered. Nasal sinusitis was suspected in 151 cases, and proved in 116—i.e., 33 per cent. of the total admissions. A very large number of other causes of toxæmia were suspected, and the principal aim of treatment here is to combat this toxæmia, generally without any coöperation from the patient. Only three cases of tuberculosis were recorded at the end of the year, and there was no other infectious disease. Cinematograph entertainments were given regularly and much appreciated. The dairy herd was twice tested for tuberculosis. During the year 18 attendants and 17 nurses obtained their R.M.P.A. certificate, bringing the totals to 93 and 61 respectively, while 14 attendants and 26 nurses were registered by the General Nursing Council.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 26TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 131 (last week 154); scarlet fever, 3504; diphtheria, 1709; enteric fever, 141 (last week 140); pneumonia, 1008; puerperal fever, 58; puerperal pyrexia, 94; cerebro-spinal fever, 11; acute poliomyelitis, 30; acute polio-encephalitis, 2; encephalitis lethargica, 11; dysentery, 17; ophthalmia neonatorum, 104. No case of cholera, plague, or typhus fever was notified during the week.

Of the notifications of enteric fever, 41 were received from the County of London—namely, one each from Camberwell, Hammersmith, Islington, St. Marylebone, St. Pancras and Wandsworth, and 35 from Lewisham. Of the 14 notifications from Kent, 8 came from Beckenham and 2 from Penge.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Oct. 29th–30th was as follows:—Small-pox, 172 under treatment, 12 under observation (last week 163 and 9 respectively); scarlet fever, 2657; diphtheria, 2364; enteric fever, 90 (last week 60); measles, 231; whooping-cough, 125; puerperal fever, 22 (plus 12 babies); encephalitis lethargica, 125; poliomyelitis, 9; "other diseases," 19. At St. Margaret's Hospital there were 16 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 6 (3) from enteric fever, 14 (4) from measles, 11 (0) from scarlet fever, 12 (2) from whooping-cough, 51 (11) from diphtheria, 102 (19) from diarrhœa and enteritis under two years, and 56 (15) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London were reported from Liverpool, Darlington, and Merthyr Tydfil. In spite of the decline of diarrhœa generally Liverpool reported 22 fatal cases, Birmingham 8, and West Ham 5.

The number of stillbirths notified during the week was 264 (corresponding to a rate of 41 per 1000 births) including 45 in London.

THE HANDLING AND STORING OF CELLULOID X RAY FILMS.

THE British X Ray and Radium Protection Committee have now amplified their preliminary suggestions for the handling and storing of celluloid X ray films, which were made in our correspondence columns after the Cleveland disaster.[1] They point out that the X ray films of cellulose nitrate in common use burn with rapidity and violence when ignited. The burning of cellulose nitrate in bulk is well-nigh explosive in character. In addition, large quantities of carbon monoxide and brown fumes of oxide of nitrogen may be generated, both of which are highly toxic, and indeed led to a heavy death-roll in the Cleveland clinic fire. Carbon monoxide is itself inflammable and when mixed with air may give rise to an explosion; celluloid will burn in the absence of air.

Recommendations.

Regulations on the handling and storing of celluloid have been issued by the Home Office, local authorities, and others. The Protection Committee make the following recommendations.

X Ray Rooms.

In all rooms where X ray films are handled *and stored naked lights and open fires* should be prohibited. Smoking should be prohibited in or near film cabinets or film stores. Films should not be placed near steam pipes, radiators or the like. A ready supply of fire extinguishers together with buckets of water and sand should be available. The best means of extinguishing burning celluloid appears to be by the application of water.

Electric light installations should be of a permanent character. Electric light bulbs in or near film stores or cabinets should be enclosed in strong glass globes.

Generous ventilation should be provided in X ray rooms. As recommended in paragraph 5 of the International Protection Recommendations, the plan of an independent exhaust fan in each room is to be preferred to a duct system common to a number of rooms. Doors should be arranged to open outwards, particularly from film-drying rooms and dark rooms.

The *stock of X ray films*, whether unexposed or developed, should be kept down to the minimum. The stock of film records should be subjected to periodical drastic weeding out. Discarded films should be at once deposited in strong fire-proof metal containers with self-closing lids and destroyed at frequent intervals. They should not be placed in general refuse bins, or burnt in a closed vessel.

Stocks of unexposed films for immediate use or current files of developed films should be stored in cool and dry lock-up thermally insulated metal or hard wood cabinets. Such a stock should not exceed a total of about 50 lb.—i.e., about 1000 12 in. by 10 in. films—distributed among several cabinets. Cabinets for unexposed films should be lead lined. *Developed films*, which are temporarily taken into hospital wards or theatres for the convenience of the medical staff, should not be left lying about in table drawers or cupboards, but should be kept in suitable metal containers. Such films should be returned to the X ray department as soon as possible.

Film Stores.

Stocks of film exceeding about 50 lb. should not be stored in the X ray department, but in a special dry, cool, and well-ventilated room reserved exclusively for the purpose. The main requirements of such a room are as follows:

(*a*) The situation of the film store should not be such as to endanger the means of escape from any part of a building. The store should not be in the proximity of a lift-shaft or staircase-well, or near an intake or outlet of a general duct-ventilating system. In no circumstances should the store communicate with a general duct-ventilating system. The store should preferably be an isolated single-storey building with independent access. Failing that, it may be placed on the roof of a building or, if that is not feasible, in one of the higher storeys in as isolated a position as possible.

(*b*) The walls, floor and ceiling of the store room should be fireproof and of robust construction. The door should be fireproof and of a self-closing, closely fitting type. If the store room forms part of a main building, a useful further precaution is a fireproof vestibule with a second fireproof door.

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[1] THE LANCET, 1929, i., 1223.

(*e*) The store should be provided with a direct vent to the outer air, preferably on the side remote from the most adjacent building. Such a vent should not normally be less than a square foot in effective area, a figure which may require to be exceeded for large stores. The vent may be protected against weather, &c., by thin unwired glass or other equally frail device.

(*d*) A film store may well be equipped with steel cabinets. If the store is designed to carry unusually large stocks of films (exceeding, say, 1 ton), it should be divided into completely isolated fireproof compartments each with its own vent and fireproof door.

(*e*) The temperature of the store should be maintained at a moderate figure. If the roof is exposed to the sun, suitable thermal lagging may be necessary in hot climates. It seems certain that good quality celluloid does not ignite spontaneously at any temperature attained under ordinary room conditions.

(*f*) The store should be equipped with an automatic water sprinkler device.

(*g*) If windows are provided in a film store, they are best situated in a north wall, though other considerations may be more important. Any windows immediately above the windows or vent of the store room should be provided with wired glass.

The committee, of whom Sir Humphry Rolleston is president, record their view that the production and use in this country of satisfactory "safety" X ray films should be encouraged.

AUSTRALIA.

(From our own Correspondent.)

Australasian Medical Congress.

The third session of the Australasian Medical Congress (British Medical Association) was held in Sydney at the beginning of September under the presidency of Dr. G. H. Abbott. Over 900 people attended, including about 350 visitors from other States and from overseas, including Sir Ewen Maclean, Sir Louis Barnett, Dame Janet Campbell, and Prof. Hugh MacLean. The inaugural meeting was held at the Town Hall, Sydney, when Lord Stonehaven, Governor-General of the Commonwealth, opened the proceedings. At the first session in the Great Hall of the University speakers from each of the States and from New Zealand gave an account of

What is Being Done in Australasia Towards Cancer Research.

In the course of the discussion Dr. F. P. Sandes, Director of Treatment in the Cancer Research Department of Sydney University, said that the University had just completed a radium emanation station for the assistance of practitioners in outlying places. He urged that the treatment of cancer by X rays and radium should be vigorously encouraged, and pointed out that the greatest difficulty lay not in getting money but in finding men with sufficient originality of mind and method to take up cancer research. Under present conditions, the students who were prepared to devote their talents and their life to research were offered less than a tradesman's income. Dr. Peter MacCallum, professor of pathology in Melbourne University, said that the statistical and experimental research on the relationship between tuberculosis and cancer in mice, which was begun by Dr. Thomas Cherry some three years ago at the Walter and Eliza Hall Institute, had already given remarkable results. He described the work now being done at this institute and at Melbourne Hospital, the Baker Institute, and the Alfred Hospital. At the Commonwealth laboratories, said Prof. MacCallum, Dr. Hirst and Miss Doery were carrying on research on the nature of metabolism of cancerous growths and had so far confirmed the work of Warburg. Dr. E. Sandford Jackson reported that lead treatment in various forms had been given a considerable trial in a number of cases in Queensland, but had now fallen into disuse. Treatment by radium was making progress, and since the Commonwealth radium had become available in Queensland hospitals radium therapy had overshadowed every other kind of treatment. The present tendency, he said, seemed to be to put the radium under the control of small coteries of medical men, and this system was to be deplored. It was important that a whole-time paid director should be appointed to each State and that there should be an attempt in research into the causation of cancer under Australian conditions. Dr. A. A. Lendon stated that a deep X ray therapy plant would shortly be installed at the Adelaide Hospital. At present this form of treatment was being carried out privately on hospital cases with encouraging results. The organisation of the radium clinic at Adelaide was not yet complete. Dr. Bronhall in a communication described the position in Western Australia. As there was at present no medical school in Perth very little experimental work was being carried out except privately, but the treatment by radium was now being freely used. The Federal Government had recently offered the sum of £5000 to establish a cancer fund, and £18,000 had already been raised. It was intended to build a department at the Perth Hospital which would include X ray rooms and deep ray treatment rooms. Sir Louis Barnett said that in New Zealand investigations of cancer, through the hospitals, had been commenced 15 years ago. For very many years the cause of cancer had been unsuccessfully sought, and he suggested that investigation of ætiology was not the only line of research that should be followed. It was necessary to explain to the public that, while the cause of cancer was being sought, attempts were also being made to secure better and more effective treatment. Dr. Burrows, of the Commonwealth Department of Public Health, told how for several years the Commonwealth Government had been endeavouring to foster cancer research and treatment in Australia. Subsidies amounting to £13,200 had been paid since 1924. The two most important problems were to find means of securing early diagnosis of cancer and of affording every member of the community an opportunity to obtain the latest and most up-to-date forms of treatment. The purchase of radium by the Commonwealth Government had tended to focus interest in treatment and research which had been steadily growing in Australia. The object of the Government was to provide a national system by which every member of the community could obtain cancer treatment of the highest class. Skilled surgical treatment was already available. What was necessary was the provision of other services. Dr. L. M. McKillop, of Brisbane, speaking on the prevention of cancer, said that medical men, as a profession, were not doing what they should towards prevention. Dr. J. L. Jona, of Melbourne, made an urgent plea for the creation of a central medical research council for the coördination of the work now proceeding all over the Commonwealth. He pointed out that under the present condition men who were making investigations in one State might not know what was being done elsewhere.

Radiation and Living Cells.

Prof. H. G. Chapman, Director of Cancer Research in Sydney, said that during the last five years a team of investigators had gathered in Sydney to learn more about the action of radiation on living matter. The study had mainly been confined to the action of X rays. The experiments of Dr. W. Moppett had shown that a beam of rays of so few adjacent wavelengths as to be termed homogeneous, might be as active as a mixed beam several thousand times as powerful physically. He had noted that some wavelengths caused atrophy of the cells of the chorio-allantoic membrane of the chick embryo, whilst others produced hypertrophy; other wave-lengths of the same intensity appeared to be without any biological activity. Further, the simultaneous application of beams of radiation with antagonistic action on tissues led to no biological effect on the membrane. It had been shown that several homogeneous beams of rays were potent biologically. The physicists in the

Sydney team had observed these wave-lengths to be the discontinuities in the adsorption of rays by lead, uranium, and molybdenum. Chemical analyses had shown lead and uranium to be present in the eggs used in these researches. It thus appeared that there was evidence that the heavy metals produced an exceptional adsorption of radiations of certain wave-lengths. Whether this adsorption was connected with the biological results remained to be seen. A study had been begun to ascertain whether the properties of lead as a catalytic agent were altered by the adsorption of X rays. Attention had been directed in Sydney to the way in which radium brought about the disappearance of new growths, and it seemed that immunological processes were concerned. Research had been undertaken to ascertain whether immunisation could be produced in the human subject by injection of proteins of tumours. Evidence was accumulating that antibodies might be produced against the proteins of the multiple melanotic sarcomata of man.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Royal Society of Edinburgh.

Sir Edward Sharpey-Schafer, the physiologist, has succeeded Sir Alfred Ewing, the physicist, as President of the Royal Society. In his retiring address Sir Alfred gave a masterly sketch of the progress of science in the 57 years of his experience, and emphasised the strong drift now manifest from physics to biology. He almost seemed to suggest that, for the time being, physics may be regarded as a series of extinct volcanoes, while biology shows an immense continent for exploration. But it is to be remembered that Einstein and Eddington are still young, while J. J. Thomson, Rutherford, and their many distinguished pupils are still with us. The quantum theory as well as general relativity have yet to be made intelligible and brought into coherence with one another, and with the ordinary experiences of life. The urgent problem for the physicist is to project an atom that will be identically the same for living matter as it is for dead matter, and on that problem some mathematical physicists are actively engaged. But unquestionably the interest in biology is growing every year. Sir Edward Sharpey-Schafer is not only a distinguished physiologist, but the symbol of a great biological movement.

Animal Breeding Department.

The work of this department, under Prof. F. A. E. Crew, is at last persuading practical breeders and farmers that research yields results of outstanding importance, and that science is a genuine guide to stock-rearing and stock selection. Recognition of this is seen in a gift to the department of £30,000 by Mr. T. B. Macaulay, president and managing director of the Sun Life Assurance Company of Canada. The wealthy corporation over which he presides has before now shown itself mindful of pioneer scientific effort. Mr. Macaulay, whose father was a Lewis man, recently presented a new wing, fully endowed, to the Lewis Hospital. The department has also received a similar gift of £30,000 from the Rockefeller International Board, and £10,000 from Lord Woolavington.

A Children's Ward for Nose and Throat Cases.

A special ward of 12 beds for the treatment of ear, throat and nose cases has been added to the Royal Edinburgh Hospital for Sick Children. This brings the total beds to 132. The new ward unit includes a properly fitted doctor's room, where minor operations and dressings can be done. About 1000 operations annually are performed in the hospital for adenoids and tonsils, and in 1927 50 mastoids were treated. The number of new patients attending this department rose from 767 in 1927 to 1200 in 1928, and the ward will make it possible to take in for short periods a much larger number than hitherto. Many adenoid and tonsil cases require indoor care after operation, and to send them home direct from the out-patient department is often very undesirable. In accepting the care of the ward Dr. Douglas Guthrie, who has been aural surgeon to the hospital since 1919, described the ward as a notable addition which would certainly prove a real boon to the patients.

The Medico-Chirurgical Society.

At a meeting of the Medico-Chirurgical Society of Edinburgh on Oct. 30th new officers were elected to fill the vacancies caused by the annual retirements. The office-bearers for the coming year are as follows:—

President: Prof. G. Lovell Gulland. Vice-Presidents: Dr. R. A. Fleming, Mr. J. W. Dowden, and Dr. E. F. Armour. Councillors: Dr. Charles McNeil, Dr. Andrew Ritchie, Dr. Murray Wood, Mr. J. W. Struthers, Dr. C. W. Somerville, Dr. W. Fordyce, Dr. H. G. Langwill, and Dr. Alex. Goodall. Treasurer: Dr. Macrae Taylor. *Secretaries*: Mr. A. Pirie Watson and Dr. H. L. Watson Wemyss. Editor of Transactions: Dr. Fergus Hewat.

PUBLIC MENTAL HOSPITALS.

SCIENTIFIC AND RESEARCH WORK.

THE first part of the Fifteenth Annual Report of the Board of Control, which we reviewed in a leading article [1] some weeks ago, deals with the administrative work of the public mental hospitals. The second part of the Board's report [2] contains, in addition to the entries of the Commissioners at the various hospitals and some statistical tables, the reports of the research carried out at the institutions throughout the country.

At *Birmingham*, as in previous years, work has centred round chronic infections, especially of the nasal sinuses and intestinal tract, and an attempt is being made to correlate the findings with disturbance of the pituitary gland, endocrine imbalance, and local damage to brain tissue. A chronic infective process has been found in a large proportion of cases, and in some it has been possible to trace it back to an acute infection such as measles, influenza, or scarlet fever. The areas of unresolved residual infection start a long chain of physical, and ultimately of mental symptoms. The relationship of actinotherapy to focal sepsis has been investigated; it appears that ultra-violet light causes an exacerbation reaction in "closed sepsis," and a healing reaction with diminution of symptoms in "open" or opened sepsis. An inquiry into the relation of mental symptoms to phases of the reproductive cycle has revealed a "menstrual reaction," or intensification of conduct disturbance during the premenstrual and menstrual phases, and a "moliminal reaction" or similar periodic intensification during the amenorrhœa of mentally disordered patients. The appearance of these reactions indicates that an ovary is still functioning, although it may be a diseased one. Bacteria have been found to pass from a diseased sphenoidal sinus to the pituitary gland, and it is believed that signs of pituitary disorder may be set up by a closed sepsis of this kind. An investigation into the Wassermann and Widal reactions of 176 mentally defective children at the Monyhull Colony has suggested an ætiological relationship between mental defect and gastro-intestinal infection in early life. Only 3 per cent. gave a positive Wassermann reaction.

At the *Cardiff City Mental Hospital* an inquiry is being made into the possible ætiological significance of a filtrable virus in dementia præcox. Work on blood-cholesterol has been published in THE LANCET (Feb. 23rd, 1929) and tends to show that the blood-cholesterol is a little lower in the pre-paroxysmal than in the paroxysmal phase of epilepsy, but shows only slight changes with the menstrual cycle. Work on the hydrogen-ion concentration of the blood and urine is being continued.

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[1] THE LANCET, Oct. 5th, p. 719.

[2] H.M. Stationery Office. Pp. 360. 9s.

The *West Riding Mental Hospital* at *Wakefield* investigated a number of cases of dysentery; at *Wadsley*, Sheffield, malarial treatment was tried for three cases of dementia præcox, one of which showed steady improvement. Eight others were treated with hormone extracts, and two of them improved enough for discharge. There are a number of post-encephalitic cases in the hospital, and these are being investigated. Some benefit has been obtained in parkinsonism from a daily morning injection of hyoscin followed by two oral doses of stramonium in the afternoon and evening. At the *Storthes Hall Hospital*, *Kirkburton*, the Meinicke turbidity reaction was tried and found to be a valuable auxiliary to the Wassermann reaction, rapidly and easily carried out.

Of the *Lancashire Mental Hospitals*, that at *Lancaster* was occupied with an intensive antityphoid campaign, as sporadic outbreaks had occurred in the two previous years. Eight carriers were identified and no further cases have occurred. Malaria treatment is followed up by tryparsamide in general paralysis, and the relationship between the malaria infection and the cytological formulæ of the blood have been studied. The effects of ultra-violet light have been noted; the best results are obtained in debilitated patients who refuse food, and in stuporose melancholics. Schnee baths have been found useful for rheumatoid arthritis, sprains, and synovitis, as well as in the after-treatment of fractures, and as a general tonic in muscular affections. At *Prestwich* the malarial treatment has been studied. At *Rainhill* a number of cases of encephalitis have been examined bacteriologically and treated with autogenous vaccines. Cases of general paralysis have been followed up, and the conclusions arrived at are that malarial treatment alone is as effective as malaria followed by tryparsamide, but that tryparsamide acts as a general physical tonic and allays motor restlessness so that the pyrexial attack is less dangerous. It is, however, apt to cause serious complications, especially visual and hepatic disturbance, and must be given cautiously and controlled by the lævulose test and van den Bergh reaction. No case has been completely cured, if cure be taken to mean complete remission of mental symptoms, serological changes, and physical signs. Dr. C. M. Bamford calls attention to a special acute type of dementia præcox, characterised by restlessness, confusion and impulsiveness, lasting for a few months, with very intense physical deterioration, no tendency to remission, and early death. In all the cases examined post mortem he has found a large macrocephalic brain with a complex convolutional pattern, a marked fibrosis of all the solid viscera, especially the liver, kidneys, and ductless glands, and an infantile cardiovascular system. At *Whittingham* the Kafka paraffin reaction of the cerebro-spinal fluid has been found to agree in almost every case of general paralysis with the Lange gold and colloidal gamboge tests, but not to show meningitic curves. Tubercle bacilli have been demonstrated in the fæces in unexpected cases by the Ligroin and Zeihl-Neillson methods. It has been assumed that puerperal insanity is of two types: melancholia produced by pressure of the uterus on the splanchnic nerves, causing increased blood pressure, and mania due to a toxic factor producing cerebral irritation. Corresponding treatment has given good results; in mania a binder over several layers of towelling is applied, with the aim of increasing arterial pressure by increasing abdominal pressure. The Boltz test has been tried on 346 cases; it is only positive in general paralysis and does not always agree with the globulin test, nor is its absence a reliable indication of the absence of general paralysis. It tends to change after malarial treatment, but not as often or as rapidly as the globulin test.

The *London County Mental Hospital* at *Banstead* submits a report on the treatment of general paralysis with relapsing fever, saprovitan and milk injections. None of them was quite as good as malaria, and saprovitan was distinctly disappointing. It seems probable that the milk reaction is due to incomplete sterilisation and not to a genuine protein reaction. Malarial treatment is also being investigated at *Bexley*. At *Claybury* the Meinicke micro-reaction in the serum and the hydrogen-ion concentration in the urine have been investigated. Malaria has been tried in idiopathic epilepsy, but apparently only causes temporary benefit. At *Horton* ultra-violet light was found most useful in toxic cases and melancholias associated with the menopause. Malarial treatment here is made the subject of intensive research and not given as a routine only; a quartan strain is being tested. At *West Park* the oculogyric crises of encephalitis have been studied; suggestion seems the most potent factor in shortening or preventing attacks. Interference with normal cortical control accounts for the increased suggestibility of these patients, as well as for the release phenomena of different subcortical centres, causing tonic fits, ocular spasms, respiratory crises, myoclonias, emotional facility, and paradoxical reactions. A large proportion of the encephalitics who suffer from oculogyric crises subsequently require certification. The ætiology of alcoholism has been investigated at the *Maudsley Hospital* and attention drawn to the fact that we know almost nothing of the anatomical and biochemical basis of the euphoric and narcotic effects of alcohol, of addiction and distaste, and of susceptibility and immunity. Tryparsamide has been found valuable for general paralysis, but its action was enhanced by combination with malaria. The sedimentation velocity of erythrocytes in the psychoses has been studied but found of no diagnostic value except in recognising pulmonary tuberculosis in cases where the patient cannot give intelligent coöperation. The *Central Laboratory* of the London Mental Hospitals has continued its work on the pathology of schizophrenia and the histology of general paralysis. It has been found that the primary disturbance in the former lies in the inexcitability of the respiratory centre, a condition closely resembling that of normal sleep. The acid-base equilibrium was found in every way similar to that of a normal sleeping man. The absence of spirochætes in the brains of general paralytics after malarial treatment has been confirmed by numerous examinations. The stretch reflexes have been studied and work has been done on the relation of muscle tension to mental effort.

Research into the relation of mental disorders and the menstrual cycle is being continued at the *Cheshire County Mental Hospital* at *Chester*. Amenorrhœa has been found in one case in seven and dysmenorrhœa in one case in five of established psychosis, while a high percentage of epileptics show pre-menstrual or menstrual grouping of the fits. At *Macclesfield* light therapy has been investigated and also the liability to suicide in various psychoses. Suicide seems to depend on a faulty physical inheritance, in which endocrine malformation is a prominent factor.

At the *East Sussex County Mental Hospital* the Kahn test has been found less reliable than the Wassermann and the urochromogen test for tuberculosis was found very unreliable. Minchin's technique for identifying tuberculous yeasts is being tried and the acidophilus and streptococcal contents of the intestine have been investigated; acidophilus protection seems to be markedly deficient in mental patients.

At the *Dorset County Mental Hospital* a search for typhoid carriers and a leucocyte study has been carried out. The Meinicke micro-reaction, the Takata-Ara colloidal reaction, Buscaino's black reaction, and Scheiner's reaction are being investigated.

At the *Croydon Borough Mental Hospital* Kahn's test has been found simpler and more reliable

Wassermann reaction. In a few cases of epilepsy ephedrine has been found more efficacious than luminal or bromides, and glucose has been found an invaluable adjunct to the treatment of asthenic cases. The sedimentation-rate of the erythrocytes has been studied; it is markedly increased in pulmonary tuberculosis, carcinoma, salpingitis, and diabetes mellitus. Ultra-violet light, although useful for skin disease, has not caused any improvement in mental cases.

The Vernes tests are being investigated at the *Leicester City Mental Hospital.* A number of cases of dysentery were studied during the year and general paralytics were treated with malaria.

St. Andrew's Hospital, Northampton, puts all its patients through a routine scheme of research and various forms of hydrotherapy have been studied. A detailed examination is being made of the bacteriology of the stomach and intestine. At *Wonford House, Exeter.* the hæmatopoietic tissues have been found to be functionally impaired in general paralysis; they are unaffected in non-paretic syphilis. Consequently an infection calling for polymorphonuclear leucocytosis will flood the blood of a paretic with immature leucocytes. The depression of leucopoietic activity is thought to account for the ease with which bedsores are developed and the liability to intercurrent infection. It is suggested that it is futile to over-stimulate an exhausted system, and that pyrexial treatment should only be used when stimulation of the leucogenic functions is likely to be successful—i.e., at the earliest stage or as a preventive routine measure in the secondary or tertiary stages of syphilis. Pyrexial treatment given to a patient with a poor leucocytic response only hastened the paresis.

This brief summary by no means covers all the scientific work undertaken at the mental hospitals. It takes no account of the articles sent to medical journals and papers read at meetings of the Royal Medico-Psychological Association. When it is realised that most of this work is done in remote country places, often far removed from the encouragement of contact with other workers and without the stimulus of team enthusiasm, the record is highly encouraging. It is true that there are more than a hundred mental hospitals and many of them are silent on research, but the printed reports are enough to show that the scientific spirit is alive in the mental hospital service, and we are happy to call attention to it.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. N. A. H. Barlow to be Surg. Comdr.

ROYAL ARMY MEDICAL CORPS.

Maj. H. F. Joynt retires on retd. pay.

ARMY DENTAL CORPS.

Lt. E. C. Browne, temp. Dental Surg., Gen. List, to be Lt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. A. R. C. Parsons having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL FORCE.

Capt. E. R. Lovell to be Maj.

ROYAL AIR FORCE.

J. G. Skeet is granted a temporary commission as a Flight Lt.

Flying Officer J. J. MacAndrews resigns his short service commission.

Flying Officer H. D. Humphreys is promoted to the rank of Flight Lt. (Dental) on promotion to the rank of Captain in the Army Dental Corps.

INDIAN MEDICAL SERVICE.

Lt.-Col. (Bt. Col.) W. H. Leonard to be Col.

Temp. Lt. Sat Chit Anand relinquishes his temp. commn.

Correspondence.

"Audi alteram partem."

JAMES BLACK'S DESCRIPTION OF CONTRACTILITY OF CAPILLARIES (1825).

To the Editor of THE LANCET.

SIR,—In the second edition of Krogh's monograph on the capillaries, which you reviewed last week, attention is drawn to a group of investigations on the contractility of the capillaries carried out early in the nineteenth century. Mention is made of Wilson Philip's studies, and also of those of Johannes Müller, who sought evidence for or against the existence of peripheral propulsive agents which might assist the heart in overcoming the peripheral resistance. Krogh, however, and also Lewis, fail to mention the interesting study of James Black (1788?–1867), who, in 1825, published in London a book of 176 pages, entitled "A Short Inquiry into the Capillary Circulation of the Blood; with a Comparative View of the More Intimate Nature of Inflammation." Black described *in no uncertain terms the phenomenon now* referred to as the "red reaction," and he observed beyond any possibility of doubt the independent contractility of the capillaries. The following protocols of two of his experiments, which occur on pp. 54 and 55 of his book, will serve to indicate the nature of his observations.

"*Exp. 4. On a frog.*—The natural circulation of the arteries in the web almost invisible, and without any red colour; but as soon as it was discovered, it was observed to circulate with considerable velocity, and the globules were not easily to be traced. Extension and gentle fastening of the foot even by the fingers increased the flow of blood, and soon filled many of the colourless vessels with red globules. The application of Aq. Ammon., and more particularly of the salt solution, soon rendered the whole capillaries visible and of double their former diameters; the circulation becoming slower, and congestion following in the veins, and lastly in the arteries. The brain was crushed, and the circulation observed in the foot previously unexperimented upon. The vessels sooner than before became more visible, the circulation also became retarded, and congestion took place in the order of vessels as before remarked; but the circulation continued 20 minutes after the injury of the brain, and, lastly, the blood slowly retired from the smaller vessels of all descriptions, and left the web pale and flaccid."

"*Exp. 5. The web of a young duck's foot was made the subject of this experiment.*—The veins, in beautiful branches, were easily seen by a common magnifying glass, but the arteries were only visible after some stimulation. The web could not be rendered transparent enough to see the red globules by the microscope. Aq. Ammon. was applied to both sides of one of the divisions of the foot; in two to four minutes great contraction took place in the large vessels; so much so, that many branches were rendered invisible, and others appeared like the finest hairs, which, before in their natural state, seemed three times the diameter. It was not a mere recession of the blood, for the line of the larger vessels was very distinctly contracted and well defined. After the space of about four minutes, all the vessels acquired their former natural diameters, and still further enlarged to complete phlogosis of the part, or to what may be termed inflammation. A fresh application of Aq. Ammon. produced a fresh contraction, but it was not near so complete as the former. The other foot was treated with a saturated solution of Mur. Sodæ, which application was soon followed by great enlargement of the vessels, especially of the larger veins in the web, which seemed much congested, until bathed on both sides with Aq. Ammon. when after five minutes general contraction was produced, and many of the small vessels were rendered invisible. During the above experiment the animal scarcely struggled."

On the basis of these and other observations Black draws 12 carefully worded conclusions, several of which may be given in his own words.

"*Third.*—The healthy and natural circulation in the capillaries depends, directly, on a tonic or *tensive* state of their delicate tubes; and immediately, on some power inherent in the part, a degree of which power seems to reside in the blood equally with the vessels, and its energy depends more on the integrity or vitality of the part or parts of this system than upon any impulse derived from the heart."

"*Fifth.*—A strong stimulus suddenly applied, in a short time, produces a contraction of all the fibres of the part and a *diminution of the diameters of the whole classes of* vessels, but more particularly of the arteries, which is followed, at a greater or less distance of time, by a corresponding dilatation—according to the extent of which, the phenomena of inflammation will be more or less observable; and more so, if the *vis a tergo* be powerful or stimulated."

"*Sixth.*—A gentle or lesser stimulus produces an evanescent contraction, followed by relaxation, increased redness, and a slight acceleration of blood in the *leading* capillary arteries and veins; owing, it seems, to the increased capacity of the distended reticular vessels, while the former are yet relatively contracted."

"*Seventh.*—The circulation in the capillary system is independent of the controul [sic] of the heart, except so far as this organ affords a constant pressure and a ready supply of blood, upon which the capillary vessels may act; and it is still more independent of the brain."

"*Tenth.*—The condition of a part, in what is termed inflammation, is essentially seated in the capillary vessels, and primarily and chiefly in those of the veins."

Black then points out that his observations are in sharp contradiction to the conclusions of Haller (1760) that the capillaries were passive agents, whose diameter depended only upon the pressure of blood passing in them. The author considered the possibility that the capillaries may act as peripheral hearts, but draws no definite conclusion. In discussing the structure of the capillaries, he says, "the muscular or elastic tunic of the larger arteries, about which there has been so much controversy, is either lost in the capillary tissue or is so *entirely attenuated* that it is incapable of demonstration, even by the aid of a strong microscope."

Black records (p. 50), that his observations "were instituted in the summer of 1823. They would have been prosecuted to a much greater extent if an amaurotic affection of one eye of the experimenter had not made its appearance during these and some other optical pursuits." He was born in Scotland, and was admitted a Licentiate of the Edinburgh Royal College of Surgeons in 1808 and M.D. of Glasgow in 1820. From 1810 to 1839 he practised at Bolton, and then moved for ten years to Manchester. In addition to his medical writings, which were numerous, he *contributed several papers on* geology and Roman archæology to the Manchester Philosophical Society.

I am, Sir, yours faithfully,
J. F. FULTON.

Magdalen College, Oxford, Oct. 15th, 1929.

PS.—Since writing this letter I have come upon a work of Marshall Hall entitled "A Critical and Experimental Essay on the Circulation of the Blood, especially as observed in the Minute and Capillary Vessels of the Batrachia and of Fishes" (London: 1831, 187 pp., 10 plates). The anatomical distinction between arterioles and capillaries is here clearly set forth, but the writer was unable to detect independent contraction of capillary vessels, and he concludes that "every fact relative to the capillary circulation leads us to ascribe its various phenomena to forces impressed upon it from without," and "there is nothing of satisfactory evidence or argument for an automatic power in them" (p. 90). Marshall Hall exerted a powerful influence upon contemporary physiological thought and his conclusions were undoubtedly responsible for the scant attention which the observations of Black and Wilson Philip received.—J. F. F.

TANNIC ACID FOR BURNS.

To the Editor of THE LANCET.

SIR,—The results of a questionaire sent out to various hospitals and authorities have been considered by the medical advisory committee of the Industrial Welfare Society. The consensus of opinion shows that, although it has been proved to be of considerable value, especially in hospitals, it should be used only under medical supervision and not as a first-aid application for burns by the general public or ambulance attendants. Nor in the nursery, owing to the complicated character of the treatment, and the extremely poisonous nature of the corrosive sublimate suggested to be used with the tannic acid.

I am, Sir, yours faithfully,
D. A. COLES,
Chairman, Medical Advisory Committee of the Industrial Welfare Society.

51, Palace-street, Westminster, S.W. 1, Nov. 1st, 1929.

THE DIAGNOSIS OF LARYNGEAL CANCER.

To the Editor of THE LANCET.

SIR,—Sir James Dundas-Grant has mentioned my name. May I reply? The battle of the biopsies will be fought by laryngologists as long as that of white and brown bread by dietitians, but the recent discussion and a subsequent correspondence with Sir James has suggested to me a classification that may prevent our talking at cross-purposes.

Class A.—The removal of a piece of the primary lesion by an endolaryngeal method: (1) when any subsequent operative treatment will be a laryngectomy or pharyngectomy; (2) when any subsequent operative treatment will be a laryngo-fissure or the making of a window in the thyroid cartilage for the insertion of radium.

Class B.—The removal of a lymph gland for evidence of secondary involvement.

In *Class A* (1) I will agree that a biopsy may be made before submitting the patient to an operation of such a magnitude. In such cases the growth is extrinsic or if primarily intrinsic is becoming secondarily extrinsic. Further, it is large. For these two reasons it is probable that the piece removed will be large enough and central enough to produce a section from which a certain diagnosis may be made.

It is in *Class A* (2) that the difference of opinion prevails. I belong to the school that would make the diagnosis by clinical observation, by waiting and watching, and the exclusion of other diseases by general medical and by bacteriological and serological investigations. In my opinion it is wrong to attempt a biopsy in these cases. The growth is intrinsic and limited to the cord, and it is small. Therefore there is a chance that the piece removed will be small and from the periphery with the result that the section may not enable a definite decision to be made. The diagnostician is then in a worse position than before; he must fall back upon the policy of waiting and watching, but under great difficulties. The wound must first heal, and when it has healed the observer cannot be sure what part of the change from the original picture is due to the trauma, and what part is due to an extension of the disease.

Further, in both cancer and tuberculosis the removal of a piece may do harm. In cancer it may result in a rapid extension of the growth so that it passes from the stage where the relatively minor operation of laryngo-fissure must be replaced by the major one of laryngectomy. In tuberculosis it is equally harmful. To call the operation of laryngo-fissure "life-endangering" in tuberculosis may be correct; but one cannot deny the science epithet to the removal of a piece for microscopical section.

A study of the cases recorded at the last meeting of our section bears out this view. Sir James showed microscopical sections of two cases. In each they confirmed that which he had made. In his second case the patient was referred to him as one of tuberculosis, and I infer that he took a piece for microscopical section because he disagreed with this. In the third case the patient was sent to him with the diagnosis of growth and he thought it tubercle. Again, the section proved him to be right. In neither case therefore did the sections help him in his diagnosis; they merely gave him pathological support in his difference of opinion with others. He produced no section in which his clinical diagnosis was proven wrong and by which he was saved from calamity. Against biopsy we have Dr. Andrew Wyllie's case (*Proceedings*, 1929, p. 72) where the microscopist was wrong, and Dr. Jobson Horne's case (*Proc.*, p. 68) even after operation the opinions of varied. To these we may add the classical case of the Emperor Frederick and similar cases where the microscopical evidence from the part removed has been inconclusive and has led to delay and a terrible suspense. The only evidence produced in favour of biopsy at this meeting was negative. Dr. Jobson Horne instanced (*Proceedings*, pp. 66, 67) four cases where the larynx was opened for a tuberculous lesion which had been thought to be cancer. Apparently these were gleaned from the history of laryngology over a period of 50 years.

Class B does not afford many opportunities for performing a biopsy and none from the cases that come within Class A (2). In cases coming under Class A (1) section of a gland may clinch the diagnosis as in the following patient. A man came up to the clinic with a cauliflower mass in the larynx which looked like a carcinoma. He had such dyspnœa that it was necessary to do a tracheotomy on the next day before the complete medical examination could be made. While doing this operation the crico-thyroid gland was found to be enlarged: the section proved to be tuberculous. This was subsequently confirmed by examination of the lungs.

I am, Sir, yours faithfully,

Welbeck-street, W., Nov. 4th, 1929. T. B. LAYTON.

THE MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LIMITED.

To the Editor of THE LANCET.

SIR,—In reply to Mr. Bowdler Henry's attack on the board of this Society, I should like to say—

(1) that I was present at the general meeting and heard the discussion on Dr. Harvey Hilliard's resolutions and was perfectly satisfied with the board's treatment of them which was at once sympathetic and firm; and

(2) that as the unanimous recommendations of the directors, as set out in the annual report, were directly attacked it was only to be expected that the board would send out for proxies.

I am, Sir, yours faithfully,

Chelsea, S.W., Nov. 1st, 1929. E. F. THOMAS.

THE BROWN v. WHITE BREAD CONTROVERSY.

To the Editor of THE LANCET.

SIR,—The letter by Dr. S. H. Belfrage in THE LANCET of Nov. 2nd, asking those who hold opposing views to those of Prof. V. H. Mottram and Miss Gladys A. Hartwell to express their views on these experiments, induces us to make the following comment. Mottram and Hartwell have now definitely abandoned their former contention that white bread contains a considerable amount of vitamin B, and is not markedly inferior in that respect to wholemeal bread or germ bread. They now admit that the two last-named types of bread are richer in vitamin B, although they still conceal the fact that white bread is exceedingly poor in vitamin B. Incidentally they make an error in suggesting that the controversy has been complicated by the advent of germ breads. If they had consulted some such standard text-books on nutrition as Hutchison's "Food and Principles of Dietetics," they would have found that germ breads had been manufactured and consumed long before the vitamins were discovered. It is therefore now agreed that white bread is inferior to wholemeal bread and germ bread in so far as its vitamin-B content is concerned. Whether this is a matter of importance to the general public or not may be left to the judgment of your readers.

Mottram and Hartwell now shift the discussion to a new ground. They say that "an ordinary diet" contains so much vitamin B amongst other things that "the deficiencies of white bread" are amply compensated. In saying this they beg the whole question at issue. We may quote here the following sentences from our previous paper[1]:—

> "On a varied diet which includes milk, butter, eggs, porridge, potatoes, and other vegetables, the absence of vitamin B from bread may not be a serious defect. But the people who can afford such a diet do not eat much bread anyhow. It is among the poorer classes, and especially the children of the poorer classes, where bread represents the bulk of the daily diet, and where butter is replaced by margarine, that the absence of vitamin B from white bread has to be considered as a serious dietetic defect. Reports of medical officers of health show that many of these children live on a diet composed of white bread, margarine, jam, and fish, with perhaps some potatoes. Such a diet is certainly deficient in both vitamin A and B, and could be made adequate as regards the latter vitamin by the consumption of bread rich in vitamin B."

It will be seen that there is here again agreement between our views and those of Mottram and Hartwell, but it will also be seen that these authors evade the issue that according to the reports of medical officers of health many children live on a diet composed chiefly of fish, potatoes, white bread, margarine, and jam. This is not "an ordinary mixed diet," and from what we know of the vitamin-B content of the articles of food composing this diet, it is poor in vitamin B_1. It would not require long and costly experiments to prove whether on such a diet the partial substitution of wholemeal bread or germ bread for white bread as suggested by us would or would not have a beneficial effect.

The diet chosen by Mottram and Hartwell in their experiments, and called the "diet of the Essex agricultural labourer," is a very different one. Their experiments, incomplete as they admittedly are, prove that the diet is defective, and since the defects are not remedied by the substitution of bread rich in vitamin B for bread poor in it, all that one can conclude is that the defects of this diet cannot be remedied by the addition of vitamin B_1 alone. But when in the last sentence of their paper the authors make the bold assumption of implying that the diet called "the diet of the Essex agricultural labourer" represents the diet of the working classes of this country we cannot agree with them. There is no justification for this assumption. Nobody can lay down a definite diet as representing that of the working or any other class. Diet varies from household to household. The letter from Sir Bruce Bruce-Porter and the experience of medical officers of health referred to in the quotation from our paper paint a very different picture from that given by Mottram and Hartwell.—We are, Sir, yours faithfully,

J. C. MOTTRAM.
W. CRAMER.

Radium Institute, Imperial Cancer Research Fund,
Nov. 4th, 1929.

CURES AND PREVENTION.

To the Editor of THE LANCET.

SIR,—Dr. Ainley Walker makes a fine point. The fact cannot be denied that the injection of the antitoxin causes destruction of the diphtheria bacilli in the patient, whatever the exact method of that destruction is, and is therefore an intravital germicide. I will take him on the theoretical point he has made. Assuming, an assumption with which, perhaps, he will not agree, that the toxin is the ferment by which the microbe hydrolyses, therefore kills, the living tissues, in order to live, surely if the combining power of that ferment were neutralised, and the ferment, therefore, not capable of bringing about the digestion of the material, the microbe must die of inanition; the antitoxin can therefore quite properly be considered a germicide. If antiferments to X.Y.'s digestive ferments were injected into X.Y., causing his death by inanition, it would be a very efficient homicide.—I am, Sir, yours faithfully,

Harley-street, W., Nov. 1st, 1929. W. M. CROFTON.

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[1] THE LANCET, 1927, ii., 1090.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Highlands and Islands (Medical Service) Fund.

The Scottish Office have issued the following explanatory memorandum in connexion with the legislation which the Government are introducing this session to authorise the removal of the existing limitation of the Government grant to the Highlands and Islands (Medical Service) Fund: "Subsection (1) of Section 1 of the Highlands and Islands (Medical Service) Grant Act, 1913, authorises the payment to the Highlands and Islands (Medical Service) Fund established under that Act of an annual grant of £12,000 out of moneys provided by Parliament to be applied for improving the medical service in the Highlands and Islands of Scotland. The Fund is administered by the Department of Health for Scotland in accordance with schemes made by the Department with the consent of the Treasury. Any unexpended balance of grant is not liable to surrender at the close of the financial year. Since 1920 the expenditure out of the Fund has been greater than the annual income, the excess having been met from unexpended balances of grant which accumulated during the war years, when it was impossible to give full effect to the approved schemes in the conditions then obtaining. These accumulated balances will be exhausted this year, and it is necessary to make further provision for financing the Fund. It is proposed to introduce legislation to remove the limitation of the grant to £12,000 by authorising such additional sum as may be annually voted by Parliament for the purpose. The additional sum proposed in any year will be included in the Estimates of the Department of Health for Scotland. It is estimated that the additional sum required to be so included will be £10,650 for the current financial year and from £20,000 to £30,000 in future years."

The Widows' Pensions Bill.

In the House of Commons on Wednesday, Oct. 30th, Mr. A. Greenwood, Minister of Health, moved the second reading of the Widows', Orphans' and Old Age Contributory Pensions Bill, and said that it was in accordance with their election pledges and the statement contained in the King's Speech that the Government had brought forward the Bill, and had undertaken a comprehensive inquiry into the complex system of social insurance that now existed. The Bill was a small instalment of a larger policy. The health insurance scheme, on the one hand, and contributory pensions on the other, were closely interlocked as regarded range of insurance and collection of insurance; but on the fundamental matters of finance and general organisation there were quite distinct principles at work. In consequence of the system having grown up piecemeal—and he was not complaining about that—different principles entered into the conception of services that were provided for closely related needs, and there had been distinct forms of administrative machinery set up for services which were broadly similar in purpose. Because of that, and the other problems which were now in the forefront of public opinion, it was the view of the Government that the time had arrived when they should take stock of the existing system of social insurance, and a Committee of the Cabinet was engaged on a survey of the various schemes, an analysis of the various and complex problems which schemes developed on independent lines inevitably brought into existence, and consideration of the very large and important questions of the relations between insurance, on the one hand, and the various forms of social problems which were met outside of insurance on the other. The Bill before the House only professed to deal with the more important problems affecting the insured people arising out of the Act of 1925; the other and larger issues were precisely those questions which were now being examined by the Cabinet. It was the desire of the Government to build up by stages towards a comprehensive, adequate, harmonious system of social insurance which would enable all citizens effectively to meet the misfortunes and risks of life. To that task they had laid their hands; they would not consider that they had completed it until they had fulfilled their obligations. But there were certain amendments of the Contributory Pensions Act that could and should be made at once. The object of this Bill was to make those amendments. The main principle of the measure was to bring within the scope of the pensions scheme persons of the same class as those for whom the original Act was intended, and who by pure accident were at present excluded from its provisions. Under this proposal would be brought within the scheme as a whole all those women whose husbands could not participate because they were over 70 when the Act came into operation, or because they died before the appointed date of the Act of 1925. At the same time opportunity had been taken to relax certain restrictions which experience of the working of the Act had shown to be necessary, and to enlarge some of the provisions which experience had shown to be desirable. By July 1st, 1930, something like 210,000 pre-Act widows would be brought within the scope of the Bill for pensions. These would be the elderly widows who were over 60. On Jan. 1st, 1931, there would be brought within the scope of the Bill the class of widows between 55 and 60 amounting to 85,000. That meant that about 290,000 widows would begin to benefit as soon as they reached the age of 65. Provision was being made for round about 500,000 pre-Act widows in the present Bill. He emphasised that number, because to-day there were about 200,000 post-Act widows receiving pensions. The Bill also proposed to do something for the pre-Act widows with dependent children. By prolonging the right to pension until the youngest child reached the age of 16, about 18,000 widows would receive this benefit. Finally, old age pensions would be given at 65 to 24,000 wives of men who happened to be over 70 before pensions began to be paid.

For the period up to 1936 the additional expenditure would cost on an average about £8,000,000 a year. The Chancellor of the Exchequer proposed to increase the Treasury contribution from £4,000,000 to £9,000,000 a year; but in 1936—with the flat £4,000,000 contribution—a very substantial increase in the State contribution would be required. In order to reach the day of larger contributions by easy stages the Chancellor of the Exchequer proposed each year to increase the State contribution by £1,000,000 until it reached, under the proposals before the House and the present Act, a maximum of £21,000,000 a year.

The Bill was read a second time.

New Bills Introduced.

On Friday, Nov. 1st, Mr. G. Hirst presented a Bill to amend Subsection (4) of Section 9 of the Workmen's Compensation Act, 1925.—Mr. Alpass presented a Bill to consolidate and amend enactments relating to midwifery, &c. Both Bills were read a first time.

Unemployment Schemes and Public Health.

On Monday, Nov. 4th, Mr. J. H. Thomas, Lord Privy Seal, made a statement in which he described the progress of his plans for dealing with unemployment. Referring to the severe drought experienced during the past summer, the right hon. gentleman said that every water authority in the country ought to be alive to the dangers of such a situation, and there would be no excuse if there was a repetition next year of the dangers and hardships which the nation had passed through. He had circularised all the authorities and those responsible for water supplies, both large and small, and he was able to announce that included in the £11,000,000 which was to be spent on schemes already approved was a considerable number of large water schemes. No water authority would be held blameless next year if they had failed to take advantage of the opportunities now afforded to them.

During the debate which followed Mr. Thomas's statement—

Sir R. Aske suggested that something might be done to deal with the unemployment in the building and allied trades, which represented 12 per cent. of the whole problem. There was a large amount of frightful overcrowding in all the great industrial centres. This had a very bad effect on the health of the people. The Government should take their courage in both hands and deal with this overcrowding.

Mr. Thomas said that one of the first measures of the Government this session would be a Slum Clearance Bill to deal with one side of the housing problem. He had urged the municipalities to take advantage of the Government's facilities to help them to undertake work which ought to have been done long ago. That offer was still open.

Sir R. Aske, while expressing satisfaction at Mr. Thomas's statement, said that slum clearance would not meet the difficulty. There was an actual shortage of houses, and they must build more houses before they destroyed the slums. The health of the people was suffering, and if the Government did not build the houses now they would have to build hospitals in future. The Government should find out how many houses were necessary, and provide one house for one family, if possible. If they did that, they would greatly benefit public health and would save a vast sum which otherwise would have to be spent in future on public health services.

Protection of Dogs Bill.

On Nov. 4th Sir R. Gower presented a Bill to prohibit the vivisection of dogs. The Bill was read a first time.

HOUSE OF COMMONS.

THURSDAY, OCT. 31ST.

Washington Eight Hours Convention.

Sir **NICHOLAS GRATTAN-DOYLE** asked the Minister of Labour when it was proposed to introduce the measure to give effect to the Washington Hours Convention.—Miss **BONDFIELD** replied: I hope to introduce the Bill at an early date.

Various Industries (Silicosis) Order.

Mr. **HOLLINS** asked the Home Secretary when he proposed to make an order to extend the present Various Industries (Silicosis) Order, so as to make provision for the payment of compensation in the case of partial incapacity due to silicosis.—Mr. **CLYNES** replied: I am anxious to provide for the partial disablement cases as soon as practicable, but adequate medical arrangements must first be made. As my hon. friend is aware, this difficult question has been under investigation by a Departmental Committee. The Committee has now reported, and a copy of the Report has been laid before Parliament. I concur generally in the arrangements recommended, but I am advised that they cannot be given effect to without further legislation. I am accordingly considering an amending Bill, which I hope may be introduced and passed into law during the present session.

Mr. **HOLLINS** asked the Home Secretary if he was aware of the abnormal number of cases of silicosis in the pottery industry for which compensation had been paid since Feb. 1st last, when the Various Industries (Silicosis) Order came into operation; and whether, in view of the serious nature of the incidence of silicosis amongst pottery workers, he would appoint a committee of inquiry to consider and report as to amendments to the present lead and dust regulations required to give adequate protection to the health of the workers engaged in the pottery industry.—Mr. **CLYNES** replied: A certain number of cases have come to the notice of the Department but I have no complete figures. As my hon. friend knows, the question of further preventive measures was very carefully investigated in 1927 to 1928 by a Departmental Committee (of which he was a member), which recommended various additional precautions, including periodic medical examinations in some of the most dangerous processes. It is intended to give effect generally to the proposals of the Committee, but I am not sure how far it may be practicable or desirable to attempt to deal with the subject pending the establishment of the new medical arrangements to which I referred in my reply to the last question. So far as I am aware, there is no need for the appointment of any further Committee.

Tannic Acid Treatment for Burns.

Dr. **VERNON DAVIES** asked the Home Secretary if he proposed to issue any instructions to factories and workhops in reference to the tannic acid treatment for burns.—Mr. **CLYNES** replied: The value of this method in the treatment of cases in hospital is demonstrated by the recent Report of the Medical Research Council, but its application o the first-aid treatment of minor cases of burns, which orm a great majority of the cases at factories and workshops, would not appear to have been explored. The Senior Medical Inspector of Factories has been asked to go into this, and the matter will be further considered on his report. Meanwhile I am hardly in a position to issue any instructions.

Experiments on Living Animals.

Mr. **FREEMAN** asked the Home Secretary whether his attention had been called to the further increase in the number of experiments on living animals, especially without anæsthetics, being 300,915 during 1928 and 44,078 more than in 1927; and whether he would consider the desirability of setting up a full inquiry into the matter with a view to preventing this practice, paid for in many cases by public funds.—Mr. **CLYNES** replied: The answer to the first part of the question is in the affirmative. The increase of experiments under Certificate A (i.e., without anæsthetics) is largely, if not entirely, due to an increased use of animals for the purposes of standardising drugs for use in medical practice, of diagnosing the diseases of patients under treatment, and of testing the purity of milk and other foods in the interests of public health. The whole question of experiments on animals was very carefully and thoroughly investigated by the Royal Commission on Vivisection which reported in 1912; and I do not consider that a further inquiry is called for.

Nursery Schools.

Mr. **KELLY** asked the President of the Board of Education the number of nursery schools in operation; and whether proposals were made for the opening of nursery schools in other areas.—Sir **CHARLES TREVELYAN** replied: The number of nursery schools in operation under the Board's regulations in England and Wales is at present 29. There are, in addition, 15 proposals before the Board for the establishment of nursery schools, and the provision of such schools is under consideration in a number of other areas.

Pollution of the River Lee.

Captain **AUSTIN HUDSON** asked the Minister of Health whether he had yet concluded his inquiries into the pollution of the River Lee; and, if so, what action he proposed to take.—Mr. **GREENWOOD** replied: I have had an investigation made. The nature of the stream makes the pollution problem difficult in this case. There has been an improvement, but the conditions are still not satisfactory. I propose to confer with the authorities concerned.

Birth Control Information.

Mr. **THURTLE** asked the Minister of Health is he had received a resolution passed by a recent conference of the National Council of Women's Societies, asking that local authorities should be permitted to give information on birth control to married women who desire it; if he was aware that this resolution was passed by a large majority; and if he was proposing to take any action to carry out the wishes of this representative body of organised women.—Mr. A. **GREENWOOD** replied: I have received this resolution, though I have not been informed by what majority it was passed. The question has been considered by the Government, and they do not propose to depart from the policy hitherto followed in this matter.

Ministry of Health Staff.

Brigadier-General **CLIFTON BROWN** asked the Minister of Health what was the number of the personnel employed by the Ministry of Health on June 1st, 1929; what are the numbers at present employed; and what was the increase or decrease in the cost.—Mr. **GREENWOOD** replied: The number of personnel employed by my Department on June 1st was 5883; the present number employed is 6006. The approximate annual increase in cost is £35,500.

Medical Officers on Local Authorities.

Dr. **VERNON DAVIES** asked the Minister of Health if his attention had been drawn to the fact that under the Local Government Act, 1929, many district medical officers and public vaccinators who had been members of county councils and county borough councils were ineligible for future membership unless they forfeited their appointments; and, as the experience of such members in health matters was of much value, would he consider some means by which the services of these practitioners could, when desired, be utilised on such county and county borough councils.—Mr. **GREENWOOD** replied: This matter has been before the Royal Commission on Local Government. Their report will be issued shortly, and any recommendation made will be duly considered.

Medical Research in India.

Major **GRAHAM POLE** asked the Secretary of State for India whether any steps had been taken in regard to the scheme, sanctioned by the finance committee of the legislative assembly in January, to remove the central medical research institute to Dehra Dun; and whether, especially in view of the objection raised by the All-India Medical Association to the removal of the institute to Dehra Dun, where there would be an absence of clinical facilities and of the scientific coöperation available in larger urban centres, the Government will examine the possibility of reconsidering the scheme.—Mr. **WEDGWOOD BENN** replied: The latest information I have is that work had not been started at Dehra Dun on Sept. 2nd. I will bring my hon. friend's suggestion to the notice of the Government of India, but I understand that they have already received representations on the same lines from one or more medical associations in India.

Manufacture of Dangerous Drugs.

Mr. **MANDER** asked the Home Secretary what was the number of factories in this country engaged in the manufacture of opium, heroin, cocaine, and other noxious drugs; the amount of capital involved; and the number of employees.—Mr. **CLYNES** replied: Eight firms are at present licensed to manufacture medicinal opium, heroin, cocaine or morphine (i.e., pure drugs under the Acts): five to manufacture medicinal opium; one to manufacture medicinal opium, morphine, and heroin: one to manufacture morphine, heroin, and cocaine; one to manufacture cocaine. I have no information as to the amount of capital involved or the number of persons employed, but the number is certainly under 50. I am sending the hon. Member a copy of the Annual Report of the British Government to the League of Nations.

Hospital Treatment for Orthopædic Patients.

Brigadier-General WRIGHT asked the Minister of Health whether representations had been made by county councils to have the legal right, which they did not now possess, to assist all needy orthopædic patients without regard to technical group distinctions; and, if so, whether he was prepared to introduce legislation to confer this right on them.—Mr. GREENWOOD replied: Representations on this subject have been received from one county council. I am advised that under Section 14 of the Local Government Act, 1929, county councils will, as from April 1st next, be empowered to provide all necessary hospital treatment for orthopædic patients.

Typhoid in London Area.

Mr. DAY asked the Minister of Health the number of cases reported of typhoid, and the number of deaths that had occurred in the London area for the three months ended to the last convenient date; and whether his officers had been able to trace the origin of these outbreaks.—Mr GREENWOOD replied: As regards the first part of the question the particulars required are as follows:—

Enteric Fever (Typhoid and Paratyphoid).—Deaths of London residents occurring in London or in metropolitan institutions.

Week ending	Notifications.	Outside London.	Week ending	Notifications.	Outside London.
July 6	2	1	Sept. 7	9	2
" 13	5	—	" 14	17	3
" 20	7	1	" 21	6	1
" 27	4	—	" 28	6	—
Aug. 3	6	2	Oct. 5	5	—
" 10	5	1	" 12	23	1
" 17	6	—	" 19	30	3
" 24	11	—	" 26	41	3
" 31	4	—		—	—
	Total ..	..	.. ..	187	18

(In addition there were two deaths occurring in London of non-residents of the County of London. The notifications in these cases are not included above.)

As regards the recent outbreak in South-East London, which is responsible for the large increase in notifications this month, my officers have coöperated with the medical officers of health of the districts affected. I understand that the source of this outbreak has not yet been definitely traced, but there is reason to believe that the infection is no longer operative.

FRIDAY, NOV. 1ST.

Medical Examinations of Pensioners.

Mr. RAMSBOTHAM asked the Minister of Pensions (1) the frequency with which ex-Service pensioners had to be re-examined before medical boards; and whether, to avoid the constant anxiety to the men and the cost of the inspection, he could accelerate the rate at which pensions were being stabilised; and (2) what classes of great war pensioners had their pensions stabilised and which had not; and to which class belonged the men suffering with eye trouble.—Mr. F. O. ROBERTS replied: Pensioners are medically examined at such intervals only as is essential to determine the rate of compensation due to them. I have full sympathy with the hon. Member's desire that final awards should be made as soon as possible in all suitable cases. This is, in fact, the practice of the Department, and already more than four-fifths of the men on the pension list, suffering from disabilities of all kinds, are in receipt of final awards. This proportion applies also to cases of affections of the eye.

MONDAY, NOV. 4TH.

Opium Consumption in India.

Major GRAHAM POLE asked the Secretary of State for India whether the six inquiries instituted by the local governments concerned to inquire into the high consumption of opium in certain areas had been completed.—Mr. WEDGWOOD BENN replied: All but one of the inquiries have been completed.

Artificial Limb Fitting Centre.

Viscount ELMLEY asked the Minister of Pensions whether the artificial limb fitting centre now situated at Norwich would be transferred to Cambridge.—Mr. F. O. ROBERTS replied: Transfer of the centre referred to in due course is contemplated; Cambridge being the most central and convenient point in the area supplied by this centre.

Final Pension Awards.

Sir GEORGE BOWYER asked the Minister of Pensions in how many cases during the last five months pensions had been re-awarded on the ground that final awards should never have been made.—Mr. F. O. ROBERTS replied: Precise statistics are not available for broken periods, but I understand that the number of cases in which further awards have been made during the five months referred to is about 500.

River Pollution.

Rear-Admiral BEAMISH asked the Minister of Agriculture if the draft Report on river pollution had now been considered by the Standing Committee; and when the issue of the Report might be expected.—Mr. BUXTON replied: A draft report will be circulated this week to the members of the committee for their consideration. The Report will be published as soon as possible after it has been approved by the committee.

National Radium Trust.

Sir KINGSLEY WOOD asked the Minister of Health the amount of money expended to date by the National Radium Trust for augmenting the supply of radium for use in the treatment of the sick.—Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: No disbursements have yet been made, but arrangements are being completed which will result in a considerable augmentation of the supply of radium during the present month.

Artificial Silk Manufacture and Public Health.

Mr. KELLY asked the Minister of Health whether reports had been received from areas in the neighbourhood of artificial silk factories as to the effect on health of the manufacture.—Miss LAWRENCE replied: Reports have been received from districts in which there are artificial silk works. These are substantially in accord with the views expressed in the Report of the Chief Alkali Inspector, to which reference is made in my reply of July 25th last to a question.

TUESDAY, NOV. 5TH.

Care of Mental Defectives in Kent.

Mr. ALBERY asked the Minister of Health what accommodation existed in Kent for the care of mental defectives and the number in such institutions on the last available date.—Mr. GREENWOOD replied: The following accommodation in the County of Kent, excluding the County Borough of Canterbury, is certified or approved for the reception of mental defectives at the instance of the Kent County Council:—

—	Defectives over age 16.	
	Male.	Female.
Cranbrook P.L.I. ..	10	20
Dover P.L.I.	—	6
Eastry P.L.I.	20	24
Malling P.L.I.	—	14
Sevenoaks P.L.I. ..	10	20
Tenterden P.L.I.	—	118*
Tonbridge P.L.I.	40 males under 16.	
Totals..	Over 16: 40 males, 136 females. Under 16: 40 males, 66 females.	

* 66 under and 52 over age 16.

There are two further institutions for defectives within the county: (1) Princess Christian's Farm Colony at Hildenborough, Kent, for 71 male and 68 female defectives; but it is conducted by a voluntary body, and the Kent County Council receives no preference in the allocation of vacancies. (2) Darenth Training Colony, Dartford, an institution of the Metropolitan Asylums Board, but all future vacancies will be filled by cases arising in the London County Council area. The Kent County Council have purchased an estate known as Leybourne Grange, on which they propose to develop a colony for mental defectives. At present the mansion is being adapted for the accommodation of about 90 female patients. On Jan. 1st last the Kent County Council was responsible for 580 mental defectives in institutions or on licence therefrom. The return then furnished did not differentiate between cases detained in institutions in Kent and elsewhere, but I am informed that many Kent cases are sent on contract to voluntary institutions outside the county, and that 261 of the 580 patients were detained in institutions of the Metropolitan Asylums Board.

Shipbreaking Workers and Lead Poisoning.

Mr. WATSON asked the Home Secretary what precautions, if any, were taken by the Alloa Shipbreaking Company at Rosyth to safeguard the health of the workers engaged on burning against the dangers of lead poisoning.—Mr. CLYNES replied: It appears from a report by one of the medical inspectors of factories who recently visited these works that this company devote great care to the prevention of lead poisoning. A doctor has been appointed to give medical supervision, and arrangements are made to transfer to other work burners who show signs of contracting, or being specially liable to, the disease. Steps are also taken to see that so far as possible men do not work in such a position as to be exposed to fumes from another burner. I am advised that there must necessarily be some risk of lead poisoning in this process, but the firm appear to be doing their best to reduce it to a minimum; and I am glad to say that the incidence of lead poisoning at the works has considerably decreased.

The Government and High Milk Prices.

Mr. WISE asked the President of the Board of Trade what action he proposed to take in view of the high cost of distribution of milk and of the disregard shown by the traders of the views expressed by himself and by the Food Council.—Mr. W. GRAHAM replied: The Government have considered the position of the Food Council with particular reference to the recent refusal of London milk distributors to conform to the Council's recommendations as to the retail price of milk in August last. I should like at the outset to state that the Government fully recognise the value of the work done by the Food Council, notwithstanding that since its inception in 1925 it has had no statutory basis and has been without power to require the production of information when it was not forthcoming voluntarily. I may add that neither the Food Council nor any other body has power to compel the observance of the Food Council's recommendations. In the opinion of the Government this position is highly unsatisfactory, and we intend to submit proposals to alter it early next year. The Government are of opinion that the interests of the consumer demand that investigation should take place not only in regard to foodstuffs, but also in regard to other necessaries of life. With this object in view, we propose to ask Parliament to set up a Consumers' Council which shall have power to obtain compulsorily any information that it may require for the purposes of its inquiries. The Government intend also to submit proposals enabling them to deal with trading interests which refuse to accept the views which the Government may reach after considering the recommendations of the Consumers' Council. As I have already indicated, it must be some months before the Consumers' Council can be set up. I am therefore asking the Food Council to remain in being for the purpose of carrying out investigations into such food questions as may arise meantime.

Obituary.

NINIAN McINTYRE FALKINER, M.D. DUB., F.R.C.P. IREL.

THE death of Dr. Ninian Falkiner occurred, after a short illness, on Oct. 30th, at the age of 74. Though his health had been unsatisfactory for some months past he was going about until ten days before his death.

Ninian Falkiner was educated at Trinity College, Dublin, and the Carmichael School of Medicine, and graduated as M.B. in 1884. He became a Fellow of the Royal College of Physicians of Ireland in 1891, and took his M.D. degree in 1900. He spent several years as a poor-law medical officer in the city of Dublin, until in 1900 he was appointed as medical superintendent of statistics in the General Register Office. He held this post for some 20 years, until he was retired on reaching the age-limit. He was for a term Vice-President of the Royal College of Physicians of Ireland, and served as examiner both in that College and in Trinity College. He was also lecturer in Vital Statistics in Trinity College.

A colleague writes of him that he was one of the most modest and self-effacing of men. "He never sought prominence, but he carried out any duties confided to him with a punctilious care. Seeking nothing for himself he was unwearied in finding opportunities for kindness to others. He never was known to utter an unkind word of others, and one cannot believe that he ever conceived an unkind thought. His memory will long be pleasant to all who knew him."

ANTONIUS JOSEPH MANASSEH, B.SC. LEEDS, M.R.C.S. ENG.

DR. A. J. Manasseh, who died on Oct. 31st, had been superintendent since 1898 of the Friends' Missionary Hospital at Brummana, on the slopes of Mount Lebanon. Born at Beirut in 1866, he was of Syrian parentage, and was brought up in the Orthodox Greek Church. He was educated at the High School of the Society of Friends at Brummana, under Theophilus Waldmeier, founder of the Lebanon Hospital for the Insane. He studied at the Syrian Protestant College, Beirut (now known as the American University), and later came to England for his medical training. He took the degree of B.Sc. at the University of Leeds, and after studying at the London Hospital qualified in 1897, later proceeding to the M.D. degree of Constantinople. He was accepted as a missionary of the Friends' Foreign Mission Association in 1897, and after a year's work in Syrian villages he became superintendent of the Quaker medical work at Brummana. In Syria he built up a wide reputation as physician and surgeon, and patients came to him from all over the country. In 1915 he was taken into the Turkish Army as a medical officer, and after being stationed at Damascus, in charge of the typhus hospital there, he was moved to the military hospital at Baalbek, and then advanced to a field hospital at Toul Kerum. There he was taken prisoner by Allenby's army, in September, 1918. He was given medical work in charge of a prison hospital by the British, but was soon released and joined the relief unit of the Syria and Palestine Relief Fund. Although suffering bad health from his experiences, he refused to take any furlough until he had been able to meet the heaviest demands of the relief work. He has since worked at Brummana, where, at the time of his death, he was superintending the building of a new hospital.

"Last spring," writes Dr. Fortescue Fox, "I had the privilege of spending some hours with Dr. Manasseh at Brummana where he had so long been the leading spirit. We discussed the site on the plan of the new hospital by which he hoped to extend the influence of this medical and educational post in the Lebanon. We went together afterwards to Beirut, and everywhere he was welcomed as much for his presence as his advice. He was a fine example of his countrymen at their best."

In 1899 Dr. Manasseh married Henrietta, daughter of George Benington of Enfield. His widow is left with a son and a daughter.

DONATIONS AND BEQUESTS.—Mr. James Fleming Fyfe Jamieson, of Ruthven, Meigle, Forfar, left £1500 for the endowment of a bed in the View Park Nursing Home, and £5000 for various charitable pruposes.—Mr. William Gilman, of Hazelcroft, Alderley Edge, Cheshire, who left over £141,000, besides personal bequests, directed that failing certain trusts, the residue of the property to be divided as to one-half equally between the Royal Infirmary, Manchester, and the Ancoats Hospital, Manchester, and one-half for such other Manchester charities, hospitals, and institutions, and in such proportions and in such manner as his trustees may think fit.—Mr. Peter Bond Burgoyne, of Broadlands, Ascot, left £1000 to the National Hospital for Consumption, Ventnor.—Mr. Thomas Albert Turner, of Lynwood, Newtown, Montgomery, left £1000 to Montgomery County Infirmary, Newtown, for the endowment fund.—Mrs. Eliza Macloghlin, Wigan, bequeathed a legacy of £10,000 to the Royal College of Surgeons for scholarships to be founded in memory of her husband, the late Dr. E. P. P. Macloghlin, of Wigan.—Mr. James Tivendale Spence, of Halbeath, near Dunfermline, left £1000 to the Royal Infirmary, Edinburgh, and the residue of his trust estate to the Dunfermline and West Fife Hospital.—Mr. Robert Benjamin Field Thornton, of Headfield-road, Savile Town, Dewsbury, left £1000 to the Dewsbury and District General Infirmary to endow a Robert Benjamin Field Thornton bed.—Mrs. Martha Roberta Meharry, of Linden Mansions, Hornsey-lane, London, N., besides other bequests, left £1000 to the Royal Victoria Infirmary, Newcastle-on-Tyne, to endow a bed in King Edward's Ward to be named after her late brother, Dr. W. J. Davison.

Medical News.

UNIVERSITY OF OXFORD.—The following awards have been announced:—Welsh Prize: A. P. Meiklejohn. Theodore Williams Scholarships: A. H. Hunt (Human Anatomy), J. W. Litchfield (Physiology), and J. R. Braybrooks (Pathology). Radcliffe Scholarship in Pharmacology: J. R. Braybrooks and G. S. Grist (equal).

UNIVERSITY OF CAMBRIDGE.—At a congregation on Nov. 2nd the following degrees were conferred:—

M.D.—T. A. Butcher.
M.Chir.—John Gray.
M.B. and B.Chir.—J. St C. Elkington, R. A. P. Gray, Alan Maberly, S. S. Chesser, and J. F. Stent.
M.B.—S. D. Isaacs.
B.Chir.—A. T. Howell and C. E. Donaldson.

UNIVERSITY OF LONDON.—Mr. Edwin Deller, LL.D., previously Academic Registrar, has been appointed to the post of Principal of the University as from Oct. 1st, in succession to Mr. T. Franklin Sibly, D.Sc., now Vice-Chancellor of the University of Reading. In 1920, Dr. Deller was appointed assistant secretary to the Royal Society, but returned to the University in 1921 to take up the post of Academic Registrar. From June, 1928, to February, 1929, he was acting Principal Officer.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—A quarterly Comitia of the College was held on Oct. 31st, with Sir John Rose Bradford, the President, in the chair. The following were admitted Members of the College:—

Ilahi Bakhsh, Thomas Henry Booth Bedford, Howard Bell, Denis Hubert Brinton, Philip Ellman, Ishak Kirolos Gayid, Leslie Wakefield Hale, Isidore Liknaitzky, Michael Malk, Arnold Ashley Miles, Sinclair Miller, Minocher Bamanji Mody, Ganpat Bapun Mohile, John Barrie Murray, John Henry Noble, Henry Edward Nourse, William Frederick Howson Ray, Cuthbert Lawson Stote, Bertrand Edward Tompson, Thomas à Beckett Travers.

Licences to practise were conferred upon 126 candidates (117 men and 9 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

H. S. Atkinson, Oxford and London; G. O. Barber, Cambridge and St. Mary's; E. E. Barnett, London; G. H. Bateman, Oxford and King's Coll.; T. S. Belcher, London; F. Bell, Oxford and St. Thomas's; E. Bellamy, Guy's; J. H. Bentley, Cambridge and Univ. Coll.; J. A. K. Brown, Manchester; W. D. Brown, Cambridge and London; D. R. Buchan, Birmingham; P. C. Chakravorty, Calcutta and Middlesex; G. Clarke, Guy's; J. P. Collinson, Sheffield; S. O. S. Cooke, Middlesex; W. H. O. Croft, Birmingham; J. H. Cyriax, Cambridge and St. Thomas's; H. W. Davies, Oxford and King's Coll.; T. Davies, Cardiff and St. Bart.'s; C. D. D. de Labilliere, St. Bart.'s; H. B. A. R. Densham, Guy's; A. Eckford, Cambridge and Guy's; J. A. Edward, Manchester and St. Bart.'s; H. G. Edwards, Cardiff and St. Bart.'s; Lilian P. Edwards, Royal Free; M. P. Ellis, Univ. Coll.; J. F. Fisher, St. Bart.'s; B. M. Fonseka, Middlesex; A. M. Fratel, Bombay and Durham; L. Gabbe, Cape and Guy's; D. K. Gaitskell, Guy's; H. S. H. Gilmer, Cambridge and St. George's; R. McN. Glover, Cambridge and Westminster; P. E. Glynn, Leeds; C. G. Gordon-Wilson, London; G. H. A. Gruetz, Cambridge and St. Bart.'s; M. B. W. Gray, London; Brynelien Griffiths, Cardiff and Charing Cross; E. Gwynne-Evans, Univ. Coll.; Verna Hockett, Adelaide and Westminster; R. H. Hadley, Melbourne, Y. A. A. Hammouda, Cairo and St. George's; Flora Hargreaves, Univ. Coll.; C. C. Harvey, Cardiff and Univ. Coll.; E. Harvey, Oxford and Middlesex; C. F. Hecker, Adelaide and London; Violet L. de A. Hickson, Westminster; F. K. S. Hirschfeld, Melbourne and London; H. B. Hodson, St. Thomas's; J. Horton, St. Bart.'s; R. H. Hucknall, Birmingham; Mary A. Hughes, Cardiff and Charing Cross; E. F. Hunt, St. George's; C. S. Kah, Cambridge and St. Thomas's; K. S. Keele, Guy's; E. J. Kerr, Birmingham; H. Y. Khwaja, Bombay and London; N. Kramer, St. Bart.'s; M. Lee, Durham and Middlesex; E. E. Lewis, St. Mary's; W. D. Lovelock-Jones, Cardiff and Univ. Coll.; F. T. F. Lutter, Cambridge and St. George's; R. W. McConnel, Cambridge and King's Coll.; E. M. MacLachlan, Guy's; F. N. Marshall, Manchester; Eileen M. Massey, King's Coll.; N. D. Matson, Otago and Charing Cross; E. C. W. Maxwell, Cambridge and St. Thomas's; P. H. Merlin, Birmingham; T. J. Millin, Dublin; C. W. Morley, Cambridge and St. Mary's; I. R. Morris, Cambridge and Guy's; D. P. F. Mulvany, Charing Cross; W. D. Neill, London; J. N. O'Reilly, Oxford and Middlesex; B. W. Paine, Univ. Coll.; E. H. Parkinson, Birmingham; L. H. Peiris, Ceylon and King's Coll.; J. Petro, Cambridge and St. George's; I. E. Phelps, St. Bart.'s; R. F. A. Philpott, Oxford and St. Thomas's; T. B. Pitts, Guy's; F. Pomerantz and E. S. Pope, St. Bart.'s; A. C. Price and N. L. Price, Bristol; S. R. C. Price, King's Coll.; F. S. C. Pritchard, Guy's; C. F. H. Quick, Calcutta and St. Mary's; J. P. Raban, Middlesex; B. Ram, St. Thomas's; J. Richardson, Cambridge and Middlesex; Marjorie E. Roberts, Royal Free; J. A. Rogers, Calcutta and King's Coll.; T. N. Rudd, London; C. R. Salkeld, Oxford and St. Thomas's; L. Savronsky, London; J. G. Scadding, Middlesex; D. Sheehan, Manchester; B. C. Singh, Calcutta and Univ. Coll.; E. Sladen, Middlesex; F. J. G. Slator, Cambridge and Durham; J. H. Smith, Cambridge and St. Thomas's; J. O. Smith, Melbourne and St. Bart.'s; A. Somerville, Sheffield; P. D. B. Spence, Edinburgh and Guy's; F. R. Stansfield, Leeds; J. E. S. Stephens, Cambridge and St. Bart.'s; T. Stephens, Cardiff and London; M. Sternfeld, Freiburg and London; Muriel H. Steven, King's Coll.; G. D. Stilwell, St. Thomas's; H. J. Stracey, Madras and St. Thomas's; B. L. Taneja, Punjab and Guy's; J. M. Taylor, St. Bart.'s; T. H. E. Taylor-Jones, King's Coll.; E. G. Thomas, Cardiff and Univ. Coll.; J. C. T. Tregarthen, Guy's; C. E. H. Turner, London; G. S. Walker, Oxford and Univ. Coll.; C. J. Waring, London; J. H. Watkin, St. Bart.'s; K. Watman, Middlesex; V. W. L. Wells, Guy's; T. H. N. Whitehurst, St. Bart.'s; and T. H. Wilson, St. Thomas's.

Dr. John Hay, Dr. F. E. Fremantle, M.P., and Dr. J. B. Leathes were elected to the Council of the College, and Dr. E. P. Poulton gave faith as an examiner in medicine. Sir Francis Champneys was re-elected a representative of the College on the Central Midwives Board, and Dr. H. Letheby Tidy was elected a member of the committee of management. Dr. Robert Hutchison and Dr. James Collier were elected members of the Mackenzie Mackinnon Research Fund Committee. Dr. J. H. Abram and Dr. A. S. Barnes were re-elected to represent the College on the Court of Governors of the University of Liverpool and the University of Birmingham respectively, while Dr. A. S. Woodwark was re-elected as representative on the Central Council for District Nursing. The President announced that Surgeon-Commander Sheldon Francis Dudley had been appointed Milroy Lecturer for 1931, and that the Jenks Memorial Scholarship had been awarded to Francis Sansome Mitchell Heggs. He also announced that permission had been granted to the Ophthalmological Society to hold a reception at the College on April 3rd next on the occasion of its jubilee, and permission was granted to a request that the Savill Memorial Oration might be delivered at the College. The Registrar announced that Dr. J. W. Springthorpe, of Melbourne, had applied for the restoration of the diploma of Member which he had resigned in 1910.

A communication was received from the Home Office that by an Order of Council made on August 15th, 1929, Part III. of the Dangerous Drugs Act, 1920, has been applied to the esters of morphine and their respective salts, and to any preparation, admixture, and extract containing them. —A communication was also received from the University of Wales announcing that the Advisory Board of Medicine had been recently dissolved.—A report was received from Dr. Fremantle, who had represented the College at the Imperial Social Hygiene Congress held in London in July last, in which he commented upon the increased interest taken by the public in the subjects before the Congress.

Dr. R. A. Young presented reports from the Committee of Management concerning alterations in connexion with the regulations for the First and Final Examinations for the L.R.C.P., M.R.C.S.—Dr. Sidney Phillips presented the treasurer's annual statement of receipts and expenditure, and auditors were re-elected. Dr. Arnold Chaplin stated that among donations to the library during the last quarter was an account of the last illness of the Earl of Beaconsfield in the words of the late Dr. Mitchell Bruce.

After receiving the quarterly report of the examiners for the licence on the examination held in July last, the President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—Out of 15 candidates entered, the following 8 have passed the final professional examination and have been granted the diploma of L.D.S.:—

George Morton Smith McGibbon, Syed Mohammed Ali, William Ainslie Elder Duncan, Walter Pearson Neilson, Robert Hugh Dewar, John Ellis Sprunt, Thomson Alexander Ferguson, and Donald Forbes Johnstone.

The following passed in the subject of pathology:—

Robert Kirkwood Nicol Clarkson and Robert Pearson Neilson.

UNIVERSITY OF DUBLIN.—On Saturday last Mr. William Pearson, surgeon to the Adelaide Hospital, Dublin, was elected Professor of Surgery in the University in succession to the late Mr. T. E. Gordon.

Mr. Pearson, who is a son of Mr. C. Y. Pearson, for many years Professor of Surgery at University College, Cork, was educated at Trinity College, Dublin, where among other achievements he won the Travelling Prize in Surgery. In 1910 he became a Fellow of the Royal College of Surgeons in Ireland, and in the same year was appointed assistant to the Professor of Surgery in Dublin University. During the war he was for some time engaged in work for the British Red Cross Society in France, and later as consulting surgeon in Sussex. He was twice mentioned in dispatches, and retired with the rank of lieutenant-colonel. Since then he has been surgeon to the Adelaide Hospital, Dublin, and to the University of Pensions Surgical Hospital at Blackrock.

Wellcome Historical Medical Museum.—On Monday, Nov. 11th, at a reception to the Egypt Exploration Society, Mr. Warren Dawson will give an address on Egyptian Magic and Medicine. The reception will be at the Museum at 8.30 P.M.

Hunterian Society.—A meeting of this Society will be held at The Cutlers' Hall, Warwick-lane, London, E.C., at 9 P.M., on Monday, Nov. 18th, when Earl Howe, Mr. E. B. Turner, and Dr. P. B. Spurgin will take part in a discussion on The Doctor and the Motorist.

Society of Medical Officers of Health.—The annual dinner of this society will be held at the Piccadilly Hotel, London, W., on Thursday, Nov. 14th, at 7.30 P.M. (Reception at 7.10.) Tickets are obtainable from the Executive Secretary at 1, Upper Montague-street, Russell-square, W.C. 1.

British Science Guild.—At 4.30 P.M. on Tuesday, Nov. 19th, at the Goldsmiths' Hall, Foster-lane, London, E.C., Sir Walter Fletcher, F.R.S., secretary of the Medical Research Council, will deliver the Norman Lockyer Lecture. His subject will be Medical Research: the Tree and the Fruit, and tickets may be had from the secretary of the Guild at 6, John-street, Adelphi, W.C. 2.

London Irish Medical Golfing Society.—At this society's week-end meeting at Sandwich there were 63 entries for the Canny Ryall Cup, and the winner was E. T. Wright. E. T. McElligott and C. Petit tied for the O'Malley Cup, and Petit won on a replay. For the Lett Cup D. S. Gordon and E. T. Wright tied with E. S. A. Crawford and C. L. Wilson: Gordon and Wright won the replay. The Cahill Trophy was won by D. R. Wheeler, the Captain's Prize by E. T. Wright, the Juniors' Prize by R. L. Rea, the Hidden Nine by D. R. Wheeler, and the Eclectic Competition by W. Calwell and D. R. Wheeler (tie).

College of Pestology.—The annual dinner and ball took place at the Piccadilly Hotel on Nov. 1st. Owing to the illness of the new President, the Duke of Sutherland, the chair was taken by Sir Thomas Horder, who pointed out that the intermediate host between the microbe and the human being was the pest, and that to deal with this intermediary was everybody's business, and therefore nobody's. He related the work of the College to the problem of slum-clearance, for as long as slums existed it was impossible to free the country of pests. The toast of the Society was proposed by Captain W. S. Saunders, M.P., and responded to by Mr. Moore Hogarth, who traced the continued usefulness of the College and declared that we were a bug-ridden country, and that it would be impossible to get all the bugs of the metropolis into a container as large as the Tower of London.

Presentation to Dr. Jane Walker.—A dinner was held at the East Anglian Sanatorium, Nayland, Colchester, on Oct. 24th, to celebrate the seventieth birthday of Dr. Jane Walker, its principal. Dr. G. E. Soltau presided, and Dr. G. H. Metcalfe proposed the toast of Dr. Jane Walker. He said that the sanatorium, which was opened nearly thirty years ago, was known not only in Suffolk and East Anglia, but throughout the world. Dr. Vere Pearson spoke of the vitality and enthusiasm shown by Dr. Walker, not only in her medical work but in her interest in music, literature, and art. The chairman said that many of the former medical residents and matrons had desired to join in giving Dr. Walker a tangible expression of their feelings towards her. She handed a bag of gold from past and present patients and members of the staff of the sanatorium to Dr. Walker.

Finance of the Middlesex Hospital.—The report for 1928, which has just been issued, again shows a considerable expansion of work. At 6271 the number of in-patients treated to a conclusion was an increase of 759, and the average number of occupied beds was 340·18, compared with 329·45 in 1927. The increase is partially accounted for by the provision of facilities at the convalescent home for surgical cases at an earlier stage of convalescence. A decrease in costs has resulted, the average weekly cost of each in-patient having fallen by 1*s.* 7*d.* to £4 15*s.* 1·15*d.*, and the total cost per head from £15 1*s.* 4·40*d.* to £13 0*s.* 8·08*d.* The number of out-patients (52,580) is an increase of 3502. There was a fractional increase in the cost in this department, a greater proportion of the time of the dispensary staff having been required owing to the growth in the number of patients. The larger number of resident patients increased the expenditure by £1096 to £100,068, which the governors regard as very satisfactory in view of the cost of the contributory superannuation scheme. The total income went up from £80,177 to £83,515. The grant from the Hospital Saturday Fund fell from £4475 to £3230. The recommendations of a joint committee of the governors and the medical committee are resulting in better conditions for the nursing staff.

Queen Alexandra's Hospital for Officers.—The tenth annual reunion dinner of this hospital was held on Oct. 30th at the Hotel Cecil, under the chairmanship of Major W. B. Binnie, a former patient. Mr. Herbert Paterson read a message of good wishes from the Princess Victoria; Lord Waring proposed the health of the former patients, and Colonel F. R. Hybart, the senior officer, replied.

University of Birmingham Dental Clinical Board.—Four post-graduate lectures will be given at the Dental Hospital, Great Charles-street, Birmingham, at 5 P.M., on Thursdays, Nov. 14th and 28th, and Dec. 5th and 12th. The first lecture will be by Mr. Harold Round on Fractures of the Jaws. Further particulars may be had from the Clerk to the Board at the University.

A Radium Cancer Clinic.—Lord Moynihan, President of the Royal College of Surgeons, last week opened a radium cancer clinic at Burnley Victoria Hospital, of which Dr. J. H. Watson has been appointed director. It is proposed that the clinic should have 1 g. of radium; the first instalment, already in use, consists of 340 mg.

A Licensed Victualler's Bed.—A bed in the Victoria ward of St. John's Hospital, Lewisham, has been endowed by the Blackheath Division of the Licensed Victuallers and Beersellers' Protection Society.

Presentation to a Medical Man.—Last week a presentation was made to Dr. G. S. Pollard on his retirement, after 23 years' service, as honorary medical director of Paulton Memorial Hospital, near Bristol. He has been a member of the medical staff for 43 years. The presentation, from the members of the medical and nursing staffs and the management committee of the hospital, consisted of an armchair, a cheque, and an album containing the names of the subscribers.

The Royal Family and Hospitals.—On Monday Princess Marie Louise laid the foundation-stone of the new Queen Charlotte's Maternity Hospital at Hammersmith.—Last week Princess Louise, Duchess of Argyll, opened a new isolation hospital (60 beds) which has been built by the Hendon urban council, at an approximate cost of £70,000.—The new X ray department of Wembley Hospital has been opened by Prince Arthur of Connaught. The foundation-stone of the institution was laid exactly three years ago, and the hospital, which cost nearly £30,000, was opened free of debt. The accommodation is already insufficient, and plans are being made for enlargement.—On Thursday in last week the Duke of York opened a new pavilion of Grindon Hall Tuberculosis Sanatorium belonging to the corporation of Sunderland.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, Nov. 11th.—5 P.M., War. Paper:—Lieut.-Colonel T. B. Layton: The Surgical Aspects of the Transport of the Wounded.

Tuesday.—5 P.M., Therapeutics. Communication:—Dr. J. H. Burn, Dr. S. Wokes, and others: The Use of Ergot. A discussion will follow. 8.30 P.M., Psychiatry (at the Wellcome Historical Medical Museum, 54, Wigmore-street, London, W.). Presidential Address:—Sir Robert Armstrong-Jones: Superstition.

Wednesday.—5.30 P.M., Surgery: Subsection of Proctology. Pathological Meeting preceded by a discussion on Complications of Operations for Piles, to be opened by Mr. Cecil Rowntree (President of the Subsection). Cases and Specimens:—Mr. Cecil A. Joll: Combined Abdomino-perineal Excision of the Rectum and Wertheim's Hysterectomy for Carcinoma of the Recto-vaginal Septum: Abdomino-perineal Excision of Rectum for Endometrioma. Mr. E. T. C. Milligan: Specimen Illustrating Early Carcinoma of the Colon; Two Cases Illustrating Peri-rectal Swellings. Mr. Lionel Norbury and others will also show specimens.

Thursday.—8.30 P.M., Neurology. Clinical Meeting at the National Hospital, Queen-square, W.C.

Friday.—5 P.M., Balneology. Paper: Dr. G. L. Kerr Pringle. 8 P.M., Obstetrics. Specimens: Mr. Clifford White will show two specimens. Short Papers:—Dr. J. Estcourt Hughes: A Case of Hydatidiform Mole with Multiple Small Syncytial Infarction of the Lungs. Dr. Kathleen Vaughan: Maternal Mortality and its Relation to the Shape of the Female Pelvis. Discussion on the Report of the Departmental Committee on the Training of Midwives. Opener: Dr. Herbert R. Spencer. 8.30 P.M., Electro-Therapeutics. Paper:—Dr. Jessie E. Sheret: Massive Collapse of the Lungs.

BIOCHEMICAL SOCIETY.

Saturday (to-day), Nov. 9th.—2.30 P.M. (In the Department of Physiology, University of Liverpool): 129th Meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Nov. 11th.—8.30 P.M., Discussion on the Relative Value of the Different Methods of Diagnosis in Gastric Disease, to be introduced by Dr. J. A. Ryle, Dr. Harrison Orton, and Prof. E. C. Dodds.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, Nov. 12th.—5 P.M., Dr. G. F. Still: The History of Pediatrics in the Seventeenth and Eighteenth Centuries. (Last FitzPatrick Lecture.)
THURSDAY.—5 P.M., Rt. Hon. H. A. L. Fisher: An Oxford Movement (Lloyd Roberts Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
THURSDAY, Nov. 14th.—5 P.M., Mr. R. P. Rowlands: Review of the Surgery of the Gall-bladder and Bile-ducts. (Bradshaw Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, Nov. 11th, to SATURDAY, Nov. 16th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Mon., 5 P.M., lecture by Dr. E. P. Poulton on (1) Treatment for the Common Cold, and (2) Recent Work on Bright's Disease. No fee. Two lectures especially suitable for M.R.C.P. candidates: Tues., 8.30 P.M., Dr. O. L. V. de Wesselow: Diabetes and Insulin. Fri., 8.30 P.M., Dr. Bernard Myers: Purpura and its Treatment.—CHARING CROSS HOSPITAL, W.C. Wed., 2 P.M., Demonstration of Gynæcological Cases by Dr. Everard Williams. No fee.—ST. PAUL'S HOSPITAL, Endell-street, W.C. Fri., 4.30 to 7.30 P.M., Demonstration of Genito-urinary Cases and Cystoscopic Examinations by Mr. W. K. Irwin. No fee.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special Post-graduate Course in Medicine, Surgery and Gynæcology, every afternoon and some mornings for two more weeks.—LONDON LOCK HOSPITAL, Dean-street, W. Post-graduate Course in Venereal Disease. Daily every afternoon and evening. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Nov. 11th.—10 A.M., Dr Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department. 4.30 P.M. (Lecture), Dr. Dowling: Dermatological Operations.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 13th.—4 P.M., Dr. C. E. Lakin: Demonstration of Cases.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Nov. 11th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 11th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Affections of Optic Nerves.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Tumours of the Cerebral Hemispheres.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Ocular Palsies.
FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Greenfield: Demonstration of Cerebral and Spinal Tumours.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Nov. 12th.—5 P.M., Dr. Wilfred Fox: Nævi.
THURSDAY.—5 P.M., Dr. H. G. Burford: Pathology Demonstration.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 13th.—4.30 P.M., Sir Thomas Carey Evans: Stone in the Bladder, with Special Reference to Treatment by Litholapaxy.

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.
FRIDAY, Nov. 15th.—5 P.M., Prof. V. H. Mottram: Human Nutrition. (Fifth of six lectures.)

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.
MONDAY, Nov. 11th.—5 P.M., Prof. Leonard Hill: Sunlight and Health.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road.
FRIDAY, Nov. 15th.—4 P.M., Mr. W. A. Mill: Acute Suppuration of the Middle Ear.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Nov. 12th.—3.15 P.M., Mr. C. S. L. Roberts: Prolapse in Women.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.
FRIDAY, Nov. 15th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Mr. Harold Cox: The Multiplication of the Unfit.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Nov. 13th.—4 P.M., Dame A. Louise McIlroy: The Influence of Pathology Upon Maternal Welfare.

ROYAL ANTHROPOLOGICAL INSTITUTE.
WEDNESDAY, Nov. 13th.—5.30 P.M. (in the Polytechnic Hall, Great Portland-street Extension), Sir Arthur Keith: Race Building—Past and Present.

ANCOATS HOSPITAL, Mill-street, Manchester.
THURSDAY, Nov. 14th.—4.15 P.M., Mr. P. McEvedy: Diseases of Veins.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Nov. 15th.—3.30 P.M., Mr. H. B. Yates: Dyspepsia of Biliary Origin.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Nov. 12th.—4.15 P.M., Dr. T. H. Oliver: Diabetes.
FRIDAY.—4.15 P.M., Dr. H. Herd: Behaviour Disorders of Childhood.

Appointments.

MORTON, E. F., L.R.C.P. Lond., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Topsham District of the County of Devon.

MCMILLAN, A. J., L.R.C.P. Lond., M.R.C.S., Tuberculosis Officer for North Devon.

RATNER, E., M.B., Ch.B. Manch., Assistant Medical Officer of Health, Stockport.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital.—H.S. At rate of £125.
Barnsley, Beckett Hospital, &c.—H.P. £140.
Barry Surgical Hospital.—H.S. At rate of £200.
Bedford County Hospital.—H.S. At rate of £175.
Birmingham City.—Asst. M.O. £750.
Birmingham, Dudley-road Hospital.—Surgeon. £700.
Birmingham, Queen's Hospital.—Jun. R.S.O. £100.
Birmingham Royal Cripples Hospital.—H.S. At rate of £200.
Birmingham, Highbury Hospital.—Res. M.O. £350–£400.
Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O. £200. Also Clin. Asst. to Ear, Nose and Throat Dept. £100.
Brighton, Hove and Preston Dispensary and Hove Hospital.—Hon. Surgeon.
Brighton, Royal Sussex County Hospital.—Sen. Asst. Path. £350.
Church Army Medical Mission.—Lady Doctor.
City of London Hospital for Diseases of Heart, &c., Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.
Bristol, Stoke Park Colony.—Director of Medical Services. £1200.
Derby County Borough.—M.O.H. £1100.
Durham County Council.—Asst. Welfare M.O. £600.
Elizabeth Garrett Anderson Hospital, Euston-road.—H.P. Obst. Asst. Three H.S.'s. Each at rate of £50. Also Clin. Assts.
Great Yarmouth General Hospital.—Jun. H.S. £125.
Harrogate Infirmary.—Sen. and Jun. H.S. At rate of £150 and £100 respectively.
Hertford County Hospital.—H.P. At rate of £150.
Ipswich, East Suffolk and Ipswich Hospital.—Hon. Ophth. Surgeon.
Ipswich, Heathfields Infirmary, &c.—Asst. Res. M.O. £250.
Islington Dispensary, 303, Upper-street, N.—Asst. Res. M.O. £120.
L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Leeds General Infirmary.—M.O. in charge of Radium Dept. £800.
Liverpool, David Lewis Northern Hospital.—Hon. Med. O. for Cardiographic Dept. Also Two Jun. Anæsthetists. £75.
Liverpool Royal Babies Hospital, Woolton.—Res. M.O. At rate of £90.
London Jewish Hospital, Stepney Green, E.—Res. M.O. Also Jun. Res. M.O. At rate of £130 and £100 respectively.

London Skin Hospital, 40, Fitzroy-square, W.—Hon. Phys. and Hon. Pathologist.
Manchester City.—Asst. Tuber. O. £650.
Manchester, Salford Royal Hospital.—H.P. At rate of £125.
Mothers' Hospital, Clapton, E.—Hon. Asst. Obstet. S.
National Association for the Prevention of Tuberculosis, 1, Gordon-square, W.C.—Asst. Med. Commissioner. £700.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Northwood, Mount Vernon Hospital.—H.S. for Cancer Section. £200.
Paddington Green Children's Hospital, W.—H.S. At rate of £150.
Queen's Hospital for Children, Hackney-road, E.—Surgeon to Ear, Nose and Throat Dept. Also H.S. At rate of £100.
Radium Institute, Riding House-street, W.—Assistant to Medical Department. £600.
Ross Institute.—Bacteriologist for South Africa.
Royal Chest Hospital, City-road, E.C.—Clin. Assts.
Royal College of St. Katharine, Poplar, E., Maternity and Child Welfare Centre.—Asst. M.O. £1 11*s.* 6*d.* per session.
Royal Free Hospital, Gray's Inn-road, W.C.—H.S.'s, H.P.'s, &c. Each £150. Second H.P. and Obstet. Dist. Asst. £100. Surg. Reg. £200. Half-time Gynæcological Reg. and Med. Reg. Each £100.
St. John's Hospital, Lewisham, S.E.—Phys. to Children's Dept. Also Cas. O. At rate of £100.
St. Peter's Hospital, 74, Vallance-road, Whitechapel, E.—Med. Supt. £900.
Sheffield, Children's Hospital.—H.P. Also Third Res. M.O. Each £100.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
Sheffield Royal Infirmary.—Clin. Asst. to Ophth. Dept. Also Clin. Asst. to Med. Depts. Each £250. Also H.S. £80.
Sheffield University, Faculty of Medicine.—Lecturer in Pathology. Also Demonstrator in Pathology. Each £500.
Southampton County Borough Isolation Hospital.—Res. M.O. £360.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. and Res. Anæsthetist. At rate of £140.
South London Hospital for Women, South Side, Clapham Common, S.W.—Clin. Asst. 1 gn. per attendance.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Aural and Ophth. H.S. and Asst. Cas. O. Each at rate of £100. Also Asst. Surgeon Dentist.
Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.
Wolverhampton Royal Hospital.—Asst. Pathologist and Pathological Registrar. £350.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Holyhead (Anglesey), Ryde (Isle of Wight), and at Wokingham (Berks).

Births, Marriages, and Deaths.

BIRTHS.

RUSSELL.—On Oct. 26th, the wife of Dr. N. L. Russell, of "Bredon," Alverstoke, of a daughter.

SHEPPARD.—At Rangoon, Burma, on Oct. 28th, to Edith T. Sheppard (*née* Marshall), M.B., B.S., wife of Lieut.-Col. A. L. Sheppard, I.M.S.—a son.

DEATHS.

GALLIMORE.—On Nov. 1st, at Leam-terrace, Leamington Spa, Thomas Gallimore, L.R.C.P., L.R.C.S., in his 80th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

RADIUM AT NORFOLK AND NORWICH HOSPITAL.—It is stated that two members of the honorary surgical staff of this hospital have privately acquired a small quantity of radium, and that hospital patients are now being treated with it.

LONDON VOLUNTARY HOSPITALS.—King Edward's Fund has issued a review of the work and finance of 136 London hospitals in the last five years, which shows an increase during the period of 14 per cent. in the daily average of in-patients, of 11 per cent. in out-patients, and 20 per cent. in out-patients' attendances. At the end of 1928 there were 15,640 beds, or 1600 more than when the Voluntary Hospital Committee made its inquiry in 1924. The total income in 1927 of £3,267,000 rose in 1928 to £3,424,000. To this must be added £978,000 received for endowment and building, making a total for 1928 of £4,402,000 for all direct hospital purposes. Subscriptions and donations have largely increased during the five years, and patients' payments have reached a higher total in each year. The compilers of the review say that so far from the voluntary hospitals "fighting a losing battle," the very opposite is the truth, the statistics showing that they are strengthening their hold upon the confidence of the public.

Notes, Comments, and Abstracts.

THE LOCAL GOVERNMENT ACT IN RELATION TO VOLUNTARY HOSPITALS.*

BY H. P. NEWSHOLME, M.D., F.R.C.P. LOND.,
MEDICAL OFFICER OF HEALTH, CITY OF BIRMINGHAM.

APART from consultation between local authorities and the representatives of the governing bodies and staffs of voluntary hospitals in regard to the general scheme of transfer of institutions, the Local Government Act contains no direct indication of any repercussion on the position of the voluntary hospital, but the approaching union between poor-law and municipal institutions offers possibilities of mutual assistance, coöperation, and coördination between the municipal and the voluntary hospitals. I am not an advocate of the municipalisation of the voluntary hospital. The Local Government Act cannot conceivably have any such result, even remotely. The ideal should be the concurrent maintenance of voluntary and municipal institutions under conditions of friendly association, allowing each to learn from, and to coöperate with, the other

Hospital Officers.

Administrative.—The first essential for coöperation is community of knowledge and of interests, and readiness to exchange information in ways free from the stiffness of officialism and the diplomatic implications of official conversations. The Incorporated Association of Hospital Officers should form an admirable channel for this if its membership could be extended to include the officers of municipal and poor-law hospitals.

Social Workers.—The hospital almoner is found on the staff of some, but not all, voluntary and public hospitals. Her work is profoundly important for the effectiveness of the hospital, both by probing into and remedying domestic hindrances to recovery, and by maintaining supervision after discharge from hospital, as well as protecting the hospital finances. I look forward to the day when every hospital will have its social service section represented by an almoner's department. By the pooling of information through personal contact, as well as by the free discussion of principles and procedure, there should be established a great network of social service in relation to the cure of disease, corresponding with the great network of social services which public authorities have established for the prevention of disease. That correspondence should, in its turn, pass into a further stage of close linkage between the two. I should, for example, like to see the almoner's department making use of the unrivalled knowledge of the local authority's health visitors about the home conditions, difficulties, and idiosyncrasies of the working classes, to maintain a degree of after-care which is at present impracticable.

Nursing Staff.—We are all competing keenly against each other in seeking candidates to be trained as nurses in our several institutions, and that competition at present implies a good deal of waste and duplication of effort. I should like to see the day when our institutions, voluntary and municipal, will collaborate rather than compete in evolving a scheme, first of joint training for the preliminary knowledge which all require, and then of interchange of nurses, which shall make fuller and more even use of the magnificent facilities for all-round training which such a pooling would imply. The difficulties, both personal and administrative, of evolving such a scheme on any large scale are obviously enormous. If, however, the present shyness of entering the nursing services should increase, sheer necessity may one day drive us to the necessary degree of inventiveness. It is possible that a scheme for the training of nurses might be evolved on lines somewhat analogous to those followed by the training of medical students, with perhaps one or more central hostels into which would be drafted the probationers for the various hospitals coöperating in the scheme. Whether those probationers would be selected in the first instance by the matrons of the several institutions individually or coöperatively, or in some other way, would be a matter for consideration. In such hostels the probationer would receive the preliminary training common to all nursing institutions, and would then be detailed to one or other of the coöperating institutions to continue her training. Whether and to what extent a system of exchange of nurses between one institution and another would be practicable is not a point into which I can enter. Such a scheme would only be an extension of arrangements which are already in effect for individual institutions.

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* Substance of a paper read before the Midland Branch of the Incorporated Association of Hospital Officers at Birmingham on Oct. 24th, 1929.

Use of Hospital Beds and Out-Patient Departments.

It is possible to visualise a number of directions in which coöperation would be useful in the allotment of hospital beds. For example, it would be of value to any given hospital to know what medical, surgical, and special department accommodation is available at any given moment at other hospitals in the same area. It is conceivable that a central information bureau, receiving regular and frequent information—say twice a day—might be a source of convenience for all hospitals. Such a bureau might with advantage develop into a central clearing-house for the purpose of minimising the long periods of waiting for admission to particular hospitals. This problem of the long waiting-list is one of immediate practical importance. I do not anticipate that we are likely to see any radical alterations in our present arrangements for the interchange of patients between hospital and hospital. It may well be considered, however, whether the duplication of special departments on a large scale in general hospitals is as desirable as the alternative of making use to a greater extent of the corresponding special hospitals, and of maintaining at the general hospitals only small special clinics for consultation purposes rather than *for systematised* and detailed treatment. *In some directions*, —e.g., in the use by agreement of some particular hospital for treatment by X rays, instead of the multiplication of X ray treatment plants at a number of hospitals—simplification and saving of expense could result, as well as the ability to provide plant on a scale which is impossible when each hospital attempts to make its own provision.

Hospital beds are to be considered not merely from the point of view of treating patients, but also from that of training medical students. I should like to see the doors of all well-run hospitals, general and special in areas serving a medical school, thrown open to medical students under conditions implying systematic instruction in the direction in which the hospital in question is peculiarly capable of enriching the student's experience.

Occasional visits to out-patient departments in various parts of the country leave an impression that there are still faults to be found—long waiting, too casual directions in regard both to procedure and to treatment, and occasionally even cavalier behaviour by both professional and non-professional staff. The cause at present seems to be indefiniteness of control. What is needed is not so much technical knowledge as the acknowledged responsibility of some one individual for securing effective and kindly discipline in the out-patient department. The qualities needed would be those of a competent business man, combined with those of a capable housewife, and mellowed by an imagination quick to grasp the many anxieties and preoccupations of the applicant for help. There should be a possibility of pooling knowledge of the details of working of out-patient departments.

Joint Purchase of Supplies, Joint Laundries Joint Workshops.

There are no doubt two aspects to the question of joint purchase of stores and provisions by a group of institutions. While the joint purchase may readily imply a substantial saving in costs without any necessary loss in quality, it may not meet the special needs or the particular tastes of some of the coöperating institutions. Granted appropriate safeguards in the purchase of particular items, however, there is ground for careful consideration of the policy of joint purchase as already applied, for example, by a considerable combined group of municipal and voluntary hospitals in Birmingham. Joint laundry work is already in force for the municipal hospitals under the Birmingham Public Health and the Maternity and Child Welfare Committees. A case might also be made out for joint workshops for the preparation of a variety of surgical apparatus. With a large enough central workshop it should be possible to deal with the individual varieties of a particular type of appliance most favoured by individual hospitals.

Treatment of Mental Disease.

Scarcely any aspect of medicine is so fundamentally important and so much neglected as the detection and treatment of mental disease at its inception. Every important town should have in connexion with the out-patient departments of most if not all of the larger general hospitals a psychiatric clinic, run in close collaboration with the mental hospitals of the area; associated with this there should be a certain number of beds for the in-patient observation or treatment of appropriate cases. Such provision would immediately attract a class of readily curable patients who at present, and rightly, refuse to regard themselves as insane, and who consequently delay in seeking the all-important treatment which might save them later from a long period of confinement in a mental hospital. It is my earnest hope that some provision may be made on these lines for a very unfortunate and at present greatly neglected section of the population. The provision of such psychiatric clinics at general hospitals would have a profoundly important reverberation on the work of other departments of the hospital. Almost all physical disease has what might be called a mental overlap, an emotional state with a mental sensitiveness which adds greatly to the symptoms and delays recovery. The influence of the psychiatric clinic on the attitude towards disease in medical and surgical wards would tend towards a quicker cure, with less prospect of pronounced relapse or recurrence, for it would help the patient to clear up the mental concomitants of his physical disease. Moreover, it might well be that any tendency towards a return of those mental concomitants, the significance of which the patient had learnt, would tend to make him watchful and eager to seek early treatment.

Measures Towards the Prevention of Disease.

While hospitals, whether municipal or voluntary, have developed to a high degree of efficiency their powers of curing disease, they are at present only in the very early stages of developing a system for the maintenance of health, the prevention of disease, and the prevention of recurrence of cured disease.

(*a*) More specific, detailed, and systematic instructions *could be given to individual patients as to the way in which* they should conduct their lives after discharge from in-patient or out-patient treatment, with a view of minimising the risks of relapse or of progression of disease, and of detecting the further deviations from the normal at the earliest moment. Such advice is given even now, chiefly by ward sisters and resident staff; but it is usually verbal, and therefore too readily misunderstood or forgotten; and it is liable often to be rather casual. Such instructions could be rendered much more effective by a system of after-care.

(*b*) Ill-health has led frequently to degeneration of the patient's habits of body and mind. Patients should therefore have instructions on discharge, by individual tuition, by leaflets, or otherwise, on the bearing of firmly-established mental and physical habits, on stability of character and effectiveness of personality, and the influence of a desultory habit mechanism in rendering character ineffective, and in diminishing social value.

(*c*) Restoration of physical health releases fresh energies for the patient, and unless he is himself made aware of this, and warned of the importance of harnessing these energies to worthy ends, he may turn back to bad habits of body and mind formed during and as a result of ill-health, and may thus use these energies in directions tending to degradation. It may be that the hospital chaplain rather than the lay staff should face this problem; but it certainly should not be left unfaced, and I should not exempt the medical and nursing staff from their share of responsibility. I should like to lay particular emphasis on this need for recognising that the patient is not merely a physical body to be healed, but an individual with a personality whose point of equilibrium must necessarily be profoundly altered by the cure of his body, an individual with as urgent a need for adjustment of his personality to the now healthier body as was previously his need for the cure of that body.

(*d*) In out-patient departments of municipal and voluntary hospitals dealing with mothers and children much more advice could be given on training in habits, on character training, and establishment of mental stability. These are directions in which the modern view of the close interdependence of physical and of mental health require systematic elaboration in hospital practice.

A Problem with Two Faces.

The problem with which we are met—that of facing the ultimate alternatives of absorption into one service, of friendly coöperation between two types of services working side by side, or of rigidly separate services—the problem found in many spheres of individual, social, industrial, political and even religious life. It appears in the antithesis of individualism and socialism, of the small shop and the multiple emporium, of the self-contained business and the large combine, of the individual and the group, of self-expression and group membership, of Quakerism and Catholicism. The system of sharing experience, of socialism, of State service has inherent in it the defect that the individual, protected *as he is from elimination by his* membership of a large system, can subside too readily to a level of easy attainment below his full capacity, if he does not maintain his idealism of aim. The system of standing on one's own feet, of individualism, of the separate independent unit, has equally an inherent weakness. The representative of the system symbolised by the voluntary hospital may be liable to an over-absorption with his own affairs, and unconcern with the difficulties of neighbours, which can lead to a form of selfishness, preventing him from exercising the breadth of influence which might result from a nearer approximation to the system of community of action. We need, therefore, be neither surprised nor troubled at the difficulties experienced in attaining a satisfactory working arrangement between the voluntary hospital unit on the one hand, and the group of State service units on the other. It is a difficulty which in varied disguises is inherent in human nature. As human nature tends when in equilibrium to find a happy mean between the two extremes, so we may expect to find the solution of our particular difficulties.

FIRST-AID TREATMENT OF BURNS BY TANNIC ACID.

PROVISIONAL instructions for applying the tannic acid treatment of burns under first-aid conditions have been drawn up by Mr. W. C. Wilson, author of the green book on this subject (No. 141 of the Medical Research Council Special Report Series), which was summarised in our columns last week. The instructions, which are included as an appendix to the report, have been modified by him in some respects as the result of helpful criticisms made by H.M. Medical Inspector of Mines, and by the professors of surgery at St. Thomas's Hospital and University College Hospital, London, to all of whom the original draft was submitted by the Medical Research Council. It is hoped that these instructions may prove useful, until fuller experience of the method has been gained in mines and other places where burning injuries are not uncommon, and where immediate hospital treatment may be unavailable.

The treatment here described is an emergency first-aid measure to be employed in cases especially where the patient is to be transported subsequently to hospital, and where the circumstances are such that some time—e.g., more than three hours—must elapse before the patient can reach hospital. If speedy removal to hospital is possible, first-aid treatment should be omitted, and the patient dispatched without delay.

A First-aid Unit.

A first-aid unit consists of the following articles:

(1) Two 2-pint enamel measures graduated in ounces.

(2) Two glass rods.

(3) Fifty packets of tannic acid powder; each packet contains 110 grs. of powder.

(4) A bottle containing tablets of corrosive sublimate. Each tablet contains 8·75 grs. Such tablets are stocked by all chemists.

(5) Five dozen packages of sterilised white surgeon's lint; each package consists of a piece of lint covered by a layer of gauze and wrapped in Kraft paper. The lint is in three forms: (*a*) A piece measuring 20 inches by 30 inches; this package is labelled "Trunk." (*b*) A bandage 4½ inches broad by 3 yards long; this package is labelled "Bandage." (*c*) A face-mask measuring 24 inches by 12 inches. In the mask a rectangular opening 7 inches by 1½ inches is cut to expose the eyes, and horizontal slits are cut 3 inches and 3½ inches long as openings for the nose and mouth respectively. The package is labelled "Face."

The unit contains one dozen "Trunk" packages, one dozen "Face" packages, and three dozen "Bandage" packages.

(6) Twelve rolls of white absorbent wool.

(7) Eight dozen gauze (open wove) bandages.

(8) A jar of vaseline and a flat stick for applying the vaseline.

Instructions in the Application of Tannic Acid.

(1) Remove all clothing from the burned area in order to make a rough estimate of the surface extent of the burn. Take great care that the patient does not become chilled.

(2) Do not attempt any cleansing of the burned area.

(3) Make up the tannic acid solution. In 2 pints of water dissolve one tablet of corrosive sublimate and four packets of tannic acid powder. Stir with a glass rod till all powder is dissolved. The solution must be warm when applied, otherwise the patient becomes chilled. This solution is antiseptic. There is no necessity to sterilise measures, glass rods, or powder. The following is a rough guide to the quantities of solution and lint required in the case of a male adult of average size: (*a*) The lint in a package labelled "Trunk" will cover the entire front or entire back of the trunk and requires *one* pint of solution. (*b*) The lint in a package labelled "Bandage" will cover one entire arm, and requires *half* a pint of solution. Two bandages cover one entire leg and require *one* pint of solution. (*c*) The lint in a package labelled "Face" will cover the face, neck, and sides of head, and requires *six ounces* of solution.

(4) According to the surface extent and regional distribution of the burn, select the number and type of packages which [illegible] will provide [illegible]nough lint to cover over the burned area. Remove the lint from [illegible] the packages, soak it in the tannic acid solution, wring out [illegible] gently, and apply the smooth side of the lint to the burned area. The hands should be washed thoroughly with soap and water before the lint is touched. Cover the lint with a layer of wool and fix with a gauze bandage.

(5) Burns of the face. *Take care that no tannic acid solution enters the eyes.*

Protect the eyes in the following way: Tell the patient to close his eyes and keep them closed. With the flat stick smear a *thick* layer of vaseline over the eyelids, eyebrows, and for some distance round the eyes. Cover the vaselined area with wool. Soak the face-mask in the solution, wring out *firmly*, squeezing out all excess solution, and apply to the face, leaving the regions of the eyes, nostrils, and mouth exposed through the openings cut in the mask for this purpose. Secure with a gauze bandage round the head and neck. The openings in the mask can be widened if necessary, or a face-mask can be improvised from a piece of lint in a "trunk" package by making the necessary openings.

Sterilisation and Storage.

(1) *Lint.* The packages with a covering of Kraft paper have previously been sterilised by steam at 15 lb. pressure for 20 minutes and dried. If the packages are kept clean and dry the lint will remain sterile for long periods.

(2) The whole unit is contained in a wooden box, which should be stored in a dry place. The lint packages and packets of tannic acid powder must be kept dry and clean. The packets of tannic acid powder are best kept in a separate tin box with a tightly fitting lid.

ENERGEN FOODS CO., LTD.

WE have received from this company forms of certificate which, upon signature by a medical man, will serve as an authority to any retailer to supply Energen Foods at a *special reduction to the patient while the patient remains under treatment.* The company claim that their wares are now generally recognised by the medical profession as useful in the dieting of diabetic and obese subjects, and those suffering from various digestive disorders, and a reduction of price will bring these foods within reach of panel patients.

JENNER AND THE CANADIAN PIRATE.

UNDER this heading the Hon. William Renwick Riddell, the Canadian Justice of Appeal, contributes an interesting story to the *Canadian Journal of Medicine and Surgery* for October, which shows that vaccination has been beneficent in other directions than that for which the originator of the practice intended it. Some will have heard that Napoleon, when about to refuse a request for the release of certain English prisoners, remarked, on being reminded by Josephine that the petitioner was Jenner, "Ah, we can refuse nothing to that name," and at that time Jenner's fame was great on the continent. In 1803, for example, the King of Spain equipped an expedition intended to diffuse knowledge of vaccination throughout the Spanish dominions in the new world, with the result that the practice spread rapidly; it was owing principally to this that the "Canadian Pirate," Jeremiah Powell, a son of William Dummer Powell, *afterwards Chief* Justice of the Court of King's Bench, Upper Canada, was released from a long term of what would have been practically slavery. The story, as Mr. Justice Riddell tells it, is as follows: Judge Powell married the daughter of one Dr. John Murray of Norwich, who was a close friend of Jenner. Jeremiah was placed by his father in a counting-house in New York, but, being of a restless nature, among other escapades, he took part in an expedition to free Venezuela from Spanish rule. He was captured, and sentenced to ten years' imprisonment in the Castle of Omoa, in the unhealthy province of Mexico, some of his colleagues being executed as pirates. Judge Powell, after an unsuccessful appeal to the Spanish Ambassador for his son's release, sailed to London with the intention of petitioning the King of Spain, and in the meantime had written to his brother-in-law, Charles Murray, in London. Charles Murray at that time had received a letter from Jenner referring to the success of the Spanish venture in vaccination, to which he replied referring to the sentence passed on his nephew, and mentioning the episode of Jenner's success with Napoleon, an episode that seems hitherto not to have been chronicled. He believed that Jenner might "have again the God-like satisfaction of being the means of setting the prisoner free." Jenner accordingly gave Judge Powell letters to the Court at Madrid, in response to which Jeremiah, the "Canadian Pirate," obtained his freedom. This the young man did not long enjoy, for shortly afterwards he was lost at sea, neither ship nor passenger being ever heard of again.

NEW LABORATORIES AT SHEFFIELD.—The students of the University of Sheffield are devoting the proceeds of this year's "rag" to the equipment of the new laboratories which are being erected at the Royal Infirmary.

Schorstein Lecture

ON THE

PRECURSORS OF CARCINOMA OF THE STOMACH.

Delivered at the London Hospital on Nov. 8th, 1929,

BY ARTHUR F. HURST, M.D. OXF., F.R.C.P. LOND.,
SENIOR PHYSICIAN TO GUY'S HOSPITAL.

EVERY year about sixteen thousand people die in Great Britain from cancer of the stomach. It is the cause of death in 5 out of every 100 people dying after the age of 40, and accounts for about one-third of all deaths from carcinoma. Even with the most modern methods of diagnosis the disease is rarely recognised sufficiently early to make it possible for a radical operation to be performed, and up to now treatment with deep X rays and with radium has met with little or no success. It is indeed doubtful whether permanent recovery occurs as the result of treatment in more than 1 or 2 per cent. of all cases of carcinoma of the stomach. So much progress has been made in the diagnosis of carcinoma of the stomach and in the technique of gastrectomy that, if all individuals suffering from suspicious symptoms were thoroughly examined without delay, many more cases could be operated upon with some hope of success. But even in the hands of the most experienced and skilful surgeons the prospects of cure would remain comparatively poor, so insidious is the onset of the disease, and so latent does it remain in its early stages.

It is clear that it is to prophylaxis rather than to improved methods of diagnosis and treatment that we must look for any real diminution in the high death-rate from carcinoma of the stomach. In my opinion such prophylaxis is possible, because I believe that carcinoma never *invades a healthy stomach*.

The actual development of carcinoma must, I suppose, be due either to a constitutional and perhaps inherited liability to the disease, or to the chance invasion of the individual by some external stimulant, as otherwise it would be impossible to explain why everybody suffering from the disorders of the stomach which predispose to malignant disease do not develop cancer. But until something is discovered which may make it possible to deal with this unknown exciting factor, our attention should be concentrated on the recognition and adequate treatment of the predisposing conditions. If this is done, I feel confident that the incidence of carcinoma of the stomach will in the next few years be greatly reduced.

I propose to approach the subject from a clinical standpoint before discussing the pathological evidence, because it was a study of the results of our clinical investigations in a series of cases of carcinoma of the stomach, undertaken in the preparation of a paper on the early diagnosis of carcinoma of the stomach for the International Conference on Cancer held in London last year,[1] which led me to the conclusions which I summarised on that occasion and which I propose, in the light of further experience, to discuss to-day.

ACHLORHYDRIA.

Fifty years ago van den Velder[2] discovered that carcinoma of the stomach is often associated with the complete absence of free hydrochloric acid from the gastric contents. Using the Ewald test-meal it was subsequently found that achlorhydria was present in about 80 per cent. of cases. The introduction of the fractional test-meal by Rehfuss in 1914 made is possible to recognise the presence of small quantities of free hydrochloric acid at one or more stages of digestion, which would have been missed by a single intubation. When this method was used, complete achlorhydria was found in only 50 per cent. of cases from the Mayo Clinic collected by Hartman[3] and in 65 per cent. of 74 cases at Guy's Hospital and New Lodge Clinic.

It has always been assumed that the achlorhydria is a result of the carcinoma, although none of the numerous theories which have been proposed to explain its occurrence appeared to be satisfactory. A study of the data obtained in our cases, and of those published by other investigators, has convinced me that this assumption is unjustified, and that the achlorhydria is a result of chronic gastritis, which precedes the onset of the carcinoma, and is in fact the most common predisposing condition.

I have never seen a case of carcinoma in which free hydrochloric acid was present at an early stage and disappeared as the disease advanced. I have also been unable to discover a single record of such a case, and not one of the numerous physicians with whom I have discussed the question has ever made such an observation. I have seen three cases of gastric ulcer in which a test-meal was given both before and after the onset of malignant degeneration. Hyperchlorhydria was present in two, and a normal curve of acidity was obtained in the third; in each case the degree of acidity was undiminished when the carcinoma had developed. The following is the history of the first case.

Carcinomatous Degeneration of Chronic Gastric Ulcer whilst under Observation.—A man of 66 had had typical symptoms of gastric ulcer for four years. On admission to New Lodge Clinic on Feb. 23rd, 1924, the diagnosis was confirmed by the discovery with the X rays of a large crater on the lesser curvature; this was associated with hyperchlorhydria and the constant presence of occult blood in the stools. He was given the usual treatment, and all symptoms disappeared within a week. He returned for re-examination on April 11th and again on May 18th; the X rays showed that the crater was much smaller, but as occult blood was still present I advised a continuation of strict treatment. He returned for the third time on June 22nd. He felt and looked strong and well, had gained 6 lb. in weight since his first admission, and had had no trace of indigestion. At this stage I thought that the small deformity still seen with the X rays must represent the scarred depression in the pancreas produced in the healing of the ulcer. Everything else seemed so satisfactory that I did not feel justified in advising operation simply because a trace of occult blood was still present in the stools.

Early in August, for the first time since the commencement of treatment, he experienced pain; it was quite different in character from the old ulcer pain, and was accompanied by nausea and anorexia. No relief followed careful dieting, and he returned to the clinic on August 31st. He had gained another 4 lb. in weight since June. Nothing abnormal was felt on abdominal examination. Occult blood was still present in the stools, and a most remarkable change had taken place in the X ray appearance in the nine weeks which had elapsed since the last examination. Instead of a very small niche with a smooth outline there was a large irregular deformity which was unmistakably due to malignant disease. The hyperchlorhydria was still present in undiminished degree.

A few days later Mr. L. Bromley performed a partial gastrectomy. A large thick scar was found on the lesser curvature, its centre forming a smooth-walled depression in the pancreas. Microscopical examination showed that carcinomatous changes were occurring on one side of the scar, and that the neighbouring mucous membrane was becoming infiltrated. There were no enlarged glands or secondary deposits. In spite of radiotherapy signs of recurrence appeared seven months later.

There can be little doubt that the persistent occult blood was due to the fact that malignant degeneration had already begun in March or April, probably before the ulcer had completely healed. This sign, therefore, preceded the earliest symptoms by five months and the earliest radiological changes by at least three months, and no diminution *in gastric secretion* had occurred in six months.

Mr. A. J. Walton[4] has stated that he has observed the acidity diminish when a chronic gastric ulcer became malignant. He tells me, however, that on re-examining the data which led him to make this statement, he discovered that the observations had been incorrectly recorded, and that he has as a matter of fact never observed such an occurrence.

I only know the history of two cases in which a test-meal had been given before as well as after the development of carcinoma of the stomach associated with achlorhydria, and in both achlorhydria was already present on the first occasion.

In February, 1905, Alexander[6] was consulted by a man of 47, who gave a two years' history of epigastric discomfort and nausea; he was found to have achlorhydria, but no other evidence of organic disease. He derived some benefit from the administration of hydrochloric acid. In April, 1908, he began to have severe pain, and in May was found to have an inoperable growth of the stomach.

I am indebted to Dr. R. A. Veale for the notes of the second case.

A woman of 62 complained of fullness and burning after meals; in June, 1920, she was found to have achlorhydria with excess of mucus. Two years later a dull continuous pain and anorexia developed, and she became progressively more pale; in February, 1920, achlorhydria was again present, but an inoperable carcinoma of the pyloric end of the stomach was found on exploration.

Porges[7] states that he has seen cases in which achlorhydria was found to be present many years before the appearance of symptoms of carcinoma.

In a large proportion of cases of carcinoma of the stomach, which show unmistakable pathological evidence of being secondary to a chronic ulcer, free hydrochloric acid is found. This fact was noted as long ago as 1890 by Hauser[8] and 1903 by Riegel.[9] Free acid was present in my three cases referred to above, and in the only one of Stewart's ulcer-cancer cases, in which a fractional test-meal was given, a high normal curve of acidity was obtained.[10] In 12 out of 14 operative cases of definite ulcer-cancer described by Orator[11] free hydrochloric acid was found with an Ewald test-meal; it is not unlikely that a fractional test-meal would have revealed the presence of free acid in one or more fractions in the two remaining cases. On the other hand, achlorhydria was found in 7 out of 8 cases, in which the carcinoma appeared to be "primary."

Using a fractional test-meal free hydrochloric acid was found in all but one of 11 Guy's Hospital and New Lodge Clinic cases of carcinoma of the stomach with more than 18 months' history, whereas 17 out of 19 with a history of less than six months had achlorhydria.

TABLE I.—*Length of History (24 N.L.C. and 14 Guy's).*

No. of cases.	Free HCl in fractional test-meal.	Less than 6 months.	6–18 months.	18 months and over.	Average (excluding*).
14	Present.	2 (5/12; 6/12)	2 (10/12; 12/12)	10 (1½, 1½, 1½, 2½, 3½, 4, 4, 12, 12, 30 years*)	3 years.
24	Absent.	17	6	1 (20 years*)	9 months.

Most of the former were presumably cases of ulcer-cancer and of the latter "primary" cancer. In 1911 Panton and Tidy[12] had obtained similar results with the less accurate Ewald test-meal; they found that 20 out of 25 cases with a history of nine months or less had achlorhydria, whereas 4 out of 5 with a history of more than two years had free acid present. Stewart[10] found tha tthe average duration of symptoms in 11 cases of definite ulcer-cancer was 6½ years or only a year less than the average duration of symptoms in a contemporary series of 146 cases of simple gastric ulcer, whereas in 48 cases of "primary" cancer it was one year, and in 10 out of Orator's[11] 16 cases of ulcer-cancer symptoms had been present for periods varying between 1 and 28 years, whereas in 5 out of 7 cases of "primary" cancer there was less than a year's history. It seems clear therefore that when free acid is present the carcinoma is likely to be secondary to ulcer, and when achlorhydria is present it is generally secondary to gastritis. Thus achlorhydria is not a sign of advanced carcinoma, in the early stage of which free acid was present, as the duration of symptoms would then tend to be considerably shorter when free acid is present than in cases with achlorhydria, whereas the reverse is actually the case.

It is natural that there should be exceptions to the general rule as to the association of free acid with ulcer-cancer and achlorhydria with gastritis-cancer, and to the relative duration of symptoms in cases with free acid and with achlorhydria. Thus achlorhydria may occur in very chronic cases of ulcer owing to secondary gastritis, and gastritis does not invariably lead to the complete disappearance of free acid from the gastric contents. Moreover, gastric ulcers are occasionally latent for long periods, and chronic gastritis, though generally latent, sometimes gives rise to definite gastric symptoms.

If achlorhydria was a result of the development of carcinoma in a stomach which had previously secreted a normal gastric juice, the prospect of survival after operation would be considerably better in those cases in which free acid was present than in those with achlorhydria. This, however, is not the case, as on analysing the results of operation five years after gastrectomy had been performed for cancer of the stomach, Hartman[3] found that 44 per cent. of 30 patients who had had complete achlorhydria were still alive, compared with only 22 per cent. of 41 with free hydrochloric acid. These figures strongly support the view that achlorhydria precedes the development of carcinoma and is not its cause.

CHRONIC GASTRITIS.

Under normal conditions the food is finely divided, softened, diluted, and brought to the body temperature in the mouth, so that any irritation which it might exert on the gastric mucous membrane as a result of its physical and chemical properties is, to a large extent, prevented. When, however, food is insufficiently prepared, owing to bolting or inadequate teeth and dentures, the stomach is called upon to carry out the neglected functions of the mouth in addition to its normal functions of digesting proteins. In the process of breaking up, softening, diluting, and warming cold or cooling hot food, in order that the insufficient preparation in the mouth should not interfere with intestinal digestion, the mucous membrane of the stomach is irritated and excess of protective mucus is secreted by the superficial cells of the mucous membrane. If long continued this irritation may eventually give rise to catarrhal gastritis, especially if the quantity of gastric juice secreted is less than the average. It is clear, for example, that the effect of strong alcoholic drinks taken apart from meals will be particularly deleterious in an individual with a stomach which habitually secretes a small quantity of gastric juice. Thus constitutional hypochlorhydria and the constitutional achylia gastrica, which occur respectively in about 8 and 4 per cent. of normal individuals (Bennett and Ryle)[13] predispose to chronic gastritis, whereas constitutional hyperchlorhydria tends to prevent its development.

Chronic catarrhal gastritis is characterised by the continuous secretion of mucus in excess of that normally called forth in response to temporary irritation. This tends to form a tenacious layer which adheres to the surface of the mucous membrane, as can often be demonstrated post mortem. Consequently the mouths of the gastric glands are blocked, and the gastric juice, which the still undamaged glands secrete, is unable to reach the lumen of the stomach; at the same time the raised pressure in the ducts must result in the inhibition of further secretion. If any juice still enters the stomach some or all of the free acid combines with the mucus. Knott[15] has shown that the resulting acid-albumin does not activate pepsin and exerts no destructive action on bacteria.

A vicious circle is now set up. Owing to the diminution or complete disappearance of the gastric juice the food is no longer softened and diluted in the stomach, so that any mechanical or chemical irritants it may contain still further damage the mucous membrane. The churning movements of the stomach break up the food less efficiently, as the connective tissue of meat and the cellulose of vegetables remain unsoftened. At the same time the antiseptic barrier normally offered by the acid of the gastric juice is lost. Streptococci from septic teeth, tonsils, and nasal sinuses flourish in the neutral or slightly alkaline contents of the stomach and invade the intestines, and Knott[16] has shown that the increased alkalinity of the contents of the small intestine, which occurs when little or no free hydrochloric acid enters the duodenum, results in the invasion of the small intestines and stomach with the colon bacillus. The mucous membrane of the stomach is now attacked by organisms, especially streptococci, and a true infective gastritis develops.

In the earlier non-infective stage the chronic catarrh is little more than an exaggeration of the normal secretion of mucus which occurs in response to the application of mechanical and chemical irritants, only the superficial parts of the mucous membrane being involved. The infective gastritis, on the other hand, leads to progressive damage of the secreting tubules; the mucous membrane which is at first thickened finally becomes atrophied, and the cells which produce hydrochloric acid and pepsin are gradually destroyed, so that true achylia results. Complete recovery from the early catarrhal gastritis with a return of normal secretion occurs if the irritation is discontinued and the mucus is washed away, but the atrophy of the secreting tubules which results from the later infective gastritis and the consequent achylia are irrecoverable.

Chronic gastritis may also be a sequel of the acute gastritis caused by food poisoning. I have seen several cases in which the history clearly pointed to such an origin, and in the rare instances in which we have had an opportunity of examining patients within a few weeks of the acute attack we have found that no free hydrochloric acid was present in the stomach, but that there was a great excess of mucus and often more or less blood, which only very slowly disappeared. In the Schorstein Lecture of 1927 Faber[14] described the chronic gastritis which may result from general infections, such as the acute fevers and tuberculosis. I have certainly seen cases in which it appeared to be a sequel of an attack of influenza, in which abdominal discomfort and vomiting were prominent symptoms. I am convinced that so-called gastric influenza represents a definite clinical condition, in which the resulting chronic gastritis and achlorhydria may be the starting-point of a variety of secondary disorders, the connexion of which with influenza has in the past frequently been regarded as imaginary.

Chronic gastritis with complete achlorhydria is often completely latent; probably the majority of cases give rise to no symptoms of any kind. It may, however, be the direct cause of nausea and vague gastric discomfort, though it never gives rise to pain or vomiting, and the gastric symptoms are rarely sufficiently marked for the patient to seek medical advice for their relief. Symptoms are more often due to the secondary effect of achlorhydria on some other organ than to the gastritis itself. Thus it is the most common of all causes of chronic diarrhoea. The achlorhydria which is an essential predisposing cause of the Addison's anæmia-subacute combined degeneration of the spinal cord-Hunterian glossitis syndrome, is, as I have shown elsewhere,[17] almost as often the result of chronic gastritis as of constitutional *achylia gastrica. It is also an important* factor in the production of all intestinal infections, chronic appendicitis and cholecystitis, and less frequently of rheumatoid arthritis and other general disorders.

Until recently our knowledge of the pathological anatomy of chronic gastritis was very deficient owing to the rapid post mortem changes which take place in the mucous membrane, although Faber's method of injecting formalin into the stomach immediately after death yielded important results. During the last few years a number of German pathologists have made a special study of the whole of the mucous membrane of specimens obtained by very extensive, though generally incomplete, gastrectomy performed for chronic ulcer and carcinoma. They have shown that in all cases of carcinoma gastritis is present. In those cases in which it appears to be "primary," well-marked atrophic gastritis is present throughout the stomach, whether the growth is small or widespread. Thus Orator[18] found diffuse, generally atrophic, gastritis involving the fundus as well as the pyloric region in 19 out of 20 such cases; in the remaining case, one of pyloric cancer, there was a very long history of alcoholic gastritis, but most of the mucous membrane of the fundus, though slightly inflamed, was not atrophic. On the other hand, although there was well-marked gastritis in the pyloric region in each of his eight cases of definite ulcer-cancer, in five the mucous membrane of the fundus was perfectly healthy, in two it showed slight gastritis, and in only one was severe gastritis present. Konjetzny,[18] Faber,[14] and others have shown that more or less localised gastritis is present in all or almost all cases of chronic ulcer, which explains its association with ulcer-cancer. This makes the presence of universal atrophic gastritis in cases of so-called "primary" carcinoma all the more significant. It seems clear in fact from the clinical and pathological evidence that the carcinoma is no more primary than in the ulcer-cancer cases, but is secondary to the gastritis, so that this form of cancer of the stomach should be called gastritis-cancer in contrast with ulcer-cancer which is due to malignant degeneration of a simple ulcer.

CHRONIC GASTRIC ULCER.

The difficult question of the development of carcinoma from simple ulcer of the stomach has been very thoroughly investigated by Stewart,[19] and I cannot do better than quote his conclusions in his own words.

> "In my series of 259 specially studied operation specimens there were 11 which, in my opinion, fulfilled all the criteria, both anatomical and clinical, of ulcer-cancer. The results are shown in Table II.

TABLE II.—*Frequency of Ulcer-cancer (Stewart).*

70 cancers—11 arising in ulcer	15·7 per cent
180 chronic ulcers—11 with cancer in the margins	6·1 ,,

> "These figures for the incidence of ulcer-cancer are rather lower than those previously published from Leeds[15]—viz., 17·5 and 9·4 per cent. respectively. This is due to the exclusion from the ulcer-cancer group of certain cases, previously included, in which a large part of the floor of the ulcer was cancerous, and in which, incidentally, the clinical history was 18 months or less. In the present series three *of the cases had histories extending over 2½, 3, and 4 years* respectively; all the others had had symptoms for five years or longer. Now it is undoubtedly true that a certain number of cases of chronic ulcer coming to operation give a comparatively short clinical history, while extensive cancerous infiltration of the crater floor does not, of itself, necessarily exclude ulcer-cancer. I am inclined to think, therefore, that if anything these latest figures err on the side of being too conservative; at the least, they must be taken as the absolute minima so far as the present series of cases is concerned."

Further analysis of his figures show a remarkable difference in the liability to malignant degeneration when the common lesser curvature ulcers are compared with the rare prepyloric ulcers. Thus although *only 3 out of 50 of the common carcinomata of the* pyloric region were secondary to ulcer, compared with 8 out of 12 of the comparatively rare lesser curvature carcinomata, no less than 3 out of 9 ulcers in the pyloric region showed malignant changes, compared with only 8 out of 172 in the lesser curvature region. In a similar series of 334 resections for ulcer Orator found 11 out of 34 in the pyloric region showed malignant changes compared with 0 out of 300 in the lesser curvature region.

ADENOMA OF THE STOMACH.

Polypous adenomata were present in 47 out of 11,000 autopsies performed by Stewart[20]; in 27 they were single, in 7 there were two, in 1 three, and in 2 four; in 10 they were numerous. Six of the 27 cases (22 per cent.) with a single polypus and 7 of the 20 with multiple polypi (35 per cent.) were associated with carcinoma. As there were 263 cases of carcinoma of the stomach in the same series, about 5 per cent. of the latter were probably secondary to simple adenomata. This condition seems to be distinct from the very rare polyposis of the stomach, in which hypertrophic gastritis has led to the development of innumerable polypoid masses scattered over the greater part of the stomach. The mucous membrane in this condition, as Menetrier[21] was the first to find out, is also very liable to undergo malignant degeneration.

LOCALISATION OF CARCINOMA OF THE STOMACH.

Although the type of gastritis which predisposes to cancer appears to affect the whole or the greater part of the stomach more or less uniformly, and although a very large majority of chronic ulcers are situated on the lesser curvature of the stomach and in the duodenal bulb, cancer is much more common in the pyloric region than anywhere else in the stomach and it never involves the duodenal bulb. It is clear, therefore, that there must be some other factor predisposing to the development of cancer when the pyloric region is affected by chronic gastritis or by chronic ulceration, which is present to a much less marked degree in the rest of the stomach and is completely absent from the duodenum. This factor is probably friction. When the normal gastric movements are watched with the X rays, it is clear that the mucous membrane of the fundus of the stomach and of the duodenal bulb is never subjected to friction. There is very little friction in the body of the stomach, but it steadily increases in intensity as the pylorus is approached, owing to the increasing depth of the waves of peristalsis, which begin at the junction of the upper and middle thirds of the stomach and only give rise to definite churning movements in the pyloric vestibule. No churning occurs either in the fundus of the stomach or in the duodenal bulb.

ADDISON'S ANÆMIA AND SUBACUTE COMBINED DEGENERATION OF THE CORD.

I have seen three cases of typical Addison's anæmia, one of which was accompanied by subacute combined degeneration of the spinal cord, associated with cancer of the stomach, and several similar cases have been recorded. In commenting on the first of my cases, which was reported by Waterfield[22] in 1923, I suggested that the nervous symptoms and anæmia were a result of the achlorhydria, to which the carcinoma had given rise, although weakness and paræsthesia of the feet were present before any gastric symptoms had developed. Porges[7] mentions a case in which a small, non-ulcerated, carcinoma of the stomach, no larger than a pea, which had given rise to no symptoms, was found at the autopsy of a patient who had died of Addison's anæmia. I now realise that the carcinoma was probably secondary to chronic gastritis, and that the subacute combined degeneration of the spinal cord and anæmia resulted from the achlorhydria which was present before the carcinoma developed. As achlorhydria is an essential predisposing factor in the production of Addison's anæmia and subacute combined degeneration of the cord, it is natural that the latter should be occasionally associated with carcinoma of the stomach, whether the gastritis which precedes its development is the cause of the achlorhydria or is simply secondary to constitutional achylia. It is interesting to note that no case has ever been recorded of the association of Addison's anæmia with a simple ulcer of the stomach or duodenum, as these conditions require the presence of free hydrochloric acid for their development.

ORIGINS OF CANCER: A SUMMARY.

It is now possible to summarise my conclusions as to the origin of an average hundred cases of carcinoma of the stomach.

1. (*a*) In about 75 per cent. of cases the carcinoma is secondary to chronic atrophic gastritis; these comprise a large majority of those with a short history, almost all of those with achlorhydria, and most of those with hypochlorhydria. (*b*) In about ½ per cent. of cases the carcinoma is secondary to polyposis of the stomach, which is probably a result of hypertrophic gastritis. The history is generally long and achlorhydria is probably always present.

2. In about 20 per cent. of cases the carcinoma is secondary to chronic gastric ulcer; these comprise a large majority of those with a long history, all of those with hyperchlorhydria and a high normal curve of acidity, and almost all of those with the average normal acidity.

3. In about 4½ per cent. of cases the carcinoma is secondary to a simple adenoma of the stomach. The history is likely to be short, and there is nothing characteristic about the test-meal.

PROPHYLAXIS.

The ideal form of prophylaxis would be not merely to recognise and treat the common precancerous gastric conditions, chronic gastritis and chronic gastric ulcer, but to prevent their development. The chief exciting causes of the two conditions are identical; the presence of one or other of the predisposing constitutional conditions determines whether either of them should develop. Prophylaxis of this kind is of the simplest nature; prevention of oral sepsis by adequate dental hygiene and frequent and efficient dental treatment; removal of septic tonsils in childhood and the early recognition and treatment of sinusitis complicating such infections as influenza; regular hours for meals and thorough mastication; avoidance of the excess of "roughage" advocated by most up-to-date food faddists; strict moderation in smoking and in the consumption of alcohol.

Theoretically it should be possible to recognise and cure the conditions which predispose to carcinoma of the stomach.

1. *Chronic Gastritis.*

(*a*) *Diagnosis.*—Although chronic gastritis rarely gives rise to gastric symptoms which are sufficiently serious to call for investigation, the associated achlorhydria is often the cause of various other conditions which lead the patient to seek for medical advice. Owing to its frequent association with chronic diarrhœa, chronic cholecystitis and gall-stones, chronic appendicitis, the Addison's anæmia-subacute combined degeneration of the spinal cord, Hunterian glossitis syndrome, and rheumatoid arthritis it is often discovered incidentally when patients suffering from these conditions are investigated with proper thoroughness. It should be remembered that no patient suffering from any one of these conditions can be regarded as "cured" if the end-result is alone treated; a patient with chronic appendicitis or gall-stones, for example, is almost certain to have further trouble sooner or later if his appendix or gall-bladder is removed and the associated achlorhydric gastritis is ignored.

A test-meal should also be given to patients who have had an attack of serious food poisoning or "gastric influenza" associated with abdominal pain and vomiting. By this means it is possible to recognise that form of chronic gastritis which is a sequel of acute gastritis, and which may, if left untreated, give rise to serious trouble later, possibly only after an interval of many years.

When those cases of chronic gastritis which come to be examined on account of gastric symptoms or the presence of secondary conditions and those which are a sequel of acute gastritis are excluded, there must remain a considerable number which are completely latent in their onset and in their course. It is not uncommon nowadays for educated people to ask for a complete physical overhaul from time to time, even when they are feeling quite well. Such a proceeding is very wisely encouraged by certain insurance companies in America. If such an overhaul included a test-meal, the presence of chronic gastritis would be recognised, and steps could be taken to treat it and thus prevent the possibility of the subsequent development of the various conditions, including carcinoma of the stomach, to which achlorhydria gastritis predisposes. The development of the type of atrophic chronic gastritis which may undergo malignant degeneration is a very slow process, so that if an overhaul given at the age of 40 includes a test-meal, which gives a normal or high curve of acidity and shows no excess of mucus, the test-meal need not be repeated for at least five years. After that it would probably be wise to repeat it every five years up to the age of 65.

(b) *Prognosis.*—In every case of achlorhydria a second test-meal should be given immediately after thorough lavage of the stomach. We have now done this for six years, and have found that in about 50 per cent. of cases free hydrochloric acid appears in the second test-meal. In these cases the prognosis is comparatively good, as the condition is still largely catarrhal; when a normal or high curve of acidity is obtained it can be concluded that little or no atrophic changes have so far taken place in the gastric mucous membrane. On the other hand, when no trace of acid is present in the second test-meal, the patient has either constitutional achylia gastrica, which may or may not be associated with secondary gastritis, or he has a comparatively advanced stage of primary atrophic gastritis. Though the inflammation may be overcome by treatment, nothing can prevent the possibility of the abnormal mucous membrane subsequently undergoing malignant degeneration.

(c) *Treatment.*—A diet should be given which contains no mechanically irritating constituents, such as the pips and skins of fruit, coarse vegetables, salads, and tough meat, and no chemical irritants such as alcohol and a large proportion of drugs in common use, except in an extremely dilute form. The food should be very thoroughly masticated, and proper dentures supplied when required. Pyorrhœa alveolaris and infected tonsils and nasal sinuses should be very thoroughly treated, and the dentist should be visited at least every six months.

The stomach should be washed out each morning before breakfast with dilute hydrogen peroxide (one drachm to the pint), the lavage being continued until no further mucus comes away; the final washing should be with plain water. The nascent oxygen set free when the hydrogen peroxide comes into contact with the mucus dislodges it much more efficiently than any other fluid, and at the same time it acts as an antiseptic. The treatment, which the patient soon learns to give himself, is continued daily with gradually increasing strength of hydrogen peroxide until no more mucus is present. It should then be continued on alternate days, then twice a week, and finally once a week for some months. Another course of treatment should be given if there should be a recurrence of symptoms, and in any case a test-meal should be given once a year, so that if the gastritis returns it can be treated without delay.

At one time I advised the administration of large doses (ʒ1 to 2) of dilute hydrochloric acid with pepsin, suitably diluted, before breakfast, and as a beverage with lunch and dinner, in all cases of achlorhydria. It is clear, however, that it is far better to restore the normal secretion of acid by treating the gastritis whenever this is possible. I therefore only give acid in those cases in which there is still no acid or insufficient acid after the second test-meal; a third test-meal should be given at the end of the first course of lavage, as the acid may have then returned even if none was present in the second test-meal, or extreme hypochlorhydria may have given place to a normal curve of acidity. Only when hypochlorhydria or achylia is found at the third test should hydrochloric acid be given continuously. It is not only useful for digesting meat and softening and diluting the food, but its antiseptic action helps to overcome the gastric infection and to prevent reinfection from the mouth or bowel.

Polyposis of the stomach.—This condition gives rise to symptoms suggestive of malignant disease. But the history is likely to be a long one without any recent aggravation, and there is generally little or no pain. In the only uncomplicated case of the kind I have seen weakness from the long-continued severe anæmia caused by the constant oozing of blood had been present on and off for nine years, together with nausea and occasionally attacks of diarrhœa and sickness.

The condition is sometimes indistinguishable from cancer with the X rays, but it may give such a characteristic picture that occasionally a correct preoperative diagnosis has been made. Achlorhydria is generally present, and one or more fractions contain blood, which is therefore always present in the stools.

The only safe treatment is partial or complete gastrectomy, as malignant degeneration may occur at any time, and it may be impossible to tell clinically or on abdominal exploration whether this has already begun. In my case, which I recorded with Adrian Stokes,[11] almost complete gastrectomy was successfully performed by Mr. Lancelot Bromley.

2. *Chronic Gastric Ulcer.*

(a) *Diagnosis.*—Though often latent in its early stages, a chronic gastric ulcer sooner or later almost always gives rise to symptoms, which, though less characteristic than those of duodenal ulcer, are sufficiently well marked and persistent to call for further investigation. It is possible to recognise the presence of every chronic ulcer of the stomach with the X rays, but it is always desirable to obtain further information by means of a test-meal and by examining the stools for occult blood before carrying out treatment.

(b) *Prognosis* and (c) *treatment.*—A gastric ulcer can be regarded as successfully treated when it has been replaced by a sound scar. This not only results in the disappearance of symptoms, but there is very little danger of malignant degeneration of a scar. In Stewart's[9] series of 259 specially studied operation specimens there was only one example of cicatrix-cancer compared with 11 of ulcer-cancer. I am convinced that all chronic ulcers of the stomach, however large and however deeply they may involve the pancreas, are capable of healing under prolonged medical treatment so long as they have given rise to no mechanical obstruction. When, however, an hour-glass stomach has developed or a prepyloric ulcer has caused pyloric obstruction, an operation should be performed. In my experience a gastro-gastrostomy, which is a far easier operation than excision, is all that is required for an hour-glass stomach; the ulcer always heals, and, moreover, it is a remarkable fact that ulcers causing hour-glass constriction rarely, if ever, become malignant. Theoretically the rare prepyloric ulcers, like the much more common duodenal ulcers which cause obstruction, would seem to call for gastro-jejunostomy, which always results in rapid healing; but as no less than 3 out of Stewart's 9 and 11 out of Orator's 84 prepyloric ulcers removed at operation showed clear signs of malignant degeneration, partial gastrectomy should be performed in all cases, as it may be quite impossible to recognise early malignant changes by simple inspection, and the X rays give far less definite information than in the case of lesser curvature ulcers. I can, however, see no reason for advising surgical treatment of a gastric ulcer producing no obstruction. Those cases in which medical treatment requires to be prolonged to three or four months are just those in which radical surgical treatment is difficult or impossible. Though gastro-jejunostomy may ameliorate the symptoms, the ulcer often does not heal, and so the possibility of malignant degeneration is not prevented. Jejunostomy does nothing which medical treatment cannot do more efficiently, and I have had two cases in which an irremovable ulcer near the cardia only healed on allowing the jejunostomy to close and instituting the usual medical treatment. As local excision was followed by recurrences within a year in 43 per cent. of 78 cases in the combined statistics of Dobson,[24] Sherren,[25] and Collinson,[26] recurrence would probably occur sooner or later in quite 75 per cent. of cases. Quite apart from the fact that partial gastrectomy, the only really radical operation for gastric ulcer, is only possible in those cases in which medical treatment is most likely to be effective, the mortality in the hands of the average hospital surgeon is probably at least twice as great as the risk of malignant degeneration, which was present in 4·6 per cent. of Stewart's 172 cases and 2 per cent. of Orator's 300 cases of lesser curvature ulcers. It is clearly wiser to undergo adequate medical treatment, if necessary prolonged for as much as three months, and survive, than run the risk, small as it may be, of death from operation. Whether the treatment is medical or surgical, it is, of course, essential to remove all foci of infection and to give the patient written instructions as to the régime he must follow in order to prevent a recurrence.

3. *Adenoma of the Stomach.*

Simple adenomata of the stomach, whether single or multiple, rarely give rise to any symptoms. If recognised, they should be excised on account of the great danger of malignant degeneration.

If the conclusions I have drawn in this lecture prove to be correct, the last word will be with the general practitioner and the physician, whose duty it will be to teach prophylaxis and to recognise the first signs of the precancerous conditions of the stomach. We may then confidently look forward to a time when the disorders, so ably described by Sherren and by Walton at this hospital as the "surgical dyspepsias," will cease to be surgical, for while some will be prevented, the remainder will be diagnosed at a stage in which they are still curable by non-operative treatment.

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ON THE

SYMPTOMATOLOGY OF INTESTINAL AMŒBIASIS.

BASED ON A STUDY OF 150 CASES.

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THE more extensive his experience of intestinal amœbiasis, the more the practitioner is bound to be impressed by the great variety of the symptoms which infection with *Entamœba histolytica* may provoke. No very great difficulty is to be apprehended in diagnosing the classical type of intestinal amœbiasis in patients complaining of a definite abdominal syndrome and the passage of blood and mucus in the stools; but it is by the less dramatic forms, or by those which present symptoms which might well bear a different interpretation, that one is liable to be led astray. During recent years we have been greatly struck by the diverse character of the amœbic syndrome, and did we not make it an invariable practice to examine the fæces microscopically in every case from the tropics presenting abdominal symptoms, we feel morally certain that, in quite a considerable proportion of cases, the correct diagnosis would have been missed. There are certain bizarre types in which constipation and flatulence constitute the outstanding features; others in which there is chronic diarrhœa; others again in which the symptoms appear to point to the gall-bladder, stomach, duodenum, and appendix as the seat of the trouble.

A study of the recent literature of intestinal amœbiasis reveals the fact that other observers, especially in America, have drawn attention to similar phenomena. James and Deeks,[1] in 1924, and more recently James[2] alone, have found that latent *histolytica* infections far exceed in number those associated with purely dysenteric symptoms at the time of examination. The latter is convinced that in Central and Northern South America *histolytica infections* cause a very large proportion of obscure gastro-intestinal troubles. Craig[3] also believes that the classical picture of amœbic dysentery is noted only in a minority of cases infected with *E. histolytica*. Musser,[4] in 1925, published an excellent account of the subject viewed from the clinical aspect. He remarks that out of 72 cases definitely diagnosed as amœbic dysentery, no less than 40 complained of chronic diarrhœa; 1 was admitted on account of asthma, 2 on account of rectal pain, and 13 on account of varying degrees of pain in the abdomen. Montier,[5] in 1922, described the more obscure forms of amœbic colitis. Some patients, he has noted, may even be constipated, whilst the misleading forms are those cases of intestinal amœbiasis in which the main symptoms are located to the right hypochondrium or to the hepatic flexure of the colon where the diagnosis has to be made from hepatic and biliary disease.

It is with the idea of emphasising the importance of these aberrant forms that we have analysed the symptoms of 150 consecutive cases of amœbic dysentery as they have occurred in practice during the last nine years. With a few exceptions, all these cases have acquired their infections in the tropics and have returned to England for treatment. In every case cited in this paper the diagnosis has been rendered absolute by the discovery of the active forms or cysts of *E. histolytica* in the fæces; these diagnoses have been reinforced in the majority of instances by sigmoidoscopic examination. The main features of this inquiry may be summarised in the accompanying table.

Analysis of 150 Cases of Amœbic Dysentery, Symptomatology, &c.

Distribution of Pain.

(Male cases, 133. Female, 17.)

Abdominal pain or discomfort—	
Present in	126
Absent in	24

	Cases.
Generalised abdominal pain	70
Epigastric discomfort ..	10
Liver area..	9
Gall-bladder area (right costal margin)	2
Right shoulder (referred pain)	2
Gastric localised	3
Duodenal localised	1
Transverse colon	1
Cæcal and appendicular..	7
Sigmoidal and descending colon	10
Lumbar localised	2

Maxima and Minima.

	Years.
Age at onset—	
Maximum	64
Minimum	$10^{10}/_{12}$
Maximum duration.. ..	30
Maximum period without active symptoms ..	6

Bowel Symptoms.

	Cases.
Diarrhœa	114
Alternating diarrhœa and constipation	8
Constipation	11
Normal regularity of motions	17
Flatulence	37

Bowel Symptoms (cont.).

	Cases.
Tenesmus	34
Blood and mucus in stools	71
Mucus only in stools ..	18

General Symptoms.

	Cases.
Pyrexia	18
Hepatitis	9
Emaciation	43

Previous Diagnoses.

	Cases.
Neoplasm of pancreas—laparotomy	1
Cholecystitis and cholelithiasis	2
Appendicitis and appendicectomy	4
Duodenal ulcer	1
Tuberculosis	1
Bacillary dysentery ..	1
Septicæmia (pyrexial case)	1

Intercurrent Diseases.

	Cases.
Kala-azar	1
Hepatic abscess	5
Tuberculous mesenteric glands	1
Pulmonary tuberculosis..	1
Malaria and ankylostomiasis	1
Malaria and ascariasis ..	1
Cystitis	1
Pregnancy	1
Pneumonia	1
Malaria	2
Sprue..	2
Gonococcal epididymitis..	1

Sex and Age Incidence.

A number of points present themselves for discussion. The overwhelming preponderance of the male is easily explicable by the greater exposure of men to liability of infection, and the relative smaller number of women proceeding to the tropics.

As regards age incidence, intestinal amœbiasis, in the European, at any rate, is a disease of adult life. Personally we have never seen amœbic dysentery in young children. What is generally taught, and we maintain to be true, is that dysentery in children is almost invariably bacillary in origin, and that amœbic dysentery is rarely, if ever, contracted before the tenth year. As will be seen by the table, the minimum age at onset in this extensive series is 10 years 10 months.

In this case the patient was the son of a missionary, who was working in the Shantung Peninsula, China. He had been born in China, and returned to England in March, 1927. Whilst in China he had one attack resembling dysentery. The real attack of classical amœbic dysentery commenced soon after his return to England in March and December, 1927. He was seen in the third relapse in February, 1928. The boy was passing typical blood and mucus stools, of which he had three to four daily. His general health was not much undermined, and there had been no appreciable loss of weight. The fæces contained numerous active *E. histolytica*. An apparently permanent cure took place after anti-amœbic treatment.

The oldest case in this series was a retired official, aged 64, who had returned from Burmah in 1922. Two years after his retirement he commenced to suffer from intermittent attacks of diarrhœa without obvious dysenteric signs. The fæces were found to contain *E. histolytica* cysts.

Latency.

Duration of Infection.—That intestinal amœbiasis may be one of the most persistent of all protozoal infections is well known. In four cases in this series the infection with production of symptoms had persisted for over 20; in one instance it had lasted 30 years.

This patient, a retired planter from Ceylon, had first contracted dysentery in 1897, and had suffered intermittently from colitis ever since. When seen in May, 1927, he was passing diarrhœic fæces containing *E. histolytica* cysts, which were successfully cultivated on Boeck and Drbohlav's medium.

A second case was seen in a printer in 1928. In this case the infection had lasted 20 years, and had been contracted on military service in India. This man had been residing in England for 28 years. In a third, seen in 1929, the infection had been contracted during the South African war in 1901, and he had continued to suffer from dysenteric attacks almost periodically since. Some ten years ago appendicostomy had been performed, and the colon periodically washed out. Although this afforded relief, it had not by any means cured the condition as *E. histolytica* cysts were found in the fæces.

That the symptoms of dysentery may vanish temporarily, even for long periods, with apparent restoration to health, has long been recognised; a year or more may elapse after the cessation of treatment before signs of the disease make themselves evident. Symptoms of dysentery may also become apparent long after the return from the source of infection. There may be a latent period of six years, as in the following case:—

A hairdresser was seen in 1929. He gave a history of frequent attacks in India, where he was born and had spent his youth. Returning to this country in 1922 he had good health for six years, and it was not till the end of 1928 that blood and mucus again appeared in the fæces. On his admission to St. Mark's Hospital the amœbæ were easily recognised in scrapings made from intestinal ulceration by sigmoidoscopy, and the case was kindly referred to us at the Hospital for Tropical Diseases, where the diagnosis was confirmed.

A second case was seen in 1923 in a soldier who served in France in 1916, where he evidently contracted the infection. Fresh symptoms of amœbic dysentery first became apparent in 1922, when the nature of the disease was proved at sigmoidoscopy and active *E. histolytica* were found in scrapings made from the bowel.

Latent periods of two or three years are comparatively common. It is the honest appreciation of this peculiarity of intestinal amœbiasis which renders it so very difficult to assess the permanent value of any particular form of treatment. It seems that the clinician has to wait six years or more to finally ascertain whether the cure has in effect been successful.

The recurrence or relapse may be acute; the onset sudden with violent diarrhœa and loss of weight. In one instance the quiescent period appeared to be as long as nine years.

This was in a sea captain who was seen in June, 1928, in an acute attack of amœbic dysentery. Cysts of *E. histolytica* were found in the fæces, and on sigmoidoscopy the typical ulceration was seen. The history clearly indicated that dysentery commenced in 1910, and that the last definite recurrence had been in 1919, when the organisms were discovered in the fæces in Liverpool.

Symptoms.

Localisation of Pain.—The absence of any distressing abdominal pain and general innocuity of the symptoms and their compatability with fair health are an outstanding feature. No very evident signs were elicited in 24 cases. In other words, amœbic dysenteric infection may be compatible with average good health.

In intestinal amœbiasis subjective pain is, as a rule, localised to certain definite areas of the large bowel; it may be, as it usually is, confined to the sigmoid and descending colon (ten cases), or to the opposite side of the abdomen, to the cæcum and appendicular area. In seven cases of this series the pain experienced by the patient and elicited by pressure was confined to the cæcum, the outlines of which can occasionally be ascertained on deep palpation. This localisation of pain is often mistaken for appendicitis, and not unnaturally the appendix may be at first suspected and removed. While not denying the frequency of true appendicitis in tropical countries, the coexistence of amœbic dysentery with pain localised to the cæcum is frequently mistaken for it. So far we are not convinced that we have encountered a case of appendicitis primarily due to amœbic infection.

Pain may be localised to the centre of the transverse colon, and an area of deep tenderness may be elicited in the epigastric triangle. The localisation of amœbic ulceration to this part is rare without the implication of other tracts of the large bowel; but when it does occur it may be most misleading. This accounted for six cases in our series: two in which the pain was registered at the outer border of the right rectus muscle and had been mistaken for gall-bladder tenderness, three in which the pain appeared in the stomach itself, and one in whom it was definitely located to the transverse colon. Then there is a small group in which the abdominal pain is referred to the lumbar region, in which case suspicion of renal trouble was quite justifiably entertained.

Emaciation is the rule in acute amœbic dysentery. In 43 cases of this series the usual loss of weight is from 14–28 lb. in a year, the greatest loss recorded being one of 42 lb. in three months. On the other hand, chronic intestinal amœbiasis so little interferes with nutrition that actual increase of body-weight, even to the extent of obesity, may be recorded. We have records of three cases in which a considerable increase of body-weight occurred. In one the duration of the disease with acute symptoms was of ten years, with an increase of 28 lb.; another in a soldier, of four years' duration, with a similar increase; a third in a lady, of three years' duration, who had in the meantime become extremely stout, but no actual figures of weights were obtainable.

Bowel Symptoms.—Obvious and chronic diarrhœa, without the appearance of blood and mucus in the stools, was the outstanding feature in no less than 114 cases. This significant fact gives support to Dobell's contention that the term "amœbic diarrhœa" must, in the majority of instances, supplant the term "amœbic dysentery." We believe that chronic "amœbic diarrhœa" is a much more common complaint than "amœbic dysentery," and that in a great many instances these amœbic diarrhœas are painless and are not accompanied by any very evident involvement of the bowel wall. Usually periods of diarrhœa alternate with those of constipation (eight cases). On the other hand, the anomalous fact asserts itself that constipation may constitute the outstanding feature of the case. We have records of 11 such. Illustrative cases are as follows:—

A young man of 28 years contracted an intermittent form of diarrhœa whilst on military service in India from 1919–22. For five years after his return to England from India he had suffered from chronic constipation, flatulence, mental and physical exhaustion, with loss of weight of 14 lb. Tuberculosis of the abdomen had been suspected. The bowels were never open, save by strong aperients. The cysts of *E. histolytica* were found, and were cultured from the stools. Loss of flatulence and increased regularity of the bowels followed a rigorous course of anti-amœbic treatment.

Another good example occurred in a locomotive driver in the Nigerian service, who complained of chronic pain in the left side of the abdomen, and the most obstinate constipation as a sequel of an acute attack of amœbic dysentery. The fæces contained *E. histolytica* cysts. The regularity of the bowels was greatly improved by anti-amœbic treatment.

Flatulence may be a most distressing symptom. Usually it is confined to the ascending colon and the cæcum. It may be obvious to the examining eye. Flatulent distension of the cæcum with retained gas, and which occasions a splash on palpation (well termed the "amœbic splash"), is so frequent as to be almost diagnostic. Flatulence is tabulated as a feature in 37 cases in this series. It may be so obvious and persistent that chronic pancreatitis or chronic intestinal obstruction may be suspected. A typical example is as follows:—

A lady was seen in 1928 whose chief complaint was loss of weight, chronic constipation, and flatulence. She had lost her complexion, the skin was harsh and dry. She presented, in fact, the clinical picture of intestinal toxæmia. The flatulence was confined for the most part to the right iliac fossa in the vicinity of the cæcum. Both sigmoid and cæcum could be easily palpated. The fæces contained *E. histolytica* cysts. Both constipation and flatulence were entirely cured by anti-amœbic treatment.

Dyspepsia.—Acute dyspeptic symptoms are often associated with flatulence. Rarely cases are encountered in which the tenderness and acuteness of pain are referred to the pit of the stomach. These are usually long-standing infections with considerable infiltration of the bowel wall.

One typical example was seen in January, 1927. The pain was referred to the right hypochondrium, especially when lying on that side. The cæcum was infiltrated and thickened, and easily palpable. The fæces contained *E. histolytica* cysts. *The dyspeptic symptoms disappeared after efficient anti-amœbic treatment.*

Cases Simulating Duodenal Ulcer.—The possibility of intestinal amœbiasis being mistaken for duodenal ulcer is one that rarely arises, but the one particular case in this series was so remarkable that a few details must be given.

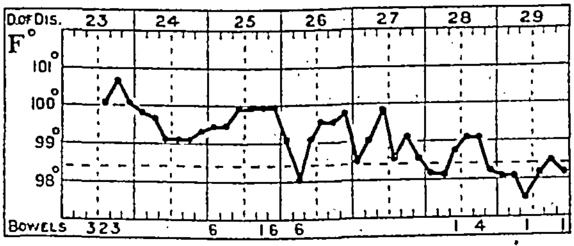
A quartermaster of an Indian liner, aged 45 years, was seen in March, 1927. This man had, three years previously, suffered from liver abscess, for which an operation was performed. After this he appears to have suffered from chronic supra-umbilical pain, flatulence, and dyspepsia. On March 17th, 1927, he was suddenly taken ill with acute abdominal pain, vomited bright blood, and passed a number of black, tarry, melænic stools. Two further bleedings took place within the next ten days, till the condition of the patient became desperate. *The anæmia was so profound* that blood transfusion had to be resorted to.

On microscopic examination of the melænic fæces one active *E. histolytica* was seen. No improvement followed the usual alkaline and dietetic treatment for duodenal ulcer, but on the other hand emetine injections of gr. 1 for six days effected a most remarkable improvement. This was reinforced later on by a complete course of emetine bismuth iodide and yatren intrarectal injections. A complete cure appeared to have been produced. The improvement to the blood picture, general appearance, and weight of the patient were alike remarkable.

Acute Amœbic Dysentery.—One of us (P. H. M-B.) has recorded[6] a case of acute onset and course with fatal results within 14 days of the onset. Such instances are extremely rare. Amœbic dysentery may, however, produce the most profound cachexia, almost resembling that of malignant disease.

A man of 29 years of age was treated in May, 1928, on his return from Nigeria. The nature of the illness had already been recognised, and he had been treated with a total of grs. 60 of emetine continuously, but the present was the most severe attack he had experienced. He had lost 28 lb. in weight within a month. The diarrhœa averaged 12 blood and mucus stools a day. The patient was obviously cachectic, the sigmoid and cæcum were definitely thickened, while on sigmoidoscopy most extensive and deep ulceration was present. *E. histolytica* were demonstrated in large numbers in scrapings from these ulcers. The response to the combined treatment with emetine-bismuth iodide and yatren was remarkable. He regained *18 lb. within the same number* of days. This was one of the worst cases from the clinical aspect we have ever seen.

FIG. 1.



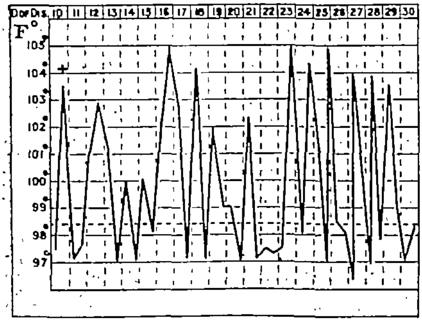
Four-hourly temperature chart in a case of acute amœbic dysentery, associated with toxic absorption showing the character of the pyrexia.

Pyrexia.—The course of a straightforward case of intestinal amœbiasis is usually apyrexial. The absence of anything like a high temperature is usually regarded as a valid point of differentiation between intestinal amœbiasis and bacillary dysentery. It is necessary to point out that this is by no means an invariable rule. In the present series there were no less than 13 cases associated with pyrexia which could not be accounted for by any other associated infection, or by coincident amœbic hepatitis.

The character of the pyrexia can be gathered from the accompanying temperature chart (Fig. 1); it is probably due to the absorption of septic matter from the bowel wall.

This patient was a ship's engineer, who was admitted to hospital in 1929 with acute amœbic dysentery, passing some 10–20 blood and mucus stools daily. The patient looked ill, with pinched facies and furred tongue. The abdomen was tender, and the cæcum and sigmoid were indurated and palpable. There was no evident enlargement of the liver. The pyrexia rapidly subsided on emetine and emetine-bismuth iodide treatment.

FIG. 2.



Temperature chart in a case of acute amœbic hepatitis with multiple rigors. The cross shows the time at which cysts and pre-cystic forms of *E. histolytica* were found in the fæces.

Pyrexia Resembling Malaria.—The fever may be so acute in onset as to resemble a malarial attack for which it is often mistaken. Of these no less than five cases have been seen where the previous diagnosis founded on the symptoms of the patient indeed had been malaria. We are convinced that these attacks are due to recurrent embolism of the liver by amœbæ derived from the bowel.

A remarkable case of this nature was admitted to hospital in November, 1927. The patient had served for years in India, where he had suffered from dysentery, and had returned in 1923 to England. A latent period of five years elapsed during which he had no symptoms. Then in August, 1927, a series of rigors commenced, resembling closely in the onset and nature that of benign tertian malaria. They were accompanied by the most profuse sweats. Sometimes two rigors occurred within 24 hours. The temperature frequently rose to 105° and 106° F. (Fig. 2). This lasted throughout three months, *till* the state of the patient became very alarming. The diagnosis was established by the discovery of active *E. histolytica* and its cysts in the fæces, together with the existence of a leucocytosis of 30,000. The amœbæ were subsequently cultured from the fæces. Eventually in December, 1927, on vigorous anti-amœbic treatment the patient made a good recovery. Although the liver was enlarged to percussion, and as ascertained by radiographic examination, there was never any acute pain referred to the organ as is usually the case in amœbic hepatitis.

These malaria-like attacks may persist over many years, and then their nature is usually quite unexpected until the stools are microscopically examined.

A fish salesman was seen in July, 1929, with a history extending back over eight years. Originally infected with amœbic dysentery in Syria, in 1918, he had on one occasion only passed blood and mucus in the stools. Ever since that time he had been subject to attacks of otherwise inexplicable diarrhœa. In June, 1929, he commenced to suffer from bouts of fever, with rigors and faintness and tenderness over the liver at the costal margin. The sigmoid flexure and descending colon were distinctly palpable. *E. histolytica* cysts were present in the fæces. There was a leucocytosis of 16,000. Immediate improvement and cessation of febrile attacks took place on anti-amœbic treatment.

Continuous Pyrexia.—Another striking case occurred in a young woman who had returned from India in 1927 and was seen a year later.

She had been taken ill at Marseilles in December, 1928, with recurrent attacks of four bouts resembling closely those of malaria, associated with abdominal dysenteric symptoms. The temperature frequently rose to 104° or to over 105° F. On admission to hospital in January, 1929, she was passing dysenteric motions containing active *E. histolytica*. She had two subacute rigors associated with a leucocytosis of 14,000. *The pyrexia speedily resolved, and* the condition entirely cleared up on anti-amœbic treatment.

Ulceration of the Rectum Without Involvement of the Rest of the Large Bowel.—The amœbic ulceration of the rectum may be solitary, and the ulcer may be of a large size and give rise to considerable local pain. The ulcer from its site, from its general character, and from the nature of the incessant blood-stained discharge, may closely simulate that of malignant disease.

We have the record of one such case in a man of 37 years of age seen in May, 1928. The condition had persisted for two years. On sigmoidoscopy a large ragged ulcer, 3 cm. in diameter, situated in the rectum, 6 cm. from the anal margin, was discovered. In its indurated character and the ragged nature of the margins of the ulcer it did not resemble an amœbic ulcer; nevertheless, active forms of *E. histolytica* were discovered in the scrapings, and it entirely healed up on vigorous anti-amœbic treatment.

Intestinal Hæmorrhage.—It has long been recognised that severe intestinal hæmorrhage may take place from amœbic ulceration of the colon. It may be so sudden and so profuse that the amœbic nature of the case may not be recognised or even suspected. The difficulty of diagnosis is made doubly severe by the fact that the amœbæ themselves are washed away by the amount of blood and cannot easily be identified by microscopic examination.

A patient was seen in January, 1926. He had suffered intermittently from attacks of amœbic dysentery for over one year, and had been found to be a chronic carrier of *B. typhosus.* Subsequent to an attack of typhoid fever in 1916 on the occasion in question the attack had been ushered in by the most profuse dark melæna, consisting almost entirely of altered blood. He had lost about 3 st. in weight. With great difficulty a few typical *E. histolytica* were found in the melæna, and a permanent recovery followed after specific treatment.

Another good case was seen in September of the same year. This was a lady of 55 years of age, who had contracted the infection in Chile early in 1926. The illness had begun suddenly with a rigor and high temperature, with pain in the right shoulder and the right arm. The diagnosis eventually turned out to be that of a hepatic abscess which had ruptured into the right lung, producing the most profuse hæmoptysis. At the same time she passed large black tarry stools in which, on microscopic examination, an active *E. histolytica* was recognised. A complete course followed intensive anti-amœbic treatment.

Painful Spasmodic Contraction of Sigmoid Colon.—Spasmodic contractions of the bowel occur in amœbic dysentery, especially in long-standing cases, and in those in whom constipation is an outstanding feature. This spasmodic contraction may dominate every other symptom of intestinal amœbiasis.

A locomotive driver from Nigeria was seen in February, 1926. He complained of chronic constipation and pain over the descending colon and sigmoid, which, though usually of a dull aching character, was punctuated by acute exacerbation. The spasmodically contracted bowel could be easily palpated. Numerous *E. histolytica* cysts were present in the fæces. Vigorous anti-amœbic treatment entirely cleared up the condition.

Hæmorrhoids.—External piles are a very frequent concomitant of intestinal amœbiasis. Almost every case of long standing shows evidences of external piles. They are probably occasioned by the straining at stool which is a feature of this disease. As a rule, we do not advocate any active interference in these cases, as the piles recede and almost disappear when the underlying cause has been adequately dealt with.

Prolapse of Rectum.—As in the case of hæmorrhoids, so may prolapse of rectum be brought about by constant straining at stool.

We have seen one such case in a medical man, 37 years of age, who was seen in October, 1927. He gave a clear history of amœbic dysentery contracted in Mesopotamia in 1922. He had suffered from a great deal of diarrhœa with a little tenesmus, but the rectal prolapse had become gradually more pronounced. Large numbers of *E. histolytica* were present in the fæces, and a sigmoidoscopic examination revealed large numbers of characteristic ulcers. Without any additional aids, a complete and permanent retraction of the prolapsus recti took place on specific treatment. The patient has remained in good health, and has undertaken a large clinical practice ever since.

Sequelæ.—Stricture of the bowel, not any actual interference with the passage of fæces as the result of amœbic ulceration, has not been observed.

Dilatation of Colon (Megacolon).—Two instances of this condition, apparently the direct result of chronic amœbic infection of the large bowel, have come under notice. In both instances the gradual onset of the condition, coming on two to three years after the cause of amœbic infection, has been observed.

The most striking instance has been watched since 1920. This man contracted amœbic dysentery whilst serving in Mesopotamia in 1917. He had relapses of dysentery in 1919, for which he was treated with six courses of emetine-bismuth iodide, and another more severe one in September, 1920, for which he was treated by a more vigorous course of emetine-bismuth iodide in the Hospital for Tropical Diseases. He appears to have been entirely cured of his amœbic infection. From 1925–27 he was under continuous observation with enormous dilatation of the colon, especially of the transverse portion, resulting in the characteristic Hirschspring's disease. The abdomen itself was greatly distended, especially in the lower quadrant, where the constant meteorism occasioned the most acute discomfort. The condition revealed by barium enema was one of gross distension and sacculation of the whole colon.

The second case in a ship's officer was similar in its main features, and in both an intimate and direct association with chronic intestinal amœbiasis could be traced.

Sprue Secondary to Intestinal Amœbiasis.

We have records of two cases in which sprue-like symptoms supervened upon an amœbic infection.

The first was a young officer who contracted amœbic dysentery in Mesopotamia, whence he returned rather acutely ill with dysenteric symptoms and the passage of active *E. histolytica* in the fæces. During his course of treatment he developed a typical acute hepatitis. All dysenteric symptoms rapidly subsided on vigorous anti-amœbic treatment, but almost immediately developed sprue-like symptoms with stomatitis, aphthous ulceration of the mouth, and the passage of large frothy sprue-like stools. The sprue state lasted for just one month and yielded to dietetic treatment. This was in April and May, 1920, since when he has remained in good health.

In the second case it was difficult to determine whether the amœbic infection antedated the sprue or not, but when the patient, who was 55 years of age, and who hailed from Bangalore, came under treatment in August, 1927, he had lost 76 lb. (5 st. 6 lb.) of his body-weight. In addition to this emaciation there was shrinkage of liver, dullness, anæmia, and the stomatitis of sprue. The fæces were large, pasty, and frothy, but also contained blood and mucus and active *E. histolytica*. Treated with the combination of emetine-bismuth iodide and rectal injections of yatren he made a very good recovery, and on returning to India nine months later he weighed 14 st., or an increase of 104 lb. of body-weight.

We think that there is a very close connexion between amœbic dysentery and sprue. The frequency with which the latter supervenes upon the former is more than a mere coincidence. Here we have records of two cases in which these diseases merged imperceptibly into one another, and it almost suggests that in certain cases sprue supervenes as a sequel of intestinal amœbiasis.

Localities in which Intestinal Amœbiasis was Contracted.

The cases quoted in this series hailed from nearly all over the world. From India, China, Ceylon, East Indies, Aden, Palestine, Mesopotamia, Salonika, Gallipoli, Egypt and the Sudan, East, West, and South Africa, New South Wales, the Mediterranean area, Venezuela, West Indies, Cape Verd, and Canary Islands. There were three records of indigenous amœbic dysentery contracted in 1917–19 on active service in France, and one in Germany contracted whilst a prisoner of war in 1918. There is also the record of an indigenous infection contracted in London.

The patient, a stevedore, aged 60, was seen in the Albert Dock Hospital in 1928. He has never left this country, but for 40 years had worked upon ships from Calcutta and Bombay, and it is from this source probably that he contracted the infection, presumably from association with lascar sailors. He had been ill for over two years with very evident signs of dysentery, and had been treated for colitis and for possible lead poisoning (lead colitis). Unfortunately he broke his leg in October, 1928, and had to be admitted to hospital for treatment when the true nature of the "colitis" was recognised by the discovery of active *E. histolytica* in the blood and mucus stools. The response to anti-amœbic treatment was as instantaneous as it was remarkable.

Associated Diseases.

The intimate connexion between amœbic dysentery and hepatic abscess is universally recognised—in fact they are but different manifestations of the same infection—but curiously they are seldom observed at the same time in the same individual. This association was noted five times in 150 cases. In three the liver abscess had antedated the present attack of amœbic dysentery, and in two only, both severe cases, was a hepatic abscess present at the same time as the patient was suffering from intestinal amœbiasis. Amœbic dysentery coexisted with malaria also on two occasions and with kala-azar once. The peculiar relationship to sprue has already been noted.

Conclusion.

The connexion between intestinal amœbiasis and the signs and symptoms is difficult to determine precisely. It depends possibly on the nature and extent of the intestinal ulceration whether the pain and discomfort are referred to one portion of the bowel or the other. Why the same infection should produce active diarrhœa in one person, and chronic constipation and flatulency in a second, cannot at present be determined. It probably depends upon the amount of mucous membrane destroyed by the amœbic infection, or the resistance of the patient to this particular infection. The diversity in the nature and severity of the symptoms produced render intestinal amœbiasis one of the most protean of all protozoal infections.

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EAST HULL MATERNITY HOSPITAL AND CLINIC.—A new Municipal Maternity Home and Infants' Hospital has recently been opened at Hull. The institution was founded by private munificence in 1912, but by 1915 the work had so greatly expanded that it was taken over by the corporation. The new premises, which already belonged to the city, have been adapted to provide 40 maternity beds, 16 cots for infants suffering from dietetic diseases, 8 beds for nursing beds, and 10 isolation beds. The hospital is a training school for midwives. In 1928 there was one death among the patients attended by a municipal midwife, and no death among the 645 women confined at the maternity home—one maternal death for 1085 confinements. On the other hand, there were 24 maternal deaths from the 5018 confinements which take place elsewhere in the city, or one death for every 209 confinements. On the same occasion there was opened the East Hull Clinic, which brings together five different departments scattered about the district. It is claimed that the Clinic "is, in many ways, unique," and it is pointed out that, under the special arrangements of the Hull Corporation, all children, whether under or over 5 years of age, can be treated. It is officially described as "an endeavour to provide a complete Public Medical Centre for East Hull."

THE INFECTIVITY OF ERYTHEMA NODOSUM.

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THE majority of cases of erythema nodosum, febrile and non-febrile, occur sporadically, and the closest investigation fails to reveal a possible source of infection. Then one meets two or more cases so closely associated one with the other that it is difficult to disregard the possibility of infection. Two illustrations of this have been brought to my notice recently by medical correspondents. For the following I am indebted to Dr. D. J. Thomas, of Melbourne :—

> A woman, aged 21, had a typical attack of erythema nodosum, subsiding quickly. A fortnight later her brother, aged 26, developed a sharp attack. Three weeks later her sister, aged 18, had tonsillitis and erythema nodosum. She had a congenital aortic defect, and her attack of erythema nodosum passed into acute bacterial endocarditis, which proved fatal about three months later.

The second instance was communicated to me by Dr. Victoria Tryon of Clifton :—

> Two female domestic servants, neither of whom had suffered from any previous illness, shared a common bedroom. One of them, aged 20, developed the rash of erythema nodosum on March 19th, 1929. There were no constitutional symptoms and the attack was over in nine days. Her fellow servant, aged 22, complained of stiffness in the joints on May 20th, and there was then some teno-synovitis of both patellar tendons. On June 3rd the rash of erythema nodosum appeared. The attack was a slight one; unaccompanied by constitutional symptoms, and she was well in eight days.

It would be easy to multiply such cases, both from one's own experience and from published reports. Even more common is the simultaneous occurrence of erythema nodosum in two or three members of the same family. Whilst the probability is that they have all been infected from a common source, one cannot conclusively refute the explanation that is so often advanced—namely, that the disease has been caused by some food poisoning or some defect of hygiene which has been common to all the sufferers.

> In 1920 I saw two sisters, one of whom developed erythema nodosum on March 20th and the other on March 23nd. One of these, a medical student, returned to her work on March 27th, long before the nodes had disappeared, and subsequently a nurse in the ward in which she was working developed erythema nodosum on April 8th, and a night nurse on May 2nd.

Small outbreaks of the disease in schools or institutions are not uncommon. Langford Symes saw 12 cases in a home of 100 young girls between May 14th and June 14th, 1907, and Arvid Wallgren[1] in 1927 reported an outbreak of 18 cases amongst a class of 34 girls. Wallgren believes erythema nodosum to be a form of tuberculosis, but the facts as stated are much more suggestive of an infective fever, for the girls were all between the age of 10 and 12 years; the cases occurred in batches as if one group had infected the next; and they occurred in the months of March, April, and May, when erythema nodosum is most prevalent. Larger outbreaks, attacking whole communities, are not infrequent. Wiborg saw 30 cases between November, 1921, and August, 1922, amongst an isolated community of 816 people at Bangsund. Dr. R. E. Roberts, medical officer of health of the Mynyddislyn Urban District Council, saw 50 cases during a period of five weeks in August and September, 1920.

Incubation Period.

It is very difficult to fix the incubation period of erythema nodosum. The notes of published cases are of little value, for as a rule the appearance of the rash is regarded as the beginning of the illness, regardless of the fact that there has frequently been a febrile period of from 7 to 14 days before the exanthem appeared. It seems, however, that the incubation period may be a very brief one. For instance, a case is reported in which a child who was suffering from erythema nodosum was admitted to a hospital ward, and nine days later two children in the ward developed the disease. There had been no previous cases of erythema nodosum in the institution. Ledoux relates the history of four girls who suffered from the disease. The first was attacked in December, the second followed nine days later, the third 12 days after the second, and the fourth 15 days after the third. My own experience would lead me to give an incubation period of about 14 days. A. A. Lendon estimates it at about 11 days. Whilst it is certain that the incubation may be brief, it is obvious that the interval between two associated cases is usually a long one, extending into weeks and sometimes months. For instance, in the case of the two domestic servants which I have already quoted the interval was nine weeks, and similarly, some years ago, I discharged a boy convalescent from erythema nodosum from the Bristol General Hospital on July 12th, and admitted his sister suffering from the same disease on August 31st. There are two possible explanations of this long interval between cases. The infectivity of erythema nodosum is very low and the ordinary healthy subject is able to withstand it. If, however, the resisting power be temporarily lowered from any cause, then the germ gets the upper hand, and the disease is developed. In this connexion it is noteworthy that erythema nodosum is very frequently preceded by a period of ill-health, or follows after some acute or chronic infection. Its close association with tuberculosis is possibly only an evidence of the debilitating result of this disease. Another possible explanation is that the infective organism survives for a long period, and the convalescent becomes a "carrier." In this way the infection would be comparable to that of diphtheria. In support of this view is the fact that relapses are not uncommon, and sometimes patients reinfect themselves over and over again. Lendon reported the case of a woman who, after a month of prodromal illness, developed the rash of erythema nodosum on Jan. 5th, 1899. Fresh crops of nodes continued to appear until the following August. The patient went to South Africa, and subsequently, in January, 1900, wrote saying she thought that she had seen the end of the illness, as the last traces had disappeared just two weeks before the date of writing.

Characteristics of the Infection.

A striking instance of how infection may persist in erythema nodosum is provided by the case of Mrs. A., whose history I detailed in my recently published monograph on this disease. This lady had her first attack at 18 years of age, and subsequent attacks when 21, 24, 27, 30, 32, and 37. By the courtesy of her medical attendant, Dr. Winifred Nott, I was able to see Mrs. A. in two subsequent attacks (eighth and ninth), one in April and the other in July, 1929. She was then 42 years of age. Although the acute attacks were several years apart, Mrs. A. stated that she was seldom free from nodules for more than a few weeks at a time. Any depressing circumstance or failure in general good health brought back a few spots. Four of the acute attacks occurred during pregnancy. Some authors have described such recurrent attacks or relapses as *chronic erythema nodosum*.

Another interesting feature in the incidence of erythema nodosum is the predilection it shows for certain families. Over and over again one sees two or three members of a family getting attacks of erythema nodosum. The attacks are many years apart, and often occur in widely separated members of the same family, so that one can exclude the possibility of infection by fomites or of one member being a carrier. Woringer calls such instances

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[1] See THE LANCET, 1927, ii., 1030.

familial erythema nodosum, and maintains that they share a similar familial constitution which renders them peculiarly liable to this infection. Of such the following is an example :—

Mrs. N. Erythema nodosum in 1886 ; eldest daughter died during attack of erythema nodosum and endocarditis, 1900 ; fourth daughter had erythema nodosum in India in 1925, and a mild attack in England, 1927 ; fifth daughter had an attack in 1920, and second and third attacks in Egypt 1921 and 1922 ; the sixth daughter had attacks in 1916, 1920, and 1922.

Females are more than three times as prone to develop the disease as are males. There is no other infectious disease which shows this peculiar sex incidence.

The nature of the infective agent in erythema nodosum is at present unknown. On the continent the view is widely held that this disease is a modified form of tuberculosis, but in this country and in America it is increasingly regarded as a streptococcal infection. Rosenow claimed to have isolated a diphtheroid organism which, in some stages, assumed a streptococcal form, and which reproduced the disease in animals, but his work has never been confirmed. Whatever the organism may be, its activity in all European countries is greatest in March and April, and this groups it with such diseases as pneumonia, streptococcus infection, tuberculosis, and encephalitis lethargica, for which the winter months, by the absence of sunlight, prepare the soil. Infection takes place through the tonsils, and it is probable that it is in these organs and in the nasopharynx that it lies dormant for weeks or months.

THE USE OF
BISMUTH IN THE TREATMENT OF CONGENITAL SYPHILIS.

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SINCE its introduction in the treatment of syphilis by Sazerac and Levaditi in 1921,[1] bismuth has been accepted as an antisyphilitic remedy of undoubted value. Laboratory experiments and clinical trial have testified to its efficacy, and many French writers regard it as therapeutically superior to mercury. It is only natural that a drug which has proved of such value in acquired syphilis should be employed in congenital syphilis, a variety of the disease that is admittedly very refractory to treatment.

Among the first to report his experience with bismuth in congenital syphilis was Müller,[2] who treated six cases in 1922, and secured a good symptomatic response without toxic effects. In the following year Cajal and Spierer[3] reported the treatment of eight cases with a bismuth tartrate preparation, and stated that its therapeutic action on active manifestations was more rapid than that of mercury and as rapid as that of the arsenical preparations. Untoward symptoms were not observed. A suspension of bismuth salts in oil was employed by Torok.[4] In his experience bismuth proved to be a more satisfactory drug than either mercury or arsenic, owing to its ease of administration and low toxicity in therapeutic doses. Several other continental writers have expressed similar approval, while dissenting opinions as to its value are offered by Pinard[5] and Frank,[6] the former asserting that bismuth is not well borne by children, and that it often causes anæmia, emaciation, and lassitude ; while Frank had one death, apparently consequent upon bismuth therapy. Wright[7] has reported very good results, and was able to render 47 per cent. of his Wassermann-fast cases serologically negative, although prolonged treatment with arsenic and mercury had been previously carried out without effect.

Mode of Administration.

In my investigations "bisoxyl," a suspension in water of bismuth oxychloride and chloretone, has been used throughout, the injections being given deeply into the subcutaneous tissue of the thigh at weekly intervals, the dose varying with the age of the child. As a rule the initial dose was 0·1 g., gradually increased to 0·2 g. if no signs of intolerance developed ; this corresponds to 0·01 and 0·02 g. of the bismuth salt itself. The injections are only accompanied by momentary pain, unlike those of intramuscular arsenic, after which some degree of local swelling and tenderness usually persists for two or three days. This fact was constantly commented on and approved of by the mothers, some of whom sanctioned treatment with bismuth, although further arsenical treatment had been refused. On this account it is very much easier to ensure regular attendance with bismuth therapy, a very important point where the duration of treatment may be a matter of years. The site of injection was always well massaged after the administration of the drug, and in no case has any localised fibrosis occurred.

Intolerance to Bismuth.

As a general rule the symptoms of bismuth poisoning are similar to those of mercurial poisoning, except that recovery from the toxic effects is considered to be more rapid in the former. Anwyl-Davies[8] regards loss of appetite, accompanied in some cases by vague feelings of indigestion and headache, as the earliest manifestations of bismuth intolerance. Loss of weight is another early sign ; in this series the patients were weighed regularly every fortnight. The weight remained absolutely stationary in four, while one of the children, who developed albuminuria, lost weight quite markedly so that the treatment was stopped. A blue line on the gums may be regarded as a most valuable sign, as it is a guide to the amount of bismuth that can be tolerated, and is thus a good index of the appropriate dosage. At first a grey line forms round the edge of the gums, and this gradually turns to a bluish colour. Even when the line becomes definitely blue, provided that there is no stomatitis, the administration of bismuth need not be stopped, but the dosage should be decreased. Colonel Harrison[9] has pointed out that the blue line along the gum margin is more frequent when the soluble bismuth preparations are used, and that in all cases treatment should be stopped as soon as stomatitis is observed.

Clinical experience of the effect of bismuth on the kidneys bears out the conclusions that Brown, Saleeby, and Schanberg[10] reached experimentally on rabbits—namely, that the toxicity of bismuth is relatively low. It is presumably on account of this discrepancy between the therapeutic and the toxic dose that patients who develop albuminuria do not continue to show it for any length of time after the treatment is ended. This is well shown in Cases 14 and 15. Within six weeks of the cessation of treatment the urine was free from albumin, and there was apparently no impairment of kidney function as judged by renal efficiency tests. It is of interest to note that both these patients had received antisyphilitic treatment for over three years before commencing the bismuth ; as they were the only cases to develop albuminuria it is possible that the previous prolonged treatment with arsenic and mercury had to some extent damaged the kidneys and rendered them more susceptible to the subsequent bismuth.

Indications for Bismuth Therapy.

The most refractory cases of congenital syphilis from the serological point of view are, as a rule, those that first come under observation in later childhood, and are included under the term "lues tarda." Many of these cases persist with positive Wassermann reactions long after the outstanding physical manifestations have healed, and despite prolonged antisyphilitic treatment. Glynn, Roberts, and Bigland, in their Medical Research Council Report,[11] suggest very strongly that strains of *Spirochæta pallida* resistant to mercury may be produced by the prolonged administration of this drug in submaximal doses. Analogous results from arsenical treatment have been recorded by Klauder,[12] who has shown that it is possible to produce arsenic-resistant strains of *S. pallida* in rabbits by giving them small subcurative doses of arsenobenzol and inoculating the strain through several animals. The cases here recorded come under a combination of these two categories, as before their bismuth treatment they had all received repeated courses of intramuscular arsenic combined with mercury by the mouth. The cases are shown in the accompanying table, the intensity of the Wassermann reaction being recorded by the number of "pluses" in each case:—

Case.	Age.*	W.R.*	No. of A. injections.	Time under M. and A. tr.	W.R. after A. tr.†	Age at commencement of bismuth therapy.	Total number of bismuth injections.	W.R. after bismuth.†
1	8 y.	2	19	6 m.	1	8	6	—
2	7 y.	4	24	18 m.	2	8	12	2
3	8 y.	4	24	12 m.	3	9	12	1
4	6 y.	4	34	3 y.	1	9	6	—
5	10 y.	4	30	2 y.	4	12	6	4
6	3 w.	2	30	3 y.	4	3	12	±
7	13 y.	2	12	6 m.	2	13	12	—
8	4 y.	3	12	6 m.	3	4	12	±
9	9 y.	4	6	3 m.	4	9	12	4
10	2 w.	2	6	2 m.	2	1	12	—
11	3 m.	3	15	2 y.	2	2	12	±
12	2 y.	2	12	6 m.	2	3	6	—
13	8 y.	4	24	2 y.	3	10	12	2
14	10 y.	4	32	3 y.	2	13	12	—
15	10 y.	3	26	3 y.	2	13	10	2

* On first attendance. M. and A. tr.=mercury and arsenical treatment. † Number of pluses. y.=years; m.=months; w.=weeks.

Comments.—Case 5. Attendance lapsed. 9. Irregular attendance. 14. Albuminuria at end of second course. 15. Albuminuria treatment stopped.

Conclusions.

Although it is impossible in any one centre to secure a large number of suitable cases, these results tend to show that it is possible to render serologically negative a certain proportion of apparently Wassermann-fast congenital syphilitics by means of bismuth, and that its use is not accompanied by any untoward symptoms, apart from the occasional occurrence of temporary albuminuria. It is suggested that these results are due to the fact that the *S. pallida* has become resistant to arsenic and mercury after prolonged treatment

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HOSPITALS AND MOTOR ACCIDENTS.—The Manchester and Salford Medical Charities Fund suggests that hospitals which treat motor accident cases should be brought in as beneficiaries in any scheme of compulsory insurance of motorists against third-party risks, and the governing body of the fund has passed unanimously a resolution urging this course upon the Government.—Lieut.-Colonel W. L. Kirby, chairman of York County Hospital, advocates the addition to all driving licences of one shilling to cover the cost of hospital charges caused by road accidents.

Clinical and Laboratory Notes.

AN UNUSUAL VAGINAL INFECTION IN A YOUNG MARRIED WOMAN.

By E. WORDLEY, M.D. CAMB., M.R.C.P. LOND.,
PATHOLOGIST TO THE SOUTH DEVON AND EAST CORNWALL HOSPITAL, PLYMOUTH.

IN an address reported in THE LANCET last week (p. 981) Colonel L. W. Harrison dealt with various pitfalls in the diagnosis of venereal disease, and stressed the importance of a very complete examination before giving a definite opinion on the nature of any suspected venereal infection. He quoted an illustrative case where, because a newly married woman developed a Bartholinian abscess shortly after marriage, a diagnosis of gonorrhœa was made—erroneously, as it turned out after further examination—and caused very great distress to the parties concerned. A case has recently come to my notice where a similar mistake might easily have been made and a marriage wrecked. It proved a useful lesson against jumping to conclusions.

A young woman, aged 20, made a runaway marriage with a man a good deal older than herself, and against the wishes of her parents. Eight days after marriage and during the honeymoon she noted a profuse vaginal discharge and much irritation around the vulva. Thinking her husband had given her some venereal infection she came home to her parents. She was at once seen by her doctor who found all the signs suggesting an acute gonorrhœa. The girl's parents told him that if she had a gonorrhœal infection it was decided to institute divorce proceedings.

Smears from urethra and cervix were taken and sent to me for examination. Numerous pus cells were present and numerous Gram-negative diplococci both extra and intracellular were found, exactly resembling the gonococcus. I am certain that if similar slides had been sent up from a venereal diseases department with a diagnosis of gonorrhœa a return of "gonococci present" would have been made unhesitatingly. However, since I knew the details of this particular case, I stated that organisms resembling the gonococcus were present, and refused to commit myself more definitely. I said that if any question arose of giving evidence in any divorce proceedings I should have to examine the patient myself and take cultures if I was wanted to give any exact evidence. Accordingly, I made a personal examination of the patient. She had a thick yellow purulent vaginal discharge, the inguinal glands were enlarged, she was acutely tender on examination, and in short, presented all the symptoms of acute gonorrhœa. Films taken again showed numerous pus cells and Gram-negative intracellular diplococci exactly resembling the gonococcus. However, cultures on blood-agar yielded no colonies resembling the gonococcus but a pure growth of fairly large whitish rather opaque colonies. On staining these they proved to be Gram-negative diplococci of the exact size and shape of the gonococcus. But on first culture they grew luxuriantly on plain agar both at 37° C. and at room temperature. Maltose and dextrose were acidified but not lactose. Apart from the sugar reactions, the fact that abundant growth was obtained on plain agar at room temperature must completely rule out the possibility of the organism being the gonococcus.

The husband next came to see me stating positively that he had never had gonorrhœa and had now no urethral discharge nor anything to suggest an infection of the genito-urinary tract. I made a careful examination of his urethra, prostate, and urine. No signs of a urethral discharge were present. No pus cells or organisms were found in the urethra, prostatic secretion, or urine. Cultures from all three were sterile. I gave as my opinion that his wife was certainly not suffering from gonorrhœa, which opinion naturally gave the greatest satisfaction to both of them. In passing it may be remarked that the girl's parents had been chiefly responsible in emphasising the seriousness of her infection and the enormity of her husband.

The infection cleared up rapidly with simple antiseptic douches.

It appears certain that there was no possibility of the wife contracting her infection from anyone else, since both assured me most positively that until she went home to her parents they were hardly out of each other's sight. It is certain that the husband had no genito-urinary infection of any sort, so one must assume that the wife was infected with this organism, somewhat resembling the *Micrococcus catarrhalis* or an aberrant staphylococcus, as a result of trauma incidental to the early days of the honeymoon. She told me that she had had a great deal of pain following the first coitus. Her mother, it may be added, was positive that the girl had no vaginal discharge of any sort before marriage, and the daughter said so herself. Yet here was a young woman who, shortly after marriage, presented all the symptoms of acute gonorrhœa. Slides showed pus cells and an organism identical morphologically in all respects with the gonococcus. A report of "gonococci present" would have been made without hesitation on these findings combined with the history and appearance of the patient. Unless divorce proceedings had been contemplated it is quite possible that I should not have advised any further examinations to be made. If so a very serious error in diagnosis would have been committed with disastrous results to the future happiness of a young married couple.

The bare possibility that the infection was not venereal was present in my mind when I first saw the patient, for many years ago, when I was working in Prof. L. S. Dudgeon's laboratory, he described to me a similar case which he had seen in his own practice. Such occurrences show, I think, the importance of a very complete and thorough examination of both husband and wife when there is the slightest element of doubt about a venereal infection.

NOTE ON AN

ANAEROBIC STREPTOTHRIX OCCURRING IN SPUTA IN PULMONARY DISEASES.

By E. T. Thompson,

BACTERIOLOGICAL ASSISTANT, PICKETT-THOMSON RESEARCH LABORATORY, ST. PAUL'S HOSPITAL, LONDON.

THROUGH the coöperation of Dr. Mackenzie Douglas and Dr. Graham Willmore I have been enabled to investigate an anaerobe occurring in the sputum of cases suffering from tuberculosis, chronic bronchitis, bronchiectasis, and asthma which somewhat resembles the organism described by myself in a record of some symbiotic phenomena, with a note by Dr. R. O'Brien, published in THE LANCET (1920, ii., 186).

In the course of that work *Bacillus tuberculosis* cultures were infected with *B. proteus vulgaris*, the common proteolytic organism of the intestines. Briefly stated, the result was that after seven days' incubation at 37° C. *B. proteus* died out, but a Gram-positive non-acid-fast organism resembling the acne bacillus was found, and this organism could only be cultivated under anaerobic conditions. Further, a similar organism was isolated, when, instead of *B. tuberculosis*, a streptothrix was employed. The interest of this latter observation is increased by the fact that when the aerobic streptothrix of actinomycosis was employed in the experiment, the resulting anaerobe closely resembled the *Cohnistreptothrix israeli*, the common cause of actinomycosis in man in Europe. The organism did not resemble any of those commonly found in accidental contaminations, and every attempt was made to prevent the entry of adventitious bacteria into the mixtures under experiment.

Since the publication of the above results approximately 2000 sputa from 1000 patients have been examined at the Ministry of Pensions Hospital, Orpington, and Queen's Hospital, Sidcup. Of this number 118 cases were actively tuberculous with positive sputa. From these cases 172 sputa were treated and examined, and the anaerobic streptothrix was demonstrated in every case. In the other sputa the anaerobe was shown to be present in 65 per cent.

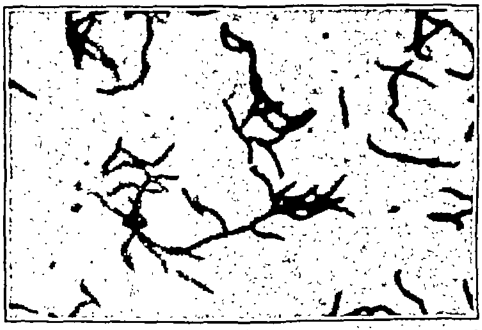
Method of Isolation.

The method employed in the isolation of this organism is as follows:—

About 0·5 c.cm. of sputum is introduced into a test-tube containing 10 per cent. glycerin in 1 per cent. peptone water 3 to 4 inches deep which has been previously autoclaved at 120° C. for 30 minutes. The mixture is then incubated at 37° C. It is not necessary to incubate under the usual anaerobic conditions, as the concomitant organisms produce a state of anaerobiosis which enables the anaerobe to grow when present.

Its appearance can generally be demonstrated in four to seven days, at the end of which time it usually reaches its maximum growth.[1] In Gram-stained specimens prepared from the sediment it will be easily recognised when present, as it is generally the only Gram-positive bacillus which develops, the other organisms present being mainly cocci. It resembles the tubercle and diphtheria bacilli, and sometimes shows true branching.

The removal of a portion of the sediment for the preparation of specimens or making cultures presents no difficulty if a finely drawn capillary tube with the upper end sealed is inserted into the sediment. When the capillary tube reaches the bottom of the sediment the sealed end is broken off, when some of the sediment will enter by capillary attraction. The tube is resealed before withdrawal to prevent any of the supernatant fluid entering. If on examination the growth of anaeromyces is considered sufficient for isolation, the remainder of the material is expressed into about 5 c.cm. of sterile water, saline, or broth. From this suspension shake cultures are made in 4 per cent. glucose agar 3 to 4 inches deep into a series of three tubes by inoculating from one tube to the other.



Microphotograph of organism from glucose agar culture. (× 1700.)

At the end of seven days small irregular opaque colonies will be seen in the depth of the medium resembling those of the acne bacillus. To examine the colonies and make subcultures a cut is made round the lower end of the test-tube with a glazier's diamond, and the cut is touched with a red-hot point of glass which will cause a clean crack round the tube, the bottom of which can now be easily removed. The column of glucose agar is blown into a sterile Petri dish. Isolated colonies can now be pricked with a straight platinum wire, for examination and making stab culture into 4 per cent. glucose agar. In three to five days growth will be noted, starting some distance below the surface of the medium. Specimens prepared from the pure cultures are Gram-positive but not acid-fast, and generally show many branching forms (see figure).

An Antiserum.

Marked deviation of complement with the sera of patients suffering from pulmonary complaints have been obtained by using a suspension of this anaerobe as an antigen. Although the organism is nonpathogenic to the lower animals a potent antiserum can be obtained by injecting it into rabbits, the serum having a high degree of agglutinability and complement fixation with its homologous antigen and *B. tuberculosis*. A few experiments have been carried out with this serum with a view to protecting guinea-pigs against infection by *B. tuberculosis*, and the results have been encouraging. Vaccines prepared from this organism have been used in cases of tuberculosis, chronic bronchitis, and bronchiectasis sometimes associated with asthma, with favourable results. Some cases have cleared up under this treatment which have proved resistant to all other methods.

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[1] Castellani, A., Douglas M., and Thompson, E. T.: Jour. Trop. Med. and Hyg., June, 1921, xxiv., 149, and July 15th, 1925, xxviii., 257.

In conclusion, I tender my thanks to Dr. Douglas and Dr. Willmore for the practical interest they have taken in this subject, and to Dr. David Thomson for the microphotograph.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

AT the meeting of this Section on Nov. 6th, with Sir HOLBURT WARING, the President, in the chair, a discussion was held on the

SURGERY OF THE SPINAL CORD.

Mr. HUGH CAIRNS said that usually the earliest symptom of a spinal tumour was pain in the back or along the distribution of the spinal nerves. It was described by patients as neuralgic, burning or tingling, or possibly it was only a sensation of tightness around the trunk or limbs. Often it was aggravated by exercise, coughing, bending, straining at stool, or even by lying down, so that some patients preferred to sleep seated in a chair. They would often admit that their extremities were cold, or that one foot was colder than the other, and the pain did not yield to drugs or measures which cured other pains. In the early stages careful examination would often disclose one or more signs of an early and incomplete Brown-Séquard syndrome. Stiffness of one leg, numbness of one foot, a creeping sensation about the ankles, or slight urgency of micturition during excitement or during a particularly bad attack of pain were some of the other symptoms that occurred before weakness set in. Often diagnosis was possible on careful clinical examination alone, but lumbar puncture provided confirmation. Usually there was blockage of the subarachnoid space, and Queckenstedt's test was valuable for its recognition. Positive results of the test could be seen even when there was no change of colour in the cerebro-spinal fluid. Mr. Cairns thought that the value of this test after operations had not hitherto been realised, and it was too often omitted during the preliminary investigation of a case. Sometimes the subarachnoid space was partly blocked and there was a delayed rise of pressure in the cerebro-spinal fluid, as shown by the manometer.

Surgeons, of course, were especially concerned with the position of spinal tumours lest they should overlook an easily removable tumour by exploring at the wrong level. In one of his cases the upper level of the sensory loss was at the eleventh thoracic dermatome, but further investigation after lumbar puncture showed a disturbance of sensation up to the level of the fifth, and the tumour was found at the sixth thoracic segment of the cord. This showed the importance of repeating the neurological examination after doing lumbar puncture. The upper level of the sensory loss should be tested not only by light touch, prick, heat and cold, but also by tuning-fork and by investigation of the patient's ability to appreciate numbers written on the skin. In compression the posterior columns were often affected more intensely, and at an earlier stage, than the lateral columns. Gordon Holmes had pointed out that careful observation of the movements of the intercostal and abdominal muscles would sometimes show the upper limit of the paralysis, while the tendon reflexes must be studied to determine the level of the lesion at the cervical and the lumbar enlargements. Mr. Cairns thought lipiodol should be used not to diagnose the presence of a tumour but rather to ascertain the exact level of a tumour which had been detected by clinical methods. It should be used, moreover, only when preparations for operation had been made. The lipiodol test was especially valuable in cases with two or more tumours of the cord. He was surprised that multiple tumours of the cord and its roots were not more often seen.

Little was known about disturbance of spinal conduction, went on Mr. Cairns, but compression of the cord by tumour should be distinguished from destruction of the cord by injury. In rare cases compression caused severe degeneration, precluding the possibility of restoring function, even after the tumour had been removed. As a rule, however, remarkably little degeneration of the cord had been found in patients who had shown severe paresis in life. The process of recovery varied remarkably in different cases. Sometimes it was evident in the paralysed limb within a few hours of removal of the tumour and soon became complete; in other cases it was delayed for a few weeks, but might nevertheless be equally complete. In other cases, again, it did not begin until a year or more after the tumour was removed and was then slowly progressive. On visiting Breslau last summer he found that Prof. Foerster had been operating on apparently hopeless cases of spinal compression, and had kept some of them in hospital for many years. One was a case of paraplegia in flexion, which has been treated for six years as disseminated sclerosis. Foerster removed a tumour from the first thoracic nerve root, and during the following 15 months the limb was straightened under anæsthetics and eventually the patient walked well. No case of spinal tumour was hopeless, and every effort should be made to get adequate institutional and orthopædic treatment during recovery.

Meningitis serosa circumscripta showed blockage of the subarachnoid space. If the adhesions could be broken up at operation the patient recovered in spite of the fact that in the few cases that had died post-mortem examination showed gliosis and scattered degeneration of the cord. The presence of adhesions and blockage of the subarachnoid space interfered with spinal conduction. Mr. Cairns found that satisfactory results from operation for spinal tumours could only be got if obstruction to the circulation of the spinal fluid was relieved. It was well to employ Queckenstedt's test after operation, especially in cases which were not recovering at the expected rate, for the subarachnoid space might still be blocked after removal of the tumour; there might be some adhesions at the site of the operation, or the tumour might have been incompletely removed, or another tumour might be present elsewhere in the spinal canal.

Mr. Cairns concluded by referring to the question of operative injury. The cord, he pointed out, was a very delicate structure, which should be respected even more than the brain; sometimes it came in for too much manipulation and its conductivity was thereby lowered. If due gentleness was observed in handling it at operation it should not show much depression afterwards.

The Queckenstedt Test and Lipiodol.

Mr. GEOFFREY JEFFERSON said that the principles of operation for cord tumours were in general those of the treatment of spinal compression as a whole. This was now on so firm a basis as to allow little room for discussion, and the methods employed were more or less stereotyped. There were, however, one or two points on which further information was still needed. The first was in regard to the Queckenstedt test, the importance of which had been emphasised by Mr. Cairns. It was true that by compressing the jugular veins one could judge, from the rapidity of the drops, whether blockage was present; but it was not a complete test and would not suffice for determining whether minor grades of blockage were present. At a meeting where he had demonstrated the results of the Queckenstedt test he had been criticised for speaking chiefly in terms of spinal compression, and it was said that he had not paid enough attention to the pain of spinal tumours. That was, in a way, a just criticism; it was true that the typical neurofibroma of the posterior root had for a time pain as its chief characteristic. But pain of a root character was not an outstanding symptom of anything like all spinal tumours. Any unexplained pain might be due to a posterior root tumour; but he did not know of anyone having been brave enough to operate for that pain alone when the legs showed no interference with conduction.

He had had a case of massive tumour of the cauda equina which filled the whole vertebral canal from the level of the first lumbar to the first sacral vertebra, but all the young man complained of was a little pain in his groin; he did not make a point of that pain, and it could only be elicited by pressure. He had bladder trouble and foot-drop, and he had been discharged from the Army as a case of hysteria.

Mr. Jefferson agreed with Mr. Cairns's remarks about lipiodol. Many cases were reported of supposed damage caused by lipiodol which did not bear close analysis, since it did not seem clear that the damage was not due to the disease process already present. It had been made evident that air caused a greater reaction in the cerebro-spinal fluid than did lipiodol. The profession seemed to be coming back to reliance on lipiodol for giving the exact level of the obstruction. In using the Queckenstedt test it was necessary to make certain that there was no fault in the apparatus.

He recalled the case of a young man who complained of tingling in his fingers and who was found to have some wasting of the interossei and disturbance of sensation at the sixth cervical segment. The Queckenstedt test was done and proved positive—i.e., there was no rise of pressure on jugular compression. At operation no cause was found for the block. Therefore, in three weeks the speaker did a second Queckenstedt test, using a larger needle, and made sure there was a free flow of fluid; on this occasion the test was negative.

Mr. Jefferson had heard it said that after operations in the mid-thoracic region there was likely to be severe vomiting, so severe sometimes as to cause death, and the suggestion had been made that the pain might be due to upset of the vegetative centres which controlled the stomach.

A woman aged 21 had come to him with very rapidly advancing symptoms of a complete transverse lesion of the cord. The condition was diagnosed as a transverse myelitis. He operated upon her and found a paravertebral sarcoma. That was entirely cured by radium, but without any improvement in her legs. At the end of three months she began to vomit; so severely did she vomit, and so distended was she, that he wondered whether she had a secondary deposit. Her blood-urea was five times the normal, and he did not doubt that was the cause of the vomiting.

This showed the importance of taking the blood-urea in all cases of spinal tumour before operation.

Discussion.

Mr. A. J. WALTON said that for prognosis in compression of the cord he had come to rely more and more on the time of development of the size of the compression. If the cord had not had time to adjust itself to its new position—i.e., if complete pressure symptoms developed in a few days—the chance of its recovering, no matter what was done, was very slight. This was a very different opinion from what was thought a few years ago, when the prognosis was based on the extent of the clinical damage and no regard was paid to the time element.

Dr. G. F. STEBBING said he had tried section of the anterolateral columns to relieve the pain of tabes, endarteritis obliterans, and malignant disease of the pelvis. In all these cases considerable relief was given, and in many it was complete. All the patients with tabes, however, had a recurrence of pain at some time after operation, though in one case the period of freedom was as long as four years. In some cases of pelvic malignant disease the pain was permanently cured. In only two cases were there evil results: one child had paralytic ileus six days after the operation, and in another there was temporary paresis of the legs, probably because of free handling of the cord.

Dr. GEORGE RIDDOCH thought the importance of root pain in extramedullary tumours could scarcely be exaggerated, though admittedly it was not always present. It might precede spinal compression by long periods. In tumour of the anterolateral column root signs might be absent, and location of the tumour was difficult. Progressive paraplegia in an adult justified suspicion of a spinal tumour. Meningitis serosa circumscripta differed in its clinical features, in most cases, from spinal tumour. The root pain of the former was diffuse and involved the supply of several roots as the condition progressed, on one or both sides of the cord. It had, however, the same slow malignant development. As a rule the position of the pain accurately indicated the site of the tumour. As to the mechanism of the production of symptoms, Sir Henry Head and he had laid stress on the vascular changes as being the main cause of the paraplegia itself, also as being the reason why the symptoms might clear up after operation. Dr. Riddoch doubted whether direct compression of the neural elements played an essential or important part in the disturbance of function in compression lesions, except in later stages. He agreed with Mr. Walton about the rapidity of symptoms of compression indicating the gravity of the prognosis.

Mr. J. PATERSON ROSS spoke of the case of a woman, aged 40, who was suffering from a spinal tumour, which was considered to be lying in an extradural position. In the opinion of Prof. G. E. Gask it was removed completely, but the patient did not improve, she slowly went downhill. He now thought it likely that the interdural projection of the tumour had been missed; the dura had not been opened.

The PRESIDENT remarked that little mention had been made of the use of radium for spinal cord tumours. He had had no experience of radium in these cases, but he had heard of a number in which radium had apparently stopped the growth.

Mr. CAIRNS, in the course of his reply, said that small doses of radon could safely be applied close to the cord, but large doses were contra-indicated, because they might destroy the cord as well as the tumour. Surgery of the spinal cord gave a good opportunity of observing the disturbance of the visceral and sympathetic fibres.

SECTION OF OPHTHALMOLOGY.

AT a meeting of this Section on Nov. 8th Mr. CYRIL WALKER, the President, took the chair, and after a number of clinical cases had been shown a paper on

RETINITIS IN DIABETICS

was read by Dr. P. J. CAMMIDGE. Although retinitis in the eyes of diabetics had been described some 70 years ago, there was still, he said, considerable doubt about its ætiology. The view at first adopted, and accepted by all the earlier observers, that the retinal changes were a direct result of the presence of an excess of sugar in the blood, had been abandoned by most modern authorities, mainly on the ground that the incidence of the complication and the severity of the primary disease did not show the relation which might be expected if this explanation were correct. The frequent presence of albumin, as well as sugar, in the urine of diabetics suffering from retinitis and retinal hæmorrhages had suggested an alternative hypothesis—namely, that the eye changes were dependent upon the effects produced by concomitant renal disease. The blood analyses he had carried out showed that in about 20 per cent. of cases there was a pronounced retention of nitrogenous waste products similar to that met with in severe nephritis, but that in the majority the evidence of renal insufficiency was comparatively slight, while in about 25 per cent. of cases it was entirely lacking. It was therefore probable that, although renal defects were the primary cause of the retinitis in a small proportion of cases, and were possibly a contributory factor in others, they were not an essential feature of the ætiology.

Apart from persistent or intermittent hyperglycæmia the most constant chemical abnormality in Dr. Cammidge's experience had been a low calcium level in the fasting blood, distinctly pathological figures having been obtained in all his cases, except those in which the retinitis was of the "albuminuric" type, with pronounced albuminuria and serious nitrogen retention. There was no evidence that the low percentage of calcium in the blood of typical cases of diabetic retinitis was the result of an "acidosis"; and although in some instances it might be accounted for by an excessive loss of lime salts in the fæces and urine, there were others in which a normal fæcal ash and a normal excretion of calcium in the urine had been found. The fact that retinitis was rarely met with in diabetics before the age of 35, and usually occurred in patients who had suffered from a mild anapothectic glycosuria for many years, probably had a bearing on the question, for such patients seemed to be particularly liable to develop arterio-sclerosis and calcification of the peripheral vessels. The vascular lesions had been shown to resemble closely those produced experimentally in rabbits by prolonged feeding with cholesterol, and it was therefore not unlikely that the persistent lipæmia found with increasing frequency in elderly diabetics with the passage of time, especially if restriction of the carbohydrate of the diet had been compensated by a liberal allowance of fat, was the determining cause of the vessel changes and, maybe, of the deficiency of calcium in the blood, since there was experimental evidence that the metabolism of cholesterol and calcium were related, a fall of the one in the blood being associated with a rise in the other and vice versa. The blood analyses he had carried out had shown a low calcium and an excess of cholesterol in cases where the excretion of lime in the fæces and urine was not excessive, but a normal cholesterol and low calcium where examination of the urine and stools revealed an unusual loss of calcium by these channels, which seemed to indicate that the deficiency of calcium in the blood was not always due to the same cause. Whatever might be the exact origin of the condition in any particular case, there could be little doubt that the diminished coagulability of the blood consequent upon a poverty of calcium was one of the factors, and possibly the most important factor, in the production of the local hæmorrhages which were of such grave prognostic significance in diabetic retinitis. Further proof of the soundness of this conclusion was furnished by the results of treatment, for it had been found that the administration of lime salts by the mouth in sufficient amount to maintain the calcium content of the blood within the normal range prevented the occurrence of local hæmorrhages in simple diabetic retinitis, although not in retinitis of the albuminuric type. Control of the hyperglycæmia and glycosuria, either by diet or with insulin, had no effect upon the tendency to local hæmorrhages, but it usually brought about a rapid improvement in the vision of the patient. This, and the fact that retinal hæmorrhages sometimes occurred without previous symptoms in patients who had been sugar-free for long periods, suggested that the changes interfering with vision and the hæmorrhagic tendency were of independent origin, the former probably being the result of local defects directly induced by the diabetic state, and consequently yielding to antidiabetic treatment, *whereas the latter arose from general vascular changes* which were not a direct result of the metabolic disturbances induced by the diabetes, and therefore required independent treatment.

Discussion.

Dr. R. D. LAWRENCE said he was anxious to learn something of the mystery of the causation of diabetic retinitis. He had spent a good deal of time looking through notes of his cases to see what proportion of diabetic patients developed this retinitis, and what factors, besides the coexistence of diabetes, seemed to be behind its production. The hospital cases which he had looked up showed a higher percentage of retinitis than Dr. Cammidge gave, for about 11 per cent. of the diabetics were diagnosed by ophthalmic surgeons to have definite retinitis. His figures were, in fact, nearer to those given by German workers. No explanation seemed to have been given for the hæmorrhages and exudates in the eye. A study of the literature from the ophthalmological standpoint showed that many people denied there was such a condition as diabetic retinitis apart from arterio-sclerosis—i.e., the latter was always present in these cases. This was, he thought, laying too much emphasis on the vascular side. It was generally admitted that all these cases had a high blood pressure, also cardiorenal and vascular symptoms, as shown by the albuminuria and the presence of casts in the urine. Ruling out those cases, however, there remained a number in which nothing seriously wrong could be found in the kidneys or general vessels, and in which the blood pressure was not abnormally high. These latter were the cases which interested him most.

Dr. Lawrence said it was news to him that the blood calcium in these cases was considered important, and he would like to know what Dr. Cammidge regarded as a low figure (Dr. CAMMIDGE: 5·8 to 6·5 is the normal for whole blood). As to the cases which did not show ordinary arterio-sclerosis Dr. Lawrence had a suggestion to offer—namely, that the real damage in diabetes was that done to the endothelium of the vessels; there seemed to be a calcification in the mesial layer of the arteries, followed by its proliferation. This would be a very serious matter in the case of eye vessels. Once this had begun in the eyes of the diabetic there probably was never a return to the normal. Another possible factor in the causation of exudates and hæmorrhages was change in osmosis caused by hypoglycæmia. These changes were responsible for the production of cataracts in diabetics. Since the introduction of insulin he had noticed, following its use, a temporary swelling of the lens. Forty per cent. of the severe cases which he treated in this way showed misty vision for the first few days or hours while the blood-sugar was being brought to the normal level. He would welcome opinions on these two suggestions which he had put forward. The change seemed to be produced by prolonged diabetes more than by the immediate presence of sugar.

Lt.-Col. A. E. J. LISTER asked what was the proportion of cases in which the retinitis cleared up, and in what form and dosage the calcium was given. In India the condition was quite common, and the proportion of retinitis cases among diabetics was higher than the figure Dr. Cammidge gave. The age-incidence was lower in India than in Britain, but the Oriental aged quicker than the European.

Dr. CAMMIDGE, in reply, said his cases had been private ones, and he had only quoted cases as retinitis which were sent to him as such—he did not claim to be an expert in the examination of the eye. His figures might show a low proportion because the condition was pronounced in them all. He found it difficult to form decided views about the ætiology, but he was inclined to agree with Dr. Lawrence that the retinitis was not altogether due to the sugar. But he certainly considered that the œdema which interfered with the vision was due to the sugar, because the condition of the eye cleared up so rapidly when the patient was treated, especially now that insulin was available. *As to treatment, the subjects of* diabetic retinitis were generally either elderly or very old, and he had a strong objection to giving insulin to elderly people if it could be at all avoided, for they already had a certain amount of change in the heart muscle, and a rapid change in the amount of sugar going to the heart might have very serious consequences. If elderly diabetics could be treated by dieting they were much more comfortable, and they responded to the treatment quite well, though they took longer to do so. In some cases one was bound to use insulin, but care must be taken that the sugar was not rapidly reduced. In his practice the calcium in the blood was estimated as regularly as the sugar. The form in which he usually gave the calcium was as calcium lactate in an emulsion of liquid paraffin, the latter because most of these patients had some intestinal catarrh. Five, six, or seven grains a day was the dose; it was a prophylactic, and it was necessary for the patient to take it for the rest of his life. Recently he had tried the effect of vitamin D; in some he had tried parathyroid, but the results had not been such as to make it worth while to continue.

Sarcoma of the Iris.

Mr. H. B. **STALLARD** showed pictures of and described a case of leucosarcoma of the iris, which was under the care of Mr. W. S. Duke-Elder. The man, aged 69, complained of failure of vision in the left eye, and was thought to have a small tumour of the iris in the right eye. It had a nodular surface, and there were small capillary loops on it. The tumour appeared to be fixed to the iris. There were also striæ in the lens. Excision of the eye was declined, therefore Mr. Duke-Elder did iridectomy. A conjunctival flap was dissected out in the vicinity of the tumour, and the anterior chamber was opened by a keratome incision. This incision was afterwards enlarged and the tumour was removed with a good piece of iris on each side of it. It was composed of spindle-shaped cells, having an oval nucleus, and there was a marked absence of intercellular stroma. The blood-vessels had very thin walls, and there was complete absence of pigment cells and of pigment granules between the cells. Later the patient consented to have his eye removed, and serial sections of the globe revealed no other abnormality. Mr. Stallard had been able to find records of 21 cases of so-called leucosarcoma of the iris.

Mr. **TUDOR THOMAS** read a paper (by Mr. M. S. Mayou and himself) on a case of sarcoma of the iris, which appeared to have originated from a mole.—Mr. **MAYOU** said his first impression was that it was a cyst, because of the discoloration of the iris; there were posterior synechiæ, and the growth seemed to transilluminate, but Mr. Thomas's view that it was a malignant growth proved correct. The growth was spreading along the surface of the iris, and had egun to invade the ciliary body. The deeper rtions of the iris were very little involved.

SECTION OF THERAPEUTICS.

THE USE OF ERGOT.

A **MEETING** of this Section was held on Nov. 12th, with Dr. **PHILIP HAMILL** in the chair, to discuss investigations on the Proper Method of Including Ergot in the Pharmacopœia.

Dr. J. H. **BURN** opened the discussion. He said that his communication was a joint paper, the investigations having been carried out at the Pharmacological Society with the help of his colleagues there. The method used for standardising the various solutions was that of Broom and Clark, which depends on the power of ergot to reduce the contraction due to adrenalin in strips of uterine muscle. Dr. Burn emphasised the fact that the action of liquid preparations obtained from ergot depends on the presence of ergotoxine or ergotamine. Histamine is present in insufficient quantities in the usual liquid extracts to produce any effects. It was not easy to decide on a suitable standard for ergot. The method used with digitalis and strophanthin, that of mixing the various samples of the drug and using a preparation made from them when its activity had been ascertained, as the standard, was not altogether suitable here. The samples of ergot obtained from Spain and Portugal were much richer in ergotoxine than those obtained from Poland and Russia, nor did the quality of the samples necessarily remain constant for any given place. In the United States, however, a similar method of standardisation to that used for digitalis was followed. A mixture of several varieties of ergot was made and extracted, and the fluid kept for six months. The standard fluid thus produced contained, on examination, 0·03 per cent. of ergotoxine phosphate. Dr. Burn and his colleagues, in attempting to establish their standard, had at first excluded Polish and Dutch ergot from their experiments and had taken the mean obtained by use of Spanish ergot. This had worked out at 0·10 per cent. which was found to be too high a standard to be followed by pharmacists, and they had subsequently reduced it to 0·05 per cent.

Methods of Extraction and Deterioration.

Dr. Burn then produced some interesting figures to show the efficacy of the various methods of extraction of the drug at present employed. The use of water only, which was the method set out in the British Pharmacopœia, gave an ergotoxine yield of less than 0·016 per cent.—in other words it was practically inert. The German method of using 50 per cent. alcohol gave 0·02 per cent.; the Dutch method of using 50 per cent. alcohol with 1 per cent. tartaric acid, and the American method of using 50 per cent. alcohol with 2 per cent. of hydrochloric acid each gave 0·10 per cent. Other acids, such as citric, phosphoric, and boric, could also be used with 50 per cent. alcohol. Tartaric, citric, and hydrochloric gave the best results when used with 50 per cent. alcohol, and the figure they yield (0·10 per cent.) is about as high as can be obtained.

Dr. S. **WOKES** submitted observations on extraction and deterioration arising out of the work described. He said it was extremely difficult to extract the whole of the ergotoxine from any given specimen. He described the method of fractional percolation used in his experiments, showing that each fraction takes out successively less ergotoxine from the sample used. Spanish and Polish ergot seldom yielded less than 0·10 per cent., while Polish and Russian ergot usually give about 0·03 to 0·05 per cent. That is to say that Polish and Russian ergot are useless if the standard is to be maintained at 0·05. The minimum standard for these samples would be 0·015 and the maximum 0·025 per cent. If they are to be used at all, he said, the standard must be lowered and it is possible to reduce the extracts from good samples to this level. Dr. Wokes then went on to speak of the important question of deterioration. He found that a sample of strength 0·07 per cent. when kept in the incubator deteriorated rapidly; by the end of four weeks it had lost more than half its activity; at the end of nine weeks it had lost nine-tenths. A similar specimen kept in the ice-chest was slower in its deterioration; at the end of twelve weeks it had lost half its activity. A sample kept at room temperature lost its activity at a rate somewhere between these two. He said that ergotoxine phosphate (1 per cent.) in aqueous solution also deteriorates; kept in the ice-chest it is found to have lost half its activity at the end of six months. Similar results were obtained with ergotamine tartrate; and ampoules of 0·05 per cent. ergotoxine phosphate fell to half their strength in 24 weeks. Samples of powdered and defatted ergot appeared to be much more stable and took up to two years at room temperature to lose their strength. Dr. Wokes therefore advised that ergot should always be kept in the powdered defatted condition, to be made up into fluid form in small quantities as required. There was, of course, the possibility that the addition of some stabilising substances might prevent the rapid deterioration, and investigations were also being attempted along these lines.

Possibilities of Oral Administration.

Dr. **BURN** then returned to complete his remarks, and said that on the showing of the experiments described by Dr. Wokes the United States Pharmacopœia and the Dutch liquid preparations of ergot must be inert at the end of three months from their *time of issue. As it was improbable that the preparations* were ever used much before that period, and as the B.P. aqueous preparation was useless, one wondered how ergot had obtained its reputation as a therapeutic measure. It had, of course, been used in the first place because of the large number of cases of abortion occurring during epidemics of ergot poisoning. But in these cases the patients were taking the raw drug, not the extract, and it had had no opportunity of deteriorating. This, of course, raised the question of the use of ergot orally as a therapeutic measure. Clearly it could be released in the digestive tract and absorbed into the blood stream, but the question of rate was important. A series of experiments had been made on spinal cats, the blood pressure being recorded and the effects upon it of adrenalin and ergot noted; a certain number of cats who had received 1 g. of powdered ergot the previous night were examined. It was found that the reversal of the adrenalin action by the ergot (from pressor to depressor) occurred earlier in the cats who had had a previous oral dose of ergot than in those who had not. On the strength of these experiments Dr. Burn had formed the opinion that the rate of absorption is sufficiently rapid to be of use therapeutically. He thought that an injection of ergot after delivery could be followed up by oral administration daily during the puerperium where necessary, and indeed there might even be some reason to guard against a cumulative action.

The CHAIRMAN asked for experiences among those present in the use of ergot by mouth.

Dr. IZOD BENNETT said that the solid preparations he had used had always produced some effects, but had invariably been made up with quinine as well as ergot.

Dr. BURN said finally that there was some reason to suppose that the weaker extracts deteriorated less rapidly than the stronger, and that possibly the strong extracts lost their activity rapidly at first and subsequently became more stabilised. Experiments were being made to test this.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society, held on Nov. 11th, the chair was taken by Mr. DONALD ARMOUR, the President, and a discussion on the

RELATIVE VALUE OF THE DIFFERENT METHODS OF DIAGNOSIS IN GASTRIC DISEASES

was opened by Dr. J. A. RYLE. The methods of diagnosis applicable in diseases of the stomach, he said, were clinical, radiological, and chemical, with exploratory laparotomy where other means had failed. Gastroscopy had not established its claims. In every case without exception the clinical method was the most important, and all further investigations depended on inquiry into symptoms and ordinary physical examination. The introduction of accessory methods had led to a certain neglect of the older clinical methods, to a loss of clinical confidence, and a lack of appreciation of the scope of inductive reasoning based on the anamnesis. Judgments had been warped and wrong conceptions had grown through the misapplication of the newer tools. The expense of investigations was another argument for conserving clinical wits and curbing a natural wistfulness for the help of objective methods which, after all, were only final in selected types of case. The demand of a half-educated public for complete inquiries was a complicating factor, but if the profession complied with this demand it would bring discredit to medicine, do disservice to the public, and cease to maintain that breed of clinicians which had been one of the prides of British medicine.

The clinical study of the dyspeptic should include: (1) an inquiry into the personal and family history; (2) a very careful inquiry into subjective symptoms; (3) observations on physical and psychological *type; (4) a general overhaul of all systems; and (5) a* special examination directed towards the digestive apparatus. The collection and analysis of symptoms was as a rule the most useful and most important. Family history was of real value in duodenal ulcer and gall-stones, as well as in dyspepsias associated with general ill-health or psychological disturbances. Age, sex, occupation, habits, seasonal fluctuations of illness, and food or drug idiosyncrasies were all important factors. Worry, fatigue, and sedentary work were potent agents in gastric disturbance, while a dyspepsia occurring regularly in spring and autumn should suggest duodenal ulceration. Nervous and anxious or phlegmatic temperaments were associated with special types of gastric reaction. The general overhaul might reveal little or much, but the little might be as valuable as the much. A rosaceous rash might clinch the diagnosis of true gastritis, as a fixed pupil or absent knee-jerk would draw attention to the tabetic crisis. The routine investigation should include a note on the skin and musculature of the abdomen, the presence or absence of cutaneous hyperalgesia or local alterations of abdominal reflexes, the conformation and contours of the abdomen, and tender points or areas of muscle guard. The teeth, tongue, fauces, stools, and vomitus must be inspected. This lengthy survey would often save time and patience expended in experimental treatment.

Classification of the Dyspepsias.

Dr. Ryle grouped the dyspepsias as follows:—

1. *Habit dyspepsias*, including over-eating, under-eating, over-work, lack of occupation and exercise, insufficient mastication, and constipation.

2. *Nervous or psychogenic dyspepsias*, including ærophagy, exhaustion, worry and anxiety states, hysteria, hypochondriasis, and refusal of food.

3. *Toxic and infective dyspepsias*, including alcohol and tobacco, indigestion, oral sepsis, tuberculosis, anæmia, debility, and visceroptosis.

4. *Irritative dyspepsias*, including ulceration, chronic infections of the appendix and gall-bladder, special sense disturbances like astigmatism, and central nervous lesions like tabes dorsalis.

5. *Mechanical dyspepsias*, including pyloric stenosis, hour-glass stomach, chronic extensive ulceration, cancer, and certain complications of gastro-jejunostomy.

In the first three of these groups, which probably comprised more than half the total seen in consulting work, radiographic investigation and gastric and stool analyses were not indicated and did not give much assistance, except that a test-meal might be a useful confirmation of the diagnosis of a true gastritis. As a means of reassurance to the patient these investigations might be useful, but a meticulous overhaul, a simple explanation, and a vigorous reassurance were usually quite effective. In the two other groups, however, prompt accessory examinations were essential. In any case where ulceration, stenosis, or cancer was reasonably suspected the patient should have a careful X ray examination, including serial snapshots and a detailed report by the radiologist of his method, the times of examination, and the screen observations. If there was hæmorrhage or perforation, however, treatment should precede investigation. There must be absolute certainty of diagnosis when the decision lay between a medical and a surgical campaign. The radiological demonstration of an ulcer was the most accurate diagnostic evidence obtainable; there might be an active ulcer without occult blood, and anything from achlorhydria to hyperchlorhydria might be found in the test-meal of gastric ulcer. In duodenal ulceration the climbing hypersecretory curve occurred in 70 per cent. of cases and was a valuable aid to diagnosis and treatment. A high peak of acidity with rapid emptying contra-indicated gastro-jejunostomy, while a gradually climbing curve with delayed emptying favoured it. Test-meal and stool examination were of no positive value in reflex dyspepsias, but a full survey of the alimentary and bile tracts might be advisable or occasionally imperative. In general, therefore, accessory methods were of little positive value in functional disorders of the stomach due to general causes; they were often helpful in functional disorders due to extrinsic organic disease, and they were indispensable allies of the clinician in structural disease.

Radiological Examination.

Dr. G. H. ORTON claimed that radiographic examination was superior to all others in the diagnosis of organic gastric disease, provided that it was carried out by an expert with long experience. He showed a series of lantern slides supporting this claim. Very little reliance was now placed, he said, on the indirect evidence afforded by X rays—i.e., the information given by the type of stomach, rate of emptying, and peristalsis. The direct evidence, however, was very nearly 100 per cent. accurate in expert hands. Many of the ulcers shown in his slides were very small and would not be detected by a single or a casual view. The axiom that an ulcer on the lesser curvature produced an incisura on the greater curvature, due to spasm, did not hold when the ulcers were very small. The results of medical treatment should be checked by a very large series of exposures; often an ulcer would only show in one out of a very large number. Healed ulcers showed an alteration of the rugæ of the stomach; transverse ribbing was typical of the scar of an old ulcer. Duodenal ileus should be detected, as it tended to create ulceration, and after gastro-jejunostomy it caused jejunal ulcers.

The Fractional Test-meal.

Prof. E. C. DODDS sent a paper which was read in his absence by Dr. J. D. ROBERTSON. He maintained that the passing of tubes, collection of specimens, and washing out of the stomach were the most important part of the fractional test-meals, and that their delegation to inexperienced persons accounted for the alleged failures of the method. First of all it was essential to see that the stomach was empty before the test-meal entered it; the aspiration tube must be moved about and care must be taken to see that it did not get blocked by mucus. No matter how clean the resting juice, the stomach should be washed out with water after it had been emptied as completely as possible. A technique had been adopted by passing two tubes, down one of which warm water was pumped by a record syringe, while an assistant aspirated through the other tube. If there were obstruction or cancer, several pints of water would be required before the washing came back clean. Then a pint of gruel was given and specimens were withdrawn every quarter of an hour for two and a quarter to two and a half hours. Great care must be taken to see that the tube did not get diverted to the pylorus. Each specimen was gently aspirated, and then injected back again several times to ensure a uniform specimen. Dr. Robertson then showed slides illustrating the difference between a test-meal carried out by an experienced and by an inexperienced person. The results in the latter case were seriously misleading. A sudden drop on a smooth curve indicated that the tube had entered the duodenum. The analysis was comparatively easy; the important part of the technique of the test-meal lay in its collection. Its value lay in the certain diagnosis it afforded of pyloro-spasm due to ulcer, cancer, or functional disturbances, of achlorhydria associated with pernicious anæmia and of advanced cancer of the stomach. In pyloro-spasm there was a large volume of resting juice, a high total acidity and free acidity, and a slow steady rise right to the end of the test. In pernicious anæmia the stomach emptied very rapidly, there was a very low volume of resting juice and little disparity between the total acidity and the base line. In carcinoma there was a large volume of resting juice with high total acidity and complete absence of free hydrochloric acid; often the odour was foul and the colour dark. The disparity between total acidity and base line was very small, provided sufficient care was exercised in washing out the stomach. In a leather-bottle stomach the volume of resting juice was low, and the stomach emptied very rapidly; there was usually blood in the dark, foul, resting juice, and the disparity was not very great. It must be remembered, however, that in earlier cases of carcinoma there might be a normal amount of hydrochloric acid and the only suspicious points might be the foul resting juice and some blood. It was often difficult to distinguish between the achlorhydria of pernicious anæmia and that of benign achylia. To distinguish them, 1 c.cm. of a solution containing 0·75 mg. of histamine acid phosphate and 40 mg. of neutral red was injected subcutaneously at the end of the test-meal, and further specimens were taken every five minutes. Normally neutral red or free hydrochloric acid soon appeared in the specimen. The patient with pernicious anæmia gave no response to this histamine test—i.e., neither neutral red nor free hydrochloric acid appeared in the stomach. Histamine, however, should not be given if the blood pressure were very low.

Much controversy had centred about the significance of lactic acid in the stomach. Careful inquiry had shown that the qualitative tests for lactic acid were unreliable, but a quantitative technique had been worked out, and 46 per cent. of resting juices had been found to contain it. The conclusion reached was that lactic acid was not pathognomonic of cancer nor produced by the cells of the body.

Discussion.

Mr. A. J. WALTON, while agreeing that the clinical examination was extremely important, thought that it was impossible to arrive at a formula for assessing the relative merits of the various diagnostic methods, as their efficacy depended so much upon the skill of the investigator. He quoted a series observed by himself to illustrate the comparatively low percentage of positive diagnoses given by X ray examination in cases where a gastric lesion was revealed afterwards at operation. He would accept a careful clinical diagnosis of lesser curve ulcer in preference to an X ray report. Much publicity had been given of late to the opinion that no gastric or duodenal ulcer should be treated surgically unless stenosis was present, this dictum being based upon the results of medical treatment as confirmed by radiological examination. Barclay, however, had stressed the fact that ulcers under medical treatment would lose their œdema, and become invisible to X rays. The usual six months period of observation after medical treatment was far too short; it was necessary to wait a year or 18 months to be certain of cure. The test-meal had given a high percentage of positive results in ulcer of the pylorus and duodenum, but only 75 per cent. in carcinoma of the stomach. Its results were liable to be ambiguous in mixed cases of ulcer and carcinoma. The clinical examination was, therefore, more important in carcinoma than in non-malignant conditions, as both the X ray and the test-meal were liable to fail.

Mr. H. W. CARSON also stressed the value of clinical methods, especially of the estimation of muscular tone by palpation. He attached particular importance to the history. Of the ancillary methods he preferred radiography, which in some of the malignant cases that had been quoted would have settled the diagnosis in five minutes. X rays were superior to chemical methods in multiple ulceration, especially when ulcers were situated so high up as to be inoperable. Some high ulcers could not be diagnosed in any other way, and the method sometimes averted an unnecessary and dangerous intervention.

Dr. G. W. GOODHART did not consider the radiological method very superior to the chemical. The majority of patients did not suffer from gastric ulcer or carcinoma, the two conditions in which X rays gave the most information. The general practitioner, however, desired a test which would enable him to distinguish the functional case from the organic. Experts might be able to dispense with ancillary methods, but not everyone who treated patients had their experience, and unfortunately very little had been done for the non-expert. He asked whether the test-meal could give the physician any idea of how to treat a functional disorder; he, himself, believed that it could.

Dr. G. E. VILVANDRÉ denied the existence of functional disorder without an organic basis. A gastric disorder might depend upon extensive pulmonary tuberculosis. Students should be taught to use their hands and eyes, and to ask the patient intelligent questions; that was the only way in which the profession—as distinct from the experts—would learn to diagnose carcinoma in its earlier stages. The radiologist could detect a penetrating ulcer of the lesser curvature, but could not yet say whether it was malignant. If all such cases were to be treated by medical means only bad mistakes must inevitably be made

Dr. A. CAWADIAS said that gastric disease was not primary, but a secondary or even tertiary result of a general or metabolic disturbance of the body, and nothing but a clinical examination would determine the diagnosis of the whole individual. Of the ancillary methods, radiology was the most important. The test-meal, he thought, was on the wane owing to its poverty of positive information; it gave information of a part only of the function of the stomach. Recent physiological research, by showing the intimate correlation that existed between organs, had invalidated the old conception of local functional diagnosis.

Dr. WALTER CARR, to illustrate the danger of dogmatism, quoted a case where malignant disease of the stomach with a very ambiguous symptom-complex had eluded clinical diagnosis for a long time, but had been revealed largely by the chemical investigation of the resting juice.

Dr. W. S. C. COPEMAN maintained that the abandonment of the test-meal on the continent did not prove that it was of no value. However, a test which depended upon the status of the tester was not a practical one, as there were not enough experts to go round, and this might be the reason why it had fallen into disrepute. The clinician wanted to know whether the stomach was reacting to the stimulus of food in a normal secretory fashion, and this information might be obtained in other ways than by estimating the free hydrochloric acid, the secretion of which was controlled by many factors. The possibilities of technical error were equally numerous. A more practical test was the total chloride estimation, which showed variations no wider than those of the hydrochloric acid test and probably gave a more accurate indication of the secretory activity of the stomach.

Dr. GEOFFREY EVANS remarked that most patients who came to a consultant suffered from functional dyspepsias. Diagnosis should proceed along the ordinary lines adopted in organic disease, the first stage being the anatomical diagnosis and the second the physiological. The ancillary methods could provide much valuable information, and each had its own value. Radiology could determine in a functional condition whether the stomach was short or long, how quickly it emptied, and the condition of its peristalsis. Similarly, the test-meal could give information available by no other means.

Replies.

Dr. RYLE agreed that those who could not be experts in radiology and chemistry had better leave these activities alone, but all practitioners of clinical medicine must try to be experts in symptoms. The test-meal gave such varying results in functional disorder that it was valueless, but he tried to apply it in all cases in which he considered the possibility of operation. Hyperacidity caused no symptoms; pain and discomfort were due to other causes, such as tonus, peristaltic abnormalities, and tension; loose thinking about symptoms could only be abolished by studying them. The chief symptoms of carcinoma—anorexia, anæmia, and fever—were clinical, but the other methods should not be neglected.

Dr. ORTON said that none of the very small ulcers were malignant, and that only X rays could determine the size and position of the lesion. Speaking of test-meals with tetra-iodo-phenolphthalein, he quoted the saying that "one had to be very robust to be a patient nowadays."

Dr. ROBERTSON also replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

A MEETING of this Section was held on Oct. 25th, with Dr. J. LAIT, the President, in the chair.

Argyria.

Dr. F. S. BOURKE showed a man suffering from argyria who was admitted to hospital on August 12th suffering from a sore throat and pains in his limbs. He gave a history of syphilis, and so was sent to the venereal department. His colour at once attracted attention. He stated that he joined the Army in 1896 and contracted syphilis in 1897. He served in India until 1908. While he was there some of the men suffered from sore throats, and as he had seen them cauterizing their throats with silver nitrate, he did the same himself. He first used silver nitrate in 1908.

The PRESIDENT said he had never seen a case of argyria, which was now, he thought, very rare. It had been more common formerly, when silver nitrate was used for treating gastric ulcer.—Dr. CYRIL MURPHY said he had seen this patient on a previous occasion, and at that time the pigmentation had only extended as far down as the abdomen.—Sir JOHN MOORE mentioned that some years ago he had seen a case which was the exact counterpart of the one now demonstrated. His patient had used silver nitrate for treating gastric ulcer.—Dr. R. A. Q. O'MEARA said that little was known about the pathology of the condition. The silver was deposited not only in the skin, but also in the internal organs. The silver formed with the albumin of the tissues an insoluble substance which was deposited between the cells, but not in the cells. He thought that the blue colour was more apparent in the face because of the relatively greater blood supply to the skin of the face as compared with the skin of other parts of the body.—Dr. E. T. FREEMAN said that in India silver nitrate had formerly been used as an astringent for the treatment of tropical diarrhœa. Possibly this patient had been given some silver for this condition while serving in India, as well as what he had used himself for cauterising the throat.

A Case of Extrinsic Stricture of the Œsophagus.

Dr. R. R. WOODS reported the case of a man, aged 48, who was first seen early in August, having had dysphagia for two months.

At that time he could only swallow fluids slowly. He had glands on both sides of his neck and a lump in the right hypochondrium the size of an orange. The liver was enlarged and the spleen palpable. X rays revealed a mediastinal tumour and a stricture at the 7–9th dorsal vertebræ. Œsophagoscopy showed an extrinsic stricture 31 cm. from the teeth. His teeth were removed and a gland sent for section. The report stated that "if it was a tumour it could only be a lymphosarcoma."

The neck was treated with fluorescein and X rays as described by Copeman, Coke and Gouldesbrough (*Brit. Med. Jour.*, August 10th, p. 233). The glands seemed to remain stationary, but the patient had only one course before his death. The œsophagus was treated with radium by means of a special applicator which enabled fully screened radon (1·2 mm. lead) to be inserted while allowing a passage for liquids during treatment. He had two applications; the first (August 28th) was 5·35 mcd. in four days and the second (Sept. 28th) 8·71 mcd. in seven days. Half a drachm of fluorescein was given every second day by the mouth during treatment. Surface applications to the thorax: radon in lead box 1·3 mm. distanced 1 cm. Front 20 mcd. in six days, back 30 mcd. in four days, each at the rate of 1 mcd. per sq. cm. Although successive X ray reports showed that the tumour was increasing his swallowing improved rapidly, and the day before his death (Oct. 9th) he had fried fish, potatoes and bread and butter for his dinner.

Post-mortem examination, said Dr. Woods, showed two points of particular clinical interest—viz., fibrosis where the radon had been applied and desquamation of œsophageal epithelium round the position of the applicator. This seemed to be the result of a peeling dose rather than a radium burn.

The CHAIRMAN described the post-mortem findings in the case. There was, he said, a large mediastinal tumour which had caused the stricture of the œsophagus by external pressure. There was no intrinsic tumour of the œsophagus. The tumour had infiltrated the right lung in a massive way, resulting in its collapse. The right pleural cavity was filled with fluid. A large tumour mass was found in the region of the head of the pancreas, and another large mass about the size of a fœtal head involved the left kidney. The liver, spleen and suprarenals were free from tumour nodules. The tumour was a lymphosarcoma. Sections cut from the site of the radium application showed fibrosis and retrograde changes in the tumour.

A discussion followed.

Dr. WOODS, in his reply, said he thought that possibly the fibrotic changes in the tumour could be attributed to the radium. All through the radium treatment the patient was getting fluorescein at the same time, but whether this had any effect on the efficacy of the radium treatment, it was not possible to say.—The CHAIRMAN, in answer to questions, said he believed that the primary growth was in the mediastinum. The spleen did not show any cyanotic induration. He thought the fibrosis which had occurred was the result of the radium treatment.

Dr. A. R. PARSONS described cases of cancer of the stomach and duodenum, and Dr. A. B. CLERY demonstrated a specimen from a case of cerebral hæmorrhage.

ST. ASAPH JOINT HOSPITAL.—A new joint hospital [illegible] *six districts which has been erected at a cost of £11,000,* was opened last week at St. Asaph. During the proceedings it was stated that the temporary hospital had been well supported and was "killing the old Welsh prejudice against hospital treatment."

MEDICAL WOMEN'S FEDERATION.—At the autumn council meeting, held in Edinburgh from Oct. 31st to Nov. 2nd, a scheme for a national maternity service, drawn up by a special committee, was accepted after discussion and slight amendment. The dismissal of women from their medical work on marriage was discussed and the opinion was expressed in a resolution "that marriage should not constitute a bar to the appointment of a woman to any medical post, nor should it be a cause for the termination of her contract. Her ability to carry out such contract should be the only deciding factor." The inadequate salaries of the medical women in the employment of the post-office were discussed, and it was reported that the Postmaster-General had consented to receive a joint deputation of the Federation and the British Medical Association. The differentiation made in the salary paid to the woman deputy commissioner under the Board of Control for Scotland was also brought to the notice of the council; the work done by all the deputy commissioners is similar in every respect, yet the woman's maximum salary is considerably less than that of the men, and this maximum was reached by her in 1910. Representations in 1922 and in 1924 without result are to be repeated. Three new committees were appointed—viz.: (1) a standing committee on national health insurance; (2) a committee for the promotion of an improved women's health service for India; (3) a committee to deal with dysmenorrhœa amongst factory workers. A resolution was passed requesting the British Medical Association to consider the desirability of a common approach to the General Medical Council to suggest the appointment of an additional direct representative for England.

Reviews and Notices of Books.

SIR CLIFFORD ALLBUTT: A MEMOIR.

The Right Honourable Sir Thomas Clifford Allbutt, K.C.B. A Memoir by Sir HUMPHRY DAVY ROLLESTON, Bt., G.C.V.O., K.C.B. London: *Macmillan and Co. 1929. Pp. 314. 15s.*

THIS must have been a difficult book to write, for it is a fully dated commentary upon the very varied life-work of a man who kept but few letters and no diary, and who left behind him no personal reminiscences. But Sir Humphry Rolleston had the great qualities for meeting the situation of being closely associated with Allbutt in this most prominent accomplishment and of being also an intimate personal friend. Further, though Allbutt preserved on his side so little correspondence, those to whom he wrote in many instances treasured his letters and their contents have been of great assistance in a study of the man, displaying him as one with multifarious and great interests to the advancement of which he gave unsparingly splendid gifts of character and learning.

The life of Allbutt is here considered in three sections: the first (1836–61) covers early life and education, and reminds us of the valuable post-graduate training which Allbutt underwent after securing classical and science honours at Cambridge and before he decided to start practice in Leeds; the second (1861–92) covers 28 years as a consultant in Leeds and three years in London as a Commissioner in Lunacy; the third tells the story of his 25 years' tenure of the position of Regius Professor of Physic at Cambridge. The famous "System of Medicine" having been projected in 1893, this last division of the book contains a description of the troubles of editorship which Allbutt faced and dispersed by his industry and orderly methods as well as by his erudition. To this period also belongs some of his best-known literary work, while throughout the whole quarter of a century he was the acknowledged guide of his calling in medical politics. Nearly two-thirds of the book is occupied with brief accounts of Allbutt's intervention in matters of the first importance, literary, scientific, and practical, as they concerned the profession of medicine, and hardly a page in Sir Humphry's closely written narrative is without some reference, date, story, or letter serving to remind us of the personality and influence of the great physician. The book will find a large audience awaiting it.

EYE, EAR, NOSE AND THROAT.

A Text-book of Eye, Ear, Nose and Throat Nursing. By ABBY-HELEN DENISON, R.N., Graduate of Massachusetts General Hospital Training School for Nurses, Boston, Mass. London: Macmillan and Co., Ltd. 1929. Pp. 295. 12*s.* 6*d.*

THIS little book contains three sections, devoted respectively to the eye, the ear, and the nose and throat. Each section begins with a succinct but readable description of the anatomy and physiology of the organs concerned, followed by a short list of drugs and solutions with notes of the purposes for which they are employed. Next comes an account of appliances and nursing treatments, such as various forms of eye pads and bandages, and the methods of irrigating the ears, and this section is followed by a description of the usual operations, the preparation for them, and the complications which must be looked for, and, finally, the nurse's miscellaneous duties in the out-patient department. Much of this part of the book is in tabular form and, being in conformity with the routine of a particular hospital, is not necessarily directly applicable to others; but it will be found valuable for purposes of reference by all nurses undertaking this special work. We are astonished to see flax-seed poultices given as the regular treatment of aural furunculosis; and, in the chapter on drugs used in nose and throat diseases, "ephedrine

1 oz.," is obviously intended for a solution of ephedrine, the strength of which is not mentioned. Lack of accuracy in a book for nurses always has its dangers, though it is of less moment in a later section on mouth-washes, where the direction is given to dissolve one tablet of potassium chlorate in a quarter of a glass of water, the size of the tablet not being specified. The book closes with a sympathetic description of the function of the social service worker. It is provided with a good index, and may be recommended for the purposes at which it aims.

Your Nose, Throat, and Ears; Their Care and Health. By L. W. OAKS, M.D., and H. G. MERRILL, M.D. London and New York: D. Appleton and Co. 1929. Pp. 167. 5*s.*

THIS is, we are glad to note, in no sense a manual of home treatment; it is indeed but little concerned with the question of treatment, but aims at giving members of the public a general idea of the functions of the nose, throat, and ears, and of the ills to which they are liable. The authors have done their work well. They have laid stress, without being unduly alarming, on the dangerous possibilities of such conditions as continued hoarseness, and they have described the commoner affections with a fair degree of accuracy in untechnical language. We would have liked to see an account of the troubles which arise in nose and ears from bathing, and of the precautions which may be taken to prevent them, and we do not agree that spontaneous perforation of the drum produces the stellate appearance figured on Plate VII., or that such a perforation will probably remain permanent. But the authors have succeeded in avoiding most of the pitfalls which beset the path of those who would write a book on technical matters to enlighten the members of the general public.

BIOCHEMISTRY.

A Text-book of Biochemistry for Students of Medicine and Science. Second edition. By A. T. CAMERON, M.A., D.Sc. Edin., F.I.C., F.R.S.C., Professor of Biochemistry, Faculty of Medicine, University of Manitoba; Associate in Biochemistry, Winnipeg General Hospital. London: J. and A. Churchill. 1929. Pp. 482. 15*s.*

THERE is very little change in the second edition of this book, but certain errors have been corrected and the whole has been brought up to date. It deserves the serious attention of teachers of physiology and biochemistry, since it was not only amongst the first of the general text-books of biochemistry appearing in the English language, but is now one of the most popular. The author has treated the subject in a broad-minded way, which makes the book useful to the physiologist who wishes to study biochemistry, and to the qualified man or medical student who wishes to apply to medicine and pathology biochemical knowledge. The keenest critic would have to admit that even on highly debatable questions the statements here expressed are fair and accurate, so that the work is likely to retain a permanent place in the literature of biochemistry.

AIDS TO DERMATOLOGY AND VENEREAL DISEASES.

By R. M. B. MACKENNA, M.A., M.B., B.Ch. Camb., M.R.C.P. Lond., Hon. Assistant Dermatologist, Liverpool Cancer and Skin Hospital. London: Baillière, Tindall and Cox. 1929. Pp. 230. 3*s.* 6*d.*

IN this little book the author, who is the son of Dr. R. W. MacKenna, displays the happy knack of combining the synoptic with the discursive methods. The result is a readable and interesting review, which covers the subjects specified sufficiently both for examination purposes and the daily exigencies of general practice. Some valuable sections on X ray and radium therapy are included, while the chapter on purpura presents an original classification based (1) on defects of the capillary walls, (2) deficiency of the blood-platelets, and (3) defects of the blood-coagulation complex—a welcome departure from such ill-defined entities as purpura simplex and purpura hæmorrhagica. There are a few useful diagrams. Fig. 1 illustrates the structure of the normal skin, but omits to label, although it depicts, the basal or germ-cell layer. Dermatologists may not agree with the suggestion on p. 9 that a starch poultice should be left in situ for as long as 12 hours. The book provides a useful compilation.

THE PREVENTION OF DISEASE IN THE INDIVIDUAL.

Third edition. By KENELM WINSLOW, M.D., B.A.S., Attending Physician to the Seattle City Hospital and King County Hospital, Washington. London and Philadelphia: W. B. Saunders Company. 1929. Pp. 431. 12*s.* 6*d.*

FIRST published in America in 1916 this book has become deservedly popular, providing as it does a detailed practical guide for the layman capable of understanding simple scientific terms. The information given on matters of personal hygiene relating to diet and exercise is excellent. In the section dealing with alcohol the author takes a sound commonsense view of the whole position; he looks with disfavour upon bootleg liquor, one part of which is said to cause the same degree of drunkenness as ten parts of pre-prohibition liquor. The classical delirium tremens patient has disappeared from American hospitals; it is doubtful if drinkers of bootleg manufacture survive to develop the chronic effects of alcoholism. Germ diseases are well described. Considerable attention is given to tropical diseases, such as malaria, yellow fever, dengue, and cholera, as well as those with which we are more familiar in this country. The chapter devoted to the prevention of diseases of middle age is well written and will be useful, not merely to the middle-aged, but to those called upon to advise them on their methods of life. The chapter on the prevention of cancer is an excellent one which the layman will readily understand. The volume may be recommended to all who find themselves called upon to lecture or speak to the public upon the preservation of health and the prevention of disease.

GYNÆCOLOGIC TECHNIC.

By THOMAS H. CHERRY, M.D., F.A.C.S., Professor of Gynecology, New York Post-Graduate Medical School and Hospital. Philadelphia: F. A. Davis Company. 1929. Pp. 678. £1 13*s.* 6*d.*

THIS book is intended for the practitioner only and deals with the technical rather than the theoretical aspects of gynæcology. Provided that books of this kind are used by those with a sound knowledge of the basic principles of the subject their value may be great, but there is always a danger that readers may forget that technical dexterity cannot compensate for the absence of knowledge of the pathology of the disease it is proposed to treat. Great pains have been taken by the authors to make the book clear and simple. The description of operations has been restricted to one standard method which is given in detail. The work is lavishly illustrated by one of the best series of illustrations in the literature; these have been drawn by the author himself and accentuate the exact points which he wishes to make clear. An operation for complete prolapse is described which entails vaginal hysterectomy; the subsequent closure of the vaginal vault, it is claimed, tightens up the cardinal ligaments. It is difficult to imagine what happens to the ureters during the process. Wertheim's hystero-vaginectomy for carcinoma of the cervix is not described; radium seems to have completely replaced the radical operation in the treatment of this disease in America. The use of electricity in gynæcology is fully discussed and this section of the book should be consulted by British gynæcologists who seem to have neglected somewhat this weapon. An unfortunate misprint occurs in a table giving the dosage of stovaine for spinal anæsthesia at different ages; if this error were not detected the reader might be led to give ten times the correct dose to children.

This work will be read with interest and profit by those called upon to operate on the female genital tract.

HÆMATOLOGY.

Einführung in die Hämatologie. By Dr. A. VON DOMARUS, Direktor der Medizin, Abteilung des Städtischen Krankenhauses Berlin-Weissensee. Leipzig: Georg Thieme. 1929. Pp. 185. M.14.

THIS book begins with a good account in plain German of the methods used in the study of hæmatology. The three plates showing the blood-cells, normal and abnormal, are well reproduced. We note that the author favours the use of actual numbers as well as percentages of the different types of white cells. As an example of the error associated with the method more commonly used in this country he points out that if the number of white cells in a case of polymorph leucopenia is expressed in percentages one is given the impression that there is a lymphocytosis, whereas in reality the lymphocytes may be normal in number. In the pernicious anæmia section more prominence might have been given to the liver treatment and to the changes this brings about in the blood picture.

The book contains much information in a small compass.

SEX AND DISEASE.

By ROBERT V. STORER, M.R.C.S. Eng., L.R.C.P. Lond. London: Butterworth and Co. (Australia), Ltd. 1929. Pp. 131. 8s. 6d.

THE main purpose of this small volume is to assist the layman in the solution of sex problems and to explain the nature and dangers of venereal diseases. The subject is presented in a clear and concise manner. In discussing the pathological effects of these diseases the author has avoided the error of magnifying the dangers and thus of terrifying the nervous and worried reader. To those who are suffering from syphilis or gonorrhœa the volume conveys much sound information; the necessity for regular skilled treatment is stressed, and the results achieved by modern methods and remedies presented in an encouraging way. Dr. Storer lays stress upon the advisability of undergoing thorough tests for cure in gonorrhœa. A brief description is included of Australian public health measures for the prevention and treatment of venereal diseases.

GREEK MEDICINE.

By ARTHUR J. BROCK, M.D. London: J. M. Dent and Sons, Ltd; New York: E. P. Dutton and Co., Inc. 1929. Pp. 256. 5s.

THIS selection, illustrative of medical writers from Hippocrates to Galen, forms the volume on Greek medicine in the Library of Greek Thought, which is now being issued under the editorship of Dr. Ernest Barker. It is appropriately dedicated to the memory of Dr. Francis Adams of Banchory. The author modestly disclaims any pretentions to finished Greek scholarship, but tells us that he has been a student of Greek since boyhood, and that for the past 20 years he has been reading Greek medicine in the original tongue. All the extracts included here, except those from Aristotle, are his own translations. The first 34 pages of introduction are explanatory, and deal with Greek medicine before Hippocrates, the empiricists, Greek medicine in Rome, methodism, pneumatists and eclectics, Rufus of Ephesus, and Galen. Dr. Brock draws an interesting parallel between Galen and St. Paul. The Hippocratic selections include *inter alia* his views on such surgical conditions as dislocation of the hip and club-foot. These extracts are followed by an account by Thucydides of the pestilence at Athens, which seems to have been more like typhus fever than anything else. Next come short excerpts from Plato and Aristotle, while notes by Rufus of Ephesus on medical interrogation of patients and on anatomical nomenclature end the first part. The rest of the book is devoted to Galen, while a short appendix contains a description of the plague at Syracuse among the Carthaginians, 397 B.C., by Diodorus Siculus, and a discourse by Aetius of Amida, sixth century, A.D., on aneurysms.

The whole forms a fascinating volume and will be welcomed by medical men with an appreciation of ancient culture.

CLINICAL LABORATORY METHODS.

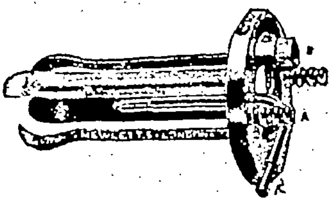
Third edition. By RUSSELL LANDRAM HADEN, M.D., Professor of Experimental Medicine, University of Kansas School of Medicine. London: Henry Kimpton. 1929. Pp. 317. 21s.

OF text-books of clinical pathology and laboratory methods there is nowadays no end. The present work stands well in the front flight and the appearance of a third edition will be welcomed by those who already know it. This book was designed largely for the American practitioner who apparently is able to spend more of his time in his "office" laboratory than his British colleague can afford to do. In this country its appeal will be mainly to the pathologist working single-handed in a small laboratory. The author confines himself strictly to procedures of proven practical value and for each of these describes one technique only. The notes given are lucid and concise and include accounts of certain techniques such as that for the determination of indican in the blood by the method of C. H. Andrews, which have up to the present not yet made their appearance in many text-books.

New Inventions.

THE VAGINOSCOPE.

UNDER this title I have introduced an instrument (here illustrated in the open position) which remedies many defects noted in specula hitherto in use. The vaginoscope, in its closed form, is of small cross section, and can therefore be introduced painlessly, the patient being in either the dorsal or lateral position. Illumination is provided by a bulb attached to a battery and flex by a long thin bent tube running in a groove along the lowest blade, the whole being removable for sterilising the instrument itself. A slight up-and-down movement at K makes or breaks electrical contact. Excellent visibility is thus obtained of the vaginal walls, the cervix, and fornices. By loosening screw-knob B), and then placing the thumb on peg (A) and the forefinger on (B) a single grip effects a simultaneous outward movement of the four blades resulting in a quick dilatation of the vagina. Sufficient dilatation having been obtained the screw-knob is tightened, thus locking the instrument. Additional expansion is produced by the bulbous extremity of the instrument, which not only acts as a retaining medium, but also enlarges the field of vision at the inner end of the vagina. No assistant is required to hold the instrument in place, and the hands of the examiner are left free to use additional instruments, &c. On completion of the examination for diagnostic or therapeutic purposes the screw-knob (B) is loosened; then gripping (B) and (C), a single movement suffices to close the instrument, which is then easily removable in its partially closed form. The instrument is a compact, self-retaining and self-illuminated speculum.



Messrs. C. J. Hewlett and Son, Ltd., 35–42, Charlotte-street, London, E.C.2, are the makers.

EDWARD BARON, M.B., Ch.B. Leeds.

THE LANCET.

LONDON: SATURDAY, NOVEMBER 16, 1929.

THE SIGNIFICANCE OF VISCEROPTOSIS.

ALTHOUGH the group of symptoms associated with a dropping of abdominal organs was lucidly described three centuries ago by RICHARD BURTON in "The Anatomy of Melancholy," their cause still remains a matter of speculation, and our knowledge is little more than a commentary on associated conditions. No one has published statistics of the average duration of life in human beings with displaced stomachs and colons; or of their comparative effectiveness as members of society[1]; until this has been done we have no right to dogmatise. But much has been written on the subject, and we are indebted to Dr. HARRY BEDINGFIELD for a scholarly summary in a thesis presented for the degree of M.D. which has been appearing in the last two issues of the *Quarterly Journal of Medicine*. In this thesis the author has reviewed more than 640 papers bearing on the chronic invalidism associated with visceroptosis. Before the introduction of the opaque meal at the end of last century the position of the abdominal viscera during life was inferred from the lessons of post-mortem dissections and observations made in laparotomies. The introduction of formalin as a hardening agent illumined the topography of the abdomen, but the light was obscured by the medium through which it came. We do not know, for instance, how long in the daily life of any person the pylorus lies in the "transpyloric plane" of Addison. With the exception of its proximal and distal attachments—the duodeno-jejunal junction and the iliac colon—the bowel certainly appears to be a mobile and wandering inmate of the abdomen, and this fact, first shown by radiology, has given rise to a new conception of visceroptosis. Until the normal is defined it is impossible to detect the abnormal. There is as yet no consensus as to the normal limits of visceral mobility, while it is increasingly recognised that function is not necessarily impaired by abnormal position. It may be recalled that in "The Ship that Found Herself" the engines which had been built to work on clean steam in an upright position were able to carry on while lying almost horizontal and consuming a mixture of oil and dirty water. Radiology has shown the alimentary canal to possess something of the same adaptability. The stomach can empty itself in the usual time and without functional disturbance, even when the skiagram shows a high degree of dropping (CONRAN and MARKER), and the same holds for other parts of the alimentary canal. Herein lies the riddle of chronic intestinal invalidism. Though the radiograms in two cases may be almost identical, in one case there is pain and disturbance of function, while in the other there is none. Symptoms associated with enteroptosis may disappear without change visible in the radiogram.

Evidently in visceroptosis some other factor is necessary before the comfort of the individual is affected, but whether this factor is to be sought in a local morbid condition or in a bodily diathesis remains undetermined. Before the advent of radiology the local condition was regarded as holding the key to the problem, but this is not the modern view. Theories galore have been brought forward to explain what may be called the primary factor in the production of symptoms in chronic intestinal invalidism. BEDINGFIELD mentions over a score, several of which call for special comment. GLÉNARD, whose name is in France associated with the condition, propounded the mechanical theory in 1885, but modified it later as his clinical studies led him to suppose that the liver played a predominant part. In hepatism, as he called it, there is invoked an inadequacy of the liver cells, congenital or acquired, which may remain latent until called into activity by some factor such as infection or trauma, when the liver fails in its detoxicating action, and a poisoning of the bowel ensues, resulting finally in stasis. ARBUTHNOT LANE, who also regards stasis as the most potent cause of symptoms, has a different theory. In 1885 he noticed a band at the junction of the iliac with the pelvic colon which might, by angulation of the bowel, give rise to obstipation; the overloaded bowel, with its tendency to kink, produces a back-working which, by a series of analogous changes, would finally affect even the stomach; bands supporting the sagging bowel contract in their turn, producing further angulation and stasis, and finally an intestinal toxæmia is produced. GOLDTHWAIT, on the other hand, regards visceroptosis as due to bodily configuration, nervous symptoms being brought about by dragging on the solar plexus. A fourth school debits the causation of symptoms to a localised pathological condition, such as constipation, entero-colitis, appendicitis, adhesions, excessive mobility or fixation of the cæcum. Physiologists have commented on the lack of harmony in the interaction between the different parts of the autonomic nervous system, producing symptoms directly or through the liberation of chemical stimuli. None of these theories in its entirety has stood the test of time, and the treatment founded upon them, whether medical or surgical, has led to disappointment. Each new line of therapy has given good results in selected cases, and the impartial observer is forced to the conclusion that the causa causans still remains to be discovered.

Between mental reactions and the functional condition of the alimentary canal a relationship has long been traced, and this assumption has been amply confirmed by radiologists. One example is A. E. BARCLAY'S well-known observation of the sudden dropping of the greater curvature of the stomach following a shock due to the slamming of a door. The most casual student of the literature of chronic abdominal invalidism must be struck with the frequent reference to mental and nervous disabilities, and the frequent resort to some congenital explanation of the symptoms. Thus we have congenital inadequacy of the liver cells, congenital dislocation of the viscera, congenital malformation of the thorax leading to a low position of the abdominal organs, failure of normal development leading to defective visceral fixation, and, in our own day, congenital bands and membranes. For some time also it has been recognised, notably by H. C. CAMERON, that there exists in children a condition symptomatically analogous in its symptoms to that found in adults. Consideration of these three factors has produced yet another theory to the effect, stated in its most general form, that in visceroptosis some departure from normal mental functioning is fairly regularly associated with the departure from normal physical functioning. An attempt has been made to associate the nervous diathesis with a particular physical configuration, but the organic structure is so modified and altered in the course of time that rigid lines of demarcation are difficult to define, one group merging into another, and leaving a large unclassifiable borderland. Indeed it is doubtful if the bodily constitution remains the same throughout life. The inherited factors are continually being played upon by the stimuli of environment, and the individual at any moment is the resultant of these forces. Constitutional inadequacy may thus be regarded as offering the most plausible explanation of the chronic abdominal invalid. By this is meant a state of physical and mental make-up, congenital and possibly inherited, which handicaps the individual in his adjustment to the various environmental stresses. Such stresses as infection, a surgical operation, a love disappointment, the loss of a parent or friend, these are all shocks to which the constitutionally inadequate cannot react in a normal manner. A particularly potent factor is a low-grade infection, whether focal or generalised, continuous over a long time, as in tuberculosis. According to the degree of mental handicap, the individual may either triumph over, accept, or become the victim of his physical inefficiency. While this view offers a good working hypothesis, and is one which fits in most closely with observed facts, we may still feel that the whole truth has not yet been told. An obvious criticism is that we cannot adequately explain the greater incidence of abdominal invalidism in women. Two explanations for this are suggested: that girls do not (or did not) lead as athletic a life as boys, and that men have no strain corresponding to that produced in woman by menstruation and its disorders. Neither is very convincing, and, of course, severe cases are met with in males.

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[1] See a discussion at the thirty-second annual meeting of the American Gastro-Enterological Association, Amer. Jour. of Surg., October, 1929, p. 470.

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PUBLIC HEALTH IN LOCAL LEGISLATION.

THE official index has just been published of the Local and Private Acts passed in the final session of the last Parliament—i.e., between November, 1928, and May, 1929.[1] In this period there were 96 Local and Private, as compared with 39 Public General, Acts. Though too voluminous and discursive for ordinary study, this local legislation contains, as usual, an experiment or two in public health and local administration which, if successful on a small scale, may some day be applied to the whole country.

We find, for instance, the Chester Corporation devising what may prove a valuable precedent for dealing with health conditions on house-boats. The Corporation is given power to prohibit the mooring of these vessels except at approved places, or unless suitable and sufficient sanitary conveniences exist or are provided, on the adjoining land. The Nottingham Corporation Act ingeniously applies to house-boats the "Tents and Vans" section of the Public Health Act of 1925. Thus by-laws at Nottingham may deal with the registration of house-boats, the prevention of river pollution therefrom by "sewage or any other offensive or injurious matters whether solid or fluid," and "the provision of such house-boats with such sanitary appliances as the Corporation may require." Elsewhere there are measures of flood prevention. The London County Council undertakes the duty of supervising and inspecting the banks of the Thames and overseeing the execution of such works as may perhaps prevent the recurrence of recent disasters. There is an echo of the latter in the Westminster City (Millbank) Improvement Act. Housing produces what seems a new clause in the Chester Act for "the provision of fixed baths in such classes of new dwelling-houses as may be prescribed." Tenants at Smethwick will have the advantage that the Corporation can put in pipes, wires and fittings, and can supply gas and electricity in houses where the occupier has asked for, and the owner has refused to give, these facilities. The amenities of town life are protected at Llanelly and Smethwick, where structural alterations can be ordered on complaint by the medical officer that smoke, gas, or vapour from outbuildings or washhouse chimneys causes a nuisance to neighbours. At Guildford, if buildings are being constructed or reconstructed, or if chimneys over 45 feet high are being erected, by-laws may require the deposit of plans showing the elevations and materials. If the proposed structure is likely to disfigure the neighbourhood, the plans are referred to a Standing Advisory Committee of three, consisting of a selected architect, surveyor, and justice of the peace, which can veto the proposal. This recalls a clause in the Bath Corporation Act of 1925. Another fresh precedent is the extended power at Chester to control the erection and painting of facia-boards, signboards, and signs.

In legislation directly concerned with health there has been a dearth of novelties lately. Blackburn, Bognor, Llanelly, and Oldbury, as well as Chester and Smethwick, obtained fresh public health powers in the past year, but most of the provisions are "common form." The control of ice-cream or potted food manufacture, the registration of ice-cream vendors and their premises, the restriction on the carrying on of business by infected persons, compensation to persons thus put out of employment, compulsory notification by doctors of food poisoning, the power to close Sunday schools during epidemics, the parent's duty to notify the head teacher of a child's infection, the extended definition of infectious disease, the obligation to furnish laundrymen's names—all these are nowadays as familiar as the provisions for dealing with unsound food, or for the cleansing of filthy premises. We noted last year in the Sheffield, Rotherham, and London County Council Acts the power to remove to hospital on a medical officer's written certificate and a magistrate's order persons who are either (*a*) aged, infirm, or physically incapacitated, and living in insanitary conditions; or (*b*) suffering from any grave chronic disease, if they are unable to look after themselves properly, or are not being looked after by others. This clause appears this year in the Blackburn and Smethwick Acts. So does the useful provision which allows the medical officer to enter (on a justice's warrant) any premises where a case of dangerous infectious disease is suspected. The two usual safeguards are added that entry must be made only between 7 A.M. and 10 P.M., and that the medical officer is not to examine anyone who is already under the treatment of a medical practitioner, except with the latter's consent. In this last proviso the Smethwick Act uses the words "registered medical practitioner," while the Blackburn Act merely says "medical practitioner." Does this mean that at Blackburn treatment by an unqualified person could prevent the medical officer from exercising his statutory power of entry and examination?

Some of the powers given to local authorities by Local Act seem trivial. It looks odd that a municipal corporation, for instance, should require the special authority of Parliament to charge anyone a fee for the use of an automatic weighing machine at public baths. The explanation lies in the restraining influence of the doctrine of ultra vires. Civic enterprise, however, triumphs over difficulties and gives a lead to the nation. Thus in many towns tests for motor drivers are now compulsory; so also is insurance by hackney carriage proprietors. Magistrates in London and elsewhere have protested the law's impotence to punish "joy-riding" (the practice of temporarily making off with someone else's car without his permission) till at length the Government has drafted a Bill on the subject. But Blackburn, Chester, and Smethwick had already made this practice a punishable offence. As with police matters, so with hygiene, Parliament seldom puts into a general Public Health Act any enabling clause which has not already appeared in local legislation.

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[1] Index to the Local and Private Acts. H.M. Stationery Office. 1*s.* 6*d.*

CARDIAC STIMULANTS.

CLINICIANS and pharmacologists always seem irreconcilable about the so-called cardiac stimulants, and doubtless some of their difficulties arise from the varying nature of "heart failure." Circulatory collapse may be attributable to a breakdown of the heart muscle, of the arterioles or capillaries, or of the vasomotor centre. Thus it is that brandy, for example, by reflex stimulation of the medullary centres or by vaso-dilatation of the peripheral arterioles may improve the action of a labouring heart, though as a direct stimulant of the heart muscle it has no value. Similarly, strychnine has little or no direct action upon the heart muscle—Prof. J. A. GUNN [1] does not think it has ever saved a life—but it has an action on the central nervous system and the vasomotor centre, and in this sense may perhaps be called a circulatory stimulant. Pituitrin is another drug which has no action on the heart itself but it is to be regarded as truly a stimulant, because it causes a powerful contraction of the arterioles and probably of the capillaries. The claims made for camphor and its numerous compounds rest on a different foundation, for it is often said that they have a direct effect upon heart muscle. For this reason they have been very widely used in heart failure, especially on the Continent.

During the last sixty years Prof. P. TRENDELENBURG,[2] of Berlin, and his assistants have been studying the activity of some of these substances in experimental conditions of cardiac and vascular insufficiency. Like other workers he has found that their action is only to be detected in a failing heart, since the optimal activity of a normal heart apparently cannot be improved by any of the substances which he has tested. The effects of digitalis and strophanthin, for instance, can only be seen in the damaged heart and TRENDELENBURG draws attention to the contrary actions of adrenalin and ephedrine in health and disease. With a healthy heart these drugs constrict the arterioles so strongly, and the peripheral resistance is thereby so greatly raised, that the cardiac output per minute actually falls; the glucosides of digitalis and strophanthus cause far less vaso-constriction and thus produce less resistance to the heart's action. With an "insufficient" heart, however, adrenalin can directly stimulate activity so that the volume pumped through in a minute increases and the pressure in the arterioles falls. When the heart was experimentally damaged either by gradual exhaustion or by suitable poison—e.g., histamine or oxidised salvarsan—TRENDELENBURG was unable to show that, in therapeutic doses, the preparations containing camphor which he examined were of any use in reducing cardiac insufficiency; some even increased it. But when heart failure was produced experimentally by asphyxia from paralysis of the respiratory centre, these camphor compounds were able to restore the respiration and in course of time they regularly overcame even the severest cardiac insufficiency. This was especially obvious when the respiratory centre was paralysed by morphia, and less so when chloral hydrate was used. A purely "vascular" failure cannot easily be produced in the laboratory, but in this type of insufficiency the camphor derivatives again seemed to be entirely inactive; while adrenalin and ephedrine, as would be expected, were able to restore the circulation to normal conditions. Digitalis and strophanthus were only slightly active.

Purely arteriole or capillary failure must be uncommon clinically, because circulatory failure usually comes from a combination of vascular and cardiac factors. In such combined failure a cardiac stimulant should both improve the heart's action and constrict the peripheral vessels. Obviously the cardiac stimulation must not be less effective than the raising of the resistance from peripheral constriction, for if the blood pressure is raised more than the heart is stimulated the circulation will be hindered rather than assisted. This may sometimes happen when adrenalin is used—since the associated cardiac improvement may not be great enough to overcome the increased blood pressure—and it must be a constant result of injecting camphor compounds if it is true that they do nothing to remove muscular failure of the heart and only have the effect of increasing the resistance against which it is acting. TRENDELENBURG's research suggests that camphor preparations are actually harmful in heart failure. At best they are inactive except where the conditions are such that by stimulating the respiratory centre we can remove the cause of failure—that is to say, when we are faced with lack of oxygen or excess of CO_2.

FOR VALOUR.

THE armistice was signed ten years ago and the entrance upon a second decade was marked by the action of the Prince of Wales in presiding over a dinner to V.C.'s given in the Royal Gallery of the House of Lords on Saturday in last week. The dinner was organised by the British Legion and 321 of the holders of the Victoria Cross, representing all parts of the British Empire and all levels of social rank, met, having the common distinction of proven valour and the common desire to assist the ex-Service men in need, and to help the widows and dependents of those who gave their lives in the Great War. The Order was instituted at the close of the Crimean War, and there are alive some 400 holders of the Victoria Cross. Of these 321 were present at the dinner, a high proportion indeed when the difficulties of travel over the distances of the Empire are remembered, and the possible age and infirmity of some of the veteran wearers of, in the graceful words of the Prince of Wales, this Most Enviable Order. Enrolled in the Order are 14 medical men, of whom the following were present at the dinner: Major W. B. Allen, R.A.M.C., Colonel J. Crimmin, I.M.S., Captain B. Hutcheson, Can. A.M.C., Colonel E. T. Inkson, R.A.M.C., Lieut.-Colonel F. S. Le Quesne, R.A.M.C., Major-General Sir Owen Lloyd, E.P., and Lieut.-Colonel J. H. Reynolds, R.A.M.C. Corporal J. J. Farmer, Army Hospital Corps, was also present.

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[1] See THE LANCET, 1928, ii., 758.

[2] Med. Klin., 1929, xxv., 1573.

Annotations.

"Ne quid nimis."

A NEW RESEARCH HOSPITAL.

A DRASTIC change in the scope and purpose of any charitable institution must have parliamentary sanction and past subscribers may be assured that this would be withheld unless the alteration was warranted by a change in the needs of the population served. The fact that an Enabling Act was passed in May of this year, allowing responsible authorities of the Mount Vernon Hospital, Northwood, to use their lands and investments for the investigation and treatment of malignant disease instead of for diseases of the chest is an indication of such a change. In recent years the establishment of sanatoriums by local authorities has so diminished the number of patients applying for admission to the hospital that its council, with the full consent of the medical staff, sought and obtained permission to turn their efforts in a new direction. A scheme of work and development, framed with the help of experts, has been generally approved and is being put into speedy effect. The council of management of the hospital on which the medical staff is represented is being assisted by an advisory committee whose duties will be to give advice on the staffing of the hospital, on medical and scientific matters, and on the forms of treatment and research to be undertaken in the hospital. The new organisation differs in many important points from that of hospitals not primarily dedicated to investigation. A whole-time director of research is to be appointed to devise and coördinate schemes of work and the appointments of the honorary staff will be subject to annual consideration in accordance with the particular object of the hospital's research into various treatments for malignant disease. The survey of the history of this hospital and the reasons for its reconstruction, given on another page, is of more than local import. The same sequence of events might equally well have occurred in the life of any hospital designed to treat cases of infectious disease which are now for the most part being dealt with effectively in rate-supported institutions. Some will regret the change, but it may be a prototype of other changes and may point the way to the sound allotment of work between voluntary hospitals and those organised and supported by the local authorities. Routine treatment of disease by established methods can be carried out safely in any well-conducted hospital. The critical investigation of pathological processes and the assessment of the scope and limitations of methods of combating them is essentially work to be carried out in a hospital designed for the purpose. Medical students would, in an ideal state, have access to both types of hospitals, though not necessarily at the same stage of their careers. The conversion of the Mount Vernon Hospital to other purposes from those which it was intended to serve is not likely to be an isolated one.

ERROR IN DIFFERENTIAL BLOOD COUNTS.

THAT even in the most carefully prepared blood smear the white cells are far from being evenly distributed is recognised by everyone who has ever looked at such a preparation. That the various classes of white cells alter in their distribution in different portions of such a smear is well known to all who study them with any closeness. And that these facts must have a disturbing effect in a differential count of white cells is self-evident. Most workers have been content to do as best they can by the random selection of a few fields in a smear; others, following Naegeli, have tried to reduce the error by counting up to a thousand cells. Meanwhile, the laws governing distribution of the white cells in a smear have not come in for much careful consideration, and this is an omission which Curt Gyllenswärd, of Stockholm,[1] has tried to remedy. His results are reported in a very long paper which bristles with formidable calculations and should be consulted in the original by those interested. In brief, it may be said that he condemns the cover-slip method of preparation, and recommends that form in which the blood is smeared on a microscope slide by drawing a second slide along its length. In such preparations, however, the smaller cells tend to be deposited more quickly than the larger cells as the movement of the blood over the receiving slide decreases. The result of this is the formation, at the top and bottom of the slide and in the "tongue" at the end, of "zones" of lymphocytes, neutrophiles, eosinophiles, and monocytes. Counts conducted in these zones may show a relative distribution of the different classes of cells very different from that which obtains in the circulating blood. To avoid the influence of such zones Gyllenswärd recommends that in making a differential count the first and the last five millimetres of the smear should never be included, and that the count should be made on the central portion of the slide in transverse travels. If these precautions are taken he finds no advantage in including more than 300 white cells in the count.

BISMUTH IN THE TREATMENT OF SYPHILIS.

EVER since bismuth was introduced into the treatment of syphilis in 1921 it has been regarded almost universally as a valuable spirochæticidal drug. From time to time, however, a voice has been raised to question the advisability of using it in place of the older remedies, mercury and arsenic. In 1927[2] Dr. T. Anwyl-Davies discussed the action of bismuth on the *Spirochæta pallida* and, following the conclusions of W. Kolle and his collaborators, declared that bismuth had no direct curative action on the infection but merely inhibited the disease. Kolle's experiments and Anwyl-Davies's conclusions were discussed and strongly contested by Dr. C. Levaditi and Dr. L. Fournier.[3] We publish this week and last two further papers on the subject and a report of the discussion at the Venereal Diseases Section of the British Medical Association at Manchester last July. Dr. T. M. Ling has been working at St. Thomas's Hospital with bisoxyl, a suspension in water of bismuth oxychloride and chloretone. Subcutaneous injection of this preparation does not lead to the persistent pain and swelling characteristic of many forms of bismuth, and Dr. Ling has found it extremely useful in congenital syphilis, especially in lues tarda. He suggests that the spirochæte can acquire resistance to arsenic and mercury after prolonged treatment, and that in cases of this kind bismuth, without causing any untoward symptoms, will render serologically negative a fair proportion of apparently Wassermann-fast patients. Prof. H. Ritter and Dr. C. L. Karrenberg have been working at Hamburg with intramuscular injections of bismogenol, a suspension of a bismuth compound of a highly valent oxybenzoic acid in olive oil. They have found this eminently satisfactory, and declare that it has an abortive action on the disease. A number of patients have been treated by bismuth exclusively.

The case for bismuth is strengthened by these new reports. Prof. Ritter and Dr. Karrenberg suggest that many of the objections alleged against it depend on the very inadequate knowledge that the physician has of the exact amount of bismuth metal he is giving and its fate in the body. They also point out that the criteria for a successful antisyphilitic remedy are by no means standard. The amount of bismuth varies extraordinarily in different preparations and in different batches of the same preparation. The rapidity of absorption varies with the mode of application, the solvent or suspension medium, the concentration and the size of the particles. Some reports base their claims for success on rapid disappearance of the spirochætes, others attach more importance to the serological changes, others again to the clinical progress or alleviation of obvious symptoms. Most people seem to agree on the relative harmlessness of the most recent bismuth preparations compared with the quite grave risk attaching to arsenic and mercury administered in spirochæticidal doses. Very little is known of its mode of action. It is not a direct spirochæticide, as the amount in the blood at any time is never great. According to Dr. Svend Lomholt, the best technique for securing regular and uniform absorption is to maintain over a long period a high concentration in the body. The choice of preparation among the many which have been placed on the market and the estimation of the danger-point, are not easy matters. Dr. Lomholt placed the daily dose at about 0·5 mg. of bismuth metal per kilo of body-weight, but laid down that axiom which it is so important to remember in these days of standard treatment; every patient must be treated as an individual according to his own particular circumstances. There is a general consensus of opinion that the treatment should not be painful if the technique is good.

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[1] Acta Pædiat., 1929, vol. iii., Suppl. ii.

[2] THE LANCET, 1927, i., 148, 199.

[3] Ibid., 1928, i., 692.

From the differences of experts no general conclusion can at present safely be drawn. A great deal of painstaking research is required to determine the factors which influence the absorption and retention of bismuth in the human body. Only those who have considerable experience of all the antisyphilitic remedies are justified in using any one to the exclusion of the others in any particular case. They act differently and each has its own values and dangers. The syphilologist must keep all three metals in his surgery, and continue to rely principally upon his clinical sense for the decision as to which and what proportion of each shall be administered in any case. Meanwhile he looks to the laboratory worker to furnish him with precise information about the pharmacology of his drugs.

TONSILS AND ADENOIDS IN FRANCE.

IN this country for many years the great majority of surgeons operating on the tonsils have aimed at complete removal, either with the guillotine or by dissection. If a portion of the tonsil remains the operation is considered to some extent a failure, and indeed septic trouble in old stumps is common enough to suggest that complete operation is advisable. To perform this ablation with enough certainty, and at the same time to secure efficient hæmostasis, it is necessary that the patient should be perfectly quiet. Hence general anæsthesia is almost always employed here for children, although local anæsthesia is being used more and more for adults. But practice of this kind differs widely from country to country. The *Vie Médicale* recently asked a number of laryngologists whether they removed tonsils and adenoids with or without anæsthesia; if under anæsthesia, what method was most advisable; and, finally, how they dealt with adults. The twenty-one replies[1] show that they do things differently in France. For children of tender years, below an age which varies from two to five years, the large majority of operators use no anæsthetic, either general or local; for older children the proportion is almost exactly reversed, a general anæsthetic being preferred by about two-thirds of those answering the queries. It may be noted that some of those who condemn the operation without anæsthesia do so very strongly on the grounds that it is inhumane, that it does not allow careful operation, and that it makes children so frightened and suspicious that subsequent medical examination and treatment become very difficult. These are considerations which receive full weight on this side of the Channel. For adults local anæsthesia is generally recommended, only two preferring a general anæsthetic; infiltration with a solution of novocain is the method usually employed. Ethyl chloride is the general anæsthetic employed almost exclusively, but it should be remembered that rapid operation is the rule, and that complete tonsillectomy is not usually its aim, or its result. Although this subject did not come directly into the questionaire, five operators said that they performed tonsillotomy, not tonsillectomy, in children, and two that they did so also in adults.

LONDON SUBWAYS.

THE urgent need to inquire into the cause of London traffic fatalities, especially among children, is referred to in the annual report of the Coroner for the City of London and Southwark. Dr. Waldo points out that during recent years some third of the deaths caused by traffic fatalities have been among children and young persons. More than ten years ago, at Dr. Waldo's suggestion, the Borough Council of Southwark adopted the system of providing crossing places at certain fixed spots, the places being indicated by signs and directional notices, while school teachers were asked to explain to children the whereabouts and uses of the provision. The results were satisfactory, and many municipal councils have followed the example of Southwark. In several places in London where the channels of busy traffic decussate subterranean passages are now employed, and more subways are projected, despite the huge expense of their construction. But these subways make for public safety and must not be confused with the subways for the passage of gas and electrical mains which, in another part of his report, Dr. Waldo regards as a proper subject for Government inquiry. Referring to recent explosions and floodings, whose occurrence is in the memory of all metropolitan dwellers, he considers that the risks run by the community are great, seeing that in 1928 the explosions in electrical manhole boxes in the City numbered six, and in 1927 no less than 14, while no satisfactory scientific explanation of the accidents is forthcoming. That the London County Council is fully aware of the situation can be assumed from the announced intentions of the General Purposes Committee of the Council following upon a report of an official inquiry into the great Holborn explosion. The General Purposes Committee suggests that the Council should give effect to the recommendation of the committee of inquiry regarding the ventilation of cellars and vaults constructed under streets and connected with buildings, and that the necessary amendments to the London Buildings Act should be secured.

THE CONTRIBUTION OF MEDICINE TO INDUSTRY.

A REPRINT[1] of the Shaw lectures, delivered by Sir Thomas Legge in the early part of the year, confirms the impression then gained[2] of the unfolding of a romantic story in industrial medicine. Certain incidents are found to stand out with prominence. First comes the fact that lead poisoning in industry, whether in the potteries or in the white-lead trade, has been robbed of its terrors by the Shaw lecturer's discovery that it was caused by breathing lead dust and by his quiet insistence upon preventive regulations based on this discovery. Here is enough to earn the gratitude of his generation, and we may sympathise with him in the rejection of his advice to the Government to abolish lead poisoning from its last stronghold in the house-painting trade. Next may be placed the success achieved in freeing the woolcomber from the danger of anthrax, an old-time enemy, through the disinfection of all suspected wool as it arrives in this country. To this subject Legge devoted his Milroy lectures over twenty years ago. Last we would mention the prominent part he played in establishing methods for extending compensation to industrial diseases, which have been widely copied by other nations. He stresses, as a Parliamentary debate last week stresses, the enormous preponderance of claims arising from coal-miners for conditions peculiar to their occupation; but coal-miners are not protected by the Factory Acts which Legge had to administer. Yet, notwithstanding the striking results attained by appointing medical inspectors of factories, of whom Legge became the first in 1898, no medical inspector of mines was created until two years ago, after the connexion of the Ministry of Mines with the Home Office had been severed for ten years, and then in response to representations from the Medical Advisory Committee of the Ministry. There is still work enough for a medical inspector of mines to do but, as Legge asks in his Shaw lectures, what might not have been accomplished if the appointment had been made more timely?

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[1] Vie Méd., Oct. 25th, p. 1053.

[1] Thirty Years' Experience of Industrial Maladies. Royal Society of Arts. 2s. 6d.

[2] THE LANCET, 1928, i., 513.

THE DANGERS OF CONSERVATIVE DENTISTRY.

THE evolution of dentistry from a surgical to a preservative art was hailed in the early part of this century as a triumph of science over mere operative zeal, and conservative dentistry was the aim of every conscientious practitioner. Every tooth which could by any means be made into a useful mechanical instrument was scrupulously preserved, and a mouth full of teeth whose pulp had been killed and extracted was passed as sound provided the gums seemed healthy. The application of radiological means of diagnosis to dentistry and the correlation of areas of rarification with pathological conditions, not only local but general, has destroyed the confidence of both medical and dental professions in such decisions. In America especially, according to Dr. Boyd Gardner, who is head of the dental section of the Mayo Clinic, it is now becoming recognised that the surgery of the mouth has been unduly belittled. In a lecture given in London at the Royal Dental Hospital on Nov. 4th, he explained that in his clinic the dental student is instructed when he looks into a patient's mouth not to think first what could be done in the way of a filling, but to have regard to the cause of the condition. The removal of foci of infection shown by radiological examination had been followed by the clearing up of general disorders such as ulcerative colitis and even of certain types of arthritis. Dr. Gardner urged the desirability of taking radiograms after as well as before any operative measure. At the Mayo Clinic exposures were standardised, so that work in the dark room could proceed with almost mechanical regularity.

The value of X rays in controlling treatment is now established in this country. Many dentists have installed apparatus next to their consulting-rooms and the convenience to the patient of such an arrangement is unquestionable. In a lecture delivered to the British Institute of Radiology on Nov. 4th Dr. J. F. Brailsford claims that the most helpful information will be obtained when the radiography is done by an impartial observer. In his view the radiogram and its interpretation should hold the same position to the patient's medical adviser, dental surgeon, and the patient as the auditor's report does to the directors, staff, and shareholders of a company. They should provide the doctor with independent evidence of the condition of the patient's teeth, particularly that which is likely to have a bearing upon his general health, and they should give the dental surgeon support in dealing adequately with any lesion which may be present. Dr. Brailsford calls attention to the embarrassing position of the physician called in to see a patient suffering from what he believes to be septic absorption, possibly from teeth, when he is told that they have already been examined radiographically by the dentist and reported to be sound. But surely this a question only of interpretation of radiograms; it calls not for a further X ray examination which, as Dr. Brailsford rightly contends, would involve the patient in unnecessary expense, but for inspection of the results of that already made in consultation with the dentist. Admittedly, whoever takes the radiograms, there is no longer justification for the wholesale extraction of teeth without X ray examination. Dr. Brailsford points out that a doctor's plea for such extractions is based on his experience that this treatment results in alleviation of certain symptoms, and that equal success attends the extraction of only those teeth shown by the radiogram to be septic, when the patient is spared the digestive disturbances often experienced by edentulous patients. The question resolves itself into the problem of interpretation of dental radiograms. Mistakes in interpretation in the past have been due to lack of experience or knowledge of photographic and radiographic technique, or of the anatomy and pathology of the part. A radiogram may be so poor that the most experienced cannot interpret it; on the other hand, it may be excellent and yet convey little or no information to the inexperienced observer. Dr. Brailsford showed a series of lantern slides illustrating pathological conditions of the teeth and jaws and of errors of interpretation.

The technique is now well standardised and the correlation of the radiographic appearances with clinical conditions has been more easily and firmly established than that of lesions elsewhere in the body. For example, a large series of post-mortem examinations is required before mediastinal radiograms can be properly interpreted, but extraction of a tooth is usually sufficient to show how accurate has been the diagnosis of an apical lesion. The radiographic signs are there for all to read, and it is only necessary to remind enthusiasts that symptoms do not always clear up when the tooth is removed.

SUPERSTITION.

SUPERSTITION is the seed of enlightenment, the negative aspect of an apprehension of things beyond present knowledge. It holds all the truths of science, but holds them so fast that sometimes it seems far more the enemy than the friend of progress. The shadowy borderland between folklore, religion, and psychology has been all too little explored, but will prove a most fruitful field for investigation by the psycho-ethnologists of the future. Sir Robert Armstrong-Jones selected Superstition as the subject for his presidential address to the Psychiatry Section of the Royal Society of Medicine on Tuesday last. He was able to illustrate his remarks by pointing around him, for the meeting was held in the Wellcome Historical Medical Museum where the outward and visible signs of the superstitions of past and present are collected in profusion. On the previous evening the Curator, Mr. L. W. G. Malcolm, had been speaking to the Egypt Exploration Society on Egyptian Medicine and showing how the superstitions of the Egyptians had contained the germs of much that we now recognise as scientific knowledge. Death and disease they regarded as unnatural and abnormal, due to possession, and the prescriptions in the papyri are prescriptions not for curing but for banishing, driving out, or terrifying the disease. The very multiplicity of the prescriptions is evidence of their unscientific nature, yet among them were some which contained appropriate drugs, and as these in time superseded their less successful fellows, so the magician gradually became a physician and the Egyptians groped their way towards a rational pharmacopœia. Through a jumble of magic and sorcery, said Mr. Malcolm, we can trace the foundations of Grecian scientific thought, and especially does civilisation owe to the Egyptians that favourable attitude to anatomy which resulted from the practice of mummification. From the Egyptians Sir Robert Armstrong-Jones traced the threads of superstition through Greeks, Romans, and Scandinavians to Anglo-Saxon and modern times, but he had no kind word to say for it. Psychologically he described superstition as suggestibility, based upon fear, and he condemned it as no innocent mistake but a wilful and shameless belief contrary to the laws of nature, to experience, and to common sense. This may certainly be applied to those who cling to superstitions or conventions when there is at hand the means of rational apprehension, but when the primitive mind is striving with inadequate equipment to grasp an idea beyond its capacity to understand, superstition may be but the stepping-stone to knowledge. The curious thing about superstitions is that they so often contain, buried deeply in apparent nonsense, the germ of the truth. Kipling has illustrated this in his tale of Nicholas Culpepper who, for the most fantastic astrological reasons, set about destroying rats as a means of combating the plague and was more successful than the half-educated scientific man of his time. Quaint beliefs still hold the field in many departments of life and medicine where knowledge has yet failed to give full illumination. We shall do better than our fathers if we investigate them with sympathetic interest, rather than despising them as foolish or harrying them as evil. Explored with intelligence they are apt to yield, as several courageous investigators have shown, an unexpected treasure of new understanding.

INFECTIOUSNESS OF TUBERCULOSIS IN CHILDREN.

WHILE the view that tuberculosis is essentially an infectious disorder is gaining ground it is generally held that only open cases of tuberculosis, with tubercle bacilli in sputum or excreta, are a danger to their associates. In children it is so difficult to obtain sputum for examination that the question of individual infectivity is a difficult one to settle. Dr. Vlademar Poulsen, of Copenhagen, has recently investigated[1] 67 children, ranging from 2 months to 8 years of age who gave a positive tuberculin reaction. His method of obtaining sputum was that first introduced by Meunier in 1898, and revived at the present day by P. F. Armand-Delille and his pupils, which consists in washing out the fasting stomach in the morning with 200–300 c.cm. of sterile water, centrifuging the result and staining the deposit for tubercle bacilli after Ziehl-Neelsen. Another portion of the sediment may be inoculated on Petroff's medium or injected into a guinea-pig if further confirmation is desired. In this way 20 out of 67 children were found to have tubercle bacilli in the wash-out containing all the sputum swallowed overnight. The age distribution of these cases with positive findings was of interest; every one of 14 cases under 1 year of age gave a positive result, a finding in keeping with the generalised nature of tuberculosis at this early period of life. In older children positive results were obtained less frequently; over 3 years of age only two children had tubercle bacilli in the wash-out, of whom one had phthisis with cavitation and the other tuberculous pleurisy. The cases in Dr. Poulsen's series of tuberculous meningitis were interesting because, as he points out, meningitis is rarely the sole localisation of tuberculosis, miliary disease in the lungs being, as a rule, present also. Out of six cases of meningitis in the series he was able to show that three were excreting tubercle bacilli. From these figures he argues the need for isolation of certain tuberculin-positive children according to their age and condition. All children under 1 year of age with a positive tuberculin reaction he regards as infectious, whether definite physical signs of disease can be found or not. Between 1 and 3 years of age, in most cases, such children are probably non-infectious unless they have meningitis or definite pulmonary localisation; while above this age it is, he thinks, safe for tuberculin-positive children to mix with others, provided neither pulmonary tuberculosis nor pleurisy is present. Even if the need for strict isolation is not generally admitted, Dr. Poulsen has done a useful service in calling attention to a method of obtaining proof of the presence of tubercle bacilli in the sputum of children. His lavage method warrants a trial in this country.

MEDICAL WOMEN AT V.D. CLINICS.

A FEW weeks ago a candidate for a post at a venereal diseases clinic in Scotland was rejected on the ground of sex, as apparently it had been decided that a woman *qua* woman could not hold such a post there. The incident naturally led to some discussion at the Medical Women's Federation, when the council was satisfied of the existence of a definite desire on the part of many women patients to be treated by practitioners of their own sex. In England and Wales, although there is no official ruling to prevent the appointment of women, the number who hold office at V.D. treatment centres seems to be comparatively small. At the close of 1928, according to the report of the chief medical officer of the Ministry of Health, the number of such centres was 188—viz., 178 in England, 10 in Wales. Besides the treatment provided at the regular centres, special arrangements exist at 11 maternity and child welfare centres for the convenience of affected women and children, and besides these there are 14 hostels for the care of girls suffering from venereal diseases and 8 institutions for the reception of pregnant women. Inquiry at the Ministry has elicited the fact that there are 52 women practitioners holding posts at treatment centres, 18 in London and 34 in the provinces. In London there are women medical officers at Guy's, King's, London, South London, Royal Free, and Royal Northern, while in the provinces there are women medical officers at Ashton-under-Lyne, Bradford, Birkenhead, Birmingham, Blackburn, Bolton, Hull, Leeds, Leicester, Lincoln, Liverpool, Newcastle-on-Tyne, Nottingham, Oxford, Plymouth, Preston, St. Helens, Southampton, Southend-on-Sea, Stroud, Sunderland, Waddon, and York. The Federation is not satisfied with this position and has passed a resolution urging that medical officers treating female venereal disease cases whether in hospitals or clinics should be women practitioners where and whenever such practitioners are available. There is cumulative evidence that the clinics serve their purpose more fully where this is the case; at the Royal Free clinic the medical officers see many of the most dangerous type of prostitute and their ability to get these women into hostels must prevent a large amount of infection. It may be that there are not at the moment enough women with sufficient experience to warrant appointment to such clinics, but if the demand was present there is little doubt that this defect would soon be remedied.

THE Nobel Prize for Chemistry for 1929 has been divided between Prof. Arthur Harden, D.Sc., F.R.S., and Prof. Hans von Euler. Dr. Harden is head of the Biochemical Department at the Lister Institute and Professor of Biochemistry in the University of London. Prof. von Euler holds the chair of organic chemistry in the University of Stockholm and is well known for his work on enzymes and vitamins.

ON Wednesday, Nov. 27th, the Duchess of Atholl will lay the foundation-stone of the new London Clinic and Nursing Home at the top of Harley-street. The ceremony will take place at noon at the Devonshire-place entrance to the Clinic, and will be followed by a luncheon at 1 P.M. at the Trocadero Restaurant, Piccadilly.

HEALTH EXHIBITION IN LONDON.—Lord Askwith will open the New Health Society's second annual exhibition at 3 P.M. to-day, Friday, Nov. 15th, at the Royal Horticultural Hall, Westminster. The exhibition will be open daily from noon to 10 P.M. until Nov. 22nd.

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[1] Jahrb. f. Kinderh., 1929, cxxv., 100.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LII.

THE DIAGNOSIS OF ACUTE FOOD POISONING.

PART I.*—CAUSATION AND CLINICAL PROBLEMS.

A STUDENT of medical evidence given at inquests on deaths from food poisoning acquires the impression that the knowledge of this subject possessed by many practitioners lags behind the scientific data available. The more specialised bacteriological and public health aspects of food poisoning are of interest mainly to experts in these subjects, and only those clinical and pathological problems which present themselves to the medical practitioner need be discussed here.

A difficulty which occurs at the outset is that of defining what we mean by "acute food poisoning." The term itself is inaccurate, because in many cases we are dealing with food infections, the poisons being manufactured subsequently to ingestion. Yet if we adopt instead the term food infections we exclude definite types and must include such infectious diseases as enteric fever, paratyphoid fever, dysentery, and cholera. These are not generally understood by the expression acute food poisoning, and the term is reserved for acute illness caused by food, due either to introduced chemical substances, toxic bacterial products in the food, or to the ingestion of bacteria which produce in the alimentary tract products causing acute illness. This clearly is not a watertight definition, but covers generally what is meant by food poisoning and excludes the ordinary bacterial infectious diseases.

Causation.

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Clinical Problems.

Food poisoning being so ill-defined a condition it is evident that in some cases doubt must arise as to its diagnosis. Obviously, with a chemical agent the symptoms must vary with the nature of the chemical poison, which is sometimes highly unexpected. For instance, atropine poisoning has resulted from eating meat stuffed with herbs containing belladonna leaves. Most of these *chemical poisons* cause gastro-intestinal irritation, but usually have a shorter incubation period than the poisons of bacterial origin. *Botulism* has a quite peculiar symptomatology since the toxins act on the nervous system and not on the alimentary tract. Except as a transient initial phase diarrhœa and vomiting are absent, indeed constipation is usual. The characteristic symptoms are visual and eye disturbances, throat symptoms, and general muscular weakness; the temperature is generally subnormal. This type has the longest incubation period (18–36 hours as an average). In *Salmonella food poisoning* the brunt of the attack is on the alimentary tract, and acute diarrhœa, severe vomiting, and abdominal pain are almost invariably present, other less prominent symptoms being a rise in temperature, cramps, and subsequent prostration. When living bacilli are ingested the incubation period is often eight hours or longer. The type due to *Salmonella toxins* without living bacilli presents a very definite clinical picture. The incubation period is quite short (2–4 hours), the onset always acute. These gastro-intestinal symptoms are usually severe in type, more so than with living Salmonella bacilli, and are followed almost always by rapid recovery (24 hours or so), the only deaths being in the old, the very young, or those damaged by concurrent disease.

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* Part II., on Laboratory Investigations, will appear next week.

[1] See THE LANCET, August 10th, p. 279.

A suspicion of food poisoning may be easy or difficult to confirm. Diagnosis is easy when a number of persons in one household are affected with acute gastro-intestinal disturbance some time after eating a particular meal. The fact that some escape an attack, even if they all consume the same food, does not of necessity invalidate a food hypothesis. In many outbreaks some who have eaten the poisonous food escape. More complex and difficult of diagnosis is the occurrence of a number of cases exhibiting gastro-intestinal irritation symptoms, but irregularly distributed as regards time of occurrence, and not following or not definitely attributable to any particular meal or article of food eaten. Sometimes very detailed inquiry is necessary before it can be shown that some article is infected but perhaps eaten in the family under different conditions—i.e., cooked, stored, &c. A diagnosis has sometimes to be made from influenza of gastro-intestinal type.

A diagnosis of food poisoning may be difficult when a single case is involved. A person, for example, consumes a meal possibly containing articles often associated with food poisoning, and some hours subsequently is taken ill with diarrhœa and vomiting. The sufferer ascribes it to the food, and may then recollect, or more often thinks he recollects, that he noted something "not quite right" about it. Great caution has to be exercised before accepting such an association as one of cause and effect, and all other possible causation factors need to be considered. On several occasions I have known acute peritonitis from a perforated ulcer or other cause diagnosed as food poisoning. Very detailed inquiries should be made as to whether the suspected food was also eaten by other persons, and if they consumed it without harm. It is unlikely that a food consumed by several persons should make only one of them violently ill. An exceptional case is when the whole of one article is consumed by the sufferer, and then laboratory diagnosis is most valuable. For example, I investigated a single case of acute food poisoning caused by the consumption of a Cornish pasty on a railway station, proof being furnished by bacteriological investigation. Many of the single cases of botulism reported in U.S.A. have an interesting explanation. The person preparing the food, usually home-canned vegetables, notices a peculiar smell and tastes a few drops of the liquor; then recognising it is unsound she throws the rest away. The taster thus furnishes the only case.

WILLIAM G. SAVAGE, B.Sc., M.D. Lond.,
Medical Officer of Health for the County of Somerset.

Special Articles.

MEDICINE AND THE LAW.

Criminal Lunatics at Large.

THE Home Secretary was asked last week about the escape from Devizes Mental Hospital of a patient who had been transferred thither a year ago from Broadmoor Criminal Lunatic Asylum. He replied that the Home Office is not officially notified of such an escape; the patient, while under sentences for larceny and false pretences, was certified insane and removed to Broadmoor; when his sentence expired in October, 1928, he ceased to be a criminal lunatic, but, being still insane, was recertified under the ordinary lunacy law and received into the Devizes Hospital. The reference to the ordinary law seems to be to Section 7 of the Criminal Lunatics Act, 1884. When a criminal lunatic is about to be "absolutely discharged" (under Section 5 of the Act) or when his sentence is about to determine, then, if the fact is made to appear to a justice of the peace by notice from the superintendent of the asylum or the governor of the prison, and if "in the opinion of such superintendent or governor such person is insane and unfit to be at large," the justice is to examine the person and make inquiry with the aid of medical evidence and to order his detention as a lunatic if satisfied that the person is insane and ought to be detained under care and treatment.

It does not appear that criminal lunatics are let loose upon the public in large numbers or without adequate discrimination. The Criminal Statistics for 1927 (the last available) show that, of 10 inmates of Broadmoor whose sentences expired in the year under review, only 2 were set at large, the other 8 being ordered by a justice to be removed elsewhere. In the same period 14 were discharged conditionally and 3 cases were readmitted on revocation of conditional discharge. The corresponding figures for the county, county borough and district asylums are as follows:—56 persons were discharged absolutely on the expiration of their sentences; of these only 4 were set at large, one was ordered to be removed elsewhere, and 51 were ordered by a justice to remain in the asylum. The Broadmoor totals of receptions and discharges of criminal lunatics are roughly the same as those for the local asylums put together. Broadmoor received 66 in 1927 and discharged 59; the other asylums received 71 and discharged 63. The Broadmoor total of discharges, however, includes 33 deaths whereas only 2 deaths are recorded in the figures for the local authorities' asylums.

Passports and Kindness.

A medical practitioner was summoned at the North London Police-court on November 3rd for having unlawfully made untrue statements for the purpose of procuring a passport for two men named in the summons. A third man was summoned for aiding and abetting the offence. One of the preliminary steps towards the issue of a passport is that the applicant should produce a declaration in a printed form verified by a declaration made by a banker, mayor, magistrate, minister of religion, barrister-at-law, physician, surgeon, solicitor or other accepted person of official or professional status. The medical practitioner in the Islington case had signed a declaration stating that he had known the two applicants for two years and could vouch for them as fit and proper persons to receive passports. The truth, according to the representative of the Director of Public Prosecutions, was that the two men had been living for only a couple of days in apartments in Upper Rathbone-place. They mentioned to their landlady's husband that they wanted to obtain passports to go abroad; he took them to his doctor and asked him to sign their applications. The

The Clinical Interpretation of Aids to Diagnosis.

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LII.

THE DIAGNOSIS OF ACUTE FOOD POISONING.

PART I.*—CAUSATION AND CLINICAL PROBLEMS.

A STUDENT of medical evidence given at inquests on deaths from food poisoning acquires the impression that the knowledge of this subject possessed by many practitioners lags behind the scientific data available. The more specialised bacteriological and public health aspects of food poisoning are of interest mainly to experts in these subjects, and only those clinical and pathological problems which present themselves to the medical practitioner need be discussed here.

A difficulty which occurs at the outset is that of defining what we mean by "acute food poisoning." The term itself is inaccurate, because in many cases we are dealing with food infections, the poisons being manufactured subsequently to ingestion. Yet if we adopt instead the term food infections we exclude definite types and must include such infectious diseases as enteric fever, paratyphoid fever, dysentery, and cholera. These are not generally understood by the expression acute food poisoning, and the term is reserved for acute illness caused by food, due either to introduced chemical substances, toxic bacterial products in the food, or to the ingestion of bacteria which produce in the alimentary tract products causing acute illness. This clearly is not a watertight definition, but covers generally what is meant by food poisoning and excludes the ordinary bacterial infectious diseases.

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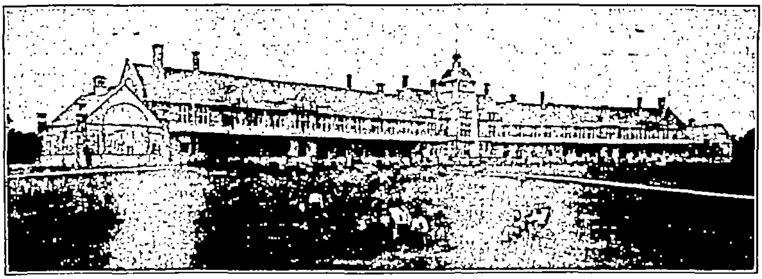
Although the Enabling Act was passed less than six months ago a considerable amount of work has already been carried out, and 150 cases of malignant disease have passed through the hospital. The radium for these cases has been obtained by loan from other hospitals and from private supplies owned by members of the staff. Much more must be available, and, as a beginning, half a gramme has been ordered for the hospital in the form of needles, and the first instalment has recently arrived. In order to carry out the work efficiently on 1500 patients per annum this supply will have to be augmented by 2½ grammes. For X ray treatment at least two sets will be necessary.



The long south frontage, with terrace and balconies.

Follow-up Department.—The results of treatment will be carefully recorded on special forms and diagrams and the patients seen at frequent intervals for years after treatment has ceased. In connexion with the follow-up department notes will be taken down in shorthand of every examination. The existing London section in Fitzroy-square will be the centre for diagnosis and for the follow-up examinations, and it is hoped that the railways may give special facilities of travel to the patients.

Medical Staff.

The members of the honorary medical and surgical staff who are remaining on the staff under the new conditions include Dr. J. F. Halls-Dally, Dr. R. Fielding-Ould, Mr. D. C. L. Fitzwilliams, Mr. C. E Shattock, Mr. P. J. Jory, Mr. H. Robinson, Dr. J. E. A. Lynham, Dr. Percy Hall, Dr. M. Weinbren, and Mr. J. G. Fernie. New appointments include Lady Barrett, Mr. Stanford Cade, Mr. Malcolm Donaldson, and Mr. Geoffrey Keynes.

A near view of the terrace.

The medical and laboratory investigations in the hospital are to be carried out by the staff acting as a *team*. The term of office of each member of the honorary staff is to be for one year only with eligibility for re-election, the term of office being entirely subordinate to the research interests. The members of the staff are not given proprietary rights over a definite number of beds, because it may be advisable from time to time to alter the proportion of admission of patients suffering from any particular type of cancer. The additional members of the medical staff appointed since the reorganisation of the hospital have been chosen from different hospitals because of their interest and experience in the radiological treatment of malignant disease. A whole-time pathologist will be appointed immediately and in the near future a physicist and a whole-time radiologist. It is also part of the original scheme that a medical director shall be appointed to lead the team and coördinate the work. This post would be an important whole-time one with security of tenure for several years.

It is hoped that keen research workers in cancer will gravitate to the hospital from all parts of the Empire. Clinical assistants will be appointed and courses of instruction in radiotherapy will be arranged.

Advisory Committee.

This committee is a new departure in hospital organisation and its duties may be summarised as follows: To advise the Council of Management upon the staffing of the hospital. To advise the Council of Management upon all medical and scientific matters. To suggest the forms of therapy and research which should be undertaken in the hospital.

The present members of this Advisory Committee are Dr. A. E. Barclay, Dr. G. E. Birkett, Dr. R. G. Canti, Prof. C. C. Choyce, Mr. W. D. Harmer, Prof. F. L. Hopwood, Sir Thomas Horder, Prof. E. H. Kettle. Mr. H. S. Souttar, and Sir Charles Gordon Watson, and other members will be coöpted shortly. Half the original members will retire at the end of three years, but in the future members of the Advisory Committee will have a tenure of office for four years, with eligibility for re-election after an interval of one year.

Accommodation and Equipment.

The hospital provides for 150 beds, and this accommodation should give a minimum turnover of 1500 patients per year. The building consists of:—

(a) Fourteen single-bed wards, ten 10-bed wards, two 18-bed wards.

(b) An operating theatre. A new theatre block to contain two complete operating suites is to be built.

(c) An X ray installation for diagnosis, which will be enlarged and brought up to date.

(d) A pathological laboratory. This will be used as temporary accommodation until the new block of research laboratories has been built.

(e) Various rooms and offices for the accommodation of the matron and resident staff.

(f) At either end of the main building are two very large rooms; one of these will be reconstructed to house the deep X ray therapy department, the other will be used for the officers of the follow-up department.

(g) A central hall.

There is a separate nurses' home and a block of buildings containing boilers, electric light plant, laundry, &c. On the west side of the hospital are the foundations of a new wing, which, when completed, will accommodate 100 additional beds, a proportion of which will be reserved for paying patients.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

New Departure in Scottish Research.

A NEW departure of the first importance has taken place in Scotland. A few years ago, when Major Elliot was Under Secretary of State for Scotland, an effort was made to get the official organisation for medical research onto a more satisfactory footing. One of the immediate results of this effort was the well-known experiment—financed by the Empire Marketing Board—on the value of milk as a food for school-children. The organisation established at the time will now be superseded by something much more comprehensive and better adapted to enable the Scottish departments, universities, colleges, and institutes to keep touch with each other and with the local authorities and to make medical and nutritional and related research a continuous accompaniment of administration.

Mr. Tom Johnston, the present Under Secretary of State, recently held a representative conference in Edinburgh. The object of the conference, he explained, was to set up a permanent liaison committee between research bodies and local authorities to see that the results secured by research institutions should be speedily made available to the public.

It is hoped that, at last, Scotland will receive her proportional official share in the work of the Medical Research Council and that the full functional use will be made of the official medical and general scientific staffs of the Departments to investigate the many problems that emerge in the course of health administration. The Departments are to be congratulated on the step taken by Mr. Johnston. The presence of Sir Walter Fletcher's name on the liaison committee, elected at the close of the meeting, indicates that the new development is a natural expansion of the working organisation of the Medical Research Council, of which he is secretary. The other members of the Committee are: Dr. J. P. Kinloch (Chief Medical Officer, Department of Health for Scotland); Dr. J. B. Orr (Director of the Rowett Research Institute, Aberdeen); Sir Robert Greig (Secretary of the Department of Agriculture for Scotland); Prof. T. P. Cathcart (Glasgow University and Hannah Dairy Research Institute); Prof. F. A. E. Crew (Edinburgh University, Animal Breeding Research Department); Dr. T. J. Mackie (Professor of Bacteriology, Edinburgh University); and Mr. John Jeffrey (Secretary of the Department of Health for Scotland). Dr. Kinloch is to be chairman of the Committee.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Irish Free State Medical Registration Council.

THE half-yearly session of the Irish Free State Medical Registration Council was held in the College of Science on Nov. 5th, 1929, the president, Dr. D. J. Coffey, presiding. The president made a statement, in the course of which he pointed out that the privileges of registration—the exclusive right of registered practitioners to give legal certificates, to claim fees in the courts, and to fill public medical appointments—had been in operation since May 20th, 1928. The Council, he said, cordially appreciated the fact that a large number of Irish-trained medical men permanently resident out of Ireland had manifested their interest in the establishment of the Register by taking the necessary steps to include their names.

Death of Dr. Frank Dunne.

Dr. Frank Dunne, of Dublin, died last week after a brief illness. He graduated as M.B. of the Royal University of Ireland in 1891, and was for many years visiting physician to the Consumptive Hospital of the Dublin Union, and also to the Allan A. Ryan Home for Consumptives. He was much interested in the treatment of tuberculosis, and did a considerable amount of work with Denys's tuberculin, which he brought before the notice of the profession in Ireland. During the war he joined the Royal Army Medical Corps, and served in Egypt for some years. He was a careful and observant physician, a man of wide general culture, and of great kindliness of character. His death is greatly regretted by his professional brethren, and also by his large class of sick poor whom he tended with skill and humanity.

Royal Academy of Medicine in Ireland.

The annual report of the Royal Academy of Medicine in Ireland for 1928–29, which was circulated a few days ago, shows a slight increase in the number of Fellows and Members, 258 compared with 245 in the previous session. Twenty-seven national meetings were held, with a total attendance of 1091, the largest number recorded for some years. The section of medicine showed the highest average attendance, the section of obstetrics coming next. The financial statement shows an improvement of a little over one hundred pounds on the year's working. The deaths of five Fellows are recorded—Mr. L. L. Cassidy, Dr. A. J. R. Dungan, Dr. W. A. Fogarty, Prof. T. E. Gordon, and Sir W. J. Thompson. Interesting biographical notices of these are supplied by the general secretary. There are 22 Honorary Fellows on the roll of the Academy.

Libel Action between Medical Men.

In the High Court, Dublin, last week, before Mr. Justice Hanne and a jury, Dr. H. V. McKeogh, of Killaloe, Co. Clare, sued Dr. P. J. Holmes, also of Killaloe, for alleged libel and malicious persecution. Dr. McKeogh had been prosecuted last year on a charge of attempted blackmail on the information of Dr. Holmes, the case ending in acquittal. The alleged libel had been contained in a letter written by Dr. Holmes to a solicitor acting for a third party. The jury found for the plaintiff in respect of both claims, assessing damages at £200 for libel, and £500 for malicious persecution.

The Robert Campbell Oration.

The Robert Campbell Oration for 1929 was delivered in the Medical Institute, Belfast, on Nov. 8th, by Prof. Andrew Fullerton. Mr. Howard Stevenson, President of the Ulster Medical Society, was in the chair, and was supported by Sir Thomas Houston. There was a large audience, widely representative of the medical profession in Ulster, and including Mrs. Robert Campbell and many of the late surgeon's intimate friends. After an eloquent and particularly apt appeciation of the late Mr. Campbell's life and work, the orator reviewed the progress of urology from ancient to modern times, paying a striking tribute to the work of Harry Fenwick in England and H. H. Young in America. An interesting series of lantern slides illustrated the lecture. A vote of thanks was proposed by Prof. Thomas Sinclair, seconded by Dr. James Moore, and carried with enthusiasm.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Congress of German Medical Historians.

THE German Medical History Society held its annual congress this year in Budapest. The occasion was taken to unveil a statue of Semmelweis built in the Elisabeth park in the centre of the city. Foreign speakers gave full recognition to the pious work done by Tibor Györy, professor of medical history at the University of Budapest, in collecting together the works of Semmelweis, and in throwing light on the question of the priority of his famous discovery.

Of the scientific communications to the Congress the most noteworthy was a lecture delivered by Prof. Sudhoff, the president, who described the results of his investigations into medical science as taught at the Arabian Toledo and Salamanca schools, and showed how this knowledge was linked with that developed in the Southern French and Italian universities. Among the other speakers Dr. I. Fischer (Vienna) exhibited a biography of Hippocrates, hand-written by Johannes Cuspinianus (1473–1529); Dr. Else Haberling (Düsseldorf) recalled the early methods of training midwives in Germany; Prof. W. Haberling (Düsseldorf) gave an account of horse riding, as a method of treatment popular in the classic age. Prof. Koch, of Frankfort, urged in his address the closer linking of medical history with medical training; L. Englert read a paper with the title "The Early History of Humoral Pathology"; and O. Temkin (Leipzig), lectured on Celsus and the Roman medical sciences.

In conjunction with the Congress a medico-historical exhibition was arranged by Joseph Ernyei in the Industrial Art Museum.

Articles by Doctors in the Lay Press.

The Press Committee of the Budapest Medical Association, having in mind recent publications on medical subjects in lay journals, warns all doctors that, though it is desirable that scientific instruction on matters of health shall appear in the daily papers, it is objectionable to exploit such articles for advertising purposes. The Ministry of Public Hygiene has shown the way to write such articles, by publishing serial notes dealing with the summer mortality of infants and the prophylactic measures designed to lower it. Caution in publishing scientific articles in the daily papers is advised, because such publications, particularly if the writer gives advice on treatment over his name, may bear the character of an advertisement. The Press Committee investigates all such articles and proposes in the future to deal rigorously with them according to the regulations of the Medical Association. Medical men are invited to submit their articles in the first place to the Press Committee, who will endeavour to place suitable manuscripts in respectable journals.

The Number of Practitioners in Hungary.

According to the latest statistical returns the number of medical practitioners in Hungary amounts to 6142, the ratio to the population being 1 : 1265. Almost half of the doctors reside in Budapest, so that the ratio in this city is 1 : 365, resulting in a keen struggle for existence, whereas there are over 2000 villages without a doctor. The number of medical students at the University of Budapest in the session 1928–29 was 1418, including 90 women, the number of students of pharmacy being only 213. The number of doctors qualifying during the year was 307; this is regarded as far too many, since the demand at present is almost nil.

The Ascertainment of Physical Defectives.

Mr. Eugen Pintér, member of the Chamber of Deputies, has proposed a scheme for the ascertainment of physical defectives, since it is the duty of the State to provide for their treatment and to educate them to be self-supporting, as well as to maintain those incapable of earning a living.

In order to obtain reliable statistics Dr. Michael Horváth, professor of orthopædics, will tour the country, and will give lectures to doctors, magistrates, and interested laymen. When the data have been collected the organisation of training centres will be undertaken. Institutions combining hospitals, schools, and workshops, staffed respectively by surgeons, teachers, and foremen, will have to be provided, but this will take time.

The work cannot be launched simultaneously through the country; Mr. Pintér suggests that the institutions first established should be in the vicinity of the four universities. The State can make a start by ascertainment but the organisation will require moral and material support from the whole community if it is to be a lasting success.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Medical Education and Registration.

THE proposal by Government for a grant of Rs.89,000 for the appointment of an officer of the Indian Medical Service to supervise medical education in India was vigorously opposed in the Assembly at its meeting on Sept. 25th. Discussion was still in progress when the House adjourned and the proposal is shelved until the Delhi session. The General Medical Council is bound to insist on a certain standard of proficiency before granting recognition of degrees granted in India—or anywhere else for that matter; if India consistently refuses to attain to this standard her degrees will, we fear, go unrecognised.

The Congress Party intends, we understand, to introduce in the next session of the Bengal Legislative Council a Bill to amend the Bengal Medical Act No. 6 of 1914 so as to "vest the Bengal Council of Medical Registration with wider powers and free it from Government control." One of the most important clauses in the proposed Bill aims at controlling the State Medical Faculty, the governing body of which is at present nominated entirely by Government.

A New Disease in Bombay.

Sixteen cases of a peculiar disease, the intimate nature of which has not yet been discovered, have appeared in Bombay since April last. Of these seven have proved fatal, and St. George's Hospital was closed for 11 days in September to allow of complete disinfection following the treatment of the cases. Subsequent events seem to have ruled out the possibility, suggested a few months ago, that we are dealing with examples of Dukes's "fourth disease," and opinion appears to be veering in the direction of a streptococcal infection similar in type to malignant scarlet fever. Research into the ætiology is in progress at the Haffkine Institute, Parel, but no definite conclusions have as yet been reached.

The Simla Municipality, at its meeting on Sept. 27th, discussed the question of medical inspection of passengers entering Simla, as a precautionary measure against the importation of infectious diseases. After a lengthy debate the committee decided to ask the

Punjab Government to set up permanent accommodation for a medical inspection staff at Tara Devi.

After a stormy career, Mr. Sarda's Child Marriage Bill, designed to prohibit the marriage of girls below the age of 14, was passed by the Assembly on Sept. 23rd by 67 votes to 14. Despite the fact that eight Moslem members protested against the Bill by walking out of the Chamber it is recognised on all sides that the measure is one of the greatest national importance.

Public Health Services.

SCHOOL MEDICAL SERVICE.

Name of district.	No. on roll.	Average elementary school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.†
Taunton ..	2784	2592	964	2571	16·0
Torquay ..	3841	3336	1264	5191	20·1
Dover.. ..	—*	5371	2028	3999	8·8
County of Cambridge	9770	8580	3573	6455	7·7

* Not given. † Excluding dental defects and uncleanliness.

Taunton.

THE borough has two features which, in some respects, tend to facilitate the work of caring for the children. It is the administrative centre for Somerset, and therefore use can be made of facilities provided by the county council; the county orthopædic clinic, for instance, is held in the school clinic at Taunton and is available for the infants and the school-children of the borough. A similar arrangement holds at the tuberculosis dispensary. Both the orthopædic and antituberculosis work are greatly aided by voluntary local agencies. Coördination of all the health services is complete, since Dr. John Allen combines the duties of medical officer of health and school medical officer, besides directing the work of the maternity and child welfare scheme. He deals with children employed in entertainments, and cites as examples of the need for careful supervision over these children, that one of their "matrons" considered it not unreasonable for these children to sleep in one bed, and another thought there was no objection to a boy of 14 sleeping in the same room as adult females. The small number of exceptional children makes it more difficult to provide special schools, and consequently there is none. Dr. Allen says there are 32 feeble-minded children attending ordinary schools where "they can obtain little or no benefit from the education provided," and that it would be greatly to their advantage if special classes could be arranged in two schools, with education suitable to their capacities. There would also seem to be a need for the provision of an open-air school as there are 34 "delicate" children and several others who could well attend these. At some other towns with but little larger numbers of children the open-air school is doing excellent work.

Torquay.

In his introduction to the detailed report on school medical work Dr. T. Dunlop remarks that the personnel of the staff is the same as in 1926–27, and that such continuity of service tends to greater efficiency in the work. Dr. J. V. A. Simpson has carried on the school duties for a succession of years and is also in charge of the maternity and child welfare centre, so that he sees the same individual as a baby, a school entrant, and as an older child about to leave school. Such continuity, in the double sense, is of special value in promoting what he obviously has at heart, the *steady inculcation of habits of health.* If, in the words of Matthew Arnold, "Education is an atmosphere, a discipline, a life," Dr. Simpson holds that the part which the school medical service plays in it "may be small, but it is important." The qualifying phrase seems to us unduly modest; this service is of immense importance, its greatest value lying not in its curative work, but in the education in hygiene which it carries out in coöperation with the teachers. Dr. Simpson himself admits this when he remarks that mothers get to appreciate the early signs of defect and come to the welfare centre because the elder brother or sister at school has been successfully treated. Again, when congratulating the authority on improvements in the hygiene of school buildings (largely as the result of his long and painstaking researches with the kata-thermometer), he emphasises its far-reaching significance, for not only does it react sharply on the health of the individual, but it is in itself an education for the pupils—a knowledge which will be applied later in their own homes. He is still more emphatic about the true use of an open-air school, which is to teach the child how to keep well by the observance and practice of a healthy way of life. It needs, he is satisfied, something more than a casual effort to ensure that a child has in all respects a sound general upbringing, but it is within the scope of human achievement.

Dover.

In his introduction Dr. A. B. McMaster says the publication, sanctioned by his committee, of the school report in one volume with that of the public health gives greater facilities for comparing the various sections of the work. The range of this work is especially wide in Dover, which is a town with the usual schools, a seaside resort, and a port with a military quarter. The maternity and child welfare work is being further developed, greater use being made of the beds provided at the Royal Victoria Hospital; the rate of maternal mortality is only 2·6 per 1000 this year. At the welfare centre 442 children were treated, and it is noteworthy that of 24 infants with ophthalmia, all retained unimpaired vision. The approval of the Ministry has been obtained for a scheme for orthopædic treatment of children under five, which will in time reduce the number to be dealt with at school age. The need for early treatment generally is illustrated by an analysis of 30 cases of convergent squint, which shows that in 14 the vision of the affected eye had become 6/60 or worse. Much useful work on refractive errors was again done at the ophthalmic clinic, when glasses were prescribed for 94 per cent. of those who attended, and of these 84 per cent. obtained them. Dental conditions appear to be generally good; attendance increased and extractions of permanent teeth diminished, while 38 per cent. of the children have sound teeth. "There is, unfortunately," writes Mr. F. Constant, L.D.S., "a small percentage of children with septic mouths, whose parents refuse year after year, despite appeals and interviews, to allow to be treated. To save these children suffering and perhaps permanent ill-health, it is a question whether some judicious pressure should not be brought to bear in the more serious of these cases." Dr. McMaster has used his influence against expenditure on a water-softening scheme, which as he shows is not necessary for health, and money is wisely being spent in other directions, such as the new school in Astor Avenue, which in many ways comes near to the ideal.

County of Cambridge.

Dr. F. Robinson's area is entirely rural in character, and this feature affects result sand methods in many directions. In rural areas the child population tends to be less physically defective than that in many of the towns, while ascertainment is carried out with greater difficulty; it is therefore not surprising that the percentage of defects found is much below the average for England as a whole. The travelling dental clinic, adopted early in this county, appears to be yielding good results; for example, the proportion of children found to need dental treatment in 1928 was only 40 per cent., compared with 65 per cent. in 1914. The percentage was even lower in 1922, and Mr. J. C. Evered, L.D.S., suggests an interesting explanation. The greatest crop of dental cases occurs at 7, so it would be especially the children born in 1915 who would affect the figures. Now whereas in central European countries the nutrition of the children suffered severely at that time, the opposite was the case in this country, perhaps on account of high wages and separation allowances. Hence it may be that better nutrition in infancy produced teeth more resistant to decay. In 1928 the percentage of refusals was lower by 1·7 per cent. than last year, an improvement to be attributed largely to the enlightenment of the parents, for which special efforts have been made at the welfare centre and the women's institute, good use being made of cinema films. In this type of area it is not surprising that the establishment of an orthopædic scheme will need an orthopædic surgeon to visit several local centres in turn, and an orthopædic nurse to travel about constantly. In country districts the new grouping of schools makes the provision of meals specially important, and a good account is given of plans to cope with the difficulty; special mention is made of what is done at the Bassingbourn Council School, where a good dinner is provided at a cost of 2½*d.* A few children whose nutritional state is so bad as to prejudice their education are sent to residential open-air schools. Owing to the scattered nature of the district no special nursery schools have been established. There has been a striking improvement in cleanliness, very satisfactory for a rural area; only 4 per cent. of the school-children were found to be not clean. There should, says Dr. Robinson, be a still further reduction in future years, as the girls grow to the age of motherhood who have become familiar with the problem through the scheme of school medical inspection. The same thought for coördination and continuity is evident in the lectures to mothers and in the extension of treatment of squint to the infants under the care of the health visitors.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 2ND, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 168 (last week 131); scarlet fever, 3487; diphtheria, 1748; enteric fever, 83; pneumonia, 979; puerperal fever, 42; puerperal pyrexia, 96; cerebro-spinal fever, 4; acute poliomyelitis, 20; acute polio-encephalitis, 4; encephalitis lethargica, 15; dysentery, 7; ophthalmia neonatorum, 108. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 5th–6th was as follows:—Small-pox, 178 under treatment, 8 under observation (last week 172 and 12 respectively); scarlet fever, 2763; diphtheria, 2587; enteric fever, 97; measles, 271; whooping-cough, 121; puerperal fever, 25 (plus 16 babies); encephalitis lethargica, 124; poliomyelitis, 9; "other diseases," 23. At St. Margaret's Hospital there were 12 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 7 (1) from enteric fever, 20 (4) from measles, 7 (0) from scarlet fever, 15 (1) from whooping-cough, 39 (6) from diphtheria, 102 (30) from diarrhœa and enteritis under two years, and 40 (9) from influenza. The figures in parentheses are those for London itself.

The deaths from enteric fever outside London were reported from Wood Green, West Bromwich, Grimsby, Wigan, Doncaster, and Newcastle-on-Tyne, 1 each. Liverpool still reports 11 deaths from diarrhœa, Manchester 8, Birmingham and Hull 5 each.

The number of stillbirths notified during the week was 252 (corresponding to a rate of 39 per 1000 births), including 38 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. J. Hamilton to be Surg. Lt.-Comdr.

The following appointments have been made:—Surg. Comdrs. W. W. D. Chilcott to *Emperor of India;* H. B. Parker to *Hawkins;* W. C. Carson to *Vulcan;* J. M. Horan to *Delhi;* M. S. Moore to *Lucia;* and G. B. Cockrem to *Vivid,* for R.N. Barracks, Devonport. Surg. Lt.-Comdr. (D.) R. J. M. Andrews to *Vivid,* for R.N. Barracks, Devonport. Surg. Lts.; C. Keating to *President,* for three months' post-graduate course; R. C. Foster to *Vivid,* for R.N. Hospital, Plymouth; R. H. Dummett to *Vivid,* for R.N. Barracks, Devonport; and J. B. Douglas to *Hawkins.*

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. W. Greaves to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Capts. to be Majs.: Bt. Maj. R. E. Barnsley, J. R. N. Warburton (and remains secd.), W. L. E. Reynolds, A. Mearns, A. E. Richmond, and T. B. H. Tabuteau.

TERRITORIAL FORCE.

Maj. T. H. Oliver resigns his commn.

Capt. O. G. Misquith to comd. 7th (Southern) Hygiene Co.

Capt. E. H. Mayhew, having attained the age limit, relinquishes his commn. and retains his rank.

Lts. J. Kerr and E. R. C. Walker to be Capts.

E. M. R. Frazer (late Offr. Cadet, Edinburgh Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

W. S. Stalker is granted a temporary commission as a Flight Lt.

Flying Offrs. Leo O'Connor, A. L. St. A. McClosky, and Ronald Thorpe are promoted to the rank of Flight Lts.

Flight Lt. (Acting Squadron Leader, Hon. Wing Commander) J. N. MacDonald is promoted to the acting rank of Wing Commander, with pay, whilst so employed.

Flying Offr. E. A. Wilson relinquishes his short service commission on account of ill-health.

Flying Offr. V. G. Pedley (Temp. Lt., General List, Army, Dental Surgeon) relinquishes his temporary commission in the R.A.F. on completion of service.

INDIAN MEDICAL SERVICE.

Lt. Thaku Chuharmal Ramchandani to be Capt. (prov.).

Lt.-Col. J. Forrest retires.

The undermentioned relinquish their temp. commns.: Temp. Capts. Hari Krishna Datta and Shiv Shanker Gupta, and Temp. Lt. Ellamana Siva Rama Menon.

COLONIAL MEDICAL SERVICES.

The following appointments were made during October: Dr. F. D. Gillespie, Dr. H. Scrimegeour, Dr. J. H. Strahan Dr. T. F. Strong, and Dr. S. N. Swift, Medical Officers, Federated Malay States; Dr. C. E. Hagenbach, Medical Officer, Malayan Medical Service; Dr. W. S. Smith, Medical Officer, Gold Coast; Dr. H. S. R. Broadbent, Medical Officer, Kenya; Dr. A. R. Cox, Medical Officer, Northern Rhodesia; Dr. Peaston, Medical Officer, Sierra Leone; Dr. D. Russell, Assistant Medical Superintendent, Mental Hospital, Singapore; Dr. J. J. Black, Dr. R. L. Hyder, and Dr. G. A. T. Jones, Medical Officers, Uganda; and Dr. R. Ramsay and Dr. P. B. Wilkinson, Medical Officers on the West African Medical Staff.

PRESENTATION TO A MEDICAL MAN.—Dr. Robert Fell, who has been the senior anæsthetist at the York County Hospital for 30 years and who has lately retired from the active staff, was entertained at dinner last week by his colleagues. Dr. W. A. Evelyn, senior physician to the hospital, was in the chair, and after dinner Dr. Fell was presented with a silver salver.

Correspondence.

"Audi alteram partem."

THE MEDICAL REGISTER.

To the Editor of THE LANCET.

SIR,—Voting papers in connexion with the election of Direct Representatives are being issued on Thursday, the 14th inst., to all practitioners having registered addresses in England and Wales. Any such practitioner who does not receive a voting paper, whether he wishes to vote in the election *or not*, should immediately communicate with the office in order to ascertain that his address is correctly entered in the Register.

I am, Sir, yours faithfully,
NORMAN C. KING,
Registrar, General Council of Medical Education and Registration of the United Kingdom.
44, Hallam-street, Portland-place, London, W., Nov. 12th, 1929.

VACCINATION OR INOCULATION AGAINST SMALL-POX?

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 2nd Dr. H. T. Gillett asks whether any experiments are being done on the production of immunity by killed vaccinia virus. In the same issue Dr. S. P. Bedson points out that I am conducting an investigation here into this question. This work has the approval and assistance of the Ministry of Health. My research is, at present, in its earliest experimental stage and few conclusions can be drawn from it. The majority of the experiments have been done on rabbits and have proved very discouraging but, recently, experiments with guinea-pigs have given more hopeful results. These findings are in accord with those of Iwanoff who also found guinea-pigs easier to immunise than rabbits.

With reference to your editorial comment upon Dr. Gillett's letter I cannot see that, should a method ever be evolved for protecting man against variola with killed virus, this would require a stock of real small-pox virus. The viruses of vaccinia and small-pox are immunologically identical and mutually protective, and the killed vaccine would be made from the former virus just as is the living vaccine in present use.

I would add to your list of virus infections from which a killed vaccine confers immunity yellow fever, against which both formolised and phenolised viruses are effective, and fowl-pox from which even a heat-killed virus provides immunity. The length of your list reinforced by my additions strongly suggests that the production of immunity by killed vaccinia virus only awaits the discovery of the correct technique.—I am, Sir, yours faithfully,

JOHN BLAND,
Freedom Research Fellow.
Hale Clinical Laboratory, London Hospital, E., Nov. 7th, 1929.

To the Editor of THE LANCET.

SIR,—The suggestive and valuable Observations on Vaccination by Dr. Bedson, and the letter from Dr. Gillett, both of which appeared in your issue of Nov. 2nd. indicate the need for the elaboration of a method of vaccination which will be devoid of the inconvenience unavoidably associated with the technique so far employed. At present we are engaged in an investigation of the question raised by Dr. Gillett—viz., the (possible) production of immunity against small-pox by inoculation of killed vaccinia virus. This work is being conducted on behalf of the Medical Research Council and is a natural corollary of our observations already published in Special Report Series No. 143 of that body.

The necessary preliminary to the production of immunity against small-pox is that it must be shown that the immunisation by vaccinia virus which has been rendered innocuous will protect against living vaccinia virus, and in this we have met with considerable success. One point must be stressed—namely, that if a living virus is used for immunising, only a small dose may be required, the immunity really being developed by reproduction in the tissues of the virus inoculated, whereas with a dead virus very much larger doses may be necessary. It is not possible to standardise a living virus unless in terms of infectivity for some laboratory animal—always an uncertain method—while it is not difficult to standardise, in the physical sense at least, the dose of the killed virus; on the other hand, such physical standardisation must be correlated with physiological activity.

Our observations are not yet sufficiently numerous to permit of a definite statement being made, but the indications so far obtained from our work are that a living virus, after modification in vitro without the employment of either antiseptics or heat, may fulfil the required conditions, these conditions being adequate protection unaccompanied by untoward local reactions or danger of post-vaccinal sequelæ.

We are, Sir, yours faithfully,
W. J. TULLOCH.
J. CRAIGIE.
Bacteriological Department, University College, Dundee, Nov. 5th, 1929.

THE CRAFT OF SURGERY.

To the Editor of THE LANCET.

SIR,—Though I have left the profession I have not lost my interest in medicine, and my experience in the war certainly increased this interest; I hope, therefore, I shall not be considered presumptuous if I say something about surgery, considered as a craft, and even make some suggestions. Surgery is a craft, a very skilled craft, requiring much natural ability and practice in its leaders, the surgeon being the principal craftsman in the medical profession, who is called on to act, when action is considered necessary. That he is much more than a craftsman hardly needs stating. The uses of surgery are increasing every day, and good surgeons are required all over the Empire; and no medical man out of touch with a large town can ever be exempt from being called on to operate; it is becoming more and more important that every medical student should be trained in the craft of his profession.

Is this craft constantly and systematically taught, for it certainly was not in my day? The surgeon's craft, owing to the fact that the work is done on living bodies, does not exactly correspond to any other, but it is closely allied to others. The instruments of surgery, though to-day very numerous, largely consist of forms of knives, saws, scissors, forceps, drills, chisels, files, hammers, screw-drivers, and needles and thread. These form in varying forms the tools of other crafts, such as carpentry, stone cutting, leather cutting and sewing, and upholstery. It would not therefore be very difficult to find masters to teach what may be called the fundamental use and upkeep of these tools, the pupil practising upon the various materials. I feel safe in saying that a course of stone cutting, even if it only consisted of lettering under, say, Mr. Eric Gill, the sculptor, would be useful to the future orthopædic surgeon. This constant practice of the hand would give a confidence to the young surgeon, which in my day he had to acquire chiefly on the living body, besides being a great relief from the reading of books. No one can cram up a craft, so that the good man would feel he could not fail in this part of his examination, while the poor craftsman would be told by his instructors that he had no chance. Even in the Final Fellowship Examination in the 'eighties, the test of skill in operating did not keep out the "butter fingers."

The born surgeon, though he probably would be the first to take advantage of this kind of instruction, can look after himself, for he can pick up what he wants anywhere; but there are not enough born surgeons to go round, and the more ordinary man must be taught the craft of surgery in exactly the same way as a carpenter or stone cutter is taught his particular craft, by learning the use of his tools under a good instructor. In one branch of medicine, dentistry, the necessity of high-class craftsmanship is well understood, and ingenious methods have been devised to teach the student the use of his hands. Dissecting would form a useful link between fundamental craftsmanship and operating first on the dead then on the living.

We are not naturally accurate, we make ourselves accurate because necessity drives us. A painter, if he is an artist, will always try to express himself before he knows anything of the craft of painting; he will force himself to learn to draw and paint, because he finds out the necessity. Perhaps my only valid excuse for daring to write this letter is that I have practised and instructed in two callings, both of which, for their fullest expression, require such infinite labour from the apprentice.

I am, Sir, yours faithfully,
HENRY TONKS.

Slade School of Fine Art, University College, Gower-street, W.C., Nov. 11th, 1929.

BROWN *v.* WHITE BREAD.

To the Editor of THE LANCET.

SIR,—Hartwell and Mottram found that their mice did not do well on an "Essex" diet, that is, a diet based on one which Dr. A. B. Hill found to be an average one for Essex agricultural labourers and their families. Miss Brad and I have been inbreeding a stock of mice for six years and we have found the mice do very well and breed very well on an Essex diet. Our diet consists of meat, 5·8; potatoes, 28·2; greens or peas or beans, 6·2; cheese, 0·8; tangerine, 2·8; sugar, 5·4; rolled oats, 0·8; milk, 8·3; white bread, 41·7. The food is got as cooked for our canteen lunch and is crumbled, shredded, and mixed together, and then minced. No water is added. We have come to regard this diet as excellent for producing fine-looking and well-breeding mice, better than what we call our "mild" diet, three kinds of grain and raw green stuff.

I am, Sir, yours faithfully,
Nov. 9th, 1929. LEONARD HILL.

INTERPRETATION OF FERTILITY TESTS.

To the Editor of THE LANCET.

SIR,—May I make two observations upon the excellent article in your Clinical Interpretation Series by Mr. Kenneth Walker last week. Incompatibility or relative fertility is often due to lack of sexual orgasm in the female with a certain male partner. Women respond with varying intensity to different males, and consequently there is a variation in quantity and quality of their sexual secretions during intercourse. This also explains why a woman will often infect one man with gonorrhœa and not others. In other words she suffers from a type of impotency.

The second point is of great medico-legal importance, particularly in cases of disputed paternity. Mr. Walker quotes the numerical calculations of spermatozoa by Comber and Sanders, and points out that conception very rarely took place when the figure was below 60 million. I would suggest some other factor was operating. Bearing in mind that usually only one spermatozoon penetrates an ovum, and that simply spraying the vulva with semen has caused pregnancy, I at least would hesitate to give a negative reply unless I found 60 million in a specimen.

I am, Sir, yours faithfully,
Harley-street, W., Nov. 9th, 1929. M. W. BROWDY.

THE HEALTH AND CONDITIONS OF WORK OF MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—Mr. Corner cannot, I think, have paid me the compliment of reading my paper, for he entirely misinterprets its purpose.

As Mr. Corner seems under a misapprehension with regard to the object of my address, which was to consider the health and mortality, not the careers, of medical students, I cannot but be doubtful as to whether the papers that he cites, his own and one by Sir Squire Sprigge, would have helped me materially. When I wrote asking for information on my subject, the Dean of St. Thomas's Hospital did not mention Mr. Corner's paper, which Mr. Corner tells me was published in the *St. Thomas's Hospital Gazette*. The Dean of St. George's Hospital similarly did not refer me to Sir Squire Sprigge's contribution regarding St. George's students. Clearly these authorities, who were in a better position than I was to be familiar with the articles referred to—*St. Thomas's Hospital Gazette* is little read outside St. Thomas's—did not regard them as being pertinent to my inquiry.

I am, Sir, yours faithfully,
E. GRAHAM LITTLE.

House of Commons, S.W., Nov. 12th, 1929.

THE DIAGNOSIS OF LARYNGEAL CANCER.

To the Editor of THE LANCET.

SIR,—Mr. Layton has evaded my question as to why my cases illustrated by lantern slides of microscopical sections "afforded a strong argument against biopsies." The cases illustrated the correction of erroneous clinical diagnoses by means of the microscopical examination of portions of tissue removed for the purpose. The assurance afforded by the unmistakable evidence of the microscope led to the prompt adoption of energetic treatment and the preservation of lives which would otherwise have inevitably been lost. Mr. Layton may have justification for his objection to microscopical biopsies, but surely not founded on those cases.

I am, Sir, yours faithfully,
London, Nov. 11th, 1929. JAMES DUNDAS-GRANT.

AVERTIN ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—I hope you will allow me to draw attention to some errors and omissions in your report of my paper on Avertin (THE LANCET, Nov. 9th, p. 979). Firstly, when speaking of the strengths of the solutions used I tried to make it clear that it is the manufacturers who now recommend a 2·5 per cent. in preference to a 3 per cent. solution on the grounds that absorption from a 2·5 per cent solution is more even and gradual but that I preferred the stronger solution for children as the smaller quantity of fluid to be injected is more readily retained by them. Secondly, the sentence beginning "fatal cases" misrepresents me, for only one death occurred in my series of 100 administrations, and I gave reasons for my belief that avertin was not responsible.

The omissions are more serious; no mention is made of the importance of testing the solution for impurities before injection, although this was emphasised. Again, no mention is made of the need for care in dosage, although a considerable part of my paper was devoted to the discussion of this essential; the result is that I am reported as saying that avertin is "a safe means of induction," whereas my statement was that it is safe if used in the doses recommended by Prof. Eichholtz.

I am, Sir, yours faithfully,
FRANCIS SHIPWAY.

York-terrace, N.W., Nov. 8th, 1929.

GENERAL MEDICAL COUNCIL ELECTION.

To the Editor of THE LANCET.

SIR,—Will you grant me the courtesy of your columns to convey to the Registered Medical Practitioners of Scotland my thanks for the renewed expression of their confidence. I shall do my best to deserve it.

I am, Sir, yours faithfully,
Edinburgh, Nov. 11th, 1929. NORMAN WALKER.

ELECTRICAL TREATMENTS IN ACUTE CONDITIONS.

To the Editor of THE LANCET.

SIR,—It is a matter for regret that most electrotherapeutists find difficulty in expressing their thoughts in recognised technical terms, and that they disregard directly appreciable or simple phenomena while in search of explanations for others. The lure of the fantastic seems to divert them from more widely accepted and plausible theories.

On reading Dr. Heald's article in your last issue (p. 974) I could not help feeling shocked at some of his statements and I am loth to let them pass unchallenged. It seems to me that, in a number of ways, the writer of the article on "Electrical Treatments in Acute Conditions" has confused causes and effects. He states that diathermy current is closely allied to the wireless wave. This is true inasmuch as a diathermy machine under requisite conditions may be made to emit electromagnetic waves of the wave-length employed in wireless. Rapidly oscillating electric fields can be made to cause ethereal disturbances and well-tuned circuits will convert these back to oscillating currents; but when diathermy apparatus is employed for electrotherapeutic purposes, the machine is used to create, in the patient's tissues, a rapidly oscillating field. It is conceivable that a small portion of electrical energy is converted into radiant energy of wireless wave-length, but it is doubtful whether those could be reconverted into electrical energy.

That heat is produced in this field is unquestionable, and that a number of phenomena attend this increase of temperature in the living tissues submitted to it cannot be doubted. All changes capable of being accelerated, whether physical, chemical, or biological, are accelerated by an increase of temperature. The viscosity of fluids is lowered, cellular activity is stimulated, and defensive processes, such as phagocytosis, antibody formation, bactericidal power, enzyme actions, &c., which generally have an optimum temperature above the normal body temperature, are stimulated. Why in the face of the extraordinary versatility of this physical agent, heat, should it be necessary to elaborate the fantastic theories which I take the liberty to quote:—

> "It has long been taught that diathermy acts only by heat, and has no specific action due to its wave-length. The very name of diathermy supports this theory. As I have said, however, diathermy currents are practically identical with ordinary wireless waves (one machine I have has a wave-length of 365 metres). This current, therefore, does not primarily belong to the heat, or infra-red, portion of the *ether scale*, but it does make itself manifest as heat after it has been *absorbed*, and to appear as such these waves must have first been absorbed and then changed to *heat waves*" (italics mine).

As it is not usual to classify currents among the electromagnetic waves or for them to be "absorbed," the last sentence is quite incoherent. Nor is it easy to understand the relevance of the sentence in brackets. Perhaps adequate understanding of such terms as "ether scale" and "heat waves" or the possibility of including oscillating currents among forms of radiant energy offer the clue to this. It matters little whether the body tissues act as a resistance to the current, or partly as leaky condensers, or whether actual ionic displacement takes place as opposed to pure electronic motion. I cannot help feeling that it is far more satisfactory to interpret the beneficial action of diathermy as the result of accelerated physiological activity following an increase of temperature.

In another paragraph Dr. Heald talks of "heat waves" given out by hot-water bottles and fomentations, and argues that diathermy currents differ from these in that "their initial structure is such that they can pass through all kinds of tissues whether conducting or non-conducting, and where they meet relatively poorly conducting tissues, such as bone, their change into heat waves is more rapid than in such vascular structures as muscles." Here one has great difficulty in making out whether he is talking of the wireless waves, supposed to be produced by the oscillating currents, or the current itself. If one was meant to understand the former, I venture to say that the different resistances of tissues would have very little influence on the amount of heat produced, unless some obscure phenomenon of cellular resonance were to interfere. To advance theories on this subject, without further evidence of this occurring, would be speculating and inviting further criticism. On the other hand, if Dr. Heald means that diathermy currents produce more heat in bones than in other tissues, he is right, always providing he does not give the current an alternative path of less resistance.

I am, Sir, yours faithfully,
Wimpole-street, W., Nov. 11th, 1929. PH. BAUWENS.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

ACCIDENTS IN MINES.

IN the House of Commons on Nov. 6th Mr. GORDON MACDONALD moved:

> "That this House deplores the heavy loss of life and the large number of non-fatal accidents in coal mines, and is of opinion that every possible step should be taken without delay to secure the fullest protection possible to those engaged in this dangerous industry."

He said that in the two years preceding the extension of working hours the rate per 1000 of fatal accidents was 1·11 in 1924 and 1·15 in 1925. In 1927—the year after the Eight Hours Act was passed—the figure was 1·25 and in 1928 it was 1·18. That showed that the Government had made things worse as regarded the number of accidents. The only hope of dealing effectively with the matter was to reduce the working day to the point at which it stood before the passing of the Eight Hours Act. In 1924 the non-fatal accidents numbered 11,937; in 1925 they were 10,622. The rate per 1000 worked out for 1924 at 158·8 and for 1925 159·3. In the two years immediately following the total was 9338 and 8347 respectively and the rates per thousand were 167·2 and 170. Between 1925 and 1928 there had been an increase of 11 per 1000 in non-serious accidents, and the same applied to serious accidents. He did not say that the increase per 1000 in the number of accidents was a direct result of the eight hours working day, but he suggested that the increased working hours was a matter which should be carefully examined in this connexion. Apart from the injuries to the body of miners caused by accidents they had to deal with the very serious menace known as nystagmus. At present there were 9775 men in this country suffering from that disease, which endangered the physical and nervous strength of every sufferer. It was about time that something was done in regard to these men. When they made a slight recovery and were able to do some light work they found themselves faced with total unemployment. The bulk of the regulations governing the life of miners to-day were made in 1911. Since that date mining life, especially underground, had been revolutionised as a result of the introduction of mechanism. The Government might consider seriously taking legislative action to deal with the situation. They might, if necessary, appoint a committee of inquiry for the purpose of consolidating all the statutory orders since 1911 and then produce an up-to-date Mines Regulation Act.

Mr. ROWSON seconded the motion.

Dr. ETHEL BENTHAM said there was no doubt about the enormous incidence of accidents, both fatal and otherwise, on the mining community. She was not an expert in the management of mines, but she had found during her fairly long experience that in many trades piece rates were responsible, not only for accidents, but for ill-health among the workers as well as for a great deal of indifferent work. The workers in every trade with which she was conversant—and she knew a good deal about the conditions in many of them—always said that accidents occurred late in the working day. They ought to consider very carefully the effects of over-long hours in such a laborious, difficult and dangerous trade as mining. She thought that most members of the medical profession—she could not speak for the whole—agreed that it was the posture and the lighting conjointly which were the cause of nystagmus, and it seemed to her that it would be possible by concerted action to get really disinterested evidence on that matter and to take measures to put an end to a disease which was quite preventable if they were ready to consider the lives of men, women and children, and the national advantage of good health instead of the narrow financial aspect of the matter which precluded sufficient money being spent on the prevention of the disease and on experiments with a view to such prevention.

The Government's Reply.

Mr. BEN TURNER, Secretary for the Mines Department, replying for the Government, said that the recorded accidents in 1928 were less than in the years before, but he had no such comfort to offer for this year. Up to 1929 the numbers were the lowest since 1860, but during the first nine months of this year they had gone back to the old rate of over 1000 persons killed each year. It was also certain that there were many unrecorded accidents. It was true that the death-rate in our pits was less than in America and Germany. That, however, was little comfort to those who lost their breadwinner, and all parties in the State were anxious, if possible, to assist in the reduction of these accidents. He wondered sometimes if the unsettled economic and other conditions in the coalfields had added to the heavy loss of life and limb. He was quite certain that there had been no slackness in the Mines Department with regard to protective measures. The rate, however, was so terrible that every effort must be made to bring about a great reduction. The present strength of the mining inspectorate was 106, including eight special inspectors who devoted the whole of their time to the inspection of pit ponies. The number of mines in 1922 was 2911 and the employees 1,163,754. Last year the number of mines was 2530 and the number of employees 951,000. In 1922 the number of inspections was 18,911; last year it was 21,718. The average number of inspections of every mine per year was 7·2 underground and 1·5 on the surface. He was certain that the new electrical development in mines called for more skilled electrical inspectors. Since 1912, when 600,000 horse power was being applied to pits, the amount had grown to 1,750,000 horse power. There was a great risk in the use of this new agency, and it required attention. To relieve the situation he hoped to appoint four additional electrical inspectors of mines. The difficulties in the way of revising legislation for the mines were twofold. In the first place, the various sections of the industry were all too preoccupied with labour and economic conditions to give it the detailed attention and constructive criticism which the Department needed. In the second place, the Government were so fully occupied with prospective legislation in this and other matters that it was impossible to overcome delay. In connexion with the code of regulations for first-aid and ambulance work he thought that delay had been caused by the procedure which was not as speedy as it should be. The practice had been to send the draft regulations to the Mining Association; then they came back to the Department, which sent them to the Miners' Federation. He saw no reason why the two sides of the industry should not meet and decide upon the best regulations instead of passing a draft backwards and forwards as had been done hitherto. Many accidents could be avoided with more care and expenditure—care on the part of the management, the officials and the men, and expenditure on the part of the owners. Accidents arising from falls of roof and from haulage were the heaviest in each week's return, and this had caused the Mines Department, through the Mines Research Board, to appoint a highly qualified specialist to organise and superintend further experimental work on these subjects and generally to assist the Safety in Mines Research Board in regard to the important mechanical problems in mines. The Department was doing much in the direction of propaganda. He hoped also that science would succeed in producing a lamp giving a safe light with a bigger candle power, which would preserve the miner's eyesight and help to make his production better. In conclusion Mr. Turner assured the House that all the suggestions put forward in the debate would receive careful consideration with a view to the promotion of safety and comfort for men in the coal pits.

The motion was agreed to.

HOUSING BILL.

On Monday, Nov. 11th, Sir R. GOWER presented a Bill to make better provision for the improvement of unhealthy areas; to provide adequate compensation for business disturbance; and to make certain consequential amendments to the Housing Act, 1925.

ILLEGITIMATE CHILDREN IN SCOTLAND.

On Nov. 12th the Duchess of ATHOLL obtained leave to bring in a Bill to amend the law regarding the duration and recovery of aliment for, and the custody of, illegitimate children in Scotland. She explained that the Bill would make the father liable for aliment until the child was 16. The mother was also given power to make application for the expenses of her confinement as well as for aliment within three months of her expected confinement, although if the case were defended by the father the decree could not become operative until after the birth of the child.

Among the backers of the Bill was Major ELLIOT.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 6TH.

Rheumatic Diseases and Pulmonary Tuberculosis in the Navy.

Dr. VERNON DAVIES asked the First Lord of the Admiralty if he was aware that in 1927, out of a total of 20 men invalided for rheumatic fever, 17 had served for less than two years and that out of a total of 79 men invalided for organic heart disease 40 had served for less than two years; and if he could offer any explanation for this high incidence of rheumatic diseases.—Mr. ALEXANDER replied: The answer to the first part of the question is in the affirmative. It is not considered that the incidence of rheumatic diseases is unduly high when consideration is given to the early age at which recruits are received into the Navy.

Dr. VERNON DAVIES also asked how many of the 159 men invalided from the Service in 1927 for pulmonary tuberculosis were granted disability pensions; in how many cases was the disease held to be attributable to the conditions of service; and how these numbers compared with those of the previous three years, expressed as a percentage of the number pensioned to the total number of cases.—Mr. ALEXANDER replied: The number of men invalided in 1927 for tuberculosis was 180, and pensions on the attributable scale were granted in 18 cases, or 10 per cent. of the total. This compares with 3 per cent. in 1926, 1 per cent. in 1925, and 3 per cent. in 1924. In a considerable number of cases pensions on the non-attributable scale were granted where the men had sufficient service to qualify.

Dr. DAVIES: Will the right hon. gentleman observe that the percentage of pensions granted has increased rapidly this year, possibly to the too great restrictions on previous years, and would he be prepared to look over some of the back cases to see if the present conditions on which pensions are granted are applicable to cases which have been previously refused.

Mr. ALEXANDER: I shall be glad to consider any representations of a specific character made to me. It is obviously difficult to go back on decisions which have been made under regulations which existed at that time, but I will consider it.

Mr. HORE-BELISHA: While the figures show an improvement under the revised rules, is not the necessity for an appeal tribunal still apparent?

Mr. ALEXANDER: As far as I have been able to look into the matter there is a considerable improvement in the method in which these cases are dealt with, but I have had no strong case put to me yet for an appeal tribunal, and, in fact, I am not at all sure that in the regular Service cases an appeal tribunal would always be to the advantage of the men. I hope that the hon. Member will consider that.

Vaccination of Naval Personnel.

Mr. MOSES asked the First Lord of the Admiralty how long it had been the practice to carry out quinquennial revaccination, as necessary of all personnel in the Navy; whether such revaccinations were compulsory; and whether he proposed to make any changes in the Navy regulations relating to the vaccination of naval recruits and dockyard apprentices under the age of 19 years who had not previously been vaccinated, in view of recent cases among the civil population of post-vaccinal encephalitis.—Mr. ALEXANDER replied: It has been the practice to carry out quinquennial revaccination of personnel of the Royal Navy when going abroad, for many years. An order was [illegible] on Sept. 7th, 1928, that revaccination of active [illegible] personnel should be carried out every five years (A[illegible] Fleet Order, 2210/28). No punishment or [illegible] incurred for declining revaccination on cons[illegible] other grounds, but precautions are taken to pr[illegible] revaccinated from becoming a danger to the Service by landing in ports where there is danger of contracting small-pox (King's Regulations and Admiralty Instructions 1417/12). It is not proposed at present to make any changes in the Navy regulations relating to the vaccination of Naval recruits, in view of the fact that these young men are likely to be exposed to the danger of infection by the severe Oriental type of small-pox as soon as they go to sea. The regulations relating to the vaccination of dockyard apprentices are under consideration.

Civil Service and Scientific Research.

Lieut.-Colonel Fremantle asked the Prime Minister if it was the intention of H.M. Government, in appointing the Royal Commission on the Civil Services, to review the status and functions of the large body of scientific and technical experts engaged in the Civil Services, with a view to the furtherance of scientific knowledge, methods, and research of those services; and if, seeing that there was no representative of science nor anyone engaged in the application of science to the needs of the community, he would consider the addition to the Royal Commission of a due proportion of such representatives.—Mr. Snowden, Chancellor of the Exchequer, replied: The Royal Commission has been appointed to inquire into and report on the structure and organisation of the Civil Service, conditions of employment of Civil Servants, and conditions of retirement from the Civil Service. Its terms of reference have been widely drawn and it will be for the Commission itself to determine the extent to which the various subjects within the scope of the reference can profitably be reviewed. I am satisfied that the Commission as now constituted is well adapted to the purposes of the inquiry and I am not prepared to enlarge its numbers.

Colonial Veterinary Scholarships.

Mr. Ormsby-Gore asked the Under-Secretary for the Colonies whether the proposed school of tropical veterinary medicine, recommended by Lord Lovat's Committee, would now be established; and what steps were being taken to improve the recruitment and training of veterinary officers for service under Colonial Governments.—Mr. Lunn, Parliamentary Under-Secretary for the Colonies, replied: A decision on the recommendation of Lord Lovat's Committee on the Colonial Veterinary Services for the establishment of a school of tropical veterinary science was deferred until the Report of the Departmental Committee on the reconstruction of the Royal Veterinary College at Camden Town was available. This report has now been issued, and the question will be further considered in the light of the recommendations contained in it. It is hoped that it will be possible to bring the proposed Colonial Veterinary Scholarship Scheme into operation next year. All the Colonial Governments which were asked to contribute towards the expenditure involved have agreed to do so, and the Colonial Development Advisory Committee are now considering an application for a grant from the Colonial Development Fund to meet the one-third of the annual cost of the scholarships which was the portion that Lord Lovat's Committee recommended should be provided from United Kingdom funds.

Motorists and Third-party Insurance.

Sir Gervais Rentoul asked the Minister of Transport whether he was prepared to introduce legislation for the compulsory third-party insurance of all motor vehicles.—Mr. Herbert Morrison replied: The desirability of requiring that the driver of a motor vehicle should obtain cover against any legal liability that may attach to him in respect of the death of, or bodily injury to, another person will be most carefully borne in mind in connexion with any Road Traffic Bill which I may be in a position to present to Parliament.

Stationary Cars and Road Accidents.

Sir Alfred Knox asked the Minister of Transport if he would, in order to prevent a frequent cause of accidents, insert in the Transport Bill the provision that cars drawing up at the side of the road after lighting-up time must be pointed in the same direction as the traffic on that side.—Mr. H. Morrison replied: I have under consideration the inclusion in any legislation that may be introduced to deal with road traffic of a provision making it an offence to leave a motor vehicle in a position dangerous to other traffic using the road. In the case of a well-lighted street a general provision of the nature suggested by the hon. Member might cause unnecessary inconvenience, and even danger, owing to the necessity of reversing vehicles in order that they might point in the proper direction.

Proposed Extension of Milk and Dairies Order.

Mr. Lawther asked the Minister of Health if he would take the necessary steps to extend the Milk and Dairies Order, 1926, to the housing of calves and young cattle, as it was held that this might help towards preventing the spread of tuberculosis.—Miss Lawrence, Parliamentary Secretary to the Ministry of Health, replied: Although my right hon. friend agrees as to the importance of the proper housing of calves and young cattle, it seems to him that the safeguarding of the health of such animals is too remote from the objects of the Milk and Dairies Order to justify him in extending the provisions of that Order in the manner suggested.

Insurance Committees and Health Lectures.

Dr. Morgan asked the Minister of Health how many insurance committees had taken advantage of the provisions of the National Health Insurance Acts and instituted lectures on health and disease prevention for the insured persons in their district; how many such lectures had been given this year and at what cost; and whether any steps were proposed to remind insurance committees of their obligations in this respect.—Mr. Greenwood replied: I am not in possession of any precise figures on the points raised in the first two parts of the question; but I am aware that certain committees have undertaken work of this character. It is not obligatory upon committees to do so, and I think they are already fully acquainted with their statutory powers.

Care and Management of Infants.

Dr. Hastings asked the Minister of Health whether he would consider the presentation of a booklet through the local authorities on the care and management of infants to the parents of every child at the time that its birth was registered.—Mr. Greenwood replied: It is the common practice for local authorities to arrange for the distribution of booklets of this kind to parents by health visitors and at infant welfare centres, and I do not therefore consider it necessary to take the action suggested by my hon. friend.

Leaflets on Treatment of Disease.

Dr. Hastings asked the Minister of Health whether his attention had been called to the amount of disease which was preventable or readily curable if treated in its earliest stages; and whether he would consider the advisability of the provision of leaflets dealing with human disease, similar in nature to the leaflets provided by the Ministry of Agriculture regarding the diseases of animals and plants.—Mr. Greenwood replied: I am aware of the facts referred to in the first part of the question. My Department have, from time to time, issued memoranda dealing with the prevention and treatment of various diseases, and further memoranda of the same character will be issued as occasion requires. These memoranda are on sale to the public, but they are primarily designed for the information of local authorities and their officers, and in some cases may conveniently form the basis for the popular leaflets or public announcements issued by such authorities.

Vacancies for Colonial Veterinary Officers.

Mr. Ormsby-Gore asked the Under-Secretary of State for the Colonies if he would state how many unfilled vacancies now existed for veterinary officers and veterinary research officers in the Colonies, Protectorates, and Mandated Territories.—Mr. Lunn replied: Apart from the consequential vacancies which will be caused by promotions now under consideration there exists at the present time one vacancy for a veterinary officer.

Pensions of Indian Medical Officers.

Mr. Wedgwood Benn, Secretary of State for India, in reply to Major Graham Pole, stated that the number of officers of the Indian Medical Service who drew pensions through the India Office chargeable to Indian revenues during the year ended March 31st, 1929, was 551, and the amount paid during the year in respect of these pensions was £310,960.

THURSDAY, NOV. 7TH.

Cancer among Industrial Workers.

Mr. Philip Oliver asked the Home Secretary whether he had yet been able to take any and, if so, what steps to facilitate the investigation at present being carried out by the London Cancer Hospital into the incidence of the disease of cancer of the bladder among workers in aniline factories.—Mr. Clynes replied: Yes, Sir. I am arranging for the coöperation of the Medical Inspectorate of the Factory Department in the investigation of the industrial history of cases of this disease; and I am also consulting the Registrar-General on the question of facilitating the supply of the statistical information required.

Escape of a Mental Patient.

Mr. Lang asked the Home Secretary if his attention had been drawn to the escape from Devizes Mental Hospital of a patient named Littleton Watson; if he was aware that this patient was transferred to Devizes from Broadmoor criminal lunatic asylum a year ago; and if he would state the conditions under which such transfers were made.—Mr. Clynes replied: I have seen a newspaper report. The escape of a patient who is not a criminal lunatic would not be reported officially to me. The patient in question, while under sentences for stealing and false pretences, was certified insane and removed to Broadmoor, as a criminal lunatic. When his sentences expired in October, 1928, he ceased to be a criminal lunatic; but as he was still insane, he was recertified under the ordinary lunacy law and received into the Devizes Mental Hospital. This is the course prescribed by statute.

Experiments on Living Animals.

Mr. Freeman asked the Home Secretary if he would give instructions that a record be kept of the kind of animals used for each experiment in vivisection, the total period during which each animal was experimented upon, and the actual time during which it suffered any kind of pain; and that this information be published in future reports.—Mr. Clynes replied: No, Sir. I do not think that the information suggested, even if it were obtainable, would serve any useful purpose. So far as the question of pain is concerned, I would remind my hon. friend that stringent conditions are imposed in all cases in which the experiment is performed without anæsthesia or the animal is allowed to come out of the anæsthesia.

Health Conditions in Artificial Silk Works.

Mr. Kelly asked the Home Secretary what action had been taken to improve the health conditions in the spinning rooms of artificial silk factories, particularly in the matter of eye injury and lung trouble; and if any prosecution had taken place against firms in this industry during the last six months.—Mr. Clynes replied: The matter has continued to receive the close attention of the inspectorate, and the further conference which I mentioned in my reply to my hon. friend on July 25th last was held last month. It was agreed that the remedy for the special trouble arising in the spinning rooms is to secure efficient ventilation, and the inspectors and occupiers are concentrating on this. In many cases improvements have been effected with beneficial results. The conditions in all these works will continue to receive close supervision. One prosecution has taken place during the last six months, the offences being failure to ventilate the churns and failure to notify cases of poisoning by carbon bisulphide. Substantial penalties were imposed.

Supply of Milk at Maternity Centres.

Mr. Fison asked the Minister of Health whether any applications had been made by local authorities for approval of additional expenditure for providing increased allowances for milk at maternity centres; whether such applications had been granted; and what was the amount of such additional expenditure approved.—Mr. Greenwood replied: Sixteen such applications have been received since June last up to the present date, of which ten have been wholly granted and one in part. The remaining five applications are under consideration. The additional expenditure already approved amounts to £1513, while the total amount under consideration is £1973.

Nursery Schools.

Dr. Hastings asked the President of the Board of Education how many of the 20 existing and 15 contemplated nursery schools were open-air schools; and whether he proposed to sanction any further nursery schools not of the open-air type.—Sir Charles Trevelyan replied: Of the 29 existing nursery schools, 28 are open-air schools and nearly all the others have good open-air facilities. The importance of securing the provision of a largely increased number of nursery schools is so great that some latitude must be allowed, as, for example, where it is proposed to adapt an existing building for the purpose, but the majority of the new schools will be of the open-air type.

Public Cleansing in London.

Major Kindersley asked the Minister of Health whether the Departmental Committee appointed to consider the Report of an investigation into the public cleansing service in the administrative county of London had yet made its Report; and whether that Report would be published.—Mr. Greenwood replied: The work of the Departmental Committee has been delayed by the unfortunate death of its chairman, Sir John Gatti, to whose public services, though I differed from him on many matters, I should like to pay my tribute. A new chairman is to be appointed, and I hope that the Committee will find it possible to make an early Report, which will pave the way to dealing with this pressing problem on effective and comprehensive lines. I see at present no reason why their Report should not be published. I can assure the House that the Government are impressed with the necessity for action, and I propose to confer with the Committee at an early date. I do not think that it would help matters to add to the Committee representatives of areas in which dumps are situated. I understand that the Committee have already considered a large part of their problem and have visited some of the dumps.

Non-Pulmonary Tuberculosis.

Dr. Hastings asked the Minister of Health the number of deaths from tuberculosis of other organs than the lung that occurred in 1928; and if any estimate had been made of the number of these deaths that resulted from infection by tuberculous milk.—Mr. Greenwood replied: Of the registered deaths in England and Wales in 1928 classified to tuberculosis, 6834 were assigned to forms of the disease other than pulmonary tuberculosis. I am advised that there is no information available on which to base any reliable estimate of the number of these deaths which were due to infection by tuberculous milk.

Derating and Voluntary Hospitals.

Mr. Wardlaw-Milne asked the Minister of Health whether it was the intention of the Government to introduce legislation extending the benefits of derating to the voluntary hospitals.—Mr. Greenwood replied: It is not at present the intention to introduce such legislation. It would not be practicable to propose the total or partial exemption of hospitals from rating without at the same time considering the claims for similar exemption of other charitable and public institutions.

Lunacy Law Reform.

Viscount Elmley asked the Minister of Health whether he intended to revise the Lunacy Laws; and, if so, when the proposals would be brought forward.—Mr. Greenwood replied: I hope that it may be practicable in the near future to introduce a Bill to effect certain improvements in lunacy law and administration.

Government and Slum Clearance.

Mr. Albery asked the Minister of Health whether he anticipated that the Government's scheme for slum clearance was likely to be in operation within the next 12 months.—Mr. Greenwood replied: Yes, Sir.

Lieut.-Commander Kenworthy asked the Minister of Health the total number of slum clearance schemes carried out during the years 1925 and 1928 inclusive; and what was the total number of persons rehoused under these schemes.—Mr. Greenwood replied: In the period from 1925 to 1928 work was in progress on 118 slum schemes, some of which had been started prior to 1925. The total number of people to be rehoused in connexion with these schemes was 71,418. In the case of 61 schemes the work of rehousing was completed during the period and provided accommodation for 20,746 persons.

Dr. Morgan asked the Minister of Health if he was aware that many persons in the south-east of London were being summoned or being prosecuted for overcrowding; and whether, in view of the prevailing conditions, over which these poor people had no control, he would seriously consider the advisability of issuing a circular letter to metropolitan local authorities requesting them to delay any such proceedings pending the introduction of his promised Slum Clearance Bill.—Mr. Greenwood replied: My hon. friend has brought some particulars to my notice. I have no power to give directions to the local authorities to refrain from action in cases which they consider they should bring before the courts.

Medical Services in Naval and Military Forces.

Dr. Vernon Davies asked the Secretary to the Treasury what progress had been made by the joint medical services committee of the Navy, Army, and Air Force in establishing a common system of costing with regard to hospitals.—Mr. Pethick-Lawrence replied: The experiments which have been tried for the past two and a half years are still in progress; but it has not yet been found possible to devise a common form for use in all the Services which will give satisfactory results.

Pulmonary Tuberculosis in the Services.

Dr. Vernon Davies asked the Secretary to the Treasury if the joint medical committee of the three Service departments and the Ministry of Pensions appointed to inquire into the relationship between conditions of Service life and pulmonary tuberculosis had come to any decision; if any report had been submitted; and, if so, if it would be available for the information of the House.—Mr. Ammon replied: The committee have reported, and as a result of certain recommendations made by them various steps are being taken by the Departments concerned. The answer to the last part of the question is in the negative.

Hysteria in Dogs.

Colonel Clifton Brown asked the Minister of Agriculture if he was aware that the comparatively new disease of hysteria was seriously affecting sheep-dogs and other dogs in this country; and what steps his department was taking to investigate the cause of this ailment and to find a cure.—Dr. ADDISON, Parliamentary Secretary to the Ministry of Agriculture, replied: I am aware of the occurrence of hysteria among dogs in this country, and although no cases in sheep-dogs have been brought to my notice, they are probably susceptible to the condition. Research into the disease is in progress at the Royal Veterinary College.

The Royal Veterinary College.

Captain CROOKSHANK asked the Minister of Agriculture if he could make any statement regarding the future of the Royal Veterinary College.—Dr. ADDISON replied: My right hon. friend has received the Report of the Committee which was appointed by his predecessor to consider the whole problem of the reconstruction of the Royal Veterinary College. The Report raises important and difficult questions which are now receiving his careful consideration, and a further statement on the subject will be made in due course.

Sounding Motor Horns at Night.

Colonel HOWARD-BURY asked the Minister of Transport whether he was aware that in Paris during certain hours of the night no motor horns were allowed to be sounded; and whether he would put in force a similar order in the London metropolitan area.—Mr. H. MORRISON replied: Although traffic conditions in London differ materially from those prevailing in Paris, I am having inquiries made with a view to ascertaining whether the principle adopted in Paris of prohibiting the sounding of motor horns during certain hours of the night in certain parts of the city would be suitable for experimental trials in some portion of the metropolitan area.

Voluntary Hospitals and Recovery of Expenses.

Major EDMONDSON asked the Minister of Transport whether his attention had been called to the position of voluntary hospitals with regard to their right to recover expenses in cases where the personal damage suffered by patients had been assured against; and whether he was prepared to take steps to introduce legislation, if necessary, to remedy the present position.—Mr. H. MORRISON replied: I am aware that the voluntary hospitals incur considerable expenditure in the treatment of motor accident cases, but I do not think that it would be practicable or desirable to provide that they should have a special legal claim to a proportion of insurance moneys in those cases where the injured person is compensated out of such moneys.

MONDAY, NOV. 11TH.

The Tuberculosis Order, 1925.

Mr. LAWTHER asked the Minister of Agriculture if he would give the figures of the number of animals slaughtered under the Tuberculosis Order, 1925, in the counties of Northumberland, Durham, Cumberland, and the North Riding of Yorkshire for the year ending December, 1928; and if he was satisfied that proper precautions existed to prevent those carcasses being used for human consumption.—Mr. BUXTON replied: The number of animals slaughtered in the counties named during 1928 under the Tuberculosis Order of 1925 was: Northumberland, 92; Durham, 210; Cumberland, 152; and North Riding, 320. The carcasses of animals slaughtered, for which compensation is paid to the owner, become the property of the local authority, and the Order of 1925 (No. 2) provides that no parts of such carcasses shall be removed for consumption without the written permission of the medical officer of health or other competent officer of the sanitary authority. I am therefore satisfied that the proper precautions exist.

Grants for Maternity and Child Welfare.

Lieut.-Colonel HENEAGE asked the Minister of Health what grant he proposed to make towards maternity and child welfare services.—Miss LAWRENCE, Parliamentary Secretary to the Ministry of Health, replied: It is estimated that the total grant payable during the present financial year in respect of these services will be about £1,170,000, as compared with £1,071,500, the total grant paid last year.

Asbestos Workers and Workmen's Compensation.

Mr. STAMFORD asked the Home Secretary whether he had received a report of the coroner's inquest on Abraham Jowett, a charge hand at Messrs. J. W. Roberts' asbestos works at Armley, Leeds, whose death was certified as being due to acute lobar pneumonia, contributed to by fibrosis due to asbestosis; and whether, in view of the risks to which workers in asbestos were exposed, he intended to schedule the disease under the Workmen's Compensation Acts.—Mr. SHORT, Under-Secretary to the Home Office, replied: Yes, Sir. My right hon. friend has received a report on this case from the inspector who attended the inquest. The risks to which workers in asbestos are exposed have been the subject of a comprehensive inquiry by the Factory Department, and my right hon. friend hopes to be in a position very shortly to consider what further precautions are necessary for the protection of the workers. The question of compensation will be considered at the same time. At the present moment he cannot make any statement on the subject.

Noxious Fumes from Cement Works.

Mr. MILLS asked the Minister of Health if he had received complaints of noxious and vegetable-destroying fumes from cement works on the banks of the River Thames; and, if so, what action was contemplated.—Miss LAWRENCE replied: Complaints have been received regarding the emission of dust. An inspector of my department has made investigations. In one case, steps have been taken to reduce the emission and the matter is continuing to receive attention. In the other case, the inspector reported that he was satisfied as to the result of the steps which had been taken.

Mr. MILLS asked the Home Secretary the measures taken to prevent nuisances by wasteful fumes from cement factories; and the comparative waste as between German works and British works.—Miss LAWRENCE replied: The emission of fumes is usually kept well in hand; the emission of dust gives more trouble. A good deal has been done and experiments are being conducted for dealing more effectively with the problem. Inspectors of my Department are in close touch with what is being done. I cannot at present say how works in this country compare with those in Germany.

Wards at Broadmoor Asylum.

Mr. OLIVER BALDWIN asked the Home Secretary whether he was aware that at Broadmoor Criminal Lunatic Asylum there was a special ward where prisoners of the richer classes were segregated; and, if so, whether he would discontinue this method of class distinction.—Mr. CLYNES replied: There is no such special ward at the asylum.

Blind Persons in England and Wales.

Mr. CLYNES, Home Secretary, informed Mr. KELLY that on March 31st last the number of blind men and women registered under the Blind Persons Act, 1920, in England and Wales was 48,108.

TUESDAY, NOV. 12TH.

Properties in Insanitary Areas.

Sir ROBERT GOWER asked the Minister of Health the number of persons who owned properties in the respective areas represented by local authorities to be insanitary, schemes relating to which had been submitted to him and awaited his approval, and the number of persons owning businesses in such areas respectively.—Mr. GREENWOOD replied: The following statement gives the information desired:—

Local authority.	Scheme.	Persons owning properties in the area and lessees of such properties.	Persons carrying on businesses in the area.
Metropolitan Borough Councils—			
Bethnal Green ..	Digby Street.	13	4
Bermondsey	Rotherhithe Street (West)	21	21
Wandsworth ..	Wandsworth Plain.	35	28
County Borough Councils—			
Bristol	Dings Area.	42	13
Exeter	No. 4 area reconstruction scheme.	5	6
Ipswich	Currier Lane, &c.	55	12
West Bromwich ..	Cooper Hill Street, &c.	32	None so far as is known at present.
Borough Council—			
Wisbech	Carpenter's Arms Yard, &c.	17	5
Urban District Council—			
Knaresborough ..	Beech Hill.	6	3

Slum Clearance Schemes.

Sir ROBERT GOWER asked the Minister of Health what schemes relating to alleged insanitary areas had been submitted for his approval by local authorities during the past five months; and what his decision in each case, respectively had been.—Mr. GREENWOOD replied: During the last five months schemes of this kind have been submitted by the corporations of Bethnal Green, Bristol, Wandsworth, and Wisbech. These schemes are still under consideration.

Medical Examination of Young Mining Workers.

DR. VERNON DAVIES asked the Secretary for Mines if he proposed to take steps to ensure that all young persons under 18 years of age entering the mining industry should be medically examined for fitness before starting work.—Mr. BEN TURNER replied: I understand that medical examination of young persons is one of the matters now under consideration in connexion with a new Factories Bill. When this Bill has become law I will consider whether any change is necessary in mining legislation to bring it into conformity with factory legislation in this respect.

Medical News.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination held from Oct. 7th to 30th the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—A. H. Baker, Manchester; J. C. Banerjee, Guy's; A. Barber, St. Bart.'s; K. C. Bhattacharyya, St. Thomas's; R. O. Brooks, Manchester; D. S. Chowdhary, London; R. E. S. Dalliwall, Cambridge and St. Bart.'s; E. Dikshitulu, Madras and Charing Cross; Sheila J. Ferguson, King's Coll.; E. C. I. Foot, Sheffield and St. Bart.'s; J. F. Galpine, Leeds; R. K. Goyal, London; Charlotte Gray, Univ. Coll.; R. S. Harrison, Guy's; Aureval Heaton, Royal Free; Katherine M. Heberlet, Univ. Coll.; Gladys M. Herbert, St. Mary's; G. L. Johnson, Columbia; E. O. Lakey, Univ. Coll.; P. A. E. Lansel, Middlesex; A. Liberis, St. Bart.'s; K. M. Macleod, Edinburgh; J. S. MacVine, St. Bart.'s; R. S. Mann, Univ. Coll.; E. K. Menon, Birmingham; B. B. Nanavatty, Royal Free; F. J. Napier, Guy's; G. L. Ormerod, Cambridge and St. Thomas's; C. H. Paull, Bristol; S. L. Rikhye, London; S. L. Robert, Birmingham; B. P. Robinson, Manchester; L. K. Robson, Guy's; J. Ross and H. K. Said, Charing Cross; J. Sakula, Middlesex; R. L. Sethi, London; Edna F. Sheridan, King's Coll.; H. Silverstein, St. Bart.'s; G. H. G. Southwell-Sander, St. Thomas's; R. G. Sowter, Guy's; Ada M. W. Stewart, Univ. Coll.; T. S. Stone and K. T. Tasker, London; P. H. Taylor, King's Coll.; Rose E. Williams, Royal Free; R. A. Wilmshurst, St. Thomas's; G. R. H. Wrangham, St. Mary's; and F. C. A. Wright, King's Coll.

Midwifery.—G. L. Alcock, St. Thomas's; Katharine M. Allen, King's Coll.; S. Amir-ud-din, Lahore; W. T. Andrews, St. Thomas's; Lily Arratoon, Royal Free; P. B. Ascroft, Middlesex; W. I. Bain, St. Thomas's; A. H. Baker, Manchester; W. L. H. L. Bell, St. George's; J. N. Bhada, Univ. Coll.; F. K. Boston, St. Bart.'s; A. D. Bourne, St. Mary's; A. E. Bowling, Leeds; Mabel Brewster, Royal Free; W. J. Burgess, St. Bart.'s; M. L. Bynoe, King's Coll.; E. C. Campbell and H. Canwarden, St. Mary's; L. Charney and D. N. Chatterji, London; W. F. Church, St. Bart.'s; D. O. Clark, St. Thomas's; Charlotte A. G. Conway, Royal Free; J. S. Cotman, St. Mary's; W. C. Creedee, St. George's; H. D. Cronyn, St. Mary's; H. J. Croot, Guy's; R. M. S. Cross and R. E. S. Dalliwall, St. Bart.'s; Elizabeth T. Davies, Westminster; H. L. G. Davies, St. Bart.'s; V. Dellal, Manchester; D. Divine, Guy's; S. Durham, London; J. M. Durr, Guy's; J. J. Eapen, Madras; Sheila J. Ferguson, King's Coll.; Doreen P. Firmin, Westminster; J. P. Flanagan, Liverpool; A. A. G. Flemming, Cambridge and Bristol; P. Frankenberg, St. Bart's; K. Ghosh, Royal Free; E. J. Goldsmith, St. Thomas's; Rebecca Goldstein, Univ. Coll.; R. W. Graham-Campbell, St. Bart.'s; E. R. Greathead, London; Sheila M. Harper, Liverpool; J. O. Harrison, St. Bart.'s; R. S. Harrison, Guy's; J. E. M. Harrison and R. M. Harvey, London; Katherine M. Heberlet, Univ. Coll.; J. R. Heming, St. Thomas's; J. E. R. Heppolette, St. Mary's; L. Hershfield, Middlesex; J. R. Hindmarsh, Durham; Constance M. Hoare, King's Coll.; R. S. Hodge and Laura M. Hollingworth, Univ. Coll.; S. W. Holmes, St. Mary's; D. W. Hoodless, Charing Cross; H. R. Hovahn, King's Coll.; Eugenie C. Illingworth, Leeds; B. Isaac, St. Mary's; H. B. Jackson, Middlesex; W. J. Johnson, Guys'; M. M. St. G. Johnstone and G. L. Jones, St. Thomas's; I. G. Jones, Univ. Coll.; Alison F. Z. Judd, Royal Free; F. B. Kantzer, Chicago; J. D. Kershaw, Univ. Coll.; J. S. Knox, St. Bart.'s; F. P. L. Lander, Middlesex; G. F. Langley, Bristol; Annie Lawson, Royal Free; S. R. Ledger, King's Coll.; D. H. Le Good, St. Thomas's; G. S. R. Little, St. Bart.'s; L. Lodge, London; J. Loofe, Leeds; V. J. Lopez, St. Mary's; S. H. Lubner, London; Marjorie N. Lunn, Royal Free; G. D. McLean, St. Thomas's; K. M. Macleod, Edinburgh; F. G. Maitland, St. Thomas's; H. S. A. Malik, Bombay; R. W. Malim and C. E. P. Markby, St. Thomas's; J. H. G. Mason, Middlesex; Ruth Milne, Royal Free; W. A. Mirza, Lucknow; C. J. Morgan, St. Bart.'s; H. C. Muirhead and F. J. Napier, Guy's; L. B. Neel, St. George's; Ethelwyn M. Newham, Royal Free; A. M. Nodine, Middlesex; C. L. Oakley, Univ. Coll.; T. C. Outred, Guy's; M. Owen, Univ. Coll.; C. E. S. Oxley, St. Thomas's; A. P. M. Page, St. Bart.'s; G. H. Pearce, Univ. Coll.; R. B. Peckham, Guy's; A. Phillips and M. Phillips, London; F. E. Pilkington, King's Coll.; A. C. Price, Guy's; Ruth Pumphrey, Univ. Coll.; S. Ramanathan, King's Coll.; E. H. Rink, Guy's; S. L. Robert, Bombay and Birmingham; H. E. W. Roberton, St. Bart.'s; J. M. Robertson, Guy's; Victoria M. Robinson, King's Coll.; Helen E. Rodway, Royal Free; J. D. Rose, Durham; J. Ross, Charing Cross; Ruth Sandeman, Univ. Coll.; F. M. Sandford, St. Thomas's; M. H. Shah, Lahore; Violet R. Sharp and Rosalie Shoenberg, Royal Free; M. Shorvon, King's Coll.; S. Silman, Leeds; H. Singh, Lahore; Margaret Skelton, Univ. Coll.; W. L. Sleight, Bristol; W. M. Smith and B. Southwell, Guy's; N. Stevens, St. Thomas's; Marjorie V. N. Sudds, Royal Free; A. L. Thomas, Guy's; Edith G. N. Thomas, Charing Cross; A. W. Valsey, D. S. Valentine, and J. N. Vasudeva, St. Thomas's; G. M. Vatsalya, Royal Free; W. N. P. Wakeley, King's Coll.; Doris E. C. Walker, Univ. Coll.; Margaret M. White, Royal Free; G. W. Whittall, St. Thomas's; A. B. Williamson, Durham; Mary Wills, Royal Free; H. A. M. Wintle, St. Thomas's; F. S. Winter, St. George's; W. Woolley, Bristol; and C. Wright, Univ. Coll.

Surgery.—R. W. F. Alles and P. B. Ascroft, Middlesex; A. K. Basu, Univ. Coll.; D. A. Beattie, St. Bart.'s; F. R. Beetham, Leeds; D. H. Bolton, St. Thomas's; A. E. Bowling, Leeds; Julia A. Boyd, Royal Free; B. H. Bramwell and R. O. Brooks, Manchester; L. V. O. Brown, Guy's; C. C. Bryson, Middlesex; W. J. Burgess, St. Bart.'s; E. C. Campbell, St. Mary's; F. W. Chippindale, Guy's; S. N. Chopra, Edinburgh; W. F. Church, St. Bart.'s; H. J. Croot, Guy's; H. L. G. Davies, Cardiff and St. Bart.'s; T. J. Davies, Univ. Coll.; C. M. Dell, St. Thomas's; C. G. S. De Silva, Guy's; A. L. Devi, Royal Free; M. B. Dixit, St. Thomas's; P. G. Dowdell and D. G. Evans, Univ. Coll.; R. H. Franklin and A. J. Gibbs, St. Thomas's; Rebecca Goldstein, Univ. Coll.; R. T. S. Goodchild, London; A. H. Grace, St. Bart.'s; B. Halfpenny, Middlesex; H. C. Haige and H. C. Harley, St. Mary's; D. Hay, St. Bart.'s; J. Henry, Leeds; R. Herring, St. Mary's; R. S. Hodge, Univ. Coll.; S. W. Holmes, St. Mary's; Ethel E. Hopper, Charing Cross; G. L. Jones, St. Thomas's; H. J. Knight, St. Mary's; G. F. Langley, Bristol; L. J. Lannaman, St. Bart.'s; Grace Law, King's Coll.; V. J. Lopez, Madras and St. Mary's; S. McDonald, Cambridge and Durham; J. D. McVean, Manchester; B. R. Medlycott, Guy's; H. C. Mehta, Middlesex; P. D. Mottet, Univ. Coll.; F. Murray, London; A. M. Nodine, Middlesex; C. L. Oakley, Univ. Coll.; H. N. Palmer, King's Coll.; G. A. Y. Parker, St. Bart.'s; C. F. L. Patterson, St. George's; D. D. Payne, St. Thomas's; L. D. Pringle Guy's; Ruth Pumphrey, Univ. Coll.; T. P. V. Rao, St. Thomas's; P. V. Reading, Guy's; J. M. Reese, St. Mary's; J. I. Rerrie, St. Bart.'s; Colleen Rice, Charing Cross; B. P. Robinson, Manchester; J. D. Rose, Durham; K. M. Ross, St. Bart.'s; J. F. Sandow, Middlesex; J. D. Scott, St. Bart.'s; J. M. Searle, London; Phyllis F. L. Simon, Royal Free; R. H. B. Snow, St. Thomas's; J. K. Stanger, Durham; F. H. Stevenson, Guy's; G. E. M. Turner, Middlesex; J. N. Vasudeva, Punjab and St. Thomas's; Doris E. C. Walker, Univ. Coll.; S. Weinstein, London; A. J. Whitaker, Univ. Coll.; Margaret M. White, Royal Free; G. W. Whittall, St. Thomas's; E. G. Wilkins, Middlesex; R. C. Williams, St. Thomas's; and T. G. Williams, Middlesex.

Pathology.—A. N. Barker, St. Thomas's; K. Baxter, Manchester; W. L. H. L. Bell, St. George's; S. Bochenek, St. Bart.'s; Kathleen M. Bodkin, Birmingham; P. Brown, London; J. Carlton, Guy's; W. F. Church; St. Bart.'s; D. O. Clark, St. Thomas's; H. Coorland, St. Bart.'s; W. C. Creedee, St. George's; R. E. M. Fawcett, St. Bart.'s; D. R. Goodfellow, Manchester; A. H. Grace, St. Bart.'s; Charlotte Gray, Univ. Coll.; C. J. K. Hamilton, Liverpool; B. Isaac, St. Mary's; H. B. Jackson, Middlesex; R. H. Leaver, St. Bart.'s; J. O. McCarter, Manchester; K. I. Nicholls, Bristol; C. L. Oakley, Univ. Coll.; A. P. M. Page, St. Bart.'s; A. Phillips, London; N. S. Plummer, Guy's; H. Ramsay, Middlesex; Louise Rees, Charing Cross; J. M. Robertson, Guy's; M. W. Robinson, Manchester; T. G. Robinson and B. Southwell; Guy's; T. Standring, King's Coll.; R. Stanley, St. Thomas's; J. G. Stewart, Westminster, K. S. Thompson, London; A. W. Valsey, St. Thomas's; O. T. Wade, Leeds; W. N. P. Wakeley, King's Coll.; A. J. White, Middlesex; G. P. B. Whitwell, Guy's; and Edna M. Wilson, Charing Cross.

OLD EPSOMIAN CLUB.—The annual general meeting of this club will be held at the Hotel Great Central, Marylebone, N.W., at 6.30 P.M. on Thursday, Dec. 12th, and will be followed by the annual dinner at 7.15 for 7.30. The chair will be taken by Brigadier-General G. T. Mair, and all Old Epsomians, whether members of the club or not, are invited to be present on this occasion. Attention is directed to the change of restaurant on this particular occasion.

MEDICO-LEGAL SOCIETY.—A meeting of this Society will be held at 11, Chandos-street, Cavendish-square, W., on Thursday, Nov. 28th, at 8.30 P.M. when Mr. F. Llewellyn Jones, M.P., will read a paper on the League of Nations and the International Control of Dangerous Drugs.

As already announced, the annual dinner will be held at the Holborn Restaurant, London, W.C., at 7.15 P.M., on Friday, Dec. 13th, with the President, Lord Riddell, in the chair.

Royal College of Physicians of Edinburgh.—A quarterly meeting of the College was held on Nov. 5th with Dr. R. A. Fleming, the President, in the chair.

Dr. William Thomson Munro was introduced and took his seat as a Fellow. Dr. Roy Mackenzie Stewart and Dr. William Malcolm McAlister were elected to the Fellowship.

The Hill Pattison-Struthers Bursary in Anatomy and Physiology was awarded to James Alexander Crawford, and the Hill Pattison-Struthers Bursary in Clinical Medicine to Dr. William Veitch Anderson. The Wood Bursary was awarded to John Macgill Drover.

Royal Faculty of Physicians and Surgeons of Glasgow.—At the annual meeting on Nov. 4th Dr. John F. Fergus was elected President in succession to Mr. G. H. Edington. The other office-bearers appointed are:—Visitor: Mr. R. Barclay Ness. Hon. treasurer: Dr. J. H. Macdonald. Hon. librarian: Dr. E. H. L. Oliphant. The representative on the General Medical Council is Mr. Edington, and the councillors are Prof. J. M. Munro Kerr, Mr. Thomas Kay, Mr. John Patrick, Dr. R. M. Buchanan, Mr. J. Galbraith Connal, Prof. C. C. Douglas, Dr. John Gracie, Prof. Andrew Allison, Dr. J. Souttar McKendrick, and Mr. W. Ferguson Mackenzie. It may be noted that Dr. J. F. Fergus's father and his brother, the late Mr. Freeland Fergus, served as Presidents of the Faculty.

In leaving office as President Mr. Edington presented to the Faculty an interesting memorial of their founder, Mr. Peter Lowe.

The gift took the form of the first edition of Lowe's "Whole Course of Chirurgerie," published by Thomas Purfoot, London, in 1597. The library already contained copies of the second, third, and fourth editions of Lowe's "Chirurgerie," and, with this presentation, it now possesses a complete set of all the works and editions of Peter Lowe.

Copies of the first edition of this book are extremely rare. One is known to be in the Radcliffe Library, Oxford; another was in the library of the Royal Medical and Chirurgical Society of London; and a third copy is in the possession of the Royal College of Physicians of Edinburgh. The destination of a fourth copy, sold in London in October, 1924, for £120, is unknown. The copy presented to the Faculty Library by Mr. Edington is slightly imperfect, lacking some few of the end pages. Otherwise it is in very good condition.

The Faculty accepted the interesting gift with enthusiasm, and cordially thanked the donor.

Glasgow University Club of London.—This club will dine at the Trocadero Restaurant, Piccadilly-circus, on Friday, Nov. 29th, with Prof. F. O. Bower, F.R.S., President-elect of the British Association, in the chair, and Sir Donald MacAlister, Chancellor of the University, as the principal guest. Any Glasgow University men who, though not members of the club, desire to be present are requested to communicate with the hon. secretaries, 62, Harley House, N.W. 1.

Decorations and Distinctions.—The King has given Royal licence and authority to Dr. Herbert Chavasse Squires to wear the Insignia of the Order of the Nile (Third Class) conferred upon him by the King of Egypt in recognition of valuable services rendered by him. Dr. D. J. Mackintosh, C.B., M.V.O., has been made a Deputy Lieutenant of the County and City of Glasgow. Dr. James Cran has been appointed an Unofficial Member of the Legislative Council of the Colony of British Honduras.

Joint Tuberculosis Council.— A post-graduate course in relation to tuberculosis is to be held in the X Ray Department of the Hospital for Diseases of the Chest, Brompton, London, S.W., from Monday to Saturday, Nov. 25th–30th, conducted by Dr. Stanley Melville and members of the staff. The course will consist largely of demonstrations on screening, with lectures on technique, the surgical aspect of tuberculosis and dental radiography. Arrangements are being made for refresher work in out-patient department or wards, and a visit to a factory to see the latest things in X ray apparatus. Application to the hon. sec. of the Council at 1, Gordon-square, London, W.C. 1.

College of Physicians of Philadelphia: *Alvarenga Prize.*—The next award of this prize, amounting to about three hundred dollars, will be made on July 14th, 1930. Essays upon any subject in medicine will be considered provided that they have not appeared in print in any form, and have not been presented elsewhere in competition for a prize. They must be in prescribed form and must be received by the secretary of the College by May 1st. The Alvarenga prize for 1929 has been awarded to Dr. George M. Darrance, of Philadelphia, for an essay on Congenital Insufficiency of the Palate.

Hospital Costs at Nottingham.—During the *first six months of the present year the average weekly cost* of each in-patient at Nottingham General Hospital was £2 14*s.* 10½*d.*, and the total cost per patient £7 8*s.* 5*d.* The average cost per bed occupied amounted to £71 6*s.* 0½*d.*; the average stay was 18·8 days.

New Hospital at Nottingham.—On Nov. 5th Princess Helena Victoria visited Nottingham and opened the new women's hospital, which has cost about £40,000, and will take the place of two older and smaller institutions. Accommodation is provided for 60 beds, and the new wing, which is shortly to be undertaken at a cost of about £12,000, will provide another 40 beds. The hospital has been opened free of debt.

Voluntary Hospital Patients in Poor-law Infirmaries.—The governors of the Royal Hospital, Wolverhampton, have arranged with the Wolverhampton board of guardians that patients recommended by its honorary staff shall, in given circumstances, be received for treatment in the New Cross Poor-law Hospital. This course has become desirable owing to the inability of the Royal Hospital to meet pressing needs. The guardians will be paid an agreed sum where patients or their dependents have contributed for a reasonable time to the funds of Wolverhampton Hospital.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Nov. 19th.—5.30 P.M., General Meeting of Fellows. *Ballot for election to the Fellowship.* 8 P.M., Pathology. Communications:—Dr. G. S. Wilson: The Isolation of *Brucella abortus* from a Human case of Undulant Fever. Dr. C. R. Harington: The Chemistry of the Thyroid. Demonstrations:—Dr. W. G. Barnard: Three Specimens of Ependymoma. Fellows and Members of other sections are cordially invited to attend this meeting.

Thursday.—5 P.M., Dermatology (Cases at 4 P.M.). Dr. H. W. Barber: Case for Diagnosis. Dr. H. W. Barber: ? Lupus Erythematosus of the Oral Mucous Membrane. Dr. G. B. Dowling: Norwegian Scabies: Pityriasis Lichenoides et Varioliformis Acuta. Dr. W. J. O'Donovan: Lichen Spinulosus. Dr. A. C. Roxburgh: Pityriasis Lichenoides et Varioliformis Acuta (with section).—Other cases will be shown.—Annual Dinner of the Society. May Fair Hotel, Berkeley-square, London, W., at 7.30 for 8 P.M.

Friday.—5 P.M., Disease in Children (Cases at 4.30 P.M.). Cases will be shown. 8 P.M., Epidemiology and Tropical Diseases. Special Discussion on Brucella Infections in Man and Animals. Openers: Dr. W. Dalrymple-Champneys (Epidemiology), Dr. J. T. Duncan (Tropical). Other speakers will also take part.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

Thursday, Nov. 21st.—8.15 P.M. A Laboratory Meeting will be held at the London School of Hygiene and Tropical Medicine, Keppel-street, Gower-street, when the following amongst others will give Demonstrations: Drs. Andrew Balfour, W. Broughton Alcock, C. A. Hoare, E. Hindle and A. C. Stevenson, Colonel S. P. James, Messrs. H. S. Leeson, M. E. MacGregor, J. F. Marshall and J. Staley, Drs. A. Robertson, J. W. Scharff, A. L. Sheather and A. C. Stevenson, H. M. Shelley, Miss E. Sikes, Prof. Warrington Yorke, Dr. C. M. Wenyon, V. B. Wigglesworth.

CHELSEA CLINICAL SOCIETY.

Tuesday, Nov. 19th.—7.30 P.M., Dinner at Hotel Rembrant, Thurloe-place, S.W., followed by discussion on Treatment of Climacteric. Opened by Dr. F. J. McCann.

LONDON CLINICAL SOCIETY.

Tuesday, Nov. 19th.—8.45 P.M. (at the London Temperance Hospital), Meeting. Cases at 8.30 P.M.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Nov. 18th., to Saturday, Nov. 23rd.—Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., lecture by Mr. A. E. Mortimer Woolf: Hæmorrhoids. No fee. Two lectures, especially suitable for M.R.C.P. candidates.—Tues., 8.30 P.M., Dr. Langdon Brown: Recent Advances in Endocrinology. Fri., 8.30 P.M., Sir William Willcox: Some Points in Connexion with the Toxic Effects of Lead, Arsenic, Morphine, Cocaine.—Prince of Wales's General Hospital, Tottenham, N. Mon., 2.15 P.M., Ward Round by Dr. A. J. Whiting. No fee.—Royal Eye Hospital, Southwark, S.E. Wed., 3 P.M., demonstration by Mr. A. D. Griffith. No fee.—London Lock Hospital, 91, Dean-street, W. Post-graduate course in venereal disease. Daily, every afternoon and evening, for two weeks.—Royal National Orthopædic Hospital, 234, Great Portland-street, W. Intensive course for two weeks.—West End Hospital for Nervous Diseases, 73, Welbeck-street, W. Lecture-demonstrations, illustrated by cases, daily at 5 P.M. Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, Nov. 18th.—10 A.M., Dr Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

Tuesday.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., *Sir Henry Simson: Gynæcological Operations.*

Wednesday.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

Thursday.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

Friday.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, Nov. 20th.—4 P.M., Mr. Norman Haire: Contraception Technique.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, Nov. 18th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics, Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

NATIONAL HOSPITAL, Queen-square, W.C.

Monday, Nov. 18th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Collier: Muscular Atrophies.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. —3.30 P.M., Mr. Armour: Surgery of Compression Paraplegia.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Vascular Lesions of Nervous System.

Friday.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Clinical Lecture.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

Wednesday, Nov. 20th.—4.30 P.M., Mr. Claude Mills: Some Interesting Urological Cases.

KING'S COLLEGE FOR HOUSEHOLD AND SOCIAL SCIENCE, Campden Hill-road, W.

Friday, Nov. 22nd.—5 P.M., Prof. V. H. Mottram: Human Nutrition. (Last of six lectures.)

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

Monday, Nov. 18th.—5 P.M., Prof. Leonard Hill: Clothing and Climate.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL Gray's Inn-road.

Friday, Nov. 22nd.—4 P.M., Mr. J. D. McLaggan: The Treatment of Chronic Suppurative Otitis Media.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Nov. 21st.—6 P.M., Mr. John Everidge: Hæmaturia: Its Diagnosis and Significance.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, Nov. 19th.—3.15 P.M., Mr. W. B. Gabriel: The Treatment of Acute Suppuration.

BRITISH SCIENCE GUILD.

Tuesday, Nov. 19th.—4.30 P.M. (in the Goldsmiths' Hall, Foster-lane, E.C.), Sir Walter M. Fletcher: Medical Research: the Tree and the Fruit.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

Friday, Nov. 22nd.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Dr. E. G. Howe: Infant, Youthful, Adolescent, and Adult Life.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

Wednesday, Nov. 20th.—4 P.M., Mr. Malcolm Donaldson: Early Diagnosis and Treatment of Malignant Disease.

CHADWICK PUBLIC LECTURES.

Friday, Nov. 22nd.—5.15 P.M. (at the Royal Society of Arts, John-street, Adelphi), Prof. A. E. Boycott: The Causes of Cancer.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Nov. 19.—5 P.M., Dr. J. A. Drake: Leprosy.

Thursday.—5 P.M., Dr. A. Whitfield: Tuberculosis Cutis (1).

ANCOATS HOSPITAL, Mill-street, Manchester.

Thursday, Nov. 21st.—4.15 P.M., Mr. P. McEvedy: Treatment of Hæmorrhoids.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, Nov. 22nd.—3.30 P.M., Mr. Mackie: Ophthalmic States related to Gastro-Intestinal Disorders.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, Nov. 19.—4.15 P.M., Mr. W. R. Douglas: Some Recent Advances in the Surgery of Cancer.

Friday.—4.15 P.M., Dr. R. Ellis: How the Electrocardiograph helps in Diagnosis and Treatment.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, Nov. 20th.—4.15 P.M. (in the Western Infirmary), Mr. Roy F. Young: Demonstration of Surgical Cases.

Appointments.

Bell, J. H., M.B., Ch.B. Edin., has been appointed Casualty House Surgeon at the Salford Royal Hospital.

Duggan, Norman, M.B., Ch.B. Manch., F.R.C.S. Eng., Honorary Surgeon to Worcester General Infirmary.

Gleave, H. H., M.B., Ch.B. Leeds., Senior Lecturer in Pathology in the University of Liverpool.

Lindsay, Elizabeth M., M.B., Ch.B. Edin., Medical Officer of the Parish of Creich and Superintendent of Swordale Institution, Bonar-Bridge, Scotland.

Paton, R. Y., M.B., B.Chir. Camb., Assistant Surgeon, Royal National Orthopædic Hospital.

Roberts, J. T. C., M.B., Ch.B. Liverp., Assistant Medical Officer of Health, Lewisham.

Saunders, M. J., L.R.C.P. & S.I., *Certifying Surgeon* under the Factory and Workshop Acts for the Portland District of Dorset.

Struthers, J. A., M.R.C.P. Lond., D.P.H., Physician to the Willesden General Hospital.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital.—H.S. At rate of £125.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Barry Surgical Hospital.—H.S. At rate of £200.

Birmingham City Babies' Hospital.—Res. M.O. At rate of £150.

Birmingham, Dudley-road Hospital.—Surgeon. £700.

Birmingham Royal Cripples Hospital.—H.S. At rate of £200.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Bolton Infirmary and Dispensary.—H.S. £150. Also Asst. H.S. £100.

Brighton, Royal Sussex County Hospital.—Hon. Surg. Clin. Asst. Also H.S. and Cas. H.S. £150 and £120 respectively.

Bristol, Stoke Park Colony.—Director of Medical Services. £1200.

Brookfield Orthopædic Hospital, Hale End, Woodford Green.—Anæsthetist. 1 guinea per attendance.

Cardiff, King Edward VII. Welsh National Memorial Association.—Area Asst. Tuber. Physician. £600.

Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100. Also Registrar. £50.

Chester Royal Infirmary.—Two H.S.'s. Each £150.

City of London Hospital for Diseases of Heart, &c., Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Colonial Medical Service.—M.O.'S. East Africa, £600. Malaya, $500 per month.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Ealing Borough.—Asst. M.O.H. £600.

East London Hospital for Children, &c., Shadwell, E.—Surgeon to Nose, Throat, and Ear Dept.

Epsom, Surrey, The Manor.—Res. Med. Supt. £671.

Essex County Sanatorium, Black Notley, near Braintree.—Res. M.O. £650.

Evelina Hospital for Children, Southwark, S.E.—Hon. Surgeon to Out-Patients. Also H.S. At rate of £120.

Glasgow, Royal Hospital for Sick Children.—Two H.S.'s.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £135.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—Cas. M.O. and Cas. Surg. O. Each at rate of £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Part-Time Jun. Cas. O. At rate of £150.

Ipswich, Heathfields Infirmary, &c.—Asst. Res. M.O. £250.

Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.

Lincoln, Bracebridge Mental Hospital.—Third Asst. M.O. £350.

Manchester, Salford Royal Hospital.—H.P. At rate of £125.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O. Also Jun. Res. M.O. At rate of £140 and £100 respectively.

Mothers' Hospital, Clapton, E.—Hon. Asst. Obstet. S.
Nairobi Municipal Council.—M.O.H. £1100.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Two Hon. Asst. S.'s.
Northwood, Mount Vernon Hospital.—H.S. for Cancer Section. £200.
Perth Infirmary.—Jun. H.S. £75.
Plymouth, South Devon and East Cornwall Hospital.—Res. Surg.O. Also H.S. At rate of £150 and £100 respectively.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Clin. Assts.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Rochford, Poor-law Hospital.—Jun. Asst. M.O. At rate of £225.
Royal College of St. Katharine, Poplar, E., Maternity and Child Welfare Centre.—Asst. M.O. £1 11s. 6d. per session.
Royal College of Surgeons of England.—Examiner in Dental Surgery.
Royal Free Hospital, Gray's Inn-road, W.C.—H.S.'s, H.P.'s, &c. Each £150. Second H.P. and Obstet. Dist. Asst. £100. Surg. Reg. £200. Half-time Gynæcological Reg. and Med. Reg. Each £100.
St. Mary's Hospital, W.—Med. Reg. to Out-patients. £200.
St. Thomas's Hospital, S.E.—Two Surg. Reg.'s. Also Med. Reg. for Children's Dept. Each £250.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
South London Hospital for Women, South Side, Clapham Common, S.W.—Clin. Assts.
Southampton, Royal South Hants and Southampton Hospital.—Asst. H.S. and Res. Anæsthetist. At rate of £140.
South Eastern Hospital for Children, Sydenham, S.E.—Res. M.O. At rate of £75.
Stamford, Rutland and General Infirmary.—H.S. At rate of £200–£250.
Surrey County Council.—Asst. M.O. £600.
Tilbury Hospital, Essex.—Med. Supt. £250. Also H.S. At rate of £150.
University College Hospital, Gower-street, W.C.—Hon. Anæs.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Aural and Ophth. H.S. and Asst. Cas. O. Each at rate of £100. Also Asst. Surgeon Dentist.
Windermere, Ethel Hedley Hospital for Crippled Children.—Res. H.S. At rate of £150.
Windsor, King Edward VII. Hospital.—Two H.S.'s. Each £100.
Worcester City Council.—M.O.H. £900.
The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Shefford (Beds), Eckington (Derbyshire), Wadebridge (Cornwall), Calvert (Bucks), and Llanfyllin (Montgomery).

Births, Marriages, and Deaths.

BIRTHS.

CRAIG.—On Nov. 6th, at Cheadle Hulme, the wife of Dr. Nicholas Craig, of a daughter.
FLOWER.—On Nov. 7th, the wife of Dr. Norman Flower, Yeovil, of a son.
HOLMES.—On Nov. 4th, at Hoghton-street, Southport, the wife of John Holmes, M.B., M.R.C.P., of a son.
HORSBURGH.—On Nov. 3rd, at Lyndhurst, Manor Court-road, Nuneaton, the wife of Dr. P. G. Horsburgh, of a son.

MARRIAGES.

RICHARDS—HODGKINSON.—On Oct. 5th, at Shiraz, Persia the Rev. J. R. Richards to Katharine Mary Hodgkinson, M.B., B.Ch., only daughter of Mr. and Mrs. W. E. Hodgkinson, Inglewood St. Michael's, Tenterden, Kent.

DEATHS.

FALKINER.—On Oct. 30th, at Dublin, Ninian McIntire Falkiner, M.D., F.R.C.P.I., late of Tyone, Healthfield-road, Terenure, County Dublin.
GILES.—On Nov. 4th, at Floraire, Torquay, Frederick William Giles, M.R.C.S., M.B.
GREENWOOD.—On Nov. 7th, at Hanover House, Regent's Park, Edwin Climson Greenwood, O.B.E., M.R.C.S., L.R.C.P., Medical Superintendent to St. John and Elizabeth Hospital.
SEALEY.—On Nov. 3rd, at Arundel-road, Tunbridge Wells, Francis Marmaduke Sealey, J.P., M.R.C.S., L.R.C.P., in his 71st year.
SWINHOE.—On Nov. 10th, suddenly, at The Close, Swindon, George Rodway Swinhoe, M.R.C.S., aged 61.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices o Births, Marriages, and Deaths.

BRITISH HOSPITALS ASSOCIATION.—This association has just been registered as a company limited by guarantee, not having a share capital, to acquire the undertaking and such of the assets and liabilities of the British Hospitals Association as may lawfully be acquired. The management is vested in a Council, the first members of which include Sir Arthur Stanley, Lord Knutsford, and Lord Stanmore. The hon. sec. is Mr. R. H. P. Orde, and the registered office, 32, Gordon-square, W.C.

Notes, Comments, and Abstracts.

RACIAL STUDY IN SCOTLAND.

IN a presidential address to the Aberdeen Medico-Chirurgical Society on Oct. 31st Prof. Alexander Low pointed out that while undoubtedly hygiene and better nutrition were important factors making for better health, attention should also be paid to racial inheritance. In Scotland much less displacement of population by invasion had taken place than was commonly supposed, and racial types could be traced in varying proportions in different parts of the modern population. Thus the study of racial strain was a matter of practical importance.

The present inhabitants of Scotland, said Prof. Low, included a primitive substratum from palæolithic days, together with representatives from the Nordic, Mediterranean and Alpine races. The tall, fair, long-headed Nordic was more suited to rural than urban conditions, and there was evidence (E. G. Bowen) that in towns he was especially liable to diseases, such as tuberculosis, when depressed into industrial poverty. The broad-headed Alpine was an element that entered largely into the make-up of the people in the north-east of Scotland and was characterised by patience, thrift, and caution. The short, dark, long-headed Mediterranean type was found in the poorer quarters of the large cities—for example, in Glasgow—where they seemed to resist disease caused by overcrowding. In Glasgow the infant mortality had shown a uniform fall, and it was argued that the large proportion of immigrant Irish and Jews had added vigour to the native stock; but the suggestion was put forward that in Glasgow there was a large Mediterranean element in the population and that this dark strain encountered the adverse conditions of city life more successfully than the Nordic.

In attempting to record developmental changes and their correlation, if any, with different race types, Prof. Low had come to the conclusion that growth-promoting internal stimuli differed in different races. Some seven years ago with the coöperation of Prof. R. G. McKerron at the Aberdeen Maternity Hospital and Dr. James A. Stephen of the Child Welfare Centre, he had begun to follow up growth in infants and had been led to study how far and in what way racial type affected development.

Knowledge of the physical characteristics of the preschool child had previously been based on single measurements of groups of infants, and there was thus no way of estimating the degree of variation in the same child from year to year. To follow the growth of individual children was slow and laborious, and though for the past seven years many had been under observation the work was still far from complete. About 1000 infants had been examined at birth and so far as possible re-examined yearly.

In the Aberdeen infants examined the average birthweight of the male infant was 3458 g. (7·625 lb.) and of the female 3444 g. (7·59 lb.). Thus there was little difference between the average weights of the two sexes, but infants born in Aberdeen were from six to eight ounces heavier at birth than those born in other towns in Great Britain. The average birth-length of males was 49·2 cm. (19·3 inches) and of females 48·7 cm. (19·18 inches), about one inch less than the usually accepted average birth-length. The average weight of the same group of infants at 12 months was 9240 g. (20·37 lb.) for males and 8306 g. (18·312 lb.) for females, and the average lengths at 12 months for males was 72·0 cm. (28⅜ inches) and females 70·1 cm. (27⅝ inches).

THE INDICTMENT OF CERTAIN INDIAN CUSTOMS.

OF the large crop of books and newspaper articles which followed the publication in 1927 of "Mother India" the great majority have already been consigned to oblivion, but some of them came from sources which it is impossible to disregard, and Mr. Field has performed a useful service in summarising the case for and against Miss Mayo's indictment of some Indian customs.[1] He is particularly well qualified for this task, since he was at one time working in close association with Miss Mayo, and has had access to documents in her possession.

In such a mass of evidence as was accumulated by Miss Mayo it was inevitable that some inaccuracies should occur, but with remarkably few exceptions her statements are substantiated. This, indeed, one would expect from her previous record which is detailed by Mr. Field and shows that "Mother India" was by no means her first adventure in the field of social research. Her book met with a hostile reception from the Indian press as a whole, but criticisms were not all unfavourable. It is a curious fact that the most striking evidence in favour of Miss Mayo's work comes indirectly from the great Hindu mystic Mohandas Karamchand Gandhi himself, although in an article in his own paper he attacked it with vigour. The Hindu customs arraigned by Miss Mayo are the very ones which Mr. Gandhi himself deplores

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[1] After Mother India. By Harry H. Field. London: Jonathan Cape. 1929. Pp. 299. 7s. 6d.

It has been said that Miss Mayo's book is untrue to facts and unjust to the people of India. The book certainly came as a shock to many European friends of India, as well as to Indians themselves, and it may fairly be argued that to enter the country through a temple of Kali, and to concentrate on social abuses throughout, is not to see it whole. To this Miss Mayo replies that she does not claim to give a complete picture of Indian life, nor pretend to dwell upon the virtues and accomplishments of the Indian people. The great question, after all, is what are the results of Miss Mayo's outspoken criticisms. Some of these are already not far to seek, although, as Mr. Field says, it will probably be decades before a comprehensive estimate can be made. For the present, however, they are sufficiently well summed up in a paragraph from the *Statesman* (Calcutta) of April 11th, 1929, which runs as follows :—

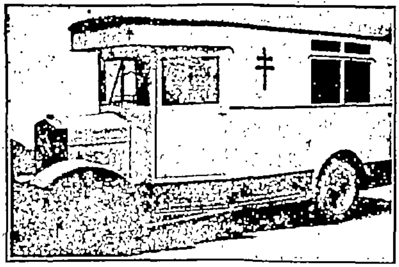
> "We believe that with all its faults of over-statement and exaggeration Miss Mayo's first book ("Mother India") did definite and traceable service. It provoked a vast torrent of indignation, but it gave strength to all the reformers who are endeavouring to change conditions in India. It shocked people out of complacency. Indians saw how they were presented to western eyes. . . . Nobody could longer blind himself to the fact that child marriage, the prevention of the remarriage of widows, the treatment of the outcaste and cruelty to animals outraged the western peoples. . . . Reform must come from within. Happily, there is evidence on all hands that Indian opinion is changing and that the new movement is finding leaders. When it has triumphed, India itself will be able to take a more charitable view of those who first uttered the thoughts of the West."

New legislation on the subject of the age of marriage has recently borne testimony to the influence which "Mother India" has brought to bear on social problems, for it can hardly be contested that the wave of feeling on this question was partly due to Miss Mayo's book.

AN ANTI-TUBERCULOSIS MOTOR VAN.

THE Fiat Motor Car Company of Turin has presented to the Red Cross Society at Rome a travelling dispensary equipped with the latest appliances of medical science for the campaign against tuberculosis. It is intended that vehicles of this type should carry the campaign into rural districts and remote mountain villages devoid of doctors and hospitals. The running cost is said to be low, for about 20 visits can be made in a radius of 20 miles or so during the day at a cost of about two shillings per consultation. The equipment, supplied by the Itan Company of Milan, comprises a complete X ray installation, microscope table, apparatus for analysis and sterilisation, as well as a projector to illustrate popular lectures on health and prophylaxis. The whole is mounted on an all-metal body motor chassis, where it can be used with the same efficiency and safety as in hospital. To avoid the diffusion of radiation, the tube is properly protected and an "antix" rubber protector screens off secondary rays. All parts of the installation which come into contact with the patient are covered with easily changeable or disinfectable paper and celluloid screens. Apparatus carrying high tension current is insulated from surrounding objects, and all metal parts are earthed. The generator, which is outside the dispensary, alongside the chauffeur, furnishes sufficient current for an X ray photograph of the thorax to be taken in a fraction of a second. The stores for photographic plates and slides are fitted with safety locks, so that should the controller forget to close them an electrical device rectifies the omission. During an X ray examination the dispensary is lit by a special filtered ray lamp which, while not interfering with the clearness of the image on the screen, does not leave the patient in the dark. The X ray apparatus can be carried into the patient's bedroom in case he is unable to leave the house. We are told that inquiries for motor vehicles of this type have been received from America, Belgium, and especially the Balkan countries.

FIG. 1.



The motor van bearing the combined red-cross anti-tuberculosis symbol.

FIG. 2.

The interior of the van with a consultation in progress.

A HOSPITAL FANCY.

AN account of the hospital of the future, as imagined by one who evidently derides many scientific "improvements" of to-day, is amusingly provided in the current number of the *St. George's Hospital Gazette*. The leading member of the staff is the "head electrical expert and master of mechanics," known as H. E. Next to him come in order electroradiological therapeutists, biochemicosanguinologists, uroproctologists, proctourologists, aurorhinists, rhinoaurists, bacteriopathological experts, electromechanicians, one physician and one surgeon! There is no dentist on the staff, for no patient is admitted to the hospital who still retains any teeth, because of the possible infection from these. The routine preparation of the stranger who desires to visit the hospital takes seven days, so thoroughly imbued are the authorities of the institution with the principles of scientific preventive medicine. Inside the hospital all use of the feet is abandoned, transport being entirely by electric propulsion or by aeronautics. In the operating theatre the table suddenly appeared under no apparent motive power and rolled itself into the middle of the theatre. A remarkable rumble heralded the arrival of the unconscious patient who was wafted on to the operating table. This, worked from without, executed a remarkable series of convulsive jerks till the patient was in the position required by the uroproctologist about to operate. He glided in on and was removed from a small electric trolley and was suspended at the convenient height in proximity with the patient's exposed anal area. This was rapidly prepared by aero-sterilisation, and the accompanying din put a premature end to the observer's visit. The imaginary hospital appears to be placed in America, but the writer's attitude and initials, J. B., are suggestive of John Bull.

THE PREVENTIVE MEDICINE OF DIVORCE.

WHILE some are disposed to believe in haste that marriage is an outgrown institution, others, equally aware of the growing divorce lists, are sure that sick marriages may often be cured and still more often the sickness be prevented. Physicians in many lands have been offering their services in the solution of this human and social problem. In June last the French Congress of Legal Medicine discussed the value of the medical pre-nuptial certificate.[1] The object envisaged was not merely to detect venereal disease but also other forms of contagious disease, hereditary defects, and early stages of such diseases as tuberculosis which are liable to make more rapid progress under the strain of marriage and pregnancy. The objections raised to the institution of this certificate were directed only against its compulsory features and not against the essential proposal that medical examination before marriage is to be encouraged. In Germany the Berlin-Steglitz section of the National Association of Red Cross Women has established a "matrimonial consultation service" to help married couples to overcome or to avoid the difficulties that arise in the course of married life.[2] Although this service is directed by a psychologist who is not a graduate in medicine, it is explained that the service works in close coöperation with the public health service. At the third international congress of the World League for Sexual Reform, held last month in London, a paper by Dr. Abraham Stone, of New York, was read in absentia. The writer pointed out that there is even a statistical correlation between premarital examination and happiness in the future married life. The importance of this procedure is again emphasised in a paper published still more recently.[3] "The preventive medicine of divorce," writes Dr. Earp, "consists in premarital advice not only on how to choose, but also on how to live with the chosen mate; supplemented by premarital medical examination, designed to exclude impossible partnerships and to safeguard others from unnecessary difficulties and pain."

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[1] Mariage eugénique et certificat prénuptial, Tribune Méd., 1929, lxiii, 308.

"ELECTRICAL SECURITY."

THE enormous increase in the use of electricity throughout the country, not only for lighting but for other services, implies a higher standard of safety in electrical installations. The wiring which has proved adequate for the lighting of a house may fail disastrously when required to carry the current needed for electric fires; in particular electro-medical apparatus of all kinds require a high standard of workmanship not only in the instrument but also in the supply feeding it. The Electrical Contractors' Association have issued a small booklet under the above title which deals with these and kindred points. The different types of installation are explained with the advantages, limitations, and relative cost of each; the makeshifts of careless wiring are tabulated and types of satisfactory fittings are described and illustrated.

The booklet has practical value, not only for the electrical engineer, but for every user of electrical power. The question arises, however, whether the high standard of safety demanded here is practicable. Most of the recommendations are based on regulations drawn up by the Institute of Electrical Engineers, and in the main they form an invaluable standard. When such schemes are drawn up the necessity of avoiding risks is felt so strongly that often an unreasonable margin of safety is demanded. Later it is found in practice that it is perfectly safe to ignore some particular rule and trust to experience, with the inevitable result that a rule which can be broken with impunity brings the whole scheme into contempt. Thus a rule originally framed to ensure perfect safety may have exactly the opposite effect in practice.

As an example, take the condemnation of ordinary twin flex which, according to this booklet, should be confined to stationary lights. The use of this form of wire for taking current to all sorts of portable apparatus is nowadays so universal that it will need more evidence than is given here of the dangers involved before the public is likely to abandon its use. The alternative specified consists of three flexible wires in an outer cover. It is difficult to see the superiority of such a cable except in the matter of kinking, whilst the increase in cost would be enormous.

MOTHERCRAFT.

MEDICAL men and women, even if they are not in practice are apt to be called into consultation on matters of mothercraft in and out of season, though their advice is not always accepted. Dr. L. G. Housden[4] has anticipated many of the questions usually asked, and suggests to his readers "if your friends worry you excessively, give them this book to read." He opens his introductory letter with the disarming statement: "This is not a medical book, but a series of short chapters dealing in a practical manner with the various problems of babyhood." The teaching is, in fact, quite elementary, and could be appreciated by young mothers of no great educational attainment, though some of the recommendations are hardly within the reach of poorer sections of the community. Dr. Housden is a relentless advocate of breast-feeding, but the faithful disciple of Sir Truby King will read with surprise the suggestions that for the first few days of life a night-feed may be given; that mackintosh knickers are unobjectionable, and that half a teaspoonful of water between feeds is the most that a baby may receive, and that only in abnormally hot weather. The author points out the absurdity of believing that new-born infants are in need of either aperients or operations; the baby who passes irregular motions and the tongue-tied baby will both achieve normality with the exercise of patience, and circumcision should only be performed where there is some real difficulty in passing water. The aim of the book is to induce a sense of confidence in the mothers who read it, and many minor causes of alarm are robbed of their terror by straightforward analysis and explanation. Perhaps the best chapter is that on character training, which emphasises the importance of the personal as well as the material environment.

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[2] Information Bulletin, League of Red Cross Societies, 1929, viii., 263.

[3] Earp, J. Rosslyn: Marriage, Divorce, and the Doctor, Colorado Med., October, 1929, p. 330.

[4] Mothercraft. By Leslie George Housden, M.B., B.S. London: Herbert Jenkins, Ltd., 1929. Pp. 128. 2s. 6d.

ANOTHER LOCAL ANÆSTHETIC.

A NEW analgesic called "perkain" receives warm commendation from those who have tried it both experimentally and in clinical practice.[1] Unlike cocaine, tutocaine, and other local anæsthetics, it is not a benzoamino-alcohol product, but is a complicated derivative of the quinoline group. It consists of colourless crystals which dissolve easily in water with an alkaline reaction. The solution can be sterilised by boiling, and can be used in conjunction with adrenalin. It is more slowly absorbed than cocaine, and poisonous effects are therefore less easily brought about and are in many cases said to be far less. It is stated that there is no likelihood of acquiring a drug habit from perkain. It has given complete satisfaction as a surface analgesic on mucous membranes, and when injected into the bladder for cystoscopy. For this purpose 30 to 40 c.cm. of a 1 in 1000 solution was used. As a spinal analgesic for lumbar injection it has not given good results in seven out of ten instances in which it was employed. So far the largest series of cases reported of the use of perkain for local analgesia is 200. One case of collapse is reported after the use of a solution much stronger than 1 in 1000.

LA CURE D'AIR.

IT is still not an uncommon practice for the physic to prescribe a sea voyage, and in the last century a to the antipodes was popular as a therapeutic meas But the physician's armoury changes with the times, and D Charles L. Julliot may be right when he suggests[2] that aeroplane will eventually replace the ship as a therap mode of locomotion. The use of aviation for the eva tion of wounded in time of war or the transport of si time of peace is already well known, but it is in Ce Europe that the air is being exploited as a form of t ment. According to a well-known German medical m a young girl of 14 has been cured of a persistent cou a trip in an aeroplane, while a neurasthenic patient obtained a renewed zest for life. Nor is there any surprising in this, for the altitude, the open air, the sp and an occasional nose-dive are all stimulating experie The review sagely warns the enthusiast from subm cases of acute mania or of advanced heart disease t aerial cure, but for many other disorders it is thou flying may replace visits to the Alps or other places of altitude. Much is already known of the physiol changes which take place at high altitudes, and it is ceivable that such knowledge may be translated in of therapeutic value: air trips of graduated heigh time for definite disorders, prolonged treatment in a c balloon for chronic cases. But Dr. Julliot is a d law, not of medicine, and he does general recommendation to the spec

"A NEW QUINOLINE DI

A PAPER by Mr. George Armitag of a New Quinoline Derivative in th appeared on p. 968 of our last is Houses, Ltd. (16, Graham-street, C inform us that they can supply t described.

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[1] Münch. med. Woch., Oct.

[2] Presse Méd., Oct. 12th

HAMPSTEAD GENERAL AND N HOSPITAL.—Last week the Duchess of of this hospital at Haverstock Hill, w The enlargements include a new dispensary, and a casualty depart pathological laboratory, a lecture t post-graduates, additions to the n resident medical staff, and a block of has necessitated the reconstruction private wing, in which there are 21

Bradshaw Lecture

ON THE

SURGERY OF THE GALL-BLADDER AND BILE-DUCTS.

A REVIEW.

Delivered before the Royal College of Surgeons of England on Nov. 14th, 1929,

By R. P. ROWLANDS, O.B.E., M.S.Lond.,
FELLOW AND COUNCILLOR OF THE COLLEGE; SURGEON TO GUY'S HOSPITAL.

The surgery of the gall-bladder and bile-ducts is only about fifty years old. Lister's[1] epoch-making discoveries had paved the way for it some twelve years earlier, but surgeons were very slow to accept his principles and to adopt his methods with confidence, and especially to apply them to do pioneer work in the dangerous area of the upper abdomen.

Before Lister's time little was attempted beyond the opening of abscesses and cautious slitting of sinuses for the extraction of stones. Through all the years that had gone before, medicine had little to offer beyond relief of pain by drugs. As late as 1890 a distinguished physician confidently advocated massage as a means of expelling stones from the bile-ducts into the duodenum.

In 1733 Petit[2] had suggested and described cholecystotomy, but the fear of peritonitis was so great that the operation was not actually performed until 1867. At this date J. S. Bobbs,[3] exploring for a supposed ovarian cyst, found and opened a gall-bladder distended with mucus, and extracted about 50 small stones, closed the gall-bladder and dropped it back; and the patient recovered. In 1878 Marion Sims performed cholecystostomy in a very late case of jaundice due to gall-stones, but the patient, who was very ill and bleeding at the nose, died soon afterwards; and in 1879 W. W. Keen had a similar experience. In August of the same year Lawson Tait[4] successfully removed a large stone from the gall-bladder and a small one from the cystic duct. The edges of the incision in the gall-bladder were sewn to the skin. By 1885 he had operated upon 15 patients, and in 1889 he published a list of 55 cholecystostomies with only 3 deaths. By this time surgery was benefiting by the teachings of Lister, and operations upon the gall-bladder were rapidly increasing.

In June, 1885, Mayo Robson, "with all the usual measures as to cleanliness, and with full antiseptic precautions, including the spray," successfully performed his first cholecystostomy, and in 1892 published his stimulating book upon gall-stones, with full details of 41 operations. Since then, thanks to the work of the Leeds School, and of many other ons at home and abroad, the surgery of the bile- has advanced by leaps and bounds (Fig. 1).

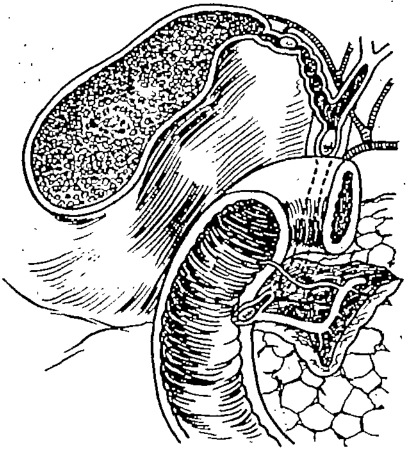
e of the most recent contributions from Leeds valuable statistical study of cholelithiasis by ross,[5] based on a series of 9531 autopsies on ts of all ages performed at the Leeds Infirmary the years 1910 to 1926 inclusive. In this 802 (or 8·4 per cent.) were the subjects of thiasis. Dr. Gross concludes that obesity has ter influence than pregnancy upon the formagall-stones; that gall-stones are only twice as n in women as in men; and that they do not nore frequently in married than in single women. so emphasises the frequent association of gall- with inflammation and cancer of the gall-r and bile-ducts.

knowledge of the abnormalities of the bile-nd of the arteries associated with them has been led by Flint.[6] Descomps[7] and Eisendrath[8] lready drawn attention to these important variations. Mayo Robson, in his book already mentioned, described the following six operations:—

1. Cholecystostomy, or drainage of the gall-bladder.
2. "Ideal Cholecystotomy": in this operation, after the stones had been removed, the gall-bladder was closed and dropped back into the abdomen.
3. Cholelithotrity, or crushing the stones.
4. Cholecystectomy, or removal of the gall-bladder.
5. Choledochotomy, or incision of the common bile-duct.
6. Cholecystenterostomy, or joining the gall-bladder to the bowel.

Cholecystostomy was the operation of choice. At first the gall-bladder was sewn to the skin, but later to the aponeurosis, to lessen the risk of fistula. It took some time for surgeons to learn that a rubber tube sewn into the gall-bladder in an airtight manner gives the best, simplest, and safest drainage. This is a good operation, and is especially useful for bad subjects and for surgeons lacking great experience. It saves lives, without endangering the bile-ducts.

FIG. 1.



Anatomy of the biliary apparatus. Stones are shown in the cystic duct, common bile-duct, and ampulla of Vater. The pancreatic duct of Wirsung and the accessory duct of Santorini are shown, the latter opening separately into the duodenum.

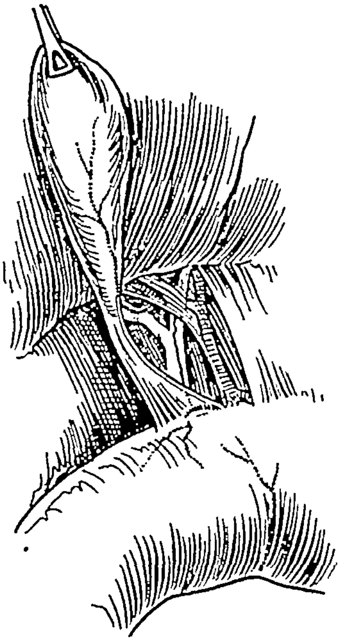
"*Ideal Cholecystotomy*" was abandoned as too dangerous—leakage and peritonitis having followed in a number of cases.

Cholelithotrity was introduced by Lawson Tait and was almost exclusively used for stones impacted in the bile-ducts, whence their extraction by incision was considered too difficult and dangerous. The stones were crushed between the finger and thumb, with padded forceps, or split by means of a fine round needle. This method, although useful at a pinch, is crude and apt to be followed by recurrence, because of the debris left in the ducts.

Cholecystectomy was introduced by Langenbuch[9] in 1882. His first operation for the removal of a calculous gall-bladder was successful, but two out of his first four operations were fatal—one from peritonitis and the other from an abscess of the choroid plexus. The operation was rarely done for some years. Robson only did it once in his first 40 cases, and only 47 cholecystectomies were recorded up to 1890. Now it is the operation of choice for most diseases limited to the gall-bladder and cystic duct, because it is the most radical and generally successful.

For many years only the serious effects of gall-stones were treated by surgery; but with increasing knowledge, acquired from operations and the study of early symptoms, both physicians and surgeons now endeavour to forestall these serious consequences, and even to prevent the formation of gall-stones, by preventing or eliminating the infection which almost constantly precedes it. This is a high aim, and offers great opportunities both for preventive medicine and preventive surgery. Dr. A. F. Hurst[10] has made valuable contributions to the medical treatment of cholecystitis. At present, operations on the bile tract are rapidly increasing in number.

FIG. 2.



The relations of the bile-ducts and blood-vessels as they lie in front of the foramen of Winslow. Variations are very common.

While contemplating this extension of surgery, the beginner should never forget that the present great success of operations upon the gall-bladder and bile-ducts, carried out by experts, can only be obtained by those who take the greatest pains to train themselves in this difficult branch of surgery, and to observe most scrupulously the necessary precautions. Much can be learnt from a careful study of the anatomy, physiology, and pathology of the bile apparatus, and especially the important and confusing changes in the surrounding tissues produced by inflammation. But the perfect skill and judgment which can save a surgeon from the pitfalls that beset his path can only be attained by watching, assisting, and operating under the supervision and encouragement of a master in this special branch of surgery. Thus, with perfect training and greater care, we ought to see and hear less of those injuries to the bile-ducts which demand difficult reconstructive operations. Here, prevention is far better than cure.

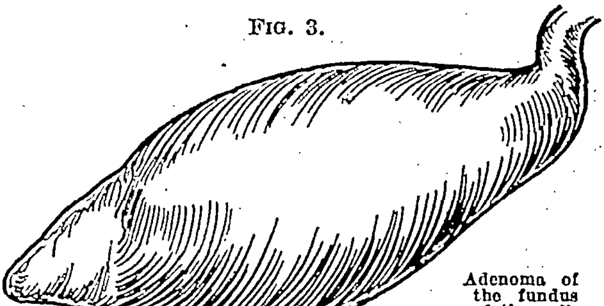
ANATOMICAL VARIATIONS OF THE GALL-BLADDER, BILE-DUCTS, AND BLOOD-VESSELS.

The *gall-bladder* varies considerably in position and size, and when it is placed high up and far back in the right loin or embedded in the liver substance it may be very difficult to deal with. Rarely it is double, divided, or absent; but frequently, as a result of disease, it is either contracted or very large; and sometimes it is so adherent to important structures as to be difficult to define or unsafe to remove.

Bile-ducts.—The cystic duct is often long, running parallel to and adherent to the common hepatic duct which it may join behind the duodenum. On the contrary, it may be, or appear to be, very short or absent. Under these circumstances, it is easy to buttonhole or divide either the common hepatic or the common bile-duct. According to Flint, an accessory right hepatic duct is present in 15 per cent. of cases. It usually discharges near the angle of union of the cystic and common hepatic ducts, and is apt to be divided during removal of the gall-bladder. If this accident passes without recognition and treatment, and the wound is not drained, leakage of bile and secondary infection may be disastrous by causing local or diffuse peritonitis (Fig. 2).

Arteries.—The so-called normal arrangement of the arteries was found by Flint in only 60 of his 200 consecutive dissections. The relations of the vessels to each other and to the ducts are so variable that constant care is necessary to avoid mistakes which may lead either to severe bleeding or to the accidental tying of the right hepatic artery. The bleeding may be almost impossible to stop without seriously damaging the bile-ducts in the depths of the wound. Tying the hepatic artery is a grave error, which is bound to interfere with the nutrition of the liver and may lead to the death of the patient. These mistakes can be avoided only by keeping very close to the gall-bladder and its duct, by using gauze dissection, and by examining each vessel very carefully before it is tied and divided. The large size of the right hepatic artery should save it from confusion with the cystic artery.

FIG. 3.



Adenoma of the fundus of the gall-bladder.

A branch of the gastro-duodenal or of the pancreatico-duodenal, or even one of these arteries, itself may lie in front of the common bile-duct just above the duodenum where it may be lacerated when the duct is hurriedly opened without carefully separating its coverings.

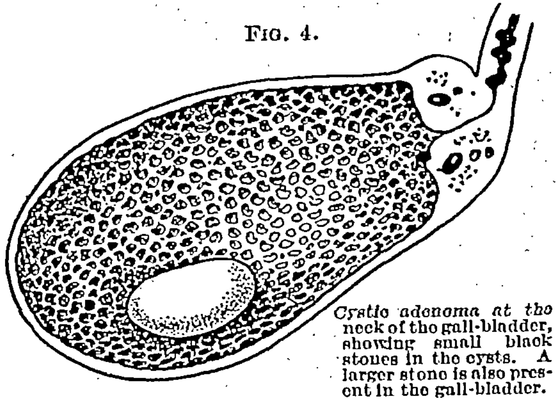
DIAGNOSIS.

Many advances have been made in the diagnosis of cholecystitis and cholelithiasis. As about 10 per cent. of the population have gall-stones, and many more have cholecystitis, there are plenty of opportunities for testing new and old methods of diagnosis. But gall-stones may lie dormant for long periods, and may be discovered accidentally during routine examinations or even after death.

In 1908 Lord Moynihan,[11] our President, gave us an excellent and most helpful account of the "inaugural" symptoms of cholecystitis. A careful study of the clinical history, symptoms, and signs enables us to make a correct diagnosis in a large majority of cases.

Simple radiography shows us the shadows of some opaque gall-stones and thick-walled or calcified gall-bladders. It may show other opacities, such as calcified glands; it should always be tried before cholecystography, because it may make the latter superfluous.* With the aid of the opaque meal,

FIG. 4.



Cystic adenoma at the neck of the gall-bladder, showing small black stones in the cysts. A larger stone is also present in the gall-bladder.

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* Dr. J. M. Redding has kindly lent me the slides illustrating this part of my lecture.

radiography indicates pressure or traction of the distended or retracted gall-bladder upon the stomach, duodenum, or colon; but these methods only give correct results in about 80 per cent. of cases. The discovery of cholecystography by Graham [13] and Cole in 1923 was a great advance; it has already borne much fruit, and promises more to come, when its merits and possibilities are more widely appreciated. Whereas simple radiography, even with the aid of opaque meals, rarely gives any indication of cholecystitis or of small or non-opaque gall-stones, Graham's method helps us to an early diagnosis of all these. It is particularly valuable in demonstrating obstruction of the bile-ducts before cholecystitis has developed or become recognisable. Obstruction of the cystic duct by a stone too small to cast a shadow, by torsion, valvulation or bands, can thus be recognised and radically treated at an early stage. It also estimates the power of the gall-bladder to concentrate and to expel bile, and of the liver to secrete it. These add much to the range and value of diagnosis.

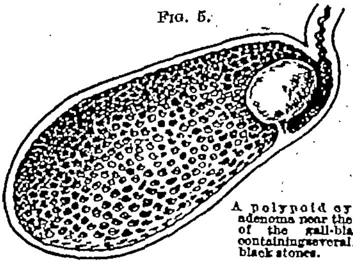
Graham's method is invaluable in the differential diagnosis of diseases of the gall-bladder from those of the alimentary and urinary tracts. The pure dye,† given with care, and in suitable doses, rarely does any harm, but it ought not to be given to patients suffering from heart disease, atheroma, abnormal blood pressure, or to those affected with chronic jaundice, cholangitis, or threatened with uræmia or hepatic insufficiency. The test is a little more accurate when the drug is given intravenously, but it is more convenient and is often considered safer when given by the mouth. Various writers estimate the accuracy of this method of diagnosis as from 80 to 97 per cent.

GENERAL INDICATIONS FOR OPERATION.

The following are the chief indications for operations upon the biliary tract:—

1. *Obstruction.*—(*a*) Of the cystic duct, as indicated by typical attacks of biliary colic with tenderness in the right hypochondrium, and often a palpable gall-bladder. Here cholecystographic evidence of defective filling may give valuable confirmation. (*b*) Of the common bile-duct, as indicated by recurrent attacks of biliary colic and jaundice, perhaps with fever; or increasing and persistent jaundice without colic, generally due to carcinoma of the pancreas or chronic pancreatitis. Great care is taken to exclude other causes of jaundice, such as cirrhosis or malignant disease of the liver.

FIG. 5.



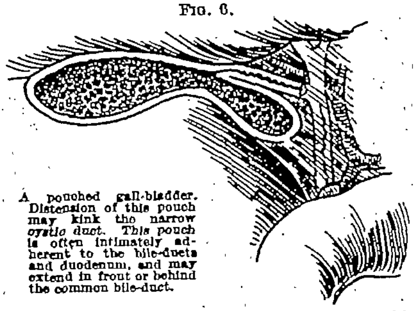
A polypoid cystic adenoma near the neck of the gall-bladder, containing several small black stones.

2. *Irritation and infection* of the gall-bladder as indicated by chronic flatulent dyspepsia, pain and tenderness over the gall-bladder; and cholecystographic evidence of disease or of stones in the gall-bladder.

The mere demonstration of gall-stones or cholecystitis is not sufficient indication for operation. In many they cause no appreciable discomfort, or *only such as* can be relieved by medical treatment. But we have no medical means of dissolving or evacuating the stones, although stones sometimes pass spontaneously along the ducts, or escape through fistulæ into the gastro-intestinal tract.

When symptoms persist or recur in spite of medical treatment, it is generally wise to recommend early operation so as to prevent a high mortality and other serious consequences of delay such as: (1) suppuration, perforation, peritonitis, acute and chronic septicæmia, osteo-arthritis; (2) jaundice and cholangitis, with risk of cholæmia and hæmorrhage; (3) cancer [14] of the gall-bladder, which develops according to Rolleston [15] and others in at least 5 per cent. of all cases of gall-stones. The danger of this complication is greater than that of operation; (4) intestinal obstruction by gall-stones which have ulcerated into the bowel; (5) pancreatitis; (6) hepatic insufficiency; (7) cardiac degeneration.

FIG. 6.



A pouched gall-bladder. Distension of this pouch may kink the narrow *cystic duct.* This pouch is often intimately adherent to the bile-ducts and duodenum, and may extend in front or behind the common bile-duct.

When possible it is safer to wait for a quiet interval before operating, so as to allow thorough investigation and preparation of the patient. Fortunately, the acute symptoms, such as colic, jaundice, and fever, generally subside under careful medical treatment; for, unlike the appendix, the gall-bladder rarely perforates or sets up spreading peritonitis. When signs of spreading peritonitis develop, or an enlarged, tender gall-bladder can be felt, and symptoms such as vomiting, fever, and rigors do not abate, or signs of acute pancreatitis develop, an immediate operation is necessary. Similarly, when jaundice, associated with fever, fails to clear up under medical treatment, an early operation offers the best hope.

These emergency operations should be limited to simple drainage of the gall-bladder or common bile-duct. Radical operations can be carried out later when the patient is better, the liver function is restored, and sepsis has subsided.

PREPARATION.

Much has been done in recent years to make operations safer by improving the preparation of patients, and this applies with special force to the surgery of the bile-ducts, which is beset with special dangers.

The patient is kept at rest, preferably in bed, for two or three days, and dieted. Plenty of sugar and glucose and bicarbonate of soda are given by the mouth, rectum, or even intravenously in all cases where failure of the liver functions is feared. Hexamine is given as a biliary antiseptic. All septic sources in the mouth, nose, and throat are treated in time to lessen the risk of pulmonary complications. When the patient is jaundiced and clotting of the blood is delayed, 5 c.cm. of a 10 per cent. solution of calcium chloride is injected intravenously for two or three days before the operation. If this fails to bring the clotting time to the normal, or there is marked anæmia, one or more transfusions of blood may be given with great advantage.

ANÆSTHETICS.

Chloroform is best avoided in these cases owing to its destructive effects on liver cells. An injection of morphia gr. 1/4 and atropine gr. 1/100 is given 45 minutes before the operation. Ether and oxygen are administered. Some prefer gas and oxygen, but this rarely affords enough muscular relaxation. Novocain injected into the free edge of the lesser omentum and near the neck of the gall-bladder lessens shock and increases relaxation. For bad subjects, twilight sleep, followed by local anæsthesia suffices, especially for simple operations. Spinal anæsthesia with a little gas and oxygen is also valuable.

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† Graham and Cole prefer the intravenous administration of 2·5 g. of phenoltetraiodophthalein. For oral administration they use 4·0 to 5·0 g. of tetraiodophenolphthalein."

Incisions.

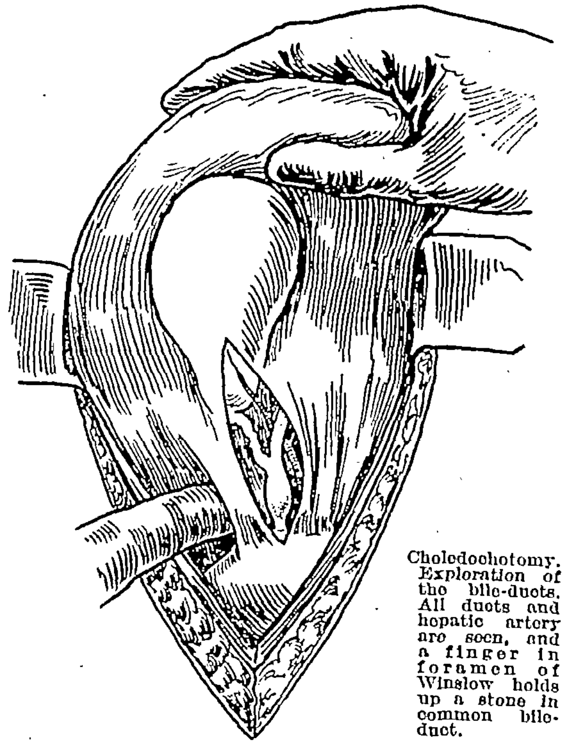
I find that Kocher's incision, which divides the whole width of the rectus muscle and its sheath 1 inch below the right costal margin, gives the best access for cholecystectomy in fat and muscular patients. It is very easy to close, and is rarely followed by ventral hernia, although it allows good drainage at its outer angle. It does not rob the rectus of an adequate nerve-supply.

The right paramedian incision gives the best access to the lower part of the common bile-duct, to the pancreas, and to the appendix adherent low down in the abdomen or pelvis. A stab wound for drainage allows the paramedian incision to be completely closed to lessen the chance of ventral hernia. For secondary operations a fresh site for the incision is generally desirable, so as to avoid adhesions and allow a free exposure, with less risk of hernia or damage to adherent organs.

Choice of Operation when the Parts are Exposed.

The abdomen having been opened, the surgeon, whenever possible without adding to the patient's risk, rapidly explores the whole abdomen so that he may discover and remove any source of sepsis. In many cases it is necessary to remove a diseased appendix, and in some a gastric or duodenal ulcer may need attention. The gall-bladder and bile-ducts are examined with the greatest care, so that no stone or disease may be overlooked. It is very important to remember that stones may rest in the common bile-duct for years without causing jaundice. At my first cholecystectomy the gall-bladder contained 90 small faceted stones, but I overlooked the hundredth, which was in the common bile-duct. It caused frequent attacks of colic without any jaundice during four years before I removed it.

FIG. 7.

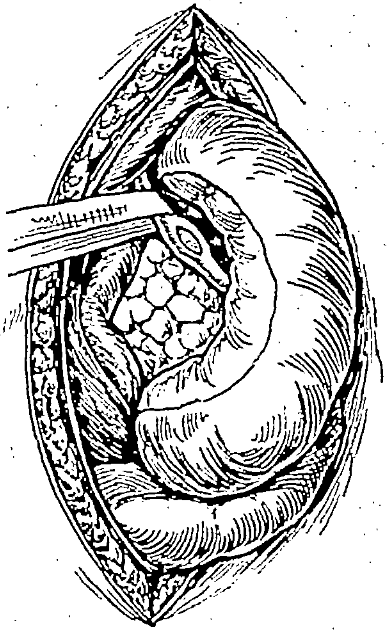


Choledochotomy. Exploration of the bile-ducts. All ducts and hepatic artery are seen, and a finger in foramen of Winslow holds up a stone in common bile-duct.

When the common bile-duct is dilated, especially with the gall-bladder present and active, the ducts must be palpated with extreme care, and often it is necessary to open the common bile-duct and to examine the passages from within.

(*a*) *When the disease is limited to the gall-bladder and cystic duct* the choice lies between cholecystectomy and cholecystostomy (Fig. 3). It is the ideal of the surgeon to operate while the disease is limited to the gall-bladder and cystic duct so that he can eradicate it. Fortunately, the gall-bladder is not indispensable, although it has been shown to have several interesting functions. Certain animals, such as the horse, the deer, and the rat, have no gall-bladder, and thousands of human beings who have had it removed get on well without it. Skilful removal in suitable cases carries little risk; therefore we need not hesitate to remove it when this is necessary. Removal is far better than drainage, for the following reasons:—

FIG. 8.



Retroduodenal choledochotomy. The stone is firmly impacted in the second part of the common bile-duct, behind the duodenum, which has been mobilised and turned over to the left. The duct was embedded in the head of the pancreas.

1. Drainage rarely cures cholecystitis because the infection lurks deeply in the walls of the gall-bladder.
2. A diseased gall-bladder being the chief factory of gall-stones is better removed to prevent recurrence.
3. It is extremely difficult to make sure of removing all the stones from the cystic duct and the gall-bladder. It is often easier, cleaner, and therefore safer to remove the gall-bladder and cystic duct without opening them.
4. Excision of the gall-bladder may get rid of an unsuspected early cancer or precancerous condition. The results of such operations are extremely favourable. I have several patients living and well many years afterwards, but it is usually too late to cure a cancer of the gall-bladder which has been recognised before the abdomen has been opened.

The chief indications for cholecystectomy are irreparable wounds and injuries or diseases limited to the gall-bladder and its duct. The most important of these diseases are: acute, chronic, and recurrent cholecystitis, especially when associated with gall-stones; typhoid infection, making a patient a typhoid carrier; gangrene, perforation, empyema, hydrops, or mucous fistula of the gall-bladder due to obstruction of the cystic duct by stone, torsion, kink, band, or stricture; fibroma, adenoma, papilloma, or carcinoma and biliary fistula or chronic jaundice due to kinking of the common bile-duct following cholecystostomy (Fig. 4).

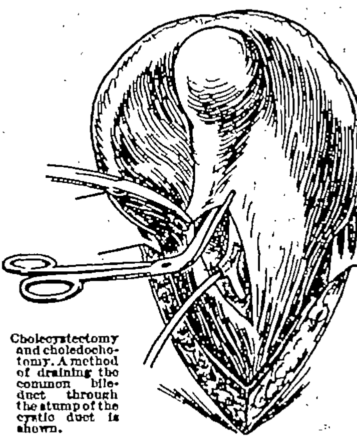
If every gall-bladder is carefully examined after removal, I believe that more new growths will be discovered. The figures illustrate some adenomata which I have removed; several contained small black stones. I think they have an important bearing upon stone and cancer formation (Fig. 5).

A. M. Shipley[14] has collected 22 cases of acute torsion of the pendulous gall-bladder; cholecystectomy was performed on all but one of these cases. This condition is almost limited to women over 60 years of age.

It is not wise to undertake cholecystectomy when the patient is very ill, old or feeble, or when the mechanical difficulties and dangers of the operation are too great for the operator. Cholecystostomy is safer under such circumstances, care being taken to remove all the stones, if possible. If the symptoms recur, secondary cholecystectomy can be performed under more favourable circumstances. Neither should cholecystectomy be attempted when there is chronic jaundice with consequent risk of hæmorrhage, unless the normal coagulation time has been restored by treatment; nor when there is infective cholangitis or hepatic insufficiency. Cholecystectomy should never be performed unless it is certain that the common bile-duct is patent.

It is easy enough to recognise gross disease of the gall-bladder, but slight abnormalities are as easily overlooked. If the clinical history and examinations, especially cholecystography and the finding of bacteria in the duodenal bile, incriminate the gall-bladder, it is generally wise to remove it although it may not look very abnormal. Other important signs of disease are: thickening, with change of colour to pink or grey; small stones often difficult to feel; white spots indicating cholecysterosis or strawberry gall-bladder; an excess of fat in the wall; enlargement of the sentinel lymphatic gland near the cystic duct; evidence of hepatitis, perihepatitis, and especially subcapsular fibrosis near the gall-bladder; and adhesions to the duodenum or colon (Fig. 6). Kinking, bands, adhesions, and deformities at the neck of the gall-bladder may be concealed until they have been fully exposed after dividing their peritoneal sheath. I have demonstrated several good examples of valvular obstruction of the neck of the gall-bladder while operating for Dr. Hurst at New Lodge Clinic.

FIG. 9.

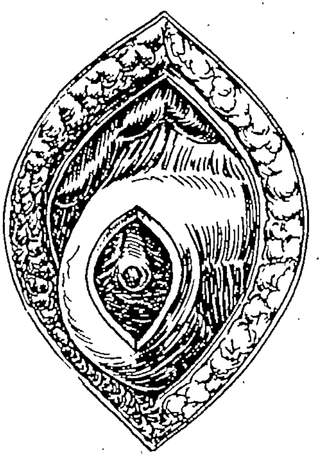


Cholecystectomy and choledochotomy. A method of draining the common bile-duct through the stump of the cystic duct is shown.

(*b*) *When the common bile-duct is affected*, obstructive jaundice generally follows, and is often due to (1) stone in the common bile-duct; (2) carcinoma of the head of the pancreas or bile-duct; (3) chronic pancreatitis.

The choice of operation is between choledochostomy, cholecystogastrostomy, and cholecystostomy (Fig. 7). When jaundice is associated with colic, it is generally due to impaction of stone or other foreign body in the common duct. It is far better to remove the obstruction, if possible, than to make a short-circuit between the gall-bladder or bile-duct and the stomach or intestine. A stone impacted in the lower part of the common bile-duct is best moved back into the first part of the duct and held there before the latter is opened. If the stone cannot be moved back and extracted from the first part of the duct, it may be necessary to mobilise the duodenum and to remove the stone from behind (Fig. 8). When the stone is impacted at or near the duodenal papilla, the trans-duodenal route is a good and safe one—far safer than prolonged efforts to displace or to crush the stone (Fig. 9). Whenever the first or second part of the common bile-duct has been opened I insert a tube for drainage; once after closing the duct I had to remove a fibrinous clot from it ten days later, and in another case in which the drainage-tube did not enter the duct, bile accumulated in the lesser sac of the peritoneum, causing serious symptoms which were relieved by drainage some days later (Fig. 11). On various occasions I have found foreign bodies (other than stone) in the common bile-duct, such as hydatid daughter cysts discharged from the parent cyst in the liver, and a slough derived from the turned-in edge of the gall-bladder after cholecystostomy.

FIG. 10.



Duodenocholedochotomy. The second part of the duodenum is brought into the wound and packed off. Vertical incisions are made in the anterior wall of the duodenum and end of the bile-duct.

If the jaundice is due to chronic pancreatitis or carcinoma of the head of the pancreas, I prefer cholecystogastrostomy to any other treatment. It is much better than draining the gall-bladder or common bile-duct to the surface of the skin, and it appears to be safer, easier, and better to drain the distended gall-bladder into the stomach than into the duodenum, small or large intestine. Fistula or obstruction occasionally followed an anastomosis with the duodenum; kinking and vomiting often followed union with the jejunum; and infection of the liver is especially likely when the gall-bladder is joined to the colon. Chronic pancreatitis, with jaundice, is generally cured by cholecystogastrostomy (Fig. 11). I have several patients who have survived many years in good health. The operation is worth while, even for cancerous obstruction of the common bile-duct, for the jaundice with intolerable itching and risk of bleeding are cured, and life may be prolonged in comfort and efficiency for many months or even for years.

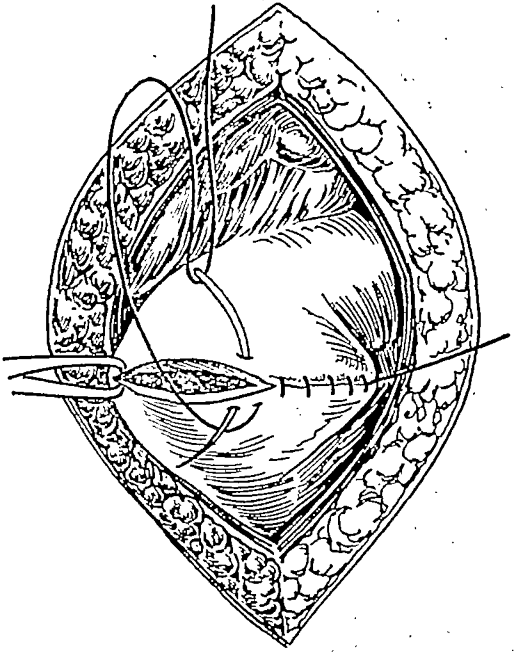
RECONSTRUCTION OF THE BILE-DUCTS.

Reconstruction of the bile-ducts is required occasionally after excision of growths, but more commonly after accidental injuries during operation. It is easier, and far better, to make the necessary repair immediately, before inflammation has changed and confused the anatomical appearances, and before ascending hepatitis and hepatic insufficiency have developed. Direct suture over a rubber tube is usually practicable in early cases. Later it may be impossible to find or to make use of the lower part of a divided duct. Then it becomes necessary to join the upper, often dilated, part of the duct to the duodenum, either by direct suture after the Mayo[17] method, or by a flap operation after Walton's[18] excellent plan. These operations are notoriously difficult and dangerous.

RESULTS.

Mortality.—The death-rate of operations upon the gall-bladder and common bile-duct is surprisingly low, considering the complicated nature and difficulties of these operations. Graham and his colleagues, in their last 309 cholecystectomies for both acute and chronic cholecystitis, with or without stones, had a mortality of 2·8 per cent. During the same time they performed 11 cholecystostomies with a mortality of 18 per cent., this operation having been performed only in those cases which were the worst risks. The death-rate of choledochotomy is naturally higher because the patients requiring it are often bad subjects, who have suffered for years and have developed complications such as secondary heart disease, cholangitis, hepatitis, or pancreatitis, and are now peculiarly liable to hæmorrhage and pulmonary complications, and above all are apt to suffer from hepatic insufficiency or nephritis. Graham had a mortality of 11·9 per cent. in 42 cases of removal of stones from the common bile-duct. Infective or suppurative cholangitis makes the mortality very high.

FIG. 11.



Duodenocholedochotomy. The wound in the duodenum is drawn into the transverse position and closed with two layers of catgut suture and sealed over with a flap taken from the *mesocolon just below it.*

Between July, 1916, and January, 1929, there were 251 operations for gall-stones and cholecystitis in my wards at Guy's Hospital, with 7 deaths—a mortality of 2·8 per cent. 202 of these patients were women, with 4 deaths; 49 were men, with 3 deaths. My junior colleague, Mr. Lancelot Bromley, operated upon some of these patients, and my surgical registrar operated on some under my supervision. During the last ten years I operated upon 175 private patients for all kinds of diseases of the gall-bladder and bile-ducts, with 11 deaths—a mortality of 6·3 per cent.

There were 10 cholecystotomies, with 2 deaths.
" " 135 cholecystectomies, " 4 "
" " 25 choledochotomies, " 5 "
" " 5 cholecystogastrostomies, with no death.

The two deaths following cholecystotomy were due to perforation of the gall-bladder causing subdiaphragmatic abscess in one case and general peritonitis in the other. Two deaths following cholecystectomy were due to pneumonia and pulmonary embolism. Another death was due to perforation of the gall-bladder with suppuration in the liver; and the last occurred in a patient suffering from severe hæmolytic anæmia secondary to streptococcal infection of the gall-bladder. The five deaths following choledochotomy were due chiefly to hepatic insufficiency in late cases. Of my private patients, 126 were women, with 7 deaths; 49 were men, with 4 deaths. There were more than 3 women to 1 man in my lists of 426 operations. D. P. D. Wilkie and others have also found the mortality higher in private patients, who are apt to wait too long and to try various treatments before operation.

It is interesting that both Graham and Blalock also find the risk of all these operations much greater in men than in women.

Ultimate Results—Cholecystostomy affords complete and permanent relief of symptoms in only about 45 per cent. of cases.[19] The persistence or recurrence of symptoms are often due to leaving some stones behind, to the persistence of inflammation in the walls of the gall-bladder, or to the formation of new stones. Secondary cholecystectomy or choledochostomy are often required.

Cholecystectomy affords complete and permanent relief in about 86 per cent. of cases.[20] Müller[21] found the results completely satisfactory in 84·4 per cent. of stone cases and 70 per cent. of the cases of cholecystitis without stones. Whipple gives similar figures. At least 80 per cent. of my results were good. The more accurate the diagnosis, the better the result.[22] Hurst[23] has pointed out that some temporary recurrence of symptoms may follow cholecystectomy, owing perhaps to spasm of the sphincter of Oddi with dilatation and other changes in the bile-ducts, secondary to the loss of the gall-bladder. Under these conditions spasmodic pains may develop and be attributed to stones left behind in the common bile-duct. Medical treatment will generally cure these symptoms and should be well tried before submitting the patient to another operation which may not discover any stone or obstruction in the bile-ducts. Adhesions between the stomach or duodenum and the gall-bladder fissure of the liver may cause pain and vomiting, but they very rarely lead to pyloric or duodenal stenosis, calling for operation. Persistence of symptoms after operation may be due to residual infection in liver or pancreas, to stones overlooked in the ducts, to errors in diagnosis, to osteo-arthritis of the spine, spastic or mucous colitis.

Choledochotomy is generally followed by great success, but occasionally symptoms persist or recur owing to a stone left behind or coming down from the liver, to a stricture in the duct or at the duodenal papilla, to blood clot or fibrin in the duct, to pancreatitis, or to the formation of fresh stones in a septic, ill-drained gall-duct; such a stone may form round a silk or even a catgut suture, or as has been already mentioned, round a slough of the gall-bladder.

CONCLUSIONS.

Infective inflammation of the gall-bladder is very common, and is difficult to cure medically. It often causes gall-stones, and sometimes cancer, to form in the gall-bladder.

Timely radical operation has a low mortality, and offers a very good chance of cure. Delay often leads to serious and dangerous consequences. The results of operations upon the gall-bladder and bile-ducts are extremely satisfactory, and compare favourably with those obtained in any other branch of surgery.

(References at foot of opposite page).

THE SULFOSIN TREATMENT OF GENERAL PARALYSIS

AND OTHER DISORDERS.

BY KNUD SCHROEDER, M.D.,
PHYSICIAN-IN-CHIEF TO THE ODENSE COUNTRY AND CITY HOSPITAL, DENMARK.

AT the thirteenth Northern Congress of Internal Medicine at Copenhagen in June, 1927, I gave a preliminary report* on the therapeutic effects I had observed after the administration of sulphur in the form of sulphurated oil ("sulfosin"). In general paralysis, repeated injections of sulfosin, producing a rise of temperature to 104° F. or higher, had a therapeutic effect similar to that of malarial treatment without its dangers and drawbacks. Further, I pointed out that the sulfosin treatment would be very likely to prove effective in other syphilitic and certain non-syphilitic lesions of the central nervous system.

My subsequent results have confirmed this view, which has now been supported by several other authors, who seem to assign to sulphur treatment a prominent part in the therapy of these lesions.

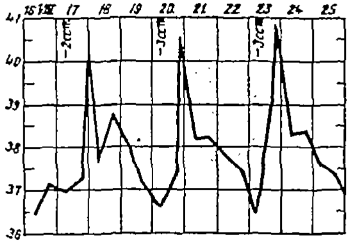
Sulfosin treatment is innocuous and can be applied everywhere—even in the most remote corners of the world—without any need for special hospitals or clinics. It is perfectly controllable; the fever can be regulated very accurately by the size of the injections, and can be made to subside at any time by their discontinuance. It can be instituted unhesitatingly even in infancy and old age, and in patients who are suffering from complications—even advanced circulatory lesions and albuminuria—that contra-indicate infection therapy. Another advantage is that the treatment may be given successfully to patients who have proved refractory to infection therapy (or in whom later injections did not take), and also to patients who cannot stand any other antiluetic treatment.

The preparation, sulfosin leo,* is a 1 per cent. solution or suspension† of sulphur (sulfur sublimatum subtilissimum) in olive oil, sterilised, according to my method, by heating in a hot-air oven, and sealed in ampoules of 1 to 10 c.cm.

Technique.

Sulfosin is injected deeply intramuscularly on the lateral side of the femur, preferably between the upper and middle thirds. The morning is the best time for injection, since the maximal temperature sets in about 12 hours later (8 to 14 hours). As the maximum is of very short duration, the temperature should be noted every hour or half hour when six to eight hours have elapsed after the injection, until the maximal height and subsequent fall have been recorded. It is important to know the maximal temperature reached, because the size of the injections will depend on it, the treatment aiming at a rise to 40° C. (104° F.) or more (see figure).

The initial dose is small (0·5 to 1·0 c.cm.), and the dose is increased by about 1 c.cm. at each injection until it eventually amounts to 10 to 12 c.cm. The temperature rises with the increase of dose. The injection is repeated when the temperature has dropped to normal—usually within 24 to 48 hours—so that the injections are given at a rate of about two a week. As a rule, ten injections constitute a series, and a new series may be started about two weeks after the preceding one. Usually two or three series are sufficient, but more may be given if desirable. At the site of injection there is often some tenderness for one or two days, culminating with pains in the femur radiating downwards; these pains may be treated with hot wet dressings or electric heat. Persisting tenderness and stiffness of the femur are treated by massage. A temperature of 104° F. is occasionally accompanied by a brief spell of indisposition.



Temperature chart (centigrade) showing rises of temperature *as a result of injections of sulfosin.*

Results in General Paralysis.

General paralysis was the first disease in which I experimented with this therapy. In February, 1924, a patient with tabo-paralysis was admitted to my department, and I had at that time no way of giving malaria treatment. So I ventured to treat him with injections of sulphurated olive oil, and the experiment turned out far more successful than could have been expected. He was admitted as an irretrievable wreck, and he was discharged in full remission, restored to life and to his profession, at which he is still working. Since then I have treated 12 cases, some more recent and some non-treated cases of long standing. Of these 12 cases, 4 were discharged in full remission, with fully restored capacity for work, and apparently cured (observation periods: 5, 4, 3, ½ years); 1 in good remission, but with a psychic defect, lack of initiative (observation period: 2 years); 1 in remission (treatment not completed); and 1 somewhat improved. Four have shown no change in their condition and 1 died (treatment not completed, but serological improvement; the patient died from pyelonephritis and pneumonia). Thus 58 per cent. of the patients were discharged in remission, including 33·3 per cent. who were apparently cured, and had fully recovered their capacity for work.

Similar favourable results have recently been obtained by Marcuse and Kallmann[1] with more advanced cases than are generally met in clinics and hospitals. In 82 cases these authors obtained a marked improvement (with a prognosis of "persisting improvement") in 19 per cent. In 41 per cent. of the cases the authors found "fair to marked improvement" in the somatic as well as in the psychic condition. The fact that these patients were not returned to their families was only due to "unfavourable domestic conditions." Warstadt[2] has treated 11 patients with sulfosin. He finds its favourable effect

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* Manufactured by Lovens Kemiske Fabrik, Copenhagen.

† The suspended sulphur can readily be dissolved by heating the ampoule over a small flame (an alcohol burner, for instance) before withdrawing its contents.

BRADSHAW LECTURE: REFERENCES.

(*Continued from previous page.*)

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to be unquestionable, and he concludes that this remedy "appears to be a substitute for malaria, and preferable to other remedies of this kind." Marcuse and Kallmann, as well as Warstadt, report several cases of favourable effect where malaria treatment had failed, and Pires[3] records two cases that were refractory to malaria and in which sulfosin treatment gave good results. Stiefler[4] is satisfied with the results he has obtained with sulfosin treatment. He says: "From our observations sulfosin appears to be a very valuable fever-producing remedy; its efficacy is evident from its influence on the clinical symptoms as well as on the serological findings." Marcuse and Kallmann conclude that sulfosin not only eliminates the dangers connected with an infectious process but, in addition to its equally great power of producing fever, it has a roborant curative effect.

I have examined the serological findings in my patients as far as possible, and found the Wassermann reaction negative in the four patients who were discharged in full remission (observation period: ½ to 4 years). These cases also showed a marked fall in the cell content of the cerebro-spinal fluid, even down to normal in some instances. Among the four patients who showed no psychic changes, two became sero-negative, and their cell content fell off (in one case from 494/3 to 6/3, in the other from 31/3 to 4/3). In sulfosin treatment, however, the clinical effect is no more parallel with the serological effect than it is in malaria treatment. The serological changes may become manifest much later.

These findings suggest, therefore, that the therapeutic effect of sulfosin treatment in general paralysis is analogous to that of malaria therapy.

Results in Other Syphilitic Lesions.

My patients with general paralysis were also under general antiluetic treatment (salvarsan, mercury, and bismuth), so that one could not with certainty attribute the favourable effect on the humoral syndrome to the action of sulfosin alone, even though our experiences so far really suggest, I think, that the sulfosin treatment is the principal factor. To decide whether, or to what extent, syphilis is influenced by treatment with sulfosin alone it was necessary to treat some syphilitics exclusively with sulfosin. Four patients with cerebro-spinal syphilis were accordingly treated with sulfosin alone.

Before treatment, the first patient (female, aged 31) showed a blood Wassermann of 0.0.0.10.100,‡ and a cerebro-spinal Wassermann of 0.40.100. Her cell count was 150/3. After eight injections of sulfosin the Wassermann reaction in both blood and cerebro-spinal fluid was negative, and the cell content had dropped from 150/3 to 10/3 (within two months).

In the second patient (female, aged 54) the Wassermann reaction in the cerebro-spinal fluid changed within five weeks from 0.0.0.0.0.0.00.100Σ25 to 0.10.00.100Σ2·5 units as a result of 12 sulfosin injections. The cell content subsided at the same time from 240/3 to 5/3.

The third patient (male, aged 57) had been infected with syphilis 32 years before, and had had no antiluetic treatment for 30 years. Within three months 12 sulfosin injections changed his Wassermann reaction in the blood from 0.20.00.100Σ25 to perfectly negative (Σ0). At the same time there was a most remarkable change in the clinical manifestations. On admission he was lying in bed, a hopeless wreck, incapable of shutting his eyes or chewing his food, with signs of bulbar paralysis and total facial paralysis; after three months' treatment he was capable of resuming his work as a drawing-master, and he has attended to his duties during the past 18 months.

In the fourth patient (female, aged 21) the blood Wassermann reaction changed from 0.00.100Σ25 to a complete negative at the same time as the Wassermann reaction in the cerebro-spinal fluid changed from 20.00.100Σ5 to 20.100Σ1·6. The cell content dropped from 231/3 to 23/3.

These changes were accomplished by eight sulfosin injections in one month.

As the changes in the serological syndrome of these patients are far in excess of any spontaneous variation, we may conclude that sulfosin has an antisyphilitic effect. This conclusion is not shaken by the possibility that the same patients might have improved in a similar way on some other antiluetic treatment. Consequently, in sulfosin treatment we have a new, hitherto unknown, remedy *against syphilis of* the nervous system.

I then felt justified in applying sulfosin treatment to some syphilitics who had not shown any signs of cerebro-spinal syphilis and, finally, in making the same experiment on some patients with recent syphilis.

I treated one male who suffered from tertiary syphilitic ulcerated gumma of the left leg. He had been infected and treated 20 years before, but had had no subsequent treatment. On admission the Wassermann reaction in the blood was 40.100. After eight sulfosin injections it was negative with heart extract but positive with syphilitic extract, and the gumma had disappeared.

I then applied sulfosin treatment to a couple of cases of recent syphilis.

The first patient (female, aged 18) had her first eruption with large, confluent, excoriated and partly hypertrophic papules on the genitalia. Sulfosin treatment was started on the day after her admission. Only five days later—after no more than three sulfosin injections—I was astonished to find that the *papules had gone. Two days later even the* marks from the papules had disappeared, and they did not show again. When five sulfosin injections had been given, the Wassermann reaction in the blood had increased very considerably (to 0.0.0.00.100 with Σ100), but it soon began to fall off, and was perfectly negative after 15 injections.§

The other patient (a female, aged 21) had her first eruption with papules in the palms and macular exanthema on the genitalia. After eight sulfosin injections the eruption disappeared and the Wassermann reaction in the blood went to negative.

I have also treated a couple of children (a girl, aged 7, and her brother, aged 5) who were suffering from congenital latent syphilis. They showed no no signs of any particular discomfort, although their temperatures went up to 105° F. In both cases the Wassermann reaction became less positive; in one case it went down to negative with heart extract, weakly positive with syphilitic extract, and Σ0.

I have treated six patients who had latent syphilis. In four of these the reaction became negative within the period of observation. I have also given sulfosin to six patients with syphilitic aortitis; all showed clinical improvement. Two of these patients suffered from angina pectoris; this condition disappeared in one of them, and was considerably improved in the other. A pre-existing albuminuria disappeared in one patient. Finally, there was one patient (male, aged 52) who suffered from aneurysm of the innominate artery and aorta, and who had not been treated for 30 years.

On admission he was in very bad condition, and his blood Wassermann reaction was 0.0.00.100Σ150. Sulfosin treatment was instituted as a last resort, and he received seven injections, with the dose increasing from 0·25 to 2 c.cm., which gave a maximum temperature of 104·6° F. without any discomfort worth mentioning or any particular heart signs. On this treatment the Wassermann reaction in his blood fell to 20.100Σ25. When admitted to hospital the patient had been cyanotic and so dyspnœic that he could not turn in bed nor sit upright, and he could take only liquid food. During the treatment, however, he kept on improving far more than could be expected, and six weeks after admission he was able to walk about and to swallow solid food. Along with this improvement the pulsation over the right clavicle disappeared, and both radial pulses beat alike, a result that was as conspicuous as it was unexpected. One could have sworn that this change was impossible, if one had not seen it develop with one's own eyes.

Beside the remarkable clinical result of sulfosin treatment, this case also shows an unquestionable effect on the Wassermann reaction, and illustrates how well sulfosin may agree even with a patient who has such a severe lesion of the main arteries.

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‡ All the Wassermann tests are done by the State Serum Institute, Copenhagen. The titration is done in series, using the following quantities of serum: 0·2, 0·1, 0·05, 0·02, 0·01, 0·005, 0·0025, 0·001, 0·0005, and 0·00025; and the figures indicate the hæmolysis in the respective tubes containing amounts of serum in this order. While 0 indicates the absence of any hæmolysis, maximal positive reaction, 100 designates complete hæmolysis, negative reaction. The values between 0 and 100 are the intermediate degrees of hæmolysis.

§ I have several times noticed this variation in the Wassermann reaction during sulfosin treatment, particularly in cases of a recent date. I consider it a biological reaction.

I have already mentioned a case which shows that sulfosin may be given unhesitatingly to patients with renal lesions and albuminuria. I add three more instances of this kind.

One of these patients suffered from chronic nephritis with marked albuminuria, which was not aggravated in spite of seven sulfosin injections (with a maximum temperature of 104·6° F. In another patient albuminuria set in after the administration of 0·15 g. of neosalvarsan with 0·25 g. of bismuth; albumin disappeared from the urine on further treatment with sulfosin alone (two series of ten injections, each amounting to 10·5+49 c.cm. of sulfosin with maximum temperatures of 104·0° F. and 105·1° F. The third patient, who had hæmorrhagic nephritis, received ten sulfosin injections (47·5 c.cm., all told, with a maximum temperature of 104·2° F.), together with 3·0 g. neosalvarsan. On this treatment the urine became free of blood as well as of albumin.

These findings show conclusively, I think, that in these different forms of syphilis sulfosin has an unquestionable effect—not only on the syphilitic products, but also on the infection itself—a fact not previously known. We do not know how this effect is brought about, but I think we have some suggestive points. Sulfosin treatment is not an infection therapy like malaria and recurrent fever therapies, but has this in common with them—that when the active agent is introduced into the sick organism it sets up a reaction which is accompanied by a considerable rise of temperature. This rise of temperature, however, is essentially different from the fever in malaria and typhoid vaccine therapy; for the rise of temperature after sulfosin is more acute than its fall, which is considerably prolonged, so as to make the base of the fever phase unusually wide, and produce a fever curve that is quite characteristic. While this fever is subsiding it frequently runs an intermittent course, which also appears to be characteristic (see figure). This reaction may be non-specific—a sort of "Reizkörper" effect—and especially pronounced in metasyphilitic conditions, but apart from this general effect I think the sulphur has also a relatively specific action, like other "chemically avid" substances.

When given in the proper way sulfosin is a perfectly harmless remedy which can be used with very serious cardiac and renal lesions. Even pregnancy or pulmonary tuberculosis do not positively contra-indicate its use—as I have learned in several cases—if only moderate rises of temperature are induced. It suits patients of all ages. In congenital lues I have given it to two children at the age of one year, and even to a child of three months (starting with 0·1 c.cm.).

Sulfosin Combined with Other Antisyphilitic Measures.

Even though these experiments indicate that sulfosin has quite a marked antiluetic effect, I still think that, as a rule, it should not be used alone but rather in combination with our present antiluetic treatment (neosalvarsan, mercury, bismuth), so that the latter is given either concurrently with or immediately after the sulfosin treatment. I have had plenty of opportunity of establishing that this combination is well tolerated. I have given this treatment to six patients with tabes dorsalis; four were improved. L. W. Harrison has also seen some good effect from the treatment in one case of tabes dorsalis. I have had no opportunity of trying it in tabetic optic atrophy, but Winkler[8] reports a good effect in three out of five cases. Stiefler has treated five cases of this kind without any effect on the optic atrophy, while other tabetic manifestations were partly improved. Amongst other syphilitic eye lesions where the sulfosin treatment may prove of value, one may mention parenchymatous keratitis. Of eight children with congenital syphilis, four had parenchymatous keratitis which improved and cleared up. In my opinion sulfosin had a favourable effect. One of these children was also suffering from osteoperiostitis, which disappeared completely. Harrison has treated two cases of interstitial keratitis with sulfosin, and he has told me that "particularly in one, the effects of the injections of sulfosin were very good, the keratitis clearing more quickly than I have ever seen it."

I have also given sulfosin with other antiluetic treatment to two patients before they had any eruption of the secondary stage, and to 13 patients with the first eruption of syphilis. In all 13 patients the Wassermann reaction became negative, after a preliminary increase in strength in five. The papules and exanthema disappeared rapidly (within 8 to 28 days) in ten of these patients, but more slowly in the other three. In two of the latter cases the neosalvarsan treatment had to be discontinued on account of violent reactions. I have treated four cases of later eruption. Here the papules and exanthema disappeared in 7 to 22 days, and the Wassermann reaction became negative in all.

From the treatment of the 19 patients we most certainly feel that we have obtained a more rapid therapeutic effect, clinical as well as serological, by adding sulfosin to the other treatment. So I think that sulfosin ought to be given as a part of the antiluetic treatment to patients who are admitted to hospital, particularly in such cases where other treatment cannot be given without eliciting some reactions, especially as I have never seen any sulfosin reaction which contra-indicated the continuance of the treatment.

Sulfosin and Non-syphilitic Lesions of the C.N.S.

In view of the favourable results obtained with sulfosin in general paralysis and other cerebro-spinal lesions of syphilitic origin, it was no far-fetched idea to try whether it would prove effective in the treatment of other lesions of the central nervous system which are not syphilitic, but strongly resemble metasyphilitic affections in their clinical manifestations and course. Epidemic encephalitis and disseminated sclerosis resemble syphilis in this way, and may improve somewhat on malaria or typhoid vaccine treatment. I therefore felt justified in trying sulfosin.

I paid particular attention to postencephalitic parkinsonism. I have treated five cases of this kind; four of them, at any rate, were definitely postencephalitic. All five improved—subjectively as well as objectively—after treatment with sulfosin; in four the improvement was very marked, and directly followed the treatment. The patients were very pleased with the treatment—in spite of the subjective discomfort it causes—and it was repeated in several instances at their own request.

In 15 cases of postencephalitic parkinsonism Stiefler found some, although a moderate, improvement. It is possible that sulfosin may also give good results in other manifestations of chronic encephalitis, but my experience in this respect is so limited that I have nothing to say about it. Unfortunately I have not had any opportunity of trying the treatment in the acute stage of epidemic encephalitis; it is not altogether unlikely that the chances of recovery on sulfosin treatment are better in the acute stage than during the later course. In one of my cases of parkinsonism the encephalitic ætiology was questionable; it may have been a case of paralysis agitans. As this patient was benefited by the treatment I have adopted sulfosin therapy for the treatment of paralysis agitans. In this connexion I may mention a case of paralysis agitans which Dr. H. Verploegh, of The Hague, has been treating after consulting with me; this patient "has improved most remarkably—even after four injections of sulfosin."

I have tried sulfosin treatment in three unquestioned cases of disseminated sclerosis, but without any recognisable therapeutic effect. The patients had imperative urination immediately after the injections, probably the result of a local action on the gliomatous process in the medulla. This effect was quite transitory. A similar local effect has been observed by Dr. Ernst Bichel (Wiesbaden) in a patient who, he thinks, showed a continuous progressive improvement after five series of sulfosin injections. Stiefler has treated 12 cases of disseminated sclerosis with sulfosin, and reports some really encouraging results. He says: "At any rate, it has served me well in several cases which did not respond enough to typhoid vaccine. Sulfosin is also preferable to treatment with typhoid vaccine when the patient is markedly debilitated or suffers from circulatory disturbances."

Sulfosin Treatment of Dementia Præcox (Schizophrenia).

In a previous paper on sulfosin treatment I suggested that the remedy might prove effective in dementia præcox. I have since used it in six cases. The treatment has been completed in three, all of whom had such a good remission that they were able to resume their work—one of them with perfectly normal mentality (observation time: 10, 10, and 5 months). Another patient improved somewhat, but nothing is known of his later condition, and one patient showed signs of beginning remission. The undoubtedly favourable result I have obtained in this way is confirmed by a report from Marcuse and Kallmann,[1] who have treated no less than 40 cases of schizophrenia by this method. In 16 of these patients they found a more or less pronounced improvement in such direct connexion with the treatment that they do not question its efficacy. They give four typical histories of patients who recovered and returned to their work. Favourable results are also recorded by Salinger,[6] who has treated 16 cases of schizophrenic psychosis and found improvement in 25 per cent. In treating 50 cases of this kind Loberg[7] has found a similar effect from sulfosin. The final results, however, are not yet available. In view of these findings one can hardly doubt that sulfosin is an effective remedy against schizophrenia. This is very significant; an effective treatment of dementia præcox is particularly desirable because this disease attacks the young and—apart from spontaneous remissions—puts the unfortunate patients in such a pitiful condition that a desire to help them is dictated just as much by compassion for the patients themselves as by the social importance of their recovery.

Summary.

1. In the human organism the administration of sulphur in the form of sulfosin (sulphurated oil) sets up a febrile condition of short duration. Repeated injections may result in a therapeutic effect on a variety of lesions of the central nervous system.
2. The chief of these lesions are general paralysis and other syphilitic lesions of the central nervous system. Experiments on fresh and older cases of syphilis have also shown an unquestionable antiluetic effect from sulfosin injections.
3. Sulfosin treatment may also have a favourable effect on other non-syphilitic lesions of the central nervous system (chronic epidemic encephalitis with parkinsonism, dementia præcox, and disseminated sclerosis).
4. The therapeutic effect produced by sulfosin treatment appears primarily to be a general reaction, associated with the rise of temperature; but there is probably also a specific sulphur effect.
5. Sulfosin treatment is preferable to infection treatment. The results seem to indicate that sulfosin has the same therapeutic effect as infection treatment without its dangers and drawbacks, as sulfosin is perfectly safe and its use is not restricted to special hospitals.

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PUNCTURE OF THE CHEST:

ITS OCCASIONS AND TECHNIQUE.*

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THE first principle in the technique of puncture of the chest is that it should be done exactly as the operator would like to have his own chest punctured. This would *not* mean no local anæsthetic, a blunt needle, an ill-fitting trocar and cannula, hitting a rib from failure to determine the exact direction of the rib and the intercostal space, breaking off a needle or producing by faulty technique a pneumothorax, so that the next man cannot possible tell what is inside. Yet all of these things happen.

The skin must be well sterilised with tincture of iodine. If the patient is very nervous or very young, ethyl chloride on the skin may be a desirable preliminary. Usually, however, I prefer to use the finest hypodermic needle for the skin puncture, changing it to a longer one when penetrating the intercostal space. The needle must be long enough to enter the pleural space without going up to the hilt. Otherwise it may break off and not be found again. If the needle is not perfectly sharp it must be sharpened on a small stone, which can be obtained from any surgical instrument maker. The point must be perfect, not like a fish-hook, as it is sometimes. The needle and the piston must both fit perfectly. No air must enter, for if it does it is impossible to be certain if air-bubbles are being drawn from the lung or the pleural cavity or are due to a faulty syringe. To test this put the end of the needle in the solution and pull back the piston forcibly. A vacuum should be formed and slowly fill with fluid; no air should enter. It is a severe test but the instrument should stand it. Fill the syringe with 2 per cent. sterile novocain[1] and put two fingers in the intercostal space to note its direction. Make a bleb of novocain with the fine needle inserted horizontally just under the epidermis. With the needle (or the larger needle) now vertical, push very slowly through the intercostal muscles, asking the patient to say when any sensation is felt. The intercostal muscles are devoid of sensation; when the patient begins to feel, the needle is approaching the nerve-endings of the parietal pleura. Now squirt out forcibly a good amount of novocain, then advance the needle a little further, asking if the patient feels anything. If the answer is "yes," give more novocain. If "no," go on. Soon the needle will enter either the pleural space or the lung or a solid area, and with gentle handling of the syringe the difference can usually be appreciated. Now withdraw the piston. If fluid is present, it will enter the syringe, and all that is necessary is done.

If nothing comes, it may be because there is nothing to come, or because there is pus too thick to go through the needle, or a new growth. Therefore a larger and longer needle is used. The patient is warned not to move and the new needle is pushed through the anæsthetised track; no pain whatsoever should be felt. If there is any pain, use more novocain; any amount can be used.

Sometimes it is very difficult to push the needle or the trocar and cannula through the skin. This means that the needle is not really sharp or that the shoulder of the trocar does not properly cover the end of the cannula. If owing to an emergency the needle cannot be sharpened or the end of the cannula bevelled on a stone, a small incision can be made in the skin after thorough infiltration by novocain. Alternatively the skin may be pinched up and the instrument pushed into the subcutaneous tissues horizontally to avoid all risk of entering the thoracic cavity suddenly and violently, and then held vertically and gently inserted. If a large instrument like a thoracoscope has to be inserted, it may be an actual advantage to make a preliminary incision down to the intercostal muscles to promote healing by first intention. But for ordinary exploration or aspiration this is crude technique and should be avoided. It frightens the patient and it leaves a scar. If an interlobar empyema or a malignant growth is suspected, it may be necessary to push the exploring needle three or four inches into the chest; this should not be in the least degree painful.

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* A post-graduate lecture to old students of Charing Cross Hospital.

[1] This is best kept in stock with a little chloroform to prevent the growth of a fungus which otherwise usually appears; the solution can be boiled in a spoon just before use and the chloroform thus got rid of.

The occasions for puncture of the chest are as follows:

Exploratory Puncture.

Exploratory puncture is indicated: (1) if fluid is suspected and it is necessary *to know its nature*; (2) to distinguish between fluid, new growth, thickened pleura, or solid lung; and (3) sometimes if there is doubt whether a pneumothorax exists.

The signs of fluid are, as a rule, dullness, weak or absent breath sounds or bronchial breathing, an absence of adventitious sounds, weak or absent vocal resonance or *whispering pectoriloquy. There are two* popular fallacies. I am often told: (*a*) that fluid cannot be present because there is bronchial breathing; in the absence of adventitious sounds this is a sign—and a common sign—of fluid; (*b*) that pus cannot be present because there is no rise of temperature, but I have seen a streptococcal empyema of seven pints *with no* fever, and many other cases of non-febrile empyema. Even if the signs are not those of fluid, but pus is strongly suspected from the symptoms and the history, exploratory puncture should be performed. Carried out gently and properly I have never seen it do any harm.

Tapping a Serous Pleural Effusion.

A serous effusion should be explored: (1) if it is causing distress; (2) if it appears to be causing high fever; (3) if it does not begin to be absorbed after *three weeks' treatment*; (4) as a diagnostic measure to facilitate X ray examination, when replacement —a method to be described—will be necessary.

If these indications are not present no useful purpose is served by interference. *Pleural* effusion right up to the clavicle will often disappear entirely in three or four weeks.

There are several ways of removing serous fluid from the chest:—

1. The simplest method is *ordinary syphonage*. All that is needed is a needle, rubber tubing, and a bottle containing *some carbolic solution. The needle is put* into the chest with the tube attached, and the distal end is placed under the fluid in the bottle, which stands on a chair by the bedside. A cough will usually drive fluid out of the tube and syphonage will take place.

2. *Negative pressure aspirators.—Potain's aspirator* I find clumsy and unsatisfactory. I use a *Dieulafoy's aspirator* if simple syphonage is not possible. It is portable, can be used for replacement, and the tube is less likely to be blocked by lymph or, if blocked, can be cleared *by reversing the action.* Care must be taken not to exert too much force, as too high a negative pressure may be created in the pleural cavity, with unpleasant, alarming, dangerous, and even fatal results. These can all be prevented by the replacement method. I have an attachment so that the exploring syringe may be fixed straight on to the Dieulafoy needles or cannula. Sometimes at the psychological moment the washer fails to function. For this reason an all-metal apparatus may be preferable, but it prevents the operator from seeing what he is doing, *and the best method* is to use the *ordinary* apparatus and test it beforehand.

3. *Replacement by air or oxygen.*—The fluid, instead of being drawn off by the force of aspiration or of gravity, is replaced by sterile air or oxygen, so that a pneumothorax is left; this soon becomes absorbed, exerting steady and gentle traction on the lung, causing it to expand. This method avoids the dangers of aspiration: cough, distress, pain, hæmorrhage, pulmonary œdema, and sudden death, and all the fluid can be withdrawn *at one operation. Its practical* value may be illustrated by the following case:—

A youth of 19 contracted influenza. In a few days severe broncho-pneumonia developed, and within nine days typical signs of a large pleural effusion were manifest and he was desperately ill. I found the whole of the left side absolutely dull, and the heart considerably displaced to the right. Exploratory puncture revealed a reddish-brown purulent fluid. I aspirated with a Woulfe's bottle and a Higginson's syringe. About a pint of pus had been removed by gentle aspiration when the patient suddenly cried out in acute distress and became intensely cyanosed. I at once stopped aspiration, *disconnected the tube from the bottle*, and placed some cotton-wool lightly over its lumen. Air was sucked into the pleural cavity through the tube and the symptoms and the cyanosis were immediately relieved. I then aspirated *another pint of fluid, allowing a little air to enter the pleural* cavity from time to time in the manner described. The immediate relief of symptoms by the admission of air was dramatic. The pain of a high negative pressure in the *pleural cavity is not sufficiently emphasised in medical* literature. Occasionally, though fluid can be obtained on exploration, more can be withdrawn when the aspirating needle is inserted. This may be because the puncture has *been made too low and the diaphragm gets in the way* (the most likely reason), or that an adhesion has been encountered, or that the fluid is under great negative pressure. It is, therefore, important not to go too low. The best places *are just below the angle of the scapula or in the axillary* line in the fifth space, the patient being turned slightly towards the unaffected side. If there is a high negative pressure this will almost certainly be felt when using the *exploring* syringe and replacement will be necessary.

Aspiration of an Empyema.

In the ordinary slowly-evolving pneumococcal empyema the *usual method of resection* with drainage at the proper time, not too early and not too late, still remains the best. There are, however, two types of empyema that must never be treated by an open operation: (1) the tuberculous empyema, and (2) the acute streptococcal empyema, or a fulminating staphylococcal or pneumococcal empyema. In the *first case operation* will produce a doubly *infected* empyema and a persistent sinus. In the second case the patient will die. Aspiration, therefore, is the right treatment until it is safe to perform an open operation. A true tuberculous empyema (by this I mean an empyema the pus of which is sterile on culture but contains many tubercle bacilli, and not an empyema secondary to a spontaneous pneumothorax which has become infected by other organisms) should either be left alone or, if it is causing symptoms, replaced by air or oxygen; it may be necessary to replace it by 5 per cent. *gomenolised olive oil or paraffin oil.*

In dealing with an acute streptococcal (sometimes staphylococcal or fulminating pneumococcal) empyema appearing rapidly and early in the course of the illness, open operation must be avoided. The mediastinum has had no opportunity to become fixed, pressure changes on the contralateral side and mediastinal fluttering will occur, and the result will almost certainly prove fatal.

Aspiration must be employed. Occasionally negative pressure drainage may be used instead. The wound *must, however, be truly air-tight.* The following case may serve as an example:—

A nurse on duty in the wards complained for two days of malaise. On the third day she was obviously ill and was found to have a high temperature. Within two days of this, the left side of her chest was filled with fluid and she was desperately ill. Exploration revealed a thin pus which contained streptococci. By means of a syringe I aspirated *as much as* I could without causing any distress. For a week and more we aspirated daily and the patient began to improve a little. By this time the pus had become much thicker and it was deemed safe a few days later to make an intercostal incision and insert a small tube. She improved progressively, but the pleura had become thickened and the pleural space would not close, in spite of irrigation by Dakin's solution. Mr. Norman Lake therefore resected and decorticated the lung. This now expanded and a perfect recovery resulted. If early open operation had been performed in this case the patient, in my opinion, would inevitably have died.

Pneumothorax and Thoracoscopy.

Aspiration may also be needed for certain cases of high positive-pressure spontaneous pneumothorax, and in certain cases of hæmothorax after wounds or accident.

Artificial pneumothorax is becoming increasingly more common. The technique of inserting the needle for refills is the same as for exploration. The technique of induction, however, is more difficult and complicated, and in giving refills it is necessary to have a knowledge of the intrapleural pressures and their variations under different conditions.

By thoracoscopy is meant the passing of an optical instrument into the pleural cavity where a pneumothorax has previously been produced. It is done for diagnosis, to determine the nature of extra-pulmonary tumours and their relation of surrounding structures, and to determine the size, position, and nature of adhesions, with a view to their severence by the cautery if they are rendering an artificial pneumothorax inefficient by holding out the lung in a part where collapse is essential. With suitable local anæsthesia the passage of the instrument is painless. All possible care must be taken at the time and afterwards to limit the amount of surgical emphysema, which is apt to occur after prolonged thoracoscopy. With a short thoracoscopy there is no disturbance.

THE INFLUENCE OF

LIVER TREATMENT ON THE MORTALITY FROM PERNICIOUS ANÆMIA.

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THE introduction of the treatment of pernicious anæmia by the Minot-Murphy method and its modifications has been followed in this country, as elsewhere, by its rapid extension, and the success attendant on this method of therapy has been confirmed in numerous reports since that time. All authorities seem to recognise in it a distinct advance in the therapeutic methods extended to patients suffering from this disease. The position now is thus comparable to that following the introduction in 1923 of insulin in the treatment of diabetes; and a review of the mortality from pernicious anæmia should possess a more than usual clinical interest.

Accurate study of the effects on mortality produced by a relatively sudden change in any factor likely to influence the course of mortality requires a clear picture of at least the more important features presented by the death-rates before that date. The object of the present note is, therefore, to resume briefly the events leading up to the introduction of this new treatment, to compare these with subsequent happenings, and to assess, if possible, in a quantitative manner the amount of improvement which has been effected by the change in therapeutic methods.

Review of the Data.

Age and Sex Distribution.—To give a general idea of the distribution of mortality by age and sex, the average death-rates by sex at certain broad age-groups for the six years 1921–26 are given in Table I. From this it will be noted that males experience at all ages a mortality about 20 per cent. lower than do females, but the difference is by no means constant at individual ages. In general the relative difference between the sexes diminishes with increasing age. Thus, at ages under 45 years the difference is about 40 per cent.; at 45 to 55, 18 per cent.; 55 to 65, 11 per cent.; and at ages over 65 years, only 2 or 3 per cent. Mortality in both sexes, however, shows an uninterrupted increase from the earliest ages up to the decennium 65 to 75, but in the final age-group again shows a slight decrease.

The *Secular Trend* of the death-rates from pernicious anæmia can be traced with accuracy only subsequent to 1920, the year in which it was first tabulated separately in the Annual Reports of the Registrar-General. Before that date deaths attributed to this disease were included in the group "Anæmia, chlorosis" (No. 58 of the international list), but, as T. H. C. Stevenson[1] has pointed out, these deaths contribute almost 90 per cent. to the total of this combined group, and the history of this cause of death prior to 1920 may, therefore, be inferred with some degree of accuracy from the records for that title. The chief interest at the moment, however, centres on the more recent events of the present decennium, and it is indeed fortunate that we possess reliable records, for an appreciable length of time, of the mortality attributed to this condition.

TABLE I.—*Mortality-rates in England and Wales by Age and Sex (1921–26).*

Age.	M.	F.
0—	4·9	7·8
25—	14·3	29·6
35—	39·7	69·4
45—	106·9	129·9
55—	226·1	252·8
65—	331·1	336·9
75 +	196·4	201·8
All ages	57·4	74·3

TABLE II.—*Trend of Mortality (Standardised Death-rates).*

Year.	M.	F.
1921	56·8	72·1
1922	62·0	71·9
1923	54·9	65·1
1924	55·8	69·5
1925	57·4	69·4
1926	58·4	74·7
1927	56·1	68·7
1928	37·2	48·0

M. = males; F. = females.

In Table II. are collected the standardised death-rates, separately for males and females, in each of the years from 1921 until 1928 (the latest records recently made available). These standardised rates of mortality, calculated by the direct method and using as "standard" the population at ages of the whole of England and Wales at the date of the 1921 Census, make allowance for the effect of the changes in the age constitution of the population which have taken place within the period under review. In both sexes, up to the year 1926, very little evidence of departure from a horizontal trend is noticeable. Between 1923 and 1926 there is an apparent slight tendency to increase both in the male and female death-rates, but these fluctuations are of no significance. That this is so has been verified in the following manner.

The average death-rates at ages for the whole period 1921–26 have been applied to the estimated age distribution of the population in each year of that period, and the expected were then compared with the actual deaths. The standard deviation of the difference between the actual number of deaths and the number which would have been recorded if the mortality at each age in any given year had been exactly the same as the average rates at ages for the whole period was taken as the square root of the expected number. In no year of the series up to 1926 do the deviations, either of the total deaths at all ages or of deaths at individual ages, exceed twice this figure.

It may, therefore, confidently be assumed that, in reference both to the total number and the age distribution of deaths from this disease, no significant change in either sex has taken place in the six, what may be termed "normal," years preceding the introduction of the new therapeutic methods.

Local Variations in Mortality.—In England and Wales the distribution of mortality from this cause is not given in the same detail as other, numerically more important, causes of death. For the available administrative subdivisions of the country the age-standardised rates of mortality, based on the experience of the years 1921–26 inclusive, for each sex, are given in Table III. The only point of interest here is the extremely low rate recorded in London. In the remaining three aggregates there is little difference either one from another or from the average for the country as a whole. The striking superiority of London is shared equally by the two sexes.

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* Working for the Medical Research Council.

[1] Registrar-General's Statistical Review of England and Wales, 1926.

Seasonal Variations.—Stevenson [2] has already pointed out that there is a definite tendency for mortality from this cause to vary with season. The most significant feature of the seasonal distribution is the relatively low death-rate in both sexes in the third quarter and the exceptionally high rate in the winter months. In Table IV. are shown the proportions of the total deaths, uncorrected for differences in the number of days, in each quarter of the year for the period 1921–26. The autumn defect and winter excess are quite evident. (More detailed information on this aspect may be obtained in the successive Registrar-General's Annual Reports, in which are tabulated the number of deaths registered in each month of the year.)

TABLE III.—*Standardised Rates of Mortality in Administrative Divisions (1921–26).*

—	M.	F.
London	34·4	41·8
County boroughs ..	59·4	72·7
Urban districts ..	64·3	75·8
Rural districts ..	57·5	75·8
England and Wales	67·4	74·3

TABLE IV.—*Seasonal Distribution of Mortality (1921–26).*

—	M.	F.
First quarter	24·83	25·98
Second "	25·07	24·56
Third "	22·70	23·40
Fourth "	27·40	26·06
—	—	—

Changes in Mortality in 1927 and 1928.

Table V. shows the male and female rates of mortality at separate and at all ages in these two years. Reference to this table and to the data previously collected in Tables I. and II. brings out the following features of interest. Compared with the average experience of 1921–26, there has been in 1927 a reduction in mortality, both in males and females, in some of the age-groups, but the total improvement, obviously small, is counterbalanced by increased mortality in the remaining periods of life. In the succeeding year, 1928, diminished mortality is a feature of every age-group, with the possible exception of the numerically unimportant period 0–25 years.

TABLE V.—*Rates of Mortality by Age and Sex in 1927 and 1928.*

Age.	Males.		Females.	
	1927.	1928.	1927.	1928.
0—	4·1	4·9	7·0	6·3
25—	12·7	12·1	26·8	16·8
35—	32·1	16·7	60·1	38·0
45—	83·0	53·4	132·1	71·9
55—	230·3	126·0	242·0	177·8
65—	309·7	269·9	353·4	280·5
75 + ...	230·3	187·4	234·3	186·9
All ages standardised	56·1	37·3	68·7	48·0

The statistical significance to be attached to these differences has been tested in a manner similar to that previously employed. The average death-rates at ages for 1921–26 are applied to the estimated population at these ages in 1927 and 1928, and thus are obtained at each age the expected number of deaths. The difference between the actual (A) and the expected (E) deaths compared with the standard deviation of the difference ($\sqrt{E}$) provides us with the required measure of reliability. If the ratio $(A \sim E)/\sqrt{E}$ does not exceed the value 2·0, one is not justified in considering the difference a real one—it might reasonably be looked upon as a random fluctuation. In the year 1927 (the figures have not been tabulated) the actually recorded deaths are fewer, though insignificantly so, than the numbers we should have expected on the basis of the 1921–26 experience, and at individual age periods, also, any tendencies towards improvement, with the one exception—namely, in males aged 45 to 55 years—might well be attributed to chance. The experience of this year, therefore, does not seem to justify any inference as to the effects of treatment on mortality. For the more interesting year, 1928, the comparison between fact and expectation is effected in Table VI. In this year, if the death-rates prevailing in 1921–26 had continued, the number of deaths which would have occurred exceed those actually recorded by as much as 55·3 per cent. in males and 45·4 per cent. in females. At individual ages, moreover, there are only four instances—namely, at ages 0–25 and 25–35 in males, and 0–25 and 75 and over in females—in which the divergence of actual from expected does not exceed the required standard of significance. It is quite certain, then, that in 1928 there was a significant reduction in the number of deaths from this disease in both sexes, although the relative amount of improvement is not constant at different ages. The greatest amelioration in males is at ages between 35 and 65 years and in females at 25 to 55 years, where the recorded deaths form only about half of what would have been recorded had the 1921–26 rates of mortality prevailed. At other ages the improvement is not nearly so great, the recorded in proportion to expected deaths being 84 per cent. in males over 65 years, and 78 per cent. in females over 55 years.

TABLE VI.—*Comparison of Actual and Expected Deaths in 1928.*

Age.	Males.		Females.	
	Actual.	Expected.	Actual.	Expected.
0—	42	41·7	53	65·9
25—	34	40·3	51	96·9
35—	41	97·6	111	202·9
45—	123	244·3	186	335·9
55—	211	378·5	330	469·1
65—	238	286·6	297	350·7
75 + ...	50	58·7	87	93·9
Total	739	1147·7	1116	1621·3

It seems reasonably certain, therefore, that, although the returns of 1927 do not provide us with much evidence of reaction of mortality to the institution of the new methods of treatment, there is ample evidence in the latest returns of correlation between these two factors.

We may note further, without actually recording the tabular matter, that the main subdivisions of the country, treated in a similar manner, provide exactly similar results—namely, no substantial reduction in 1927 but great improvement in the succeeding year. There is, too, a suggestion that the improvement has been greatest in London, somewhat less in county boroughs, and still less in the smaller urban districts. Rural districts show the same rate of decline as do county boroughs. These remarks apply equally to both males and females.

Expected and Actual Deaths by Season.

This other important feature must be mentioned. Since, as has been shown, the mortality from this cause exhibits definite relation to season, it was considered advisable to compare the records of the two years 1927–28 in somewhat greater detail. The expected numbers of deaths in males and females in these two years were distributed to the four quarters of each year in the same proportions as had already been found for 1921–26, and these were then compared with the seasonal experience which was actually recorded in these two years. It will be seen from the data compiled in Table VII. that in males the actual deaths exceeded the expected in the first and third quarters of 1927, that in the second quarter these were practically identical (the slight difference is statistically quite insignificant), whereas in the fourth quarter the actual deaths amounted only to 79 per cent. of what would have been recorded had conditions remained as in 1921–26. Compared with the standard error involved, this is a numerically important deficit. In each of the four seasons of 1928 we find the actual deaths well in defect of the expected, and, what is perhaps of greater significance, the relative difference gradually increases throughout the year. Thus, in the first quarter the actual deaths formed only 78 per cent. of the expected; in the second quarter, 65 per cent.; in the third, 64 per cent.; while in the last quarter for which records are available the ratio was still further reduced to 51 per cent. of the numbers anticipated. This steadily increasing divergence between fact and expectation constitutes probably a point of fundamental importance in the records of mortality statistics.

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[2] Ibid., 1925.

In females a somewhat similar encouraging trend is manifest, except that the records of the year 1927 do not at all suggest the intervention of any agency favourable to a declining death-rate. Thus, although there is a statistically significant discrepancy in the second quarter of this year, no such difference is apparent in the remainder of the year, in which actual and theoretical deaths almost exactly correspond. In the succeeding year, however, no doubt can possibly exist as to the significance of the general tendency. In the first quarter the deaths which occurred formed only 74 per cent. of what we should have predicted; in the second, 70 per cent.; in the third, 66 per cent.; and, finally, in the fourth, 65 per cent.

TABLE VII.—*Expected Deaths distributed according to Season and Compared with Actual Deaths.*

—	Males.		Females.	
	Actual.	Expected.	Actual.	Expected.
1927.				
January ..	307	279·5	434	412·7
April	278	282·2	348	390·2
July	273	255·5	361	371·8
October ..	244	308·4	410	414·0
1928.				
January ..	223	285·0	312	421·2
April	187	287·7	278	398·2
July	168	260·5	250	379·4
October ..	161	314·5	275	422·5

Such a tendency is exactly what would be expected from the extensive and extending use of a beneficial therapeutic agent.

Summary and Conclusions.

The inferences suggested by the foregoing analysis of the mortality returns of pernicious anæmia in England and Wales may be resumed briefly as follows. For the six years immediately preceding the introduction of the new dietetic treatment of this disease the rates of mortality in both sexes pursued a course which was practically horizontal, the age and sex distributions of the deaths at the same time showing no important changes. In 1927 there was a slight tendency towards improvement apparent in males and specially affecting the returns of the last three months of the year; but, taken in conjunction with the findings for the mortality among females, it may fairly be said that the evidence of significant change which can be derived from these statistics is not at all convincing. In the succeeding year a very definite decline in mortality took place—a reduction of some 915 deaths over expectancy, affecting both sexes, limited chiefly to young adult and middle ages, beginning early in the year and consistently increasing towards its close; greater in London than elsewhere and occurring in the absence, so far as we are at present aware, of change in any factor liable to affect the course of mortality other than the method of treatment. The general inference seems obvious. That there has been a definite lag between the institution of the new treatment and the response of the death-rate is not at all surprising. The whole of the evidence is consistent with the view of causal association between the two factors and, judging from the course of mortality in the comparatively short period since the institution of specific therapy, it would seem safe to predict that extension of the treatment to a still larger proportion of patients suffering from the disease will be reflected in further decline in the mortality attributed to this cause.

A CASE OF

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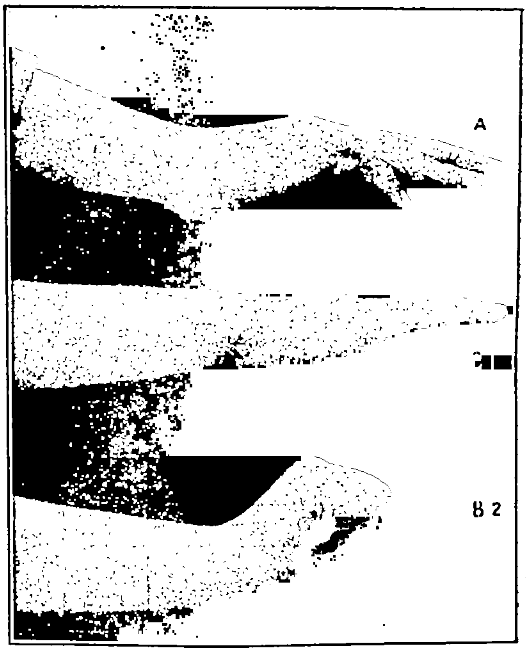
THE diagnosis of this condition presents no difficulty, even when the patient happens to be an adult. There is always a history of the contracture having been present ever since infancy, undergoing very little change if left untreated; and in some cases its congenital character is emphasised by the presence of other congenital abnormalities, such as club-foot, hare-lip, hammer-toe, &c. As a rule both hands are affected more or less equally. Females are said to be more liable to the condition than are males. The type of contracture is quite characteristic; the metacarpophalangeal joint is hyperextended, the proximal interphalangeal joint is flexed (usually to about a right angle), and the distal joint is extended or tends to be extended. In many cases, but not in all, the contracted proximal interphalangeal joint is stiff; no movement can be obtained at it, actively or passively; but the patients learn to accommodate themselves to this, having never known anything different, and it seems to handicap them little, if at all; I know, for instance, of a brilliant surgeon whose dexterity as an operator is certainly not impaired by it. The stiffness of the joint seems to be entirely due to changes in the soft parts; radiograms never show any abnormality. The palmar fascia is never affected; this is one of the most important points of distinction, in adult cases, from Dupuytren's contracture. The principal contracture seems to be, primarily, in the capsule of the joint on its flexor aspect; in this respect there is a close resemblance to congenital contracture of the knees, whilst the stiffness of the joints is

FIG. 1.



The hand in a case of kamptodactyly before treatment (A) and after treatment (B).

reminiscent of many cases of congenital contracture of the shoulder-joints, though the latter class sometimes show radiographic abnormalities.

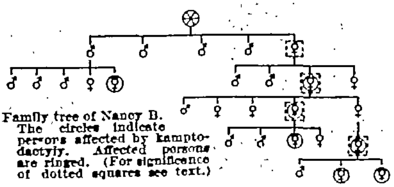
As in all congenital deformities, there is a marked tendency to relapse after treatment by stretching with splints. But, in the early stages of the condition, there is no difficulty in straightening the fingers by means of simple palmar splints.

In the present case the patient was a female child, 14 months old, and a strip of aluminium, ¼ inch wide, bent to fit the little finger and palm, was affixed by means of a continuous spiral of zinc oxide strapping, a tiny pad of white felt being placed on top of the projecting joint and beneath the tip of the middle phalanx. By gradually straightening the splint as the contracture yielded, the finger was straightened in the course of six weeks. The splint is now being applied intermittently to prevent any recurrence of the deformity, and it is hoped, by keeping the child under observation, to ensure a permanent cure.

The photographs (Fig. 1) show another case, that of a girl aged 12, in whom the same method brought about complete correction in four months. In both cases flexion and extension of the little fingers are full, painless, and normally powerful.

The mother of the younger child, Nancy B. (who was under my care as an out-patient at Croydon General Hospital), took a particularly intelligent interest in the condition, and compiled a family tree (Fig. 2), showing which members of the family had been affected, out of the total number, in six generations; it is believed that the condition was present in earlier generations, but no exact information is available about these. The tree, as presented, is probably pretty accurate, since the mother went to much trouble to obtain corroborative evidence from various relatives. It is interesting to note that, in each generation, the firstborn child (shown on the right of the tree) escaped. It may be noted that there was no consanguinity between any of the fathers and mothers, and that there were no cases of similarly affected persons marrying.

FIG. 2.



Family tree of Nancy B. The circles indicate persons affected by kamptodactyly. Affected persons are ringed. (For significance of dotted squares see text.)

Observations by Prof. Wells.

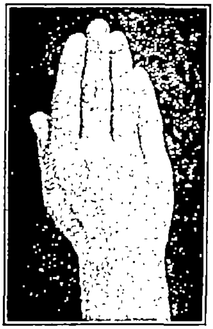
The family tree was submitted to Prof. G. P. Wells, of the Department of Zoology, University College, London, who examined it with Prof. Watson and Mr. Palmer, and kindly made the following commentary upon it.

"It is not by any means easy to get a simple story out of it, but we would like to make the following suggestions. Assuming the condition to be due to a single Mendelian gene, it must be recessive, because it runs through the first generation without showing itself. If this be true, the character could never appear again unless one of the people in whom it was carried happened to marry another who also carried the gene. Now this must have happened no fewer than five times, all the people indicated by dotted squares having married other heterozygotes—which is at first sight a very improbable proposition! It would very greatly increase the value of the data if information could be got as to the other families which married into this one. In the table as it stands only one parent of each generation is accounted for, while in considering the results of any pairing one naturally wants information about both. Thus it would be interesting to know whether the partners of all the people ringed with dotted squares came from unrelated families without any trace of a similar deformity, or whether there is any evidence of inbreeding (such as cousin marriages) in the pedigree. The latter event would, of course, diminish the improbability of the ringed people having married other heterozygotes.

"In the matter of the firstborn not being affected, this is, in our opinion, a chance result. It is hard to see how such a selective effect could come about, and (as the number of firstborn in the table is only 6 out of 26 individuals) the odds against such a distribution are not very great. What is rather more remarkable is that only females are affected, although apparently the gene can be transmitted through males. But here again it is difficult to judge whether the number of individuals recorded is sufficient to warrant the inclusion of extra factors (such as a sex-linked modifying gene) *to explain* the restriction."

As far as could be ascertained, there was in fact no history of any similar affection in any of the persons marrying into the affected family, and there was certainly no intermarrying.

FIG. 3.



The hand in a case of klinodactyly.

Prof. Crew's Notes.

Upon Prof. Wells's suggestion, the pedigree was also sent to Prof. F. A. E. Crew, of the Animal Breeding Research Department of the University of Edinburgh, who very kindly sent me the following notes upon the case, and references to the literature:—

"The condition which you describe has been recorded by several people, but always rather imperfectly. Your case is an instance of a sex-limited or sex-controlled dominant which, for reasons unknown, is not always expressed. I am assuming, of course, that the non-appearance of the condition in males is significant, and that it appears in females because of their different physiology (sex controlled). It would be interesting to make a very complete examination of the grandmother of the last generation in your family tree; it seems somewhat strange that she did not exhibit some degree of the condition. I am sorry that one cannot give a simpler explanation, but that seems always to be so in the case of the human. The expression of a hereditary character seems to be conditioned by many forces, of which one as yet knows nothing.

"So-called 'klinodactyly' (see Fig. 3) is a condition where the end joint of the little finger (and frequently the ring finger) is inclined sideways towards the middle finger, and is stiff. Mode of inheritance is dominant.[1] This bending to the side occurs very often as a consequence of brachyphalangy of single fingers. So-called 'kamptodactyly' is a condition where the little finger (and frequently the ring finger) is bent forward and is stiff. Goldflam[2] reports on a family where, in three generations, 26 persons were affected.

"Many hereditary disturbances of muscular function and pathological muscular structure are known. No case of dominancy has been observed. Most cases are to be classed as muscular dystrophies. It is not infrequent for sex-linked recessive 'Anlagen' of muscular dystrophy to appear. Lenz[3] the relative difference gradually increases throughout the year. Thus, in the first quarter the actual deaths formed only 78 per cent. of the expected; in the second quarter, 65 per cent.; in the third, 64 per cent.; while in the last quarter for which records are available the ratio was still further reduced to 51 per cent. of the numbers anticipated. This steadily increasing divergence between fact and expectation constitutes probably a point of fundamental importance in the records of mortality statistics.

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[1] Wegelin, K.: Berl. klin. Woch., 1917, p. 283.

[2] Goldflam, S.: Münch. med. Woch., 1906.

[3] Menschliche Erblichkeitslehre, by Baur, E., Fischer, E., and Lenz, F. Munich, 1927, p. 233. Erbliche Nervenleiden, by Lenz.

In females a somewhat similar encouraging trend is manifest, except that the records of the year 1927 do not at all suggest the intervention of any agency favourable to a declining death-rate. Thus, although there is a statistically significant discrepancy in the second quarter of this year, no such difference is apparent in the remainder of the year, in which actual and theoretical deaths almost exactly correspond. In the succeeding year, however, no doubt can possibly exist as to the significance of the general tendency. In the first quarter the deaths which occurred formed only 74 per cent. of what we should have predicted; in the second, 70 per cent.; in the third, 66 per cent.; and, finally, in the fourth, 65 per cent.

TABLE VII.—*Expected Deaths distributed according to Season and Compared with Actual Deaths.*

—	Males.		Females.	
	Actual.	Expected.	Actual.	Expected.
1927.				
January ..	307	279·5	434	412·7
April	278	282·2	348	390·2
July	273	255·5	361	371·8
October ..	244	308·4	410	414·0
1928.				
January ..	223	285·0	312	421·3
April	187	287·7	278	398·2
July	168	260·5	250	379·4
October ..	161	314·5	275	422·5

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THE diagnosis of this condition presents no difficulty, even when the patient happens to be an adult. There is always a history of the contracture having been present ever since infancy, undergoing very little change if left untreated; and in some cases its congenital character is emphasised by the presence of other congenital abnormalities, such as club-foot, hare-lip, hammer-toe, &c. As a rule both hands are affected more or less equally. Females are said to be more liable to the condition than are males. The type of contracture is quite characteristic; the metacarpophalangeal joint is hyperextended, the proximal interphalangeal joint is flexed (usually to about a right angle), and the distal joint is extended or tends to be extended. In many cases, but not in all, the contracted proximal interphalangeal joint is stiff; no movement can be obtained at it, actively or passively; but the patients learn to accommodate themselves to this, having never known anything different, and it seems to handicap them little, if at all; I know, for instance, of a brilliant surgeon whose dexterity as an operator is certainly not impaired by it. The stiffness of the joint seems to be entirely due to changes in the soft parts; radiograms never show any abnormality. The palmar fascia is never affected; this is one of the most important points of distinction, in adult cases, from Dupuytren's contracture. The principal contracture seems to be, primarily, in the capsule of the joint on its flexor aspect; in this respect there is a close resemblance to congenital contracture of the knees, whilst the stiffness of the joints is

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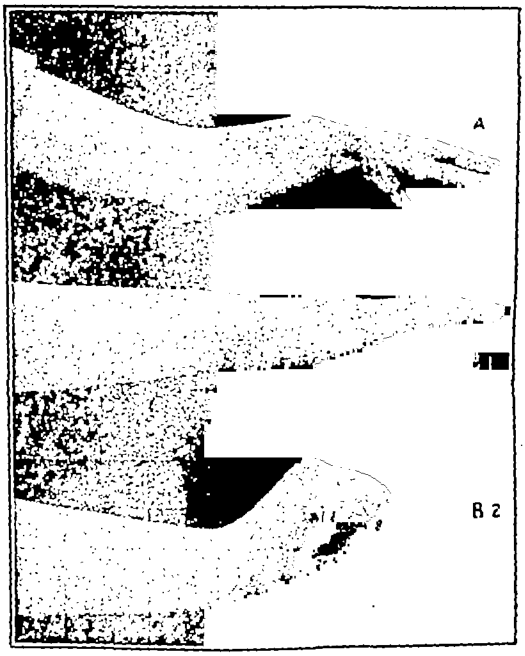

The hand in a case of kamptodactyly before treatment (A) and after treatment (B).

board. Microscopic examination of the sputum showed no tubercle bacilli but there were many cocci arranged in chains, together with an enormous number of pus cells. A skiagram taken shortly after admission showed a dense homogeneous opaque shadow with horizontal upper margin at the level of the fourth rib in front, the shadow merging homogeneously with the cardiac and diaphragm shadows. Above and to the outer side was a clear pocket between the third and fourth ribs, bounded externally by the chest wall and with its inner margin concave outwards midway between the chest wall and mediastinum. Above and to the inner side of this clear area was a shadow of moderate and uneven density, though much less dense than the basal shadow, extending to the apex of the lung. The heart was not apparently displaced to the left. A provisional diagnosis was made of partial pneumothorax due to perforation of bronchus in a case of empyema; subsequent investigation proved this to be correct. A series of leucocyte counts gave an average of 17,500, and a detailed examination of the purulent expectoration was made by Dr. A. F. O. Davey, of the Public Health Laboratory, Manchester, who reported as follows: "Microscopic examination shows pus cells and numerous organisms, chiefly streptococci, some of which occur in long chains. Blood-agar plates inoculated with the material produce a profuse growth, chiefly of hæmolytic streptococci. Two animals were inoculated on Sept. 12th and both died on the following day. Films from the heart blood showed streptococci and on cultivation hæmolytic streptococci were again obtained."

The subsequent history is interesting. The sputum, which on admission had been very profuse, gradually became less and the lad's condition improved. On Sept. 5th he complained of headache and pain in the right chest. The following day his temperature rose to 100·6° and he coughed up half a pint of very thick purulent material. He felt better after this and his temperature became normal. The physical signs in the right lung about this time were: defective movement; tactile vocal fremitus present all over; dullness on percussion, especially over the lower lobe; some breath sounds with a few crepitations over the upper lobe; no breath sounds over the lower lobe. A second skiagram now showed no evidence of the air-pocket, the whole of the right side of the chest appearing as a dense opacity. He was discharged from hospital on Sept. 26th, his condition having greatly improved since admission.

The accidental perforation of a bronchus was fortunate for the patient in that it provided an exit for the pus in a case of empyema hitherto unrecognised. Considering the marked improvement in his condition after the evacuation of the pus, resection of rib was deemed unnecessary, as the prognosis in such cases is said to be fairly good.

I have to thank my colleagues, Dr. C. W. Laird and Dr. G. B. Charnock, for providing me with the opportunity of investigating this case, and the Central Tuberculosis Officer (Dr. Lissant Cox) for permission to publish it.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

THE TRAINING OF MIDWIVES.

A MEETING of this Section took place on Nov. 15th, Dr. ARTHUR E. GILES, the President, being in the chair.

Dr. HERBERT SPENCER, in introducing a discussion on the Report of the Departmental Committee on the Training of Midwives,[1] pointed out that only one of the 12 members of the Committee was an obstetrician. That one member, Dr. J. S. Fairbairn, and Mrs. Richmond had dissociated themselves from those recommendations which involved the splitting up of the functions hitherto performed by the Central Midwives Board. Dr. Fairbairn and Mrs. Richmond urged that no such momentous changes should be made without full and open discussion not only by the midwives, teachers, teaching schools, and other interested parties in England, but also by the corresponding Boards in Scotland and both Divisions of Ireland, with whom there had hitherto been complete reciprocity. With most of the rest of the report he assumed that members of the Section would agree, especially with the recommendation for preferential treatment of medical students over midwives in the allocation of cases in the medical schools, and with the comment that a large amount of valuable clinical material was used by midwives who did not intend to practise. Parts 1 and 5 of the report dealing with the historical aspect of the subject and with administration were those which most nearly concerned the Section of Obstetrics, and these merited the most earnest consideration. Dr. Spencer said he thought the report of the Departmental Committee might well have pointed out that it was to the persistent efforts of the Obstetrical Society of London that the Midwives Act of 1902 was due. He believed that the Section would agree that the Central Midwives Board had performed its duties well, and that the Section would not think the duties could properly be carried out by a Ministry of Health, whose treatment of the panel doctors was characterised by the Lord Chief Justice of England as pure despotism.

Criticism of Administrative Proposals.

Dr. T. WATTS EDEN said that the report of this Committee contained much with which the Section of Obstetrics and obstetric teachers would find themselves in agreement. It was to the administrative proposals that serious exception was taken. The principle upon which the practice of midwifery had been carried on in this country since the first Midwives Act was passed was, that their affairs were dealt with by a statutory authority appointed for the purpose, into whose hands were placed all matters concerned with the education and training and professional conduct of midwives. Dr. Eden thought this was a very sound principle, from which, however, the Departmental Committee proposed an entire departure. Upon the statutory authority the three classes mostly concerned—obstetric teachers, general practitioners, and medical officers of health—were all represented, so that the affairs of the midwives were in the hands of those who knew something about the matter. He would not say that the constitution of the Central Midwives Board was an ideal one; it might have been more ideally representative of the classes chiefly interested, and it might have been given wider powers, but within the limits imposed upon it the Board did very excellent work. Obstetricians were now asked to consent to depriving this statutory authority of its most important functions, to the removal of responsibility for the training and education of midwives out of their hands. It was proposed this responsibility should be vested in the Ministry of Health, which should have the assistance of something which was called an advisory committee. The experience of himself and his colleagues was that advisory committees of Government departments were not allowed to do very much. When the Ministry of Health was constituted an advisory medical committee was appointed, with Sir Bertrand Dawson (now Lord Dawson) as its chairman, and he believed that body had never been given any serious work to do at all. When medical subjects came up for inquiry the practice of the Ministry was to make its arrangements and appoint its committees of inquiry independently of its own advisory committee; and Dr. Eden expected that if this scheme should go through, the advisory committee on midwifery would meet with much the same fate. Even if it were asked for its opinion at all the Ministry would not necessarily accept the advice given—and the power would be entirely in the hands of the Minister. This matter must also be considered in connexion with the scheme set out in the report of the Departmental Committee for the formation of a national maternity service,

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[1] See THE LANCET, Sept. 28th, pp. 669 and 680.

It was contemplated by this Committee that when their scheme was put into operation four-fifths of the confinements of the country would be carried out by midwives who would be paid for their services under the Insurance Act by the local authority, and would consequently be, to a great extent, under the control of the Ministry of Health. The result would be that the practice of midwifery, roughly speaking, would pass under the control of a Government department instead of being, as it was now, in the hands of the profession, guided by the statutory authority. He hoped the Section would agree that such a change could not be carried through without great detriment to the teaching and practice of midwifery.

One of the important duties of the Central Midwives Board was the inspection and approval of the institutions in which midwives were trained. It was true that their power with regard to inspection had been seriously interfered with by the action of the Ministry of Health, because when the poor-law institutions began to train midwives the Ministry of Health said: "You cannot inspect these institutions; they are Government institutions, and we will inspect them ourselves." But the Ministry of Health had no inspectors on its staff capable of inquiring into the efficiency of the methods of instruction given and the suitability of the general system on which the institution was worked. In the resolution which would be submitted to this meeting it would be suggested that the transference of the education and training of midwives and the inspection of their training schools from the ad hoc authority to a Government department was a retrograde step, and that the control and education of midwives and their professional conduct and the bearing of the institutions in which they were trained should still remain in the hands of the authority appointed for the purpose. The Section might consider that that authority should be a larger and more influential body than the Central Midwives Board, that it should be given greater powers, that the majority on that authority should be those who knew, from the practical point of view, what the practice of midwifery was, and that it should be strengthened by the addition of others whose experience of affairs generally and business would be an advantage from the point of view of organisation. But an ad hoc authority there must be if anything like liberty in this matter was to be preserved, either to doctors or to midwives. He did not doubt that, if this scheme should go through, there would be produced before long another scheme by which doctors who practised midwifery under the Insurance Act would also become officials in the Ministry of Health and be paid by the State, so that thus the hole practice of midwifery—except the fractional rt concerned with those to whom expense was no ject—would pass into the hands of the Ministry, ist as the treatment of infectious diseases and tuberculous diseases had done. If such a movement as the present one was likely to succeed, the sooner the profession made its voice heard in opposition the better; and the Section was being asked on this occasion to take the first step—it was hoped it would not be by any means the last step—in making it clear to the Government that such proposals as the Departmental Committee had put forward were totally unacceptable.

The Teacher's Standpoint.

Prof. L. **McIlroy** spoke as a teacher. If 75 per cent. of the midwifery cases of the country were conducted by midwives under the control of the Ministry of Health, who, she asked, would look after the remaining 25 per cent? Would they be looked after by the specialists only, or by the general practitioners? Teachers were not out to train specialists after graduation; they were teaching the future general practitioner, and if practitioners were not going to do midwifery it was time the medical schools set about saving the money spent on their education in obstetrics. She thought it a great pity that up to the present time this Section had been so involved in the maelstrom of scientific work that it had stood aside and had not taken any active part in this controversy. It was a serious matter from the point of view of the teachers and that of practitioners. She wondered what type of person would exercise control in this matter at the Ministry. It might be someone who knew the administrative machinery, but the difficulties of the doctor and midwife could not be understood except by one who was living the life of an obstetrician. If the advice of the general practitioner and of the teacher were shut out, little would be left. The midwife service had been efficient because midwives had had the advantage of the training and the teaching of specialists. She believed that the retention of the Central Midwives Board would make for a better service for the country than would any Government organisation.

A Member of the Departmental Committee.

Dr. J. S. **Fairbairn** said in an organ of the lay press Lord Hewart had stated: "The conclusion is irresistible that it is manifestly the offspring of a well-thought-out plan the object and effect of which were to clothe the Department with despotic powers over midwives and midwifery generally." The word "Departmental" was the clue to the whole thing. The Department suggested that the Committee was required, the Department determined its composition and its chairman, and those who were to be members of it were not told who their colleagues were to be. On the whole, it was an almost comical body from which to expect a sound opinion on midwives. The administrative side had been in the majority on the Departmental Committee which, unlike a Royal Commission, did not publish its evidence in full. Much of what was tendered was not within the proper meaning of evidence. Only one midwife had sat on the Committee, and she could scarcely be said to represent practising midwives. He had had the feeling throughout the sittings that he was in an antipathetic atmosphere, hostile to the Central Midwives Board, and that the case had been prejudged. The proposal supposed to emanate from the London County Council was apparently the voice of the medical officer of health of that body who had never had to do with midwives. Dr. Fairbairn agreed with Dr. Eden's views about inspection by the Ministry of Health. The Central Midwives Board was not allowed to look inside the poor-law institutions. In some of these hospitals there were, perhaps, 30 confinements in a year, and since it was desired that the nurses should obtain their certificates in midwifery, such nurses were taken from their duties in other wards and were summoned to be present at the confinement in order to be signed up. This was termed training in obstetrics. He felt that these recommendations were the thin end of the wedge, and that sooner or later the medical profession would be involved in similar proposals in so far as the insured women were concerned. He hoped this Section would make its protest.

Discussion.

Dr. W. H. F. **Oxley** (Chairman of the Maternal Mortality Committee) said that questions of the kind under discussion profoundly affected maternal mortality, and he felt that his Committee would consider evidence tendered by this Section on the point, as they were anxious to reach conclusions of real value.

Dr. **James Young** expressed the hope that Dr. Oxley, having heard the discussion, would place the justice of the cause before his Committee. The debate left little room for doubt that the efforts to bring about this change were misdirected. The discussion, and other statements which had been made, should do much to convince those in authority that there was reason for giving the Central Midwives Board a larger representation than ever, and that the responsibility for the management of the affairs of this large professional body should be far more in their own hands. Then there would be nothing to prevent the raising of the standard of midwives.

The PRESIDENT wished it to be clearly understood that the Section was not discussing this matter in any spirit of trade-unionism—i.e., with the idea that the members were seeking to serve the interests of the medical profession—many of whom would be glad to be relieved of the most arduous and worst-paid part of their work. The prevailing feeling of the Section, he was sure, was that if the practice of midwifery were removed from the supervision of medical men, and placed in the hands of a Government department, the well-being of lying-in women and of new-born children would be seriously impaired and imperilled. It was on that broad and important ground, that of the public health, that he personally felt so strongly that the resolution to be submitted should be supported. If carried, the resolution would pass to the Council of the Society, and be forwarded to the proper quarter.

A Resolution.

The resolution, which was carried unanimously, was as follows:—

> "The Section of Obstetrics and Gynæcology of the Royal Society of Medicine having discussed the Report of the Departmental Committee on the Training and Employment of Midwives is of opinion:—
>
> "1. That the responsibility for the education and training of midwives, including approval and inspection of training schools, should be retained in the hands of an independent body appointed for the purpose and consisting largely of those who are or who have been engaged in the practice of midwifery.
>
> "2. That the proposal contained in the Report to limit the power of the Central Midwives Board and to give the Minister of Health the sole responsibility of approving and inspecting training institutions and teachers, and of laying down the curriculum of training, would, if adopted, be prejudicial to the teaching and practice of midwifery in this country.
>
> "3. That the Departmental Committee responsible for the recommendations to which we take exception was not a representative body inasmuch it contained only one member out of thirteen who had practical knowledge both of the teaching and practice of midwifery, and this member dissented from the main recommendations of the Committee."

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

A QUARTERLY meeting of this association was held in London on Nov. 6th, with Dr. NATHAN RAW, the President, in the chair. A paper on some experiments with

Suggestion and Association Tests in the Feeble-minded.

was read by Dr. T. SAXTY GOOD, who pointed out that suggestion and suggestibility were two different processes. By suggestion was meant the sum total of (1) stimuli received by sight, hearing, taste, smell, touch (designated external stimuli), and (2) from the autonomic system, which did not enter consciousness in health, except as urges connected with primitive instincts. This could be termed auto-suggestion. The condition of the body called illness was a condition in which the sympathetic system became conscious. Feeble-mindedness was, psychologically, a failure of repression and a falling to a lower type of mind. The results of suggestion and association tests he had performed could be translated in practice as meaning that the dominant parent who had been complacent to the child would cause it to grow up positive to suggestion, whereas a repressive dominant parent or prototype would produce a negative reaction in the child.

Dr. GEOFFREY SHERA read a paper on

Bacillus Acidophilus in Mental Patients.

During 18 months, he said, he had examined the stools of cases admitted to the East Sussex Mental Hospital within a week of their arrival. Among 53 mental cases the reaction of the stool was alkaline in 80 per cent., neutral in 10 per cent., and acid in 10 per cent; 30 per cent. showed abnormal coliform bacilli, while 69·1 per cent. showed abnormal streptococci. *Bacillus acidophilus* was obtained in pure culture within 72 hours in 9·4 per cent.; in 41·5 per cent. the appearance of this organism was delayed more than 72 hours. Abnormal aerobes were present in 20·6 per cent. of the cases; non-hæmolytic staphylococci in 38·9 per cent., and hæmolytic in 7·5 per cent.; non-hæmolytic streptococci in 43·1 per cent. and hæmolytic in 54·3 per cent. Constipation, said Dr. Shera, was an accompaniment of *B. acidophilus* deficiency, and in general practice this deficiency was usually remedied by the administration of *acidophilus* milk or emulsion. Constipation was the rule in mental patients, and aperients were needed. Eighty-one per cent. of mental patients showed deficiency of *acidophilus*, so that it was reasonable to attribute at least part of the prevailing intestinal toxæmia in them to this. The weakness of the intestinal defensive mechanism was obvious in these patients. Warren Crowe had evolved a method of pathogenic selection, and this made the remedy more hopeful.

Dr. B. H. SHAW referred to his own attempts in this direction, giving a prepared meal each night. The meal was so unpalatable that after a short time he had to desist.

Dr. M. STEWART said that the theory that mental disease could be caused by the condition Dr. Shera described had come in for a good deal of criticism. The reason this subject had been worked at so persistently was obvious. When mental patients arrived they clearly had bowel poisoning, loaded intestine, foul tongue, bad breath, sallow features, and constipation, sometimes alternating with diarrhœa. There was also an increase in coliform bacteria, and a lessened quantity of those of the *acidophilus* group.

Dr. A. W. PETRIE agreed about the number of fallacies encountered in these investigations. Those who had done the plating of fæces had been struck by the abnormal plates of mental patients, especially in the increase of the non-lactose fermenters or the late lactose fermenters. In mental patients there had generally been a good deal of disease which had upset the flora. He suggested that taking the fæces for examination on the first arrival of the patients meant taking them at a time of temporary upset, and when they were in a particularly toxic state owing to neglect. He had sometimes succeeded in altering the flora picture of patients but usually he had not noted any coincident mental benefit. He would like to know what kinds of mental conditions were dealt with by Dr. Shera. The paranoid type would probably tend to have a normal intestinal flora, whereas the agitated or stuporose melancholic would have one that was more abnormal. On the whole, treatment along these lines had been, in his hands, rather disappointing.—Dr. W. F. MENZIES said that in Dr. Shera's long and painstaking work little was stated about the mental condition of the patients who were treated. Similar treatment based on earlier researches of asylum workers had not, he thought, brought about mental improvement as a rule.—Dr. G. W. T. H. FLEMING said that five years ago two Americans had shown that the liver had very little power of detoxifying histamine. He thought a good deal of work required to be done on those lines.

Dr. SHERA, in his reply, said his practice was to ask for a loose motion for the examination, but if the patient was constipated an aperient was given overnight. With the glucose broth method, however, he was indifferent about the type of stool; the broth would show the bacillus if it were there. He did not claim that *acidophilus* therapy would necessarily eliminate the abnormal coliforms, but it was sound practice to try to re-establish that bacillus in the intestine. Prof. Embleton had told him of another way of eliminating the coliforms—namely, by giving an antivirus by mouth. Progress had not yet reached the stage when one could classify the flora according to the mental state. He reminded the meeting that any milk which was sour was not necessarily *acidophilus* milk.

HUNTERIAN SOCIETY.

MEMBERS of the Medico-Legal Society were invited to attend a meeting of this Society which was held on Nov. 18th. The President, Dr. E. C. YOUNG, occupied the chair, and Lord HOWE opened a discussion on

THE DOCTOR AND THE MOTORIST.

Quoting from Table D of the first report of the Royal Commission on Transport, he stated that over 6000 people had lost their lives on the roads of this country in 1928. It was quite possible to reduce this figure by at least 10 per cent., and it was imperative that some action should be taken at once. The speed-limit might be made a little higher, but if it were abolished the police would be compelled to prosecute for driving to the public danger. To be justly tried the cases would have to be heard at great length, and the work of the courts would be much increased. Moreover, he doubted whether the present courts were sufficiently well equipped to deal with this most difficult issue, and recommended—in case the speed-limit were removed—special traffic courts, analogous to the commercial court, assisted by technical assessors.

The six most prolific causes of an accident were, he said, all preventable: excessive speed, inattention, confusion or lack of judgment, failure to exercise care at road junctions, improper cutting in or out, failure to keep to the proper side of the road, and inexperience. A competence test alone would enormously reduce the casualties under these six headings. This test might be voluntary and conducted by local panels, who would issue graded certificates. The grade of a driver's certificate, or its absence, would be taken into account by the court and insurance companies would favour the driver with the good certificate, so that its possession would be a practical necessity. The allegation that the skilled driver was the cause of accidents was not borne out by Table D.

Dr. E. B. TURNER held that if the appalling tale of accidents was to be reduced it was vitally necessary to ensure by some form of test that drivers were physically fit. Among physical conditions which rendered a driver unsafe were bad sight, liability to petit-mal or epileptic fits, in some cases the loss of a limb, convalescence from certain illnesses, and progressive paralysis. The question of youth or age i relation to competence could only be decided in ch individual case. His opinion of the woman ver was that “when she was good she was very ry good, but when she was ——” unspeakable. On the whole, he thought women failed through expecting old-world courtesy in tight corners; courtesy was very difficult to extend when three cars were mixed up at a cross-roads. Nevertheless, they were improving every year. To illustrate his ideal of the fit driver he quoted Kipling's lines, beginning: “An even heart that seldom slows its beat, the cool head willing what that heart desires; the measuring eye that guides the hands and feet, the soul unbroken when the body tires.”

The Team Spirit in Traffic.

Mr. MERVYN O'GORMAN said there was not one traffic problem but a cohort of problems which required a scientific approach. All that could be proposed to-day was a method of study, not a solution; anyone who pretended to have a solution was a public peril. Road safety demanded the continuous attention of traffic units to the job of being a traffic unit in traffic; anything that disafter[illegible]d drivers or walkers added to the risk of general [illegible]: bad name-plating, bad lighting, slippery going to and vague signals, for example. When the schools set demand approximated to a man's maximum education the danger line was reached; anything that that up [illegible]ving more difficult or fatiguing or called for simultaneous observation of more objects, or a wider angle of vision or quicker apprehension, could only be tolerated in so far as it added to the intensity of attention. The psychology and physique of the individual, therefore, was a factor. A far-reaching and compulsive rule was: “Show your intention and heed the other fellow's.” No class of traffic unit could be privileged and yet be safe. Transport was required for wealth, life, happiness, and civilisation, and safe speed was essential for transport. The power to accelerate was a power for safety. The exercise of consideration by all to assist the free movement of all would give swifter movement to all. The team spirit was a cardinal necessity.

Dr. P. B. SPURGIN agreed with Mr. Turner's demand for a periodical test of physical fitness. He would apply it first to all drivers of commercial vehicles and of motors plying for hire, as most owner-drivers were medically examined from time to time for other reasons. To Mr. Turner's list of disqualifications he added heart disease; it was not uncommon to hear of elderly men, quite unfit, who had fallen dead at the wheel while driving passengers. Some form of insurance should be made compulsory to compensate both the motorist and the person injured, both by way of personal assistance and of defraying the cost of treatment in hospitals, which at present suffered much loss from treating motor casualties without payment.

Alcohol and the Motorist.

As a police-surgeon Dr. Spurgin saw a large number of motorists accused of being drunk in charge of a car; it was then his duty to say definitely, not whether the accused was fit to be in charge of a car, but whether he was drunk. He would, he said, be very grateful to anyone who could tell him what drunkenness was. The Lord Chief Justice had made the very definite statement that “drunk is drunk,” meaning that there were no degrees of drunkenness, a maxim which was right in law and in common sense. There were, however, degrees of alcoholism, which was quite a different matter. A high authority had expressed the view that that person was drunk who had taken drink to such an extent as to disturb his mental balance and render him unfit to deal with the ordinary matters of daily life. This did not go quite far enough, and the best definition up to date had been that of the British Medical Association: that a man was drunk who at the material time was so affected by the influence of alcohol that he was unable to perform his ordinary functions normally. The ordinary function of the motorist was driving the car, and if he was overcome to any extent by alcohol he was unfit to drive a motor-car and therefore drunk. Like the seven ages of man, there were seven stages of drunkenness, and it was a moot point at which of them drunkenness itself began. The stages were: relaxation, bonhomie, expansiveness and loquacity (somewhat dangerous ground); cantankerousness (here there was little trouble in diagnosis), pugnacity, somnolence, and coma. The layman did not understand the difficulty of the problem presented by these border-line motor cases. Clever barristers sometimes pulled medical evidence to pieces in detail when the witness had based his opinion on the accused's condition as a whole, and their clients got off. Nevertheless, many suspects were released from custody at once because the police-surgeon could not quite certify them drunk, and those who escaped when actually charged were very lucky.

Some Practical Suggestions.

Mr. MASSAC BUIST reminded the meeting that the problem was to reduce, not necessarily the absolute number of accidents, but the number per mile per head. The work was badly hindered by the lack of statistics. The law of motoring would, he hoped, be made clear and up to date, but its administration was another matter altogether; while there were still magistrates who spent their time hounding the police on to prosecute for every minor infraction, statistics based partly on police-court results would be deceptive. Public education was necessary in many directions. A factor which produced a large number of accidents was the general tendency to drive old cars, with their high centre of gravity and indifferent brakes, like new ones. It was also an astounding fact that many persons who had driven for months could not reverse their cars; the "fair-weather" driver was a great danger. Moreover, the percentage of drivers who could control a skid had never been so low. Many drivers needed education in the art of signalling without forgetting their own intentions and obstructing the traffic. It had been said that many roads were so steeply cambered that it was impossible to drive on the left; this was largely a matter of training, though manufacturers would have to pay more attention to the solidity of their wheels.

He recommended the American plan of making all drivers, at certain cross-roads, actually stop their cars before proceeding; this was a marvellous preventive of accidents. The weakness of a driving test was that it did not necessarily expose the candidate's ability to deal with an emergency. The insurance companies opposed compulsory insurance because they thought it would force them to take risks they would not otherwise accept, but Mr. Buist proposed that insurance against third party risks should be compulsory for drivers and optional for companies. This would make the companies the means of ridding the roads of the really bad drivers and—a less recognised danger—the bad example they set to beginners. The great difficulty in the way of financial assistance to hospitals for the treatment of motor casualties was that neither the press nor the public would take any interest in the movement. Insurance companies were at present unable to pay over to the hospitals any part of the sums awarded to their clients, and legislation was needed if this me[illegible] tracti collision [illegible] to be available. A very heavy fine patches [illegible]ted on persons who absconded without sum of the capacity t[illegible] inducing local practitioners to treat do dr[illegible]

Discussion.

Lord RIDDELL advocated that doctors and hospitals who had treated motor casualties should have a right of action for fees with a first charge on the patient's vehicle.

Mr. BERNARD O'CONNOR suggested that all motorists should be trained and examined on the same plan as that applied by the London General Omnibus Company. In a collision with a pedestrian, when the court found contributory negligence on both sides, the motorist fared worse because he caused the injury.

Dr. CAMPBELL McCLURE proposed and Sir BRUCE BRUCE-PORTER seconded a vote of thanks to the speakers.

Lord HOWE, replying, pleaded for the spirit of sportsmanship, which would go a long way towards solving traffic problems.

MANCHESTER MEDICAL SOCIETY.

AT a meeting held at the University on Nov. 6th Prof. E. D. TELFORD described two cases of

Hydatid Disease of the Lung.

The first case was that of a boy, aged 14 from whom a large cyst of the lung was easily removed by thoracotomy. In the second case, a woman of 40 had made a complete recovery after the spontaneous expectoration of two very large hydatid cysts of the lung. Dr. Telford emphasised the frequency of multiple cysts in the same patient and produced evidence to show that the hydatid cyst was of much slower growth than was commonly supposed. Diagnosis was based on the occurrence of eosinophilia and anaphylactic phenomena with the aid of the complement-fixation and Casoni tests. Small hydatids deeply placed in the lung might, he thought, be left to expectant treatment, but hydatids near the pleural surface should be submitted to operation owing to the risk of rupture into the pleural cavity.

Dr. FERGUS R. FERGUSON read a paper on the

Familial Ataxias.

The term, he said, was originally employed to denote a number of cases of ataxia with an hereditary or familial incidence, but as the years have gone by it has come to be used to include a variety of different diseases, many of which show little or no ataxia. The tendency has been to regard these diseases as more or less distinct and separate entities, although for the sake of convenience they are generally included in a neurological text-book under the same heading. The group includes the ataxias associated with the names of Friedreich, Marie, Sanger Brown, and Neff, families described by Klippel-Durante, Cestan and Guillain, Ballet and Rose, Batten, Miura, so-called familial disseminated sclerosis and familial spastic paralysis. The cases described by Sanger Brown and Neff seemed to be confined to the original family, but Gordon Holmes had clearly shown that there were numbers of cases masquerading under the name of Marie which were quite unlike his original "hereditary cerebellar ataxia." The clinical picture, in fact, varied according to which system—psychological, cranial nerves, pyramidal, extrapyramidal, sensory, and cerebellar—was affected. The probable unity of these various diseases was suggested by the occurrence of Friedreich's and Marie's form in the same family (Bayer and Gy, Ferrier and Chassin), by transition types between the two (Perrero, Lenoble, and Margulies), and by the evidence of a family, investigated by Dr. Macdonald Critchley and himself, in which 13 members were affected, most of them with the following features: (1) age of onset, 35–45; (2) euphoria and emotional instability; (3) ocular paralyses, nystagmus, and optic atrophy; (4) evidence of pyramidal disease; (5) widespread sensory disturbances; (6) certain extrapyramidal manifestations. Superficially, some of these cases resembled and had been diagnosed as Parkinson's disease or disseminated sclerosis. Although post-mortem evidence was lacking, probably all had a common pathological basis in hereditary abiotrophy of the neurones.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

CLINICAL CASES.

A MEETING of this Society was held at the Aberdeen Royal Hospital for Sick Children on Nov. 7th, Prof. A. LOW, the President, being in the chair, when a demonstration of clinical cases was given by members of the staff.

A Case of Spinal Curvature.

Mr. A. MITCHELL showed a boy of 7 with a year's history of pain in the back and loss of weight. On examination there was scoliosis of the dorsal region of the spine with curvature to the right and slight kyphosis. The last dorsal and first three lumbar vertebræ were prominent. There was pain in the lumbar region on jarring the spine. The boy walked unwillingly, with a crouching gait, supporting himself by holding his thighs. There were no signs of pressure on the spinal cord or nerve roots. The Wassermann reaction was negative. X ray examination showed the presence of lesions involving three pairs of vertebræ, ninth and tenth thoracic, twelfth thoracic and first lumbar, and third and fourth lumbar. Mr. Mitchell did not think that the lesions were tuberculous, in view of their multiple nature, but suggested the possibility of a multiple septic infection.

THE TREE AND THE FRUIT.

THE British Science Guild was founded in 1905 by NORMAN LOCKYER, the famous physicist and astronomer, who died some 15 years later. The object of the founder was to promote by organised effort the application of scientific methods and their practical issues to public affairs generally, thus instructing the country that it must look to science, as it advances, for the main solutions of fundamental social problems. In an appeal directed to the public last week by Lord MELCHETT (the president of the Guild), Sir RICHARD GREGORY and Dr. J. S. YOUNG (respectively chairman of the executive and finance committees of the Guild), and Lady LOCKYER, assistant treasurer, it is indicated that the advancement of science for public good lies especially within three spheres of endeavour—namely, that of research, that of education, and that of propaganda in advocacy of the benefits to be obtained through science alike by Government departments, educational and local authorities, and individual employers. This last sphere of work for public good the Guild claims to have filled successfully by the aid of experts in science in all its branches, whose aid has been given gratuitously, a fact which enforces the appeal of the Guild for financial support.

Under the foundation of the Guild lectures are given each year associated with the name of NORMAN LOCKYER, and last Tuesday the fifth of these lectures was delivered in the Hall of the Goldsmiths' Company by Sir WALTER FLETCHER, secretary of the Medical Research Council, who asked a large audience to consider broadly the field of work which is tilled by the followers of medicine. With such a scope for an address the lecturer could only attempt to dwell upon certain features or episodes that have significance for our guidance at the present time, and in the historical drama of the evolution of medicine he selected the changes during the three centuries between the accession of HENRY VIII. and QUEEN VICTORIA as illustrative of the whole story. In an interesting comparison of the development of the mathematical, chemical, and physical sciences with that of medical science, he pointed to the fact that in the former there had been a progress that had been [illegible]ontinuous in the main from the days of Greek civilisa[illegible] onwards, while in the latter there have occurred [illegible]ificant breaks in the forward march. Clearly [illegible]ing the Dark Ages there was no regular development in our knowledge of physics, but, despite the huge material obstacles, the study of both mathematics and chemistry was maintained. In the case of medicine, however, the scientific status remained unaltered, save in a few sporadic directions, between the first century B.C. and the seventeenth century. Here and there discoveries that proved of value were made sporadically, but for the most part the superstitions of old mythology befogged the path of medical learning, prevented the doctor from searching out the truth on the lines of natural philosophy, and even prevented him from following the teachings of HIPPOCRATES, whose doctrines throughout this long period represented the truth. These doctrines lost by the inventions of many disciples and gained little from any additions to knowledge of natural philosophy. This is a curious reflection when we remember the debt that modern developments of professional equipment owe to our increased familiarity with physics and chemistry and their mathematical and physical foundations. Why did not the acquisition of physics, which proved so fruitful of result in the material and moral development of the world, have no correlating influence upon medicine and surgery? To this question there is no single answer, but two circumstances are predominant as contributing to the explanation, if not explaining the anomaly. First the material with which medicine and surgery have to deal cannot be treated in the main on mathematical or logical grounds; and secondly, when the rule and the balance can be trusted, the microscope is very generally an adjuvant for the obtaining of necessary information, and the microscope did not arrive until after the death of HARVEY.

And now, in compensation for the lagging of the past, we have so fierce a rate set to medical progress that neither our educational machinery nor our laboratory methods can keep pace. Not only, as Sir WALTER FLETCHER pointed out, has medical knowledge come so tumultuously as to allow no proper time for the adjustment of the traditional system of medical training, but the new learning is often so directly associated with researches in the domains of physics and chemistry, which can only be conducted by experts along their own lines, that the initiative often passes from the physician to the scientific worker in the laboratory. These words must not be taken to imply a supersession of medicine, for their significance is exactly in opposition to this; we have, on the contrary, a practical proof here of the growth and development of medicine, in that the art and science of healing are steadily annexing the results obtained by workers engaged in other provinces of wisdom. But as these provinces, as well as the province of medicine thus allied to them, are alike in the stage of a rapid acquisition of knowledge, it can be readily believed that scientific workers are sorely needed. What is not so easy to believe, though equally true, is the fact that these workers, even the leaders among them, are not duly rewarded by the public. Though the happiness of the world's future may depend upon the activities of the army which is wresting from Nature her secrets, that army is undermanned and ill-paid.

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CANCER OF THE STOMACH.

SOME 16,000 persons die annually in Great Britain from cancer of the stomach. So rare is it for a case of this disease to be cured, or even to give the semblance of cure for an appreciable period after treatment, that many clinicians state freely that they have never seen such an occurrence, and surgeons are glad to exhibit at medical societies any rare cases in which they have been able to prolong life for more than a few years. At a time when the whole world is more than ever interested in cancer research, and when the activities of the Radium Commission are raising hopes which have never been entertained before, it is perhaps salutary, if discouraging, to reflect that at the present day there exists even with the latest radiological technique no real avenue of hope for the sufferers from this, the commonest of all forms of cancer. Established cancer of the stomach is not difficult to diagnose—tumour formation, vomiting, and cachexia are signs which are unmistakable and are usually harbingers of impending doom; but apart from these late features, there exist to-day diagnostic facilities which enable this disease to be recognised by the expert physician after quite a brief observation of the patient whose dyspepsia or other early signs have led him to seek advice. In the course of the discussion at the Medical Society of London on Nov. 11th, which we reported last week, it was made clear that even when clinical examination yields no clue, the competent radiologist can detect loss of motility in the gastric wall, early malignant ulceration, or a minute filling defect in the very early stages of cancer of the stomach. Moreover, the expert in gastric analysis is able to find changes from the normal picture of gastric secretion yielded after a test-meal, which confirm the suspicions of the physician.

Even when cancer of the stomach is diagnosed practically as soon as the patient seeks medical relief, there is little hope of cure. The clinician of the future will either have to discover entirely new methods of treatment, or, if reliance is to be placed upon existing methods, to diagnose the disease before ever it gives rise to symptoms. In the face of this problem any authoritative comments on the precursors of carcinoma of the stomach are clearly of interest. Dr. A. F. Hurst thus chose a valuable subject for his Schorstein Lecture, which appeared in our columns last week. Starting with his expression of belief that cancer never invades a healthy stomach, he proceeded to discuss the conditions which he believes to be its precursors. The old idea that free hydrochloric acid was absent in practically all cases of cancer of the stomach has been banished since the introduction of fractional gastric analysis, and most experienced observers now agree that this acid is to be found in about half the cases examined if it is carefully sought for. It still remains a remarkable fact that a considerable proportion of cases of cancer of the stomach exhibit achlorhydria, and Dr. Hurst believes that this condition is not the result of malignant change but is an expression of chronic gastritis which has been present in the patient perhaps for many years, and has been the predisposing cause in the development of the carcinoma. His personal experience goes to show that achlorhydria does not develop in the course of the disease, and that among cases of cancer of the stomach in which the history of dyspepsia is short the majority can be shown to exhibit this phenomenon. It is now generally recognised that one of the most important functions of the gastric secretion is to sterilise, at any rate partially, all material which enters the stomach. When, therefore, the secretion of acid is defective, not only is the softening and dilution of the foodstuffs impaired, but any pathogenic organisms swallowed have ample opportunity to increase the irritation thus mechanically produced. In this way progressive damage to the secreting tubules and mucous membrane develops, and in time an achlorhydria, which at first may have been due to temporary blockage of the secreting glands, becomes permanent owing to the destruction of these tissues. Earlier recognition of achlorhydria and gastritis might be expected if patients could be persuaded to submit themselves to routine examination during various periods of their lives, and in this way treatment might be more frequently instituted at an early stage. Dr. Hurst believes that the other group of cases which show a very definite concentration of hydrochloric acid are for the most part those of malignant change occurring in a chronic gastric ulcer. These cases form the majority of those in whom the history extends back for more than a year, and he believes that in this group must be placed about 20 per cent. of all cases of cancer of the stomach. With this conclusion many physicians will find it difficult to agree. It is true that a number of surgeons of great experience, including such authorities as Lord Moynihan and the surgeons of the Mayo Clinic, have taught that malignant change is by no means uncommon in chronic gastric ulcers. Their opinion has been founded largely upon the histological reports on material removed at operations. The figures of L. B. Wilson and W. C. MacCarty from the Mayo Clinic purported to show that the vast majority of cases of cancer of the stomach gave histological evidence of previous simple ulcers, and that 68 per cent. of apparently simple peptic ulcers, when resected, showed evidence of malignant change. These figures have been much disputed both in this country and in the United States. The evidence is subjected to close analysis in the important book on "Gastric and Duodenal Ulcer" recently published by Dr. A. F. Hurst and Prof. M. J. Stewart,[1] where the latter carefully surveys the results of work on material received in the pathological department of the University of Leeds in recent years. Prof. Stewart's series included 259 specimens removed at operation; 70 of these were frank cases of carcinoma, 11 of which were held to yield strong evidence that a simple ulcer had preceded them. Of the remainder, 11 showed early malignant change in the margin of an apparently simple gastric ulcer. Prof. Stewart believes these figures to be on the conservative side, in that a short history in some of the cass of obvious cancer did not, in his opinion, exclude the possibility of a rapid malignant change in an ulcer which was originally simple. This evidence has clearly been responsible to some extent for Dr. Hurst's belief that a chronic ulcer is the precursor of malignant disease in 20 per cent. of all cases of cancer of the stomach.

The reasons why many will disagree with him must, however, be stated with equal prominence. In the first place, the opinion of a pathologist, however eminent and careful, as to whether a lesion in any given specimen of malignant disease examined has been present for years as a benign ulcer is at best an opinion which would not be easy to prove conclusively. In the second place, it is impossible to escape from the remarkable fact that practitioners and physicians who have cases of chronic gastric ulcer under their care, sometimes for many years, do not see these cases gradually transformed into examples of cancer of the stomach. Dr. Hurst in his Schorstein Lecture records only one case in which he believes he has seen the development of malignant change from a simple peptic ulcer, and the critical reader will note that even in that case the symptoms had been present for a relatively short period. Records of cases of long-standing peptic ulcer terminating after years in malignant disease are exceedingly rare. In our view gastric ulcer has not yet been proved to be an important precursor of cancer of the stomach. But while it would be too optimistic to assume that the successful treatment of gastric ulcers throughout the country would have an important effect on diminishing the incidence of malignant disease of the stomach, there is nowadays no excuse for leaving an unhealed ulcer untreated, especially since medical treatment is proving such an effective weapon. Dr. Hurst himself admits that there is very little danger of malignant degeneration of a healed scar, and points out that in Prof. Stewart's series of specially studied operation cases there was only one example of cicatrix cancer compared with 11 of ulcer cancer. It is possible that the ætiological connexion between gastric ulcer and gastric cancer will remain for ever unsolved, since the general recognition and prompt treatment of the former lesion by modern medical or surgical means will make a chronic ulcer of long standing a clinical rarity.

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[1] Gastric and Duodenal Ulcer. H. Milford, Oxford University Press. 1929. Pp. 544. 63s.

Annotations.

"Ne quid nimis."

THE OPTICAL PROPERTIES OF THE CEREBRO-SPINAL FLUID.

DURING the last 20 years the cerebro-spinal fluid has provided a rich field for those who have the desire and ability to search for the hidden things in the chemistry and physics of the body. The chief value of this fluid from the point of view of research lies in the constancy of its normal chemical and physical composition, and in its comparative freedom from the proteins and protein compounds which complicate the physico-chemical examination of the blood. Since Mestrezat settled the normal chemical composition of the fluid many investigators have examined the relation of variations in this to variations in blood chemistry with fruitful results. It may even be said that the chemistry of the cerebro-spinal fluid in disease has in many ways helped us to understand the chemistry of the blood. More recently the finer methods of the physical laboratory have been applied to the cerebro-spinal fluid, partly from a pure desire for knowledge, and partly in an attempt to find new methods which will help in the diagnosis of disease. Electric properties, such as electro-conductivity and the electric charge of the proteins, have already been examined, and now the optical properties of the fluid are being investigated by modern instruments.

Two recent papers deal with the refractility of the fluid and its power of absorption of the ultra-violet end of the spectrum. Penfold and Price,[1] who have investigated the refractile properties of the fluid with the Zeiss dipping refractometer, had the results of several previous workers as a basis for their investigations. It may be said at once that their results agree closely with what had previously been found. They establish the normal refractility at 1·33510 in the adult and 1·33508 in the child, with variations of no more than six units in the fifth decimal place. Any greater variation they have found to be pathological, and to indicate some disturbance either in the chemistry of the cerebro-spinal fluid alone or more commonly in the chemistry of the blood. The chief value of their work appears to lie in the correlation which they have sought and sometimes obtained between the changes in the proportions of the chemical constituents of the cerebro-spinal fluid and the alterations in refraction. Thus in nephritis and diabetes the refractility as calculated from the chemical examination might be identical with that obtained directly by the refractometer. When this parallelism was not obtained it was considered that some chemical substance which had not been investigated in the routine examination was present in abnormal concentration, and a further examination might reveal this. In diseases of the central nervous system there was often little departure from the normal refractility, since an increase in protein might be compensated by a reduction in the chlorides or glucose. Increase of refractility was much more common than reduction, and was the rule in many diseases of the nervous system, such as cerebral and spinal tumour. On the whole, however, the refractometry of the cerebro-spinal fluid appeared to be of more clinical value in general diseases such as uræmia and diabetes than in diseases confined to the central nervous system.

The absorption of the ultra-violet end of the copper arc spectrum has been studied by Fretson Skinner,[2] who hoped to gain by this means some indication of the nature of the colloids present in the cerebro-spinal fluid. In this he was disappointed, for the absorption of ultra-violet rays appeared to have no necessary relation to the colloids in the fluid. Nor were any characteristic bands observed. He did, however, find important variations from the normal in certain diseases. Thus tabes dorsalis constantly caused an increased absorption at the ultra-violet end of the spectrum, general paralysis rather more, and tuberculous meningitis much more. Some diseases, such as disseminated sclerosis, might, however, give almost normal spectra. The number of fluids examined and the exact spectrum given by each is not stated. This method of examining the cerebro-spinal fluid is of some theoretical interest, but until the results which it gives can be correlated with changes in the constituents of the fluid it is likely to be of little practical value.

SNAKE-BITE AND ANTIVENIN.

SNAKE-BITE does occasionally, if rarely, give rise to alarming symptoms in this country, as our correspondence columns recently testified.[1] Our only poisonous snake is the adder, but in the United States of America rattlesnakes are responsible for the majority of cases, although the number of bites by copper-heads exceeds those of any other one species. In the current *Bulletin* of the Antivenin Institute of America, R. H. Hutchison has collected 607 case reports of snake-bite for the year 1928, and found that the species of snake could be identified with a fair degree of accuracy in three-quarters of them. From April until July the risk of snake-bite increases steadily, but it begins to decline again in the middle of September, and has practically ceased to exist by the middle of October. The greatest danger seems to lie in picking up or reaching for something on the ground, because any movement towards an unseen snake will elicit a lightning-like defensive bite. The symptoms vary considerably, but in most cases swelling and pain appeared early, and were the outstanding features. If the bitten part did not hurt and swell, the snake was either non-poisonous or its injection apparatus was not working properly. Other symptoms noticed were weakness, giddiness, hæmorrhage, difficulty in breathing, nausea and vomiting, as well as a host of occasional disturbances. The reports include almost every conceivable method of treatment, from the application of a freshly killed chicken to cauterisation, and specific treatment with antivenin. From this abundance of recommendations three first-aid methods have emerged as having real value. The first is the application of a tourniquet above the bite, drawn tightly enough to obstruct venous return. It should be released every quarter of an hour for at least two minutes to re-establish the circulation, its purpose being only to diminish the rate at which the venom enters the general circulation. The second measure is a crucial incision over the bite, deep enough to allow the escape of serum, and the third is mechanical suction to withdraw free venom. Experiments on dogs have shown that the common applications, such as potassium permanganate, kerosene or turpentine, are useless. Potassium permanganate oxidises and destroys the venom outside the body, but in the poisoned wound its local destructive action does more harm than can be balanced by the possible destruction of some unabsorbed venom. A review on the fatal cases emphasises the importance of early treatment under competent medical direction. In half the cases which eventually died there was delay of more than two hours before the first dose of antivenin was given. Antivenin gives prompt relief, and as long as the patient is alive there is a chance that it will counteract the poison. The Institute recommends as first-aid measures, the application of a tourniquet a few inches above the bite and an immediate subcutaneous injection of antivenin, supplemented by incision and suction if the bite has been inflicted by a large snake and if the symptoms are severe and develop rapidly. The victim is advised not to run or get hot, and to avoid alcohol and cauterisation. The antivenin injection should be repeated every half hour unless and until symptoms are markedly reduced, and intramuscular injection is better than subcutaneous; while for cases not seen until some time after the bite intravenous or, for small children, intraperitoneal injection is recommended. Caffeine, strychnine, and intravenous saline should be available where there is much shock.

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[1] Penfold, W. J., and Price, C. A. E.: Med. Jour. Australia, 1929, Sept. 28th, p. 424.

[2] Skinner, E. Fretson: Jour. Neur. and Psycho-path.,

[1] THE LANCET, Oct. 5th, p. 744; and Oct. 19th, p. 850.

The Walter and Eliza Hall Institute of Research in Melbourne is devoting a special grant from the Commonwealth department of health to researches on the Australian snake venoms. Venom is being collected from a large number of snakes by making them bite through a fine piece of rubber stretched across a medicine glass. The death-rates from the common snakes in Australia are 50 per cent. from the death-adder, 40 per cent. from the tiger snake, and 9 per cent. from the brown snake. Dr. K. D. Fairley has studied the results of intravenous injections of venom in sheep, and has found that the clotting-time of the blood is increased but that no intravascular clotting was caused. He has also studied the dentition and bite mechanism of the venomous snakes, and places the death-adder first and the brown snake last. In another paper he shows that a snake which has recently struck may still be dangerous, for even after biting several times it may still have an appreciable amount of venom left in the gland. His experiments suggest that tiger-snake venom, after the natural bite, is absorbed into the circulation in less than two minutes, so that if ligature and incision are to be effective they must be applied within this time. The value of this method depends on a thermolabile constituent of the venom, for if the thrombase in the venom was destroyed by heating to 75° C., ligature only delayed and did not prevent death. On the whole, therefore, he does not think that ligature is of very much use except to delay absorption, while the excision is being carried out. Dr. C. H. Kellaway, director of the Institute, has described a new phenomenon in the action of the snake venoms on isolated smooth muscle. The reaction closely resembles the anaphylactic reaction; the muscles can easily be desensitised, and one venom will sensitise to others. The action of the venom appears to be on the muscle itself, and not on the end plate, and the desensitisation is permanent.

IRRADIATED MILK.

STANDARDISATION in the vitamin content of foods has made an important step forward. On p. 1090 of our present issue Miss K. H. Coward, D.Sc., makes a comparison between irradiated cow's milk, and cod-liver oil as sources of vitamin D, and she is able to do this accurately by comparing both with a standard solution of irradiated ergosterol. She takes as her standard the antirachitic power of one ten-thousandth of a milligramme (0·0001 mg.) of irradiated ergosterol and calls this one antirachitic unit. Though this unit is not as yet universally adopted, its use is certainly an important step in the right direction. Dr. Coward was able to demonstrate that the antirachitic value of the milk was very materially augmented by a brief period of irradiation—30 seconds approximately. Before irradiation the milk only possessed about one twenty-fifth of an antirachitic unit per gramme; after irradiation the value was enhanced to one-fifth of a unit, and in some cases, differently irradiated, to two units per gramme. Thus a child receiving a litre of milk daily would get the equivalent of 0·004 mg. of irradiated ergosterol in the non-irradiated milk, while in the best irradiated milk the equivalent would be 0·2 mg. The former amount would probably be insignificant, but the latter might be adequate prophylactically, though probably not curatively for an infant. The usual curative dose for an infant is from 1 to 2 mg. Dr. Coward lays emphasis on the marked deficiency in antirachitic potency of ordinary milk which has not been irradiated. On Oct. 5th we published a paper by Dr. Chalmers Watson and others in which some remarkably successful cures of rickets with irradiated milk were recorded. The amount of milk given was not very large, and for some reason it seems to have been effective in one case in which the specific antirachitic agent, irradiated ergosterol, is stated to have failed. On the other hand, H. Hentschel and A. Roszkowski[1] express themselves strongly against the use of irradiated milk in the treatment of florid rickets, as compared with the use of irradiated ergosterol. If it could be ensured that irradiated milk, at no enhanced cost, would reach children who are not touched by any other form of antirachitic prophylaxis, it might have a considerable value; but otherwise it seems undesirable that its use should replace that of irradiated ergosterol, which is specific in the treatment of rickets.

PATHOGENESIS OF CONGENITAL SYPHILIS.

THE poverty of the material at the disposal of the clinician and more especially the clinical teacher of to-day, as compared with that to which he had access at the beginning of the century, has been remarked upon by physicians when occasion has led them to retrospect of their own experience. Sir Humphry Rolleston, in a remarkable address to the Medical Society of London on changes in the clinical aspects of disease, drew attention to the increased rarity of certain morbid conditions, due in some cases to the effects of treatment and in others to variations in the virulence of infective agents. Dr. F. J. Poynton, in his presidential address to a section of the Royal Society of Medicine in the present year, reminded his hearers of the kind of material that presented itself to pediatrists of the time of Cheadle—material which at any rate in civilised countries will never be seen again. Since it may well be said that the greatest advances in preventive and curative medicine have been made in connexion with diseases of the young, it is likely that in these disorders especially the material furnished by the past was superior to that of to-day. This fact does not apply to the clinician alone, but exerts a considerable effect on the activities of the pathologist, almost always with the result that he is driven to employ more indirect methods of investigation, and that the exact stages and sequences of the morbid process are more difficult to determine. No more striking testimony to the existence of this state of affairs could be forthcoming than the recent appearance[2] of Dr. Oluf Thomsen's pathological atlas of congenital syphilis in the fœtus, a disorder which has to so great an extent been modified by antenatal supervision and specific treatment. Dr. Thomsen has reproduced in a separate volume (with a short explanatory text written in German) the illustrations taken from his comprehensive work on the subject published in Danish in 1912. He justifies this course by the statement, which no one who has seen the material will be likely to challenge, that it would hardly be possible to obtain a collection of specimens at the present date which would be in any way its equal. He has incorporated with these illustrations a review of the problems connected with the transmission of syphilis to the fœtus, and discusses the evidence which has accumulated in the years since they first appeared, giving a lucid summary of his interpretation of this evidence. In general, he has found little cause to alter the view which he formerly expressed, that the infection of the fœtus is a placental one, and that a germinal (paternal) one is a hypothesis unsupported by evidence. Dr. Thomsen puts forward as facts of great significance that it has never been shown that an ovum infected with the spirochæte is viable (*lebensfähig*), and that in all the material which he investigated he has failed to find definite histological evidence of syphilis in a fœtus less than 5 months old.

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[1] Münch. med. Woch., 1929, lxxvi., 1423.

[2] Pathologisch-anatomische Veränderungen über die Congenitale Syphilis bei dem Fœtus und dem neugeborenen Kind. Copenhagen: Levin and Munksgaard; Leipzig: Georg Thieme.

He believes that this is to be explained by the fact that infection invariably takes place through the placenta, and that the latter does not become permeable to the virus until some period in the middle of pregnancy. The appearance of these admirable illustrations in a more accessible form will render available to a much larger number of readers some very important work on these questions.

ANNUAL HOLIDAYS.

A PRIVATE Members' Bill, introduced last week, proposes to grant to every employed person, after 12 months' work, a holiday of eight clear consecutive days with pay. The parliamentary debate on this Bill, which is reported in another column, makes interesting reading. No speaker objected to the principle embodied in the measure; but the opponents advanced arguments based on the claim that the cost would be prohibitive, without in any way considering the value of the increased efficiency arising from a well-earned rest. Few who have studied the results of establishing for human beings those hours and conditions of work which make for health, have any doubt that industry, efficiency, and even wealth result from their adoption. Instance after instance was quoted of trades in which this scheme is already honoured; each is to-day a successful trade. Yet the others close their minds to the idea that in this and in similar schemes for welfare lie the secret of success. The fact quoted in the debate that probably 40 per cent. of the workers in Europe to-day are under agreement of some sort to be paid while they are having their holidays will come to many as something of a revelation of the social advances being made among our immediate industrial rivals. Industrial economics always allow substantially for the replacement of machinery, and similarly should allow also for the resuscitation of the human element as a paying proposition. All Government employees, either established or unestablished, who come under the class of industrial workers now receive an annual holiday with pay. Clearly the time is due when this commendable example should be extended to the whole nation by Act, as are bank holidays. What is right and advantageous for the health and efficiency of our successful industries cannot but be good for the nation as a whole. The Bill was accorded a second reading, but no hope was held out that time will be granted for its passage through the House.

INTERNATIONAL HEALTH IN 1928.

FOR the fourth successive year the League of Nations has published an International Health Year Book, which offers valuable statistics for the comparison of sanitary organisation in 29 countries and under 35 Public Health Administrations. A large amount of thorough and important work is embodied in the volume for 1928[1] and an effort has been made to reduce the tables given for different countries to a corresponding scheme; unfortunately, in some cases suitable figures were not available so that direct comparison between all nations represented proved impossible. The probable inclusion of Egypt in the League of Nations in the near future makes the consideration of the statistics given for this country of some political interest. Great strides have been made of late years in the organisation of the Egyptian Public Health Department, and in 1927 the whole system was coördinated by the creation of a Ministry of Public Health. It is, of course, inevitable that Egypt still lags some way behind European countries, for two reasons: in the first place public health work in that country has been of comparatively short duration—the Public Health Department was formed only in 1886—and in the second place the rising population and the limitation of territory by the fertility of the Nile Valley makes overcrowding a serious and increasing problem. Public health work in every direction meets with this problem, especially, needless to say, in the large cities. To take an example a street sweeper in Cairo may be paid only five piastres a day (one shilling), out of which he supports himself and often two wives and families. Thus a nursing (and possibly pregnant) mother with three or four young children will feed herself and them for about two piastres a day on a diet of dates, beans, and vegetable rissoles, obtained from a street-vendor whose wares are spread on the ground at the corner of a dusty street, and voraciously haunted by flies. It is not surprising, then, that the death-rate among young children remains high as compared with the rates in European countries, and that it is tending to rise. The mortality among Egyptian infants under one year of age is given as 146 per 1000 live births during 1926; in Germany for the same year it was 102, in France 77, in Denmark 85, in England and Wales 70, and in the Irish Free State 74. The conditions giving rise to this marked difference are not such as can be corrected effectively or completely by sanitary legislation, as they are partly industrial and largely due to overcrowding. Various other factors will obviously contribute to the same end; superstition and ignorance play a large part, but these will naturally have less effect as education improves. The high infant mortality is more than balanced by the high birth-rate, which has always been on the increase in Egypt except during the war years. The birth-rate per 1000 inhabitants, however, shows a slight drop in the statistics for the last two years given—13·2 in 1926 to 42·7 in 1927. Yet this figure is extremely high when compared with the following: Austria, 17·8 per 1000 inhabitants in 1927, France 19, Germany 18·4, and England and Wales 16·6 in the same year. With a rising population in a limited territory, a high mortality among infants becomes almost a necessary condition of life to the survivors. It will be interesting to see what means will be used by the Egyptian Ministry of Public Health to attack this problem; a partial and temporary relief may, of course, result from improvements in damming and irrigation. The statistics supplied by the League of Nations should be of especial value to the administrators of countries such as Egypt whose conditions of public health are below the average of all the nations. The summaries provided of measures obtaining elsewhere may not be detailed enough to show how they could be adapted to local conditions, but may at least stimulate inquiry and eventually their study may lead to a general increase in efficient public health service throughout the civilised world.

THE DOCTOR AND THE MOTORIST.

THE urgent problem of how to reduce the increasing number of road accidents concerns the medical profession both as motorists and as doctors. The discussion held last Monday by the Hunterian Society, and attended by the Medico-Legal Society, clarified many important points in this aspect of State medicine. The chief heads of the subject are the desirability of tests of competency and of physical and psychological fitness for drivers; compulsory insurance; the remuneration of voluntary hospitals and private practitioners who treated casualties; drunkenness in drivers; general education; and direct legislation. The speakers all agreed that some test of physical fitness was urgently required and probably some form of psychological test as well, but recognised great difficulty in laying down a uniform syllabus and in administering it when laid down. Earl Howe, better known perhaps by his former title of Viscount Curzon, made the practical suggestion that competency tests should be voluntary and conducted by local panels who would issue graded certificates. The value of these in legislation and insurance would make them a practical necessity; moreover, the possibility of obtaining a higher certificate would provide an essential factor in motoring education which is now lacking—the incentive to improvement. Mr. E. B. Turner and others relied on the physical test to eliminate drivers suffering from defective special senses, essential limbs, dangerous heart disease, progressive paralysis, and similar conditions which constituted a danger in themselves. There was a general consensus of opinion that a test for temperament, quickness of reaction, self-control, and other psychological qualities was as yet hardly worked out and was certainly not capable of general application, but no one doubted its desirability as an ideal. Mr. Mervyn O'Gorman, vice-chairman of the Royal Automobile Club, stated what, if it can be confirmed, is a most interesting observation, that 50 per cent. of all accidents, avoidable and unavoidable alike, happen to the same 20 per cent. of drivers. It would be well worth the trouble and expense to eradicate this destructive minority, but the process might not be popular. Compulsory insurance is repugnant to many insurance companies, but Mr Massac Buist suggested compelling drivers to insure as a condition of their licence, and then leaving the insurance companies to refuse the bad ones. It is obvious that some provision is required to protect third parties against the results of the motorist's default or failure to insure himself. Connected with this is the proposal that insurance companies should pay an adequate sum out of awarded claims to remunerate hospitals which have treated traffic casualties free, but nothing can be done in this direction without legislation. Mr. Buist complained that the public took no interest in the question at all, and if this is so, there is all the more reason for the medical profession to busy themselves with it. The burden of motor casualties presses on some hospitals with a very grievous burden, and there is little sign of a general recognition by these patients of their moral obligations. Complaints are also made by many private practitioners that victims of minor motor accidents often disappear quickly after treatment without paying for it. Lord Riddell's suggestion will appeal to many: that hospitals and practitioners should be given a right of action against these patients, with a first charge on the motor vehicle. Dr. Percy Spurgin deplored the unsatisfactory state of the law on the subject of drunkenness in charge, but hinted that in practice much fewer offenders were charged than ought to be. The chief requirements of general education were the obvious ones of learning to manage the car, slowing at cross-roads, considerateness for other drivers, and the remainder enumerated by Mr. O'Gorman. The discussion showed, therefore, a number of departments of the problem which directly concerned all medical men. The general practitioner can do an enormous amount to solve the traffic problem. He is usually, for one thing, a constant motorist in all weathers, and traffic is familiar ground to him. He sees many motorists as patients and is in a position to warn them when not to drive, and often, by way of hint and fable, to instruct them how to drive, and to draw their attention to the public problems of traffic. Finally, as the person with the greatest moral influence to-day in the country, he can spread Mr. O'Gorman's "spirit of team-work," by practice more than precept.

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[1] Published by League of Nations Health Organisation at Geneva. London: Constable and Co. 20s.

ETHICS OF DENTAL PRACTICE.

AT the opening of the seventeenth session of the Dental Board of the United Kingdom, the chairman, Sir Francis Dyke Acland, had little of a formal character to report, but struck out a new line by informing the Board of a few of the matters which had arisen in the course of its ordinary business since its last meeting. A number of these dealt with aspects of dental practice interesting from an ethical point of view. A hairdresser had offered to scale his customers' teeth. The chairman felt so convinced that the scaling of teeth came within the words of the Act, "such treatment as is ordinarily given by dentists" (which is prohibited by persons not on the Medical or Dentists' Registers), that he directed the Board to prosecute. Practitioners had inquired whether they might pay the editors of local directories for putting in their qualifications. The chairman advised that it would be in the interest of persons consulting a directory that the qualification in respect of which a practitioner is registered should be inserted free, but that editors might reasonably make a small charge for adding his telephone number. A practitioner had inquired whether he might write to firms offering to set up a clinic for treating their employees. The chairman replied that he found it difficult to distinguish between what was proposed and offering householders to treat their servants or the members of their families, and that, therefore, he had much better not. The Hearts of Oak Benefit Society had made an arrangement with the Public Dental Service Association under which their non-State insured members should be treated at the scale of fees applicable to health insurance patients—the Society issuing to its members a letter containing the words, "It is open to you to present the enclosed letter to your dentist," and a form containing the words, "To the dentist selected by the member." As, in fact, the arrangement only applied if the dentist selected was a member of the Association, the chairman said that the arrangement was unsatisfactory and might easily involve an element of canvassing. The position was being reconsidered. In the last example which he gave, the Board heard that the London Coöperative Society had been asking for a commission from dentists treating their members on the fees which the members had been paying direct to the dentist. The Society had justified this "under the arrangements which they have with dentists and other tradesmen," they expecting a commission "on any trade obtained through their agency." This was, said Sir Francis, an unwise letter on their part, because if dentists obtained patients through an agency there was a suspicion that they were allowing the agent to canvass for them. All the dentists were warned, with the result that the Society became disturbed. It was explained that the letter had been written by a subordinate ("I suppose," said the chairman, "it was only this subordinate who had been responsible for the commission being demanded"), and the Society took the step of informing all the dentists who treat its members that if the patient paid his fees direct, the dentist was not justified in making any allowance to the Society.

RADIUM POISONING TREATED BY A PARATHYROID EXTRACT.

IN the manufacture of luminous paints crystallised zinc sulphide is mixed with radium, mesothorium, or radiothorium. The luminescence of such paints depends on scintillation. It is due to an alpha particle which consists of a helium nucleus containing two positive charges striking the crystalline phosphorescent zinc sulphide and causing a flash. Radium poisoning among New Jersey factory girls who were engaged in painting numerals on illuminated watch dials was first described by H. S. Martland[1] in 1925. It was traced to the habit of pointing camel-hair brushes with the lips. After a latent interval of one to seven years plastic anæmia may develop, and, preceding or following this, severe necrosis of the mandible or maxilla has been reported. "Radiation osteitis" of the femora, spine, and humeri have also been seen in these cases and it was followed by osteosarcoma in 2 cases out of 15. Chemists exposed to the manufacture of the radio-active constituents of luminous paints have met the same fate. C. K. Drinker, in 1925, suggested that the radio-active substances were stored in the bones of the victims, and ultimately, by testing the organs at autopsy by means of the α-electroscope, amounts up to 180 micro-grammes were found in bone, chiefly in the cortex. This discovery supplies the explanation of the bone changes and of the fatal aplasia of the marrow, for 95 per cent. of the rays coming from the bone are alpha rays, which are 10,000 times more destructive of human tissues than gamma rays. The treatment of the condition is, of course, preventive and we have never heard of any cases in Europe where the workers in this trade do not point their brushes with the lips. Removal from exposure, hygiene of the mouth, prevention and treatment of sepsis, and treatment of the anæmia—these, naturally, have all been carried out in cases where symptoms have started. In addition it occurred to several people, including Flinn,[2] to attempt elimination of the dangerous substances from the bone.

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[1] See THE LANCET, 1928, ii., 612, 625.

As long ago as 1861 Gusserow analysed the tissues of rabbits poisoned by lead and found by far the highest concentration of this metal in the bones. In discussing his observation he suggested an analogy between the storage of lead and calcium in the skeleton and hinted that changes in the organism as a whole might give rise to migration of lead as well as of calcium to and from the bony deposit. J. C. Aub, L. T. Fairhall, and A. S. Minot, in 1924, confirmed these observations experimentally in cats and also in patients poisoned by lead in industry. They found that artificial acidosis produced by large doses of ammonium chloride caused very effective elimination of lead and of calcium. Donald Hunter and Aub, in 1927, used injections of parathormone (Collip's parathyroid extract) and were able still further to increase the output of lead. This principle applied by Flinn and Seidlin to three girls with radium poisoning has caused gain in weight, improvement of the general condition, and great increase of the elimination of radio-active substance in the stools and expired air.

APRIL 1st, 1930.

THE date on which poor-law hospitals and institutions will be transferred to county and borough councils is still four months distant, but if these transferred institutions are to be appropriated by the public health authority on that date there is little time to spare. Memorandum L.G.A.26, which has just been issued by the Minister of Health, asks the councils concerned to submit proposals indicating whether it is their intention when the land in question (including, of course, the buildings upon it) is transferred to them, to apply to the Minister for his approval of its appropriation for the purposes of one of the special Acts. Any application is to be accompanied by a plan showing in a distinctive colour the land and buildings proposed to be appropriated, and by a report from the medical officer of health (or other appropriate officer) describing the present and proposed arrangements of the land and buildings. Couched, as it is, in formal terms, the memorandum deals, nevertheless, with the beginning of a revolution in public health practice. The opportunity was described by Sir Robert Bolam at the annual banquet of the Society of Medical Officers of Health, reported on page 1122, as not merely one of a lifetime, but as an opportunity unparalleled in centuries, for under the new régime the medical officer of health should, he said, be able so to alter the minds of legislators as to make the work of the medical profession at large bear fruit. At the same banquet Sir Arthur Robinson, First Secretary to the Ministry of Health, indicated the many directions in which the Local Government Act of 1929 will affect the public health service. On his right, by a curious chance, was sitting as chairman of the banquet the medical officer of health for Bradford, the only place in the United Kingdom where a general hospital is under municipal control. As a result of the changes which will begin on April 1st next, the exception is likely to become the rule, although, as Sir Arthur said, the right way to set to work is not per saltum, but gradually, quietly, and in the end surely. There may indeed be few councils which will take the drastic step of appropriating on the appointed date the institutions which are transferred to them, but, as the first circular issued by the Minister of Health to local authorities indicated,[1] they are made responsible on that date, severally or jointly, for the provision, maintenance, and management of all public institutions for the cure or mitigation of physical or mental disease. All Fools' Day, 1930, will tax to the utmost the wisdom of the wisest administrator.

CHARLES HOSE.

BY the death of Charles Hose the scientific world has lost a valuable worker in many directions, for although the centre of his activities was always the province of Sarawak the knowledge of natural history which he acquired there and on many expeditions passed into general knowledge through his writings. He entered the services of the second Rajah Brooke at a time when much of Sarawak was unexplored; neither animal nor vegetable, nor indeed human, life was understood, and Hose leapt at the opportunity of research along many and differing lines. He became a mining expert, and his oil discoveries added greatly to the wealth of Sarawak, while his anthropological studies are recorded in the "Pagan Tribes of Borneo," a work written in collaboration with Dr. William McDougall. His personal knowledge of leading tribesmen enabled him to construct maps of hitherto unexplored territory. Hose, who was made an honorary Fellow of Jesus College, Cambridge, in 1926, having previously received the D.Sc. from his University, gave his ethnological collections partly to the University and partly to the museum of the Royal College of Surgeons of England.

THE fifteenth annual report of the General Board of Control for Scotland (H.M. Stationery Office. 2s.) includes, besides details of the present condition of establishments for mental patients, some pertinent general remarks on the provision made for care and treatment of patients in asylums. According to the Scottish commissioners it has long been demonstrated that only a negligible number of the mentally affected cannot be treated under the same conditions as obtain in general hospitals. The desiderata of the ideal mental hospital, therefore, are full facilities for diagnosis and treatment; it should have well-equipped laboratories and a modern X ray apparatus under experienced medical control, and the administration of treatment by means of electricity, water, and light should also be supervised by a doctor. A dental room and a dentist who pays regular visits is highly desirable. The commissioners distinguish Edinburgh District Asylum at Bangour Village by citing it as an ideal hospital as regards provision for diagnosis and treatment, and give high praise to the new solarium being erected at the Govan District Asylum.

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[2] Flinn, F. B., and Seidlin, S. M.: Parathormone in the Treatment of Radium Poisoning. Bull. Johns Hopkins Hosp., Nov. 1929, p. 269.

[1] THE LANCET, 1929, i., 841.

EXTENSION OF THE CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.—Last week Princess Louise, Duchess of Argyll, opened a new wing of this institution. The extension, which has cost £51,000, will greatly relieve the pressure on the waiting-list.

LEICESTER ROYAL INFIRMARY.—On Nov. 13th the the Duchess of Rutland opened the reconstructed West Ward, named after the late Sir Edward Wood Ward, a former chairman of the governors. The day was chosen as being the sixty-seventh anniversary of the day upon which the ward was originally opened, and the same order of service was followed. The cost of the work, including two new operating theatres and their equipment, is £87,000.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LIII.

THE DIAGNOSIS OF ACUTE FOOD POISONING.

PART II.*—LABORATORY INVESTIGATIONS.

Wilful Poisoning.

WITH single cases of suspected food poisoning the possibility of wilful poisoning must be kept in mind. With a wide range of possible poisons it is impossible to discuss either symptoms or post-mortem appearances; these are fully described in books on toxicology. Remains of food left unconsumed by the patient are important to secure as unobtrusively as possible, and in particular any food or drink which may have been consumed only by the sufferer. If vomiting has occurred it is particularly important to secure samples either in bulk or on any linen on which it has been voided. Samples of urine are occasionally useful. In *post-mortem* examinations chief importance attaches to the stomach and this should always be ligatured off carefully with its contents and preserved for examination. Pieces of the small intestine should also be ligatured and preserved as well as the kidneys and liver. Other internal organs are less useful. It is essential to place the organs in jars which can be securely stoppered and *sealed* to prevent the possibility of tampering.

Local Inquiries by the Physician.

We must distinguish between the preliminary inquiries of the physician in charge of the cases and the more detailed and searching investigations possible to the medical officer of health with his facilities as regards right of entry and inquiry, and with the help he can call upon from the staff at his disposal. All outbreaks should be notified to the medical officer of health and his coöperation requested. Promptitude is however of moment and the physician in charge should make certain preliminary inquiries.

It is important, while the facts are fresh and defensive attitudes have not had time to develop, to make very careful inquiries about the food eaten by the sufferers. If there are a number of cases all subsequent to and seemingly related to a particular meal attention should be concentrated upon the exact constituents of that meal, the components eaten by *all* the persons who partook of it (sufferers and unaffected) with some general idea as to the amounts consumed. Frequently this preliminary inquiry will indicate with reasonable certitude the food at fault and elicit the fact that the sufferers were entirely confined to those who ate it.

Special efforts should be made to obtain some of this food, *as actually supplied*, for laboratory examination. This needs more personal trouble than is often given. It is not sufficient to merely ask for some of the food to be supplied. Many investigations have been handicapped by the fact that the food supplied for examination has not been the food as supplied but unconsumed, but has vaguely been part of the same food. It must be emphasised that only local or special portions may be infected and the rest of the food be quite sound. The fault may rest with meat gravy infected after preparation and standing, the meat from which it was made being perfectly good, and yet the meat alone is sampled. In some canned food outbreaks the writer has found that no steps have been taken to collect unconsumed scraps from the opened tin but that another tin of the same batch has been sent to the laboratory.

It is important to make a careful note of the physical conditions of the food before it is stale and decomposition changes may have started. The value of this examination is mainly on its negative side, since these cases often reach the courts and the physical condition of the food is an important point for the defendant. It is perhaps useful to point out that in the vast majority of food poisoning outbreaks (excluding botulism) the incriminated food is not noticeably altered in either appearance, taste, or smell when examined before secondary changes have developed. In botulism the food usually has a peculiar odour and taste, but sometimes appears unaltered. It is useful to note whether any domestic pets have eaten the infected food and have been ill.

After the presumptive food vehicle has been ascertained very detailed inquiries as to the source of infection are necessary. These are, however, very specialised, and for them the help of the medical officer of health should be invoked. They involve a careful study of the precise methods of preparation of the food, the conditions of storage after preparation, cleanliness conditions, the tracing and investigating of the original sources of the food, and the consideration of the possibilities of contamination from rats, mice, or other sources.

Laboratory Aids.

The laboratory is of undoubted value in the elucidation of food poisoning outbreaks, but there is a tendency on the part of the practitioner to attempt to throw all the onus of proof upon the pathologist. The intelligent coöperation of the clinician is necessary if satisfactory results there are to be obtained. The following three points are essential.

1. *Complete information must be supplied to the pathologist.*—In the first place, it is the bacteriologist, not the chemist, whose assistance s required, unless a definite chemical cause is suspected. It will be clear from the first article that the possible causes are very numerous. The practitioner must realise that the lines of investigation are essentially different for the different varieties of food poisoning. For living Salmonella bacilli the use of particular media is indicated, with serological tests; botulism requires a totally different bacteriological technique, chemical poisoning naturally requires a chemical examination, while to demonstrate *Salmonella* toxins in the absence of living bacilli is extremely difficult, often impossible. Unless the pathologist is fully informed by the clinician of all the facts he may lose valuable time and use up unrenewable food material upon investigations along the wrong lines. It will have been noted from the first part of this article how helpful is information about the symptoms, and how particularly useful are data concerning the incubation period. The different types of food poisoning all have different incubation periods.

2. *The right material must be submitted.*—Four classes of material throw light upon the causation—i.e.,

(*a*) *Any portions of the supposed peccant food.*—These must be actual portions remaining over (even scraps) from the food supplied which caused the illness. Frequently none is available.

(*b*) *Post-mortem materials from fatal cases.*—The spleen, pieces of liver, pieces of the small intestine, pieces of large intestine, and kidney are the most useful. To make a post-mortem examination and fail to submit the organs to bacteriological examination is for the most part a waste of time. When available this is both the easiest and the most reliable material on which to base a diagnosis as to the cause of infection.

(*c*) *Voided material from the cases.*—Specimens of fæces, and sometimes vomit, from the sufferers while in the acute stage, may give positive results, but are less useful than the other groups of material. In suspected chemical poisoning vomit material is particularly valuable.

(*d*) *Samples of blood for serological examination from the sufferers.*—One great advantage is that there is no urgency about these samples, since any serological reactions persist for many weeks, while in any case they will *not* develop until a week or more after the onset. The collection of these specimens, therefore, is better left over until the other samples have been sent and their examination started, which will enable the bacteriologist to indicate exactly what he requires. Classes (*a*) (*b*) and (*c*) must be sent without delay.

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* Part I., on Causation and Clinical Problems, appeared last week.

3. *The material must be submitted properly.*—The directions of the writer, which have been adopted by the Ministry of Health, are as follows:—

Specimens of excreta may be sent in clean wide-mouth bottles. The food may be put in a clean tobacco tin. The organs from fatal cases should each be wrapped in a piece of clean cloth, wetted and wrung out (only damp, therefore) with 30 per cent. glycerin solution. All the organs may be placed so wrapped in one large tobacco or other tin. If possible, the samples should be sent packed in ice. An impromptu ice-box can be made by using a fairly large biscuit tin, and packing the tins and bottles in one side of this, and filling the other part with dry ice in small pieces. The tins and bottles must be secured from rolling about when the ice melts by means of cloths and wood partition, or other device. The biscuit box should be packed in a wood box with at least two inches everywhere of sawdust between the two boxes. If ice is not procurable the samples must be sent without it rather than be delayed.

The Interpretation of the Pathological and Chemical Data.

In cases of chemical poisoning the actual chemical agent responsible may be ascertained and an estimate arrived at as to dosage.

The analyst will supply information on the amounts present. A careful calculation is then necessary to ascertain whether this could represent a poisonous dose. Mere detection of a chemical poison does not necessarily imply that it was responsible. For example, in a case of botulism from canned fruit small quantities of tin may be found and be of no significance.

In *botulism* the pathologist may or may not be able to isolate *B. botulinus*, but he can often demonstrate, by animal experiments, the presence of botulinus toxin and ascertain the type of this bacillus responsible.

In *Salmonella poisoning*, if living bacilli are present, they can usually be isolated from the food, if any of it is available. They are never present in sound food. Fæces examinations, if collected during the acute stage or soon after, usually enable the bacillus to be isolated, but these bacilli tend to disappear fairly rapidly, and samples collected a week or so after recovery are often negative. In paratyphoid fever cultural blood examinations are often positive, but it is extremely rare for these to be successful in Salmonella food poisoning, and they are not worth doing.

With food poisoning from Salmonella toxins the laboratory report may be quite negative, since it is often impossible to demonstrate their presence in a articular outbreak; this is, however, possible in ome cases by special procedures. The diagnosis is then only a probable one based upon the whole of the facts of the outbreak.

In fatal cases the internal organs almost invariably yield the bacilli in outbreaks due to living Salmonella bacilli, and diagnosis in these cases is usually a simple matter.

Serological tests.—In many outbreaks no food is available, there are no fatal cases, and fæces samples are either unobtainable or obtained late and negative. In such cases the serological tests may furnish the only bacteriological clue. Inquiries have to be made as to the possibility of previous protective inoculations against typhoid and paratyphoid fevers, but apart from this it is rare for sera to give a positive reaction in any moderate dilution with any of the Salmonella strains. A positive reaction in a dilution of 1 : 50 or higher is therefore of great diagnostic value, and may be conclusive. While only a little blood, which can be withdrawn from the finger or ear in the ordinary way, is required, it should be more than the one or two drops which is often sent. It is quite easy to collect an adequate 0·5 c.cm. from the finger.

Fallacies.—There are a few fallacies to keep in mind as regards laboratory reports. If the food is of a meat type and is not submitted fresh the bacteriologist will find many bacteria and invariably *B. proteus*, because this organism is always present, in the writer's experience, in meat allowed to begin to decompose. The pathologist returns this in his report as present, but as such it means nothing. The presence of other strains such as *B. coli*, streptococci, &c., also cannot have significance under such conditions.

Conclusion.

In many mild outbreaks, from one cause or another, the bacteriologist's findings will be negative and the cause of the outbreak will remain obscure. These negative findings will decrease when fresher and better material is submitted and when our present knowledge as to causation is extended.

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Special Articles.

RECENT WORK ON THE HORMONES OF THE OVARY.

OVULATION IN HUMAN BEINGS.

IT is not too much to say that nearly all the work on ovarian hormones during recent years is founded on the discovery of the cyclical changes in the vaginal epithelium which accompany the sexual cycle in small mammals. Stockard and Papanicolaou[1] first noted them in the guinea-pig in 1917, and the observation was later found to apply to the rat and mouse.

The implication of this purely biological investigation was grasped by Allen and Doisy,[2] who saw in this discovery the long-sought means of determining the activity of ovarian and placental extracts. Rats and mice were used for the experiments; their ovaries were removed, and smears from the vagina were examined microscopically. After oöphorectomy the sexual cycle is of course absent, and the rats remain in a permanently diœstral condition,* which corresponds with a characteristic histological appearance in the smears made from the vaginal epithelium. If an active preparation made from the ovaries or placenta is now injected into these animals, a cyclical change in the type of smear is produced, resembling that which occurs in the normal animal, and about 48–72 hours after the injection the leucocytes, accompanied by a few nucleated epithelial cells originally present in the diœstral state, have almost entirely disappeared and have given place to a cornified type of cell in which the nuclei are barely visible. These cells disappear as the time after the injection increases until finally the leucocytes and nucleated cells denoting the diœstral state are again preponderant.

Armed with this method of assay Allen and Doisy were able to consolidate much of the good work which had been done during the previous twenty years, and—what was no less valuable—were able to indicate the doubtful value of many investigations, which, in the absence of a reliable test object, had obscured the outlook and brought discredit on this branch of physiology. The result has been a tremendous development of research upon these lines in all countries. This work is mainly of two kinds: (1) the preparation of ovarian extracts of increasing purity, so that certainly less than 0·01 mg. is now necessary to produce œstrus in the rat—the ultimate object of this type of work is, of course, the isolation and chemical identification of the pure substance; (2) a study of the physiological and pharmacological properties of these extracts. Concurrently with these investigations some few early results of clinical tests have already appeared.

It may not be clear why so long an interval should have elapsed before this obviously very active substance should receive extensive clinical trial. The chief reason has been the nature of the early extracts, which were very crude and consisted of an insoluble oil hardly suitable for the purpose. More recently, however, the substance has been obtained by several workers independently in a water-soluble form of very high activity (Laqueur,[3] Jordan, Thayer, and Doisy[4]; Allen, Dickens, Dodds, and Howitt).[5] It still remains to be seen what will be the value of this material in medicine.

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* The diœstrus is an interval between two periods of sexual desire in animals.

The Ovary and the Pituitary Body.

Meanwhile, research in another direction has been carried on by Zondek and Aschheim[6] in Germany and by Smith and Engle[7] in America. These authors showed independently and almost simultaneously that transplants of the anterior lobe of the pituitary body into immature female rats and mice produced very remarkable changes in the ovaries. Cornified epithelium appeared very soon in the vagina, and uterine hyperæmia, ovarian development, and the formation of large follicles or corpora lutea resulted. These effects are explained as due to the action of the anterior lobe hormone on the ovary, which is itself stimulated to produce its hormone or hormones, as in natural puberty. Ovulation may occur and many more corpora lutea than are normally found in these animals may be caused to appear. The anterior lobe hormone has no effect on animals whose ovaries have been removed.

These striking results, which are clearly of great importance, were followed by the remarkable discovery of Zondek and Aschheim that the anterior lobe hormone is excreted in the urine of women during pregnancy. The fact that the urine of pregnant women, and almost none other, when injected directly into immature mice, produces changes similar to those described above in the ovaries and uterus, has been made the basis of a biological test for pregnancy by Zondek and Aschheim, as has already been described in these columns.[8]

This work of the German and American investigators has clearly shown the relation long suspected to exist between the ovary and pituitary body. But there is probably more than one active principle contained in the anterior lobe of the latter gland, as is shown by the pioneer work of Evans and Long[9] in which they produced giant rats by injection of very concentrated extracts of ox pituitaries. Besides the growth-promoting principle we have also the hormone or hormones responsible for luteinising or ovulation, follicle-ripening, and also the production of local hyperæmia and the consequent formation of corpora hæmorrhagica, such as are obtained in rats by the injection of the urine of pregnant women. These last are so characteristic of the injection of urine—whilst gland transplants produce mainly follicular growth followed by ovulation and the formation of corpora lutea—that Engle[10] has recently questioned whether the derivation of the active principle in the urine of pregnancy from the anterior pituitary is really proved. This will evidently be difficult to settle with certainty, but on the information at present available it seems probable that Zondek's assumption is justified.

Fluhmann[11] has lately reported that bilateral oöphorectomy led to the appearance of anterior lobe hormone in the blood of 12 out of 10 women studied. The time which elapsed between operation and the test varied from 8 days to 13 years in the different cases. In several cases of sterilisation by irradiation, and in some cases of functional amenorrhœa, the reaction was also found to be positive. The same method as that employed by Zondek and Aschheim was used, except that the patient's blood-serum and not urine was injected. This work suggests that possibly further valuable modifications of this test of Zondek and Aschheim may be forthcoming, and that these may find useful diagnostic applications. Much more study of these important matters is necessary, and the increasing literature on the subject shows that it is already in progress.

The Time of Ovulation in the Menstrual Cycle.

Of a somewhat different nature, but equally remarkable, is the recent work of Knaus[12] from Prof. E. Knauer's clinic at Graz. In this case also the starting-point is from some purely biological researches, this time due to Hammond working with the rabbit.[13] As is well known, in the rabbit coitus is regularly followed by ovulation at a known interval of time. It is thus possible to bring about ovulation at any time in this animal, and it has been found that the presence of the corpus luteum is accompanied by the development of a considerable insensitiveness of the rabbit's uterus to the action of pituitrin. This change is recorded in vivo by filling the uterus with fluid and recording the uteric pressure as a kymographic tracing. The injection of pituitrin into an animal which has not ovulated produces an immediate contraction which is not obtained in the same animal after ovulation.

Knaus has used this new biological reaction in an attempt to solve the vexed question of the exact time of ovulation in the human female, and the result of his test is remarkable. He claims that it is possible to say with certainty that a normal woman with a regular four-weekly cycle cannot conceive during the first ten days or after the 18th day of the menstrual cycle—that there is, in fact, a physiological sterility during this period. This conclusion is contrary to what has been fairly generally accepted for many years, but such observations at least show the immense practical importance of studying the internal secretions of the ovary.

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VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Pathological Research in Vienna.

Prof. Jarisch, who at present is the chief of the Pharmaco-Experimental Institute of the University of Innsbruck (Tyrol), is shortly to be appointed as successor of the late Prof. Paltauf, who was director of the Vienna Institute for General and Experimental Pathology. With the new director a new departure in the work of the institute is anticipated. Prof. Paltauf favoured research into morbid anatomy, whilst Jarisch will turn his attention more to pathological physiology and to biochemistry. Some time ago efforts were made to convert the existing pathological institute into an institute for experimental therapeutics, on the model of Ehrlich's Institute in Frankfort, but the plan had to be abandoned.

A new institute for cancer research is, however, shortly to be opened in Vienna. The necessary funds have been contributed by a generous grant by Mr. Childs, an American philanthropist, who sought and found cure from a serious malady in this city. The cancer institute will be directed by Dr. Edelmann, who has converted for this purpose a private nursing home and equipped it as a centre for experimental therapeutic research. It will be organised in connexion with the Federal Serotherapeutic Institute, and Prof. Jarisch and Dr. Pick, professor of pharmacology, and Dr. Edelmann will coöperate in the systematic study of cancer, and, it is hoped, will attract many foreign students to work out their problems in Vienna.

The Decreasing Birth-rate in Vienna.

The official report just published of the Austrian Board of Health for 1928 shows that the population of the Republic was 6,536,892 persons on Dec. 31st of that year. The number of living births amounted to 115,014; of deaths, 96,321. This means a slight increase of population for the whole Republic, but not for its capital. In Vienna the statistics show a surplus of 6411 deaths over births. In the current year the loss will be still greater since the first six months of 1929 show an excess of deaths over births, amounting to 5631. Vienna had, in 1914, a population of over 2,000,000, and in 1928 only of 1,862,470, and the loss is yearly more marked. The chief reason for the drop of the population figure, which is barely half what it was in 1913, is the decline of the birth-rate, for the death-rate is also constantly decreasing. One factor, the emigration from the capital to the country, plays a part which must not be neglected, but the chief reason seems to be voluntary birth restriction from economical considerations.

Trichinosis in Vienna.

At a recent meeting of the Gesellschaft der Aerzte Dr. Reitter demonstrated several cases of trichinosis which have lately been observed in this city. Eighteen cases of trichinosis in this country were reported in 1925 and 1926, and since then, according to Dr. Reitter, cases have been more frequent than is generally supposed. He recently discovered two more cases. One patient was a woman of 50, who was sent to hospital diagnosed as nephritis, because of swelling of the eyelids and face, combined with slight albuminuria. She ran a temperature of 102° F. and had intense pains in the legs, but no other symptoms. The diazo reaction was strongly positive, and eosinophilia was present. The fever disappeared after a week. An excision from the gastrocnemius muscle verified the diagnosis of trichinosis. The second patient was a woman aged 25, who came to the hospital on account of supposed sinusitis frontalis. This patient also had high fever (101·6°), a swelling of the eyelids, pains in the limbs, and a positive diazo reaction. The nose was found to be normal. After a blood count showing 17,500 leucocytes and 44 per cent. of eosinophiles, the correct diagnosis was easily reached, and verified by an excision from the gastrocnemius, where an enormous quantity of trichinellæ was visible. This patient was cured in 18 days. Dr. Reitter puts stress on the presence of eosinophilia, which is a cardinal sign. But one must look for other symptoms more easily detected by the general practitioner: pyrexia, with high temperature, œdema of the face, or at least of the eyelids, pains in the muscles, positive diazo reaction, and negative findings of other organs. Diagnosis is then easily verified by a blood count and microscopic examination of a piece of muscle. The only reliable prophylaxis against trichinosis is sufficient boiling of pork. In the discussion following Dr. Reitter's demonstration Dr. Weinberger emphasised the necessity of compulsory notification of trichinosis by veterinary inspectors, so that the sale of infected meat is made impossible. The centralisation of slaughtering in district slaughter-houses with inspection of the meat by qualified persons is necessary, besides the control of all foreign imported meat, as is done in some parts of Germany. Dr. Decastello pointed out that small outbreaks are certainly frequent, but pass unrecognised as "nephritis" or "rheumatism." He had observed that a swelling of the spleen is generally not noticeable, but the patellar reflexes are often absent (owing to injury to the muscles). The therapeutic measures consist in injections of salvarsan, trypaflavine, urotropine, but are not reliable. Some cases prove fatal from myocarditis or thrombo-arteritis.

Diffusion Anæsthesia of the Peritoneal Cavity.

Dr. Mandel, of the clinic of Prof. Hochenegg, has used lately a new method to anæsthetise the abdominal region, which he calls diffusion anæsthesia. Under local anæsthesia he opens the abdominal wall, inserts a drain, and pours into the peritoneal cavity 250–350 cubic centimetres of a ¼ per cent. to ½ per cent. solution of percain. This substance is a derivative of quinoline, and has nothing to do with cocaine. Its anæsthetic property is very high; it is active in a solution of 1:120,000 upon the cornea of the rabbit. Its action is superficial, but it has a high degree of penetration. Dr. Mandel has operated on 30 cases in this manner. A group of six cases consisted of exploratory laparotomy with absolute anæsthesia, the operations lasting up to one hour; a second group consists of five gastro-enterostomies with complete anæsthesia. No pain was felt even when the organs had to be handled and pulled. A third group comprises 15 gastrectomies. In three cases the method was a failure, perhaps owing to the fact that the solution used was old, not freshly made; the others were quite satisfactory. A fourth group is formed by four appendicectomies, and also showed very good results. Dr. Mandel uses pantopon before operation and adds adrenalin to the percain. No complication was noted, but further observations are necessary to decide the indication for this method.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Tuffier and the Chair of Surgery.

YOUR account of Théodore Tuffier (p. 993) does no more than justice to one who, as you say, upheld a great surgical tradition. Surprise has been expressed that he was never granted the full professoriate by the Paris Faculté, although he became agrégé in 1880, when he was but 32 years old. This appears the more remarkable, as in France at least great importance is attached to the status of professor, which is the key to most forms of hospital practice, as well as to the recruiting of assistants and pupils. The omission was due to personal and not professional considerations. Tuffier, however, had no need of official status; for many years his surgical service attracted every foreign surgeon passing through Paris, and his pupils are scattered all over the earth. He was a marvellous teacher, able to set out the hardest subject in clear language which impressed itself on the memory. As a surgeon he was rapid and skilful, often changing his methods, for he had no use for routine; each case was dealt with according to the findings of the moment. He was always ahead of his colleagues in trying every new operation, and stamping it with his own personality. You have spoken of his pioneer work in rachianæsthesia, but he was for some time the only surgeon in Paris to practice blood-transfusion by direct anastomosis of the radial artery of the donor to the saphenous vein of the recipient. It was, in fact, with some tremor that his assistants watched this operation, for once the anastomosis was performed, no one knew how much blood was passing, and whilst the recovery of the recipient might be dramatic, the operation had to be hurriedly stopped owing to the fainting of the donor. This was the way in which one of the most beneficent of therapeutic measures arose, and Tuffier's work was the prelude to the quick and simple process of present-day transfusion. In the social life of Paris, Tuffier took a high place. His judgment was always sound, and if adverse was couched in such a way as to appear almost indulgent. He was, besides, a great traveller.

Death of Prof. Lecène.

A second blow to surgery is the loss of Paul Lecène, who has died at the age of 51, as the result of typhoid fever contracted by operating on a case of cholecystitis. He passed rapidly through the earlier stages of a surgical career, and was made professor of clinical surgery in 1921. He was a man of wide culture, reading Greek as if it was his native language, and being one of the first authorities on morbid histology. He kept himself fit by outdoor sport, and was a practised boxer. His vast knowledge and robust character made him a formidable adversary at scientific meetings, but those who suffered at his hands had to admit his fairness and honesty of purpose. Several of his books on surgical morbid anatomy will rank as classics.

Euthanasia and Morphia.

A recent acquittal on a murder charge has revived interest in what is known as euthanasia, although it may be stretching a point to apply the term to the process of exterminating a suffering patient with several bullets from a revolver held in a hand rendered clumsy by emotion. The medical man has only to recall the tremor with which he applied the knife for the first time to the live skin of one of his fellows. Nevertheless, most doctors in this country would have voted as the jury did in the case of Richard Corbett, indicted for accelerating the death of his mother, who was suffering from a generalised cancer. A similar verdict has been given three times in the last five years. Euthanasia has been widely discussed here, and whatever may be its philosophy, it is a fact that the whole medical corps is opposed to its introduction into the law. One point made in court during the Corbett trial does not seem to have received the emphasis it deserves. Mrs. Corbett, although her suffering had been such as to bring a spectator of it to the verge of desperation, had been given no morphia. I do not know the reason for this in her case, but I do know intimately of a case in which a patient to whom the help of morphia was refused was killed by his wife, who was horrified at his suffering. It must be kept in mind that since the law on pharmacy, instituting what is called "*Tableau B*," came into force in 1916, chemists and physicians alike live in terror of morphia. Honourable practitioners have been brought before the magistrate for giving to agonised patients with cancer doses of morphia considered too high by an inspector of pharmacies. Some chemists actually prefer not to stock morphia at all, in order to avoid the annoyance of inspection. The law of 1916, which was framed with the laudable object of saving from the asylum a handful of wretched addicts, has set the terror of prosecution amongst physicians, and has condemned to helpless suffering thousands of patients who might have been relieved of it.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Civic Guard and the Protection of Children.

SPEAKING last week at the annual meeting of the Society for the Prevention of Cruelty to Children, General Eoin O'Duffy, Chief Commissioner of the Civic Guard of the Irish Free State, gave interesting information about the work done by the Civic Guard in carrying out the Acts for the protection of children. He drew attention to the frequency of infanticide in recent years, the number of cases reported in the five years 1924–28 being 80, with 50 prosecutions. He was not satisfied that the punishment of those guilty of infanticide was sufficient. It was sometimes difficult to get juries to appreciate the seriousness of the crime. The murder of infants was not placed on the same level as the murder of adults. During the same five years there had been 806 prosecutions under the Children's Act, and in the year 1928 there had been 11,042 prosecutions under the School Attendance Act. In many counties there had been no attempt to carry out the inspection of boarded-out children.

The Medical Society of University College, Dublin.

At the opening meeting for the session of the Medical Society of University College, Dublin, the president, Dr. D. J. Cannon, read an interesting address on the Relationships of Gynæcology to Endocrinology and to Other Branches of Medicine. He gave a clear account of recent researches on the mechanism of the menstrual function, and showed that there was reason to believe that not only the ovary, but also the thyroid and the pituitary were active in the stimulation or control of menstruation. He also discussed the relations of gynæcology to abdominal surgery and to psycho-analysis. The paper was discussed by Prof. R. J. Rowlette, Senator H. L. Barnaville, Prof. M. R. J. Hayes, Dr. D. G. Madill, and President D. J. Coffey, who occupied the chair.

Presidency of the Royal College of Surgeons in Ireland.

At a meeting of the Royal College of Surgeons in Ireland, held on Nov. 15th, Prof. Andrew Fullerton, of Belfast, was elected President in room of the late Prof. T. E. Gordon, who died last July. Mr. Fullerton is the immediate past-President of the College, having been in the chair from 1926 to 1928. He will now hold office until the annual election of the officers next June.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1928 statistics of two inland and three seaport towns:—

Name of town and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respirat. ry diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Leeds .. .. (476,500)*	16·1	12·9	1·13	1·16	2·1	2·0	79/37	31	4·6
Bradford .. (288,500)	15·3	13·6	1·00	1·52	2·6	1·6	69/31	25	5·4
Portsmouth .. (240,700)	17·2	11·3	0·95	1·31	1·4	2·2	55/23	26	5·4
Cardiff .. .. (227,000)	17·0	11·7	1·21	1·14	1·9	1·8	77/32	30	5·8
Birkenhead .. (159,200)*	18·5	12·3	1·23	1·48	2·2	1·9	80/34	40	5·5

* In both these cases the boundaries were extended on April 1st, 1928, and the Registrar-General gives a population for statistical purposes—viz., 474,800 for Leeds and 157,000 for Birkenhead.

The proportions of notified stillbirths to live births were: Leeds, 5 per cent.; Bradford, 4·5 per cent.; Cardiff, 6·4 per cent.; Birkenhead, 5 per cent.; and Portsmouth, not given.

Leeds.

Dr. Johnstone Jervis reports that by the extension of the boundaries on April 1st the area of the city was increased by 7060¼ acres to 38,100 acres, and the population by about 5000. The hours of sunshine were 1320·5 as compared with 1177 in 1927. A table shows that in 1928 Leeds occupied ninth place, equal with Manchester, for death-rate among the 13 large English towns, the towns with higher rates being Liverpool, Bradford, and Newcastle. Deaths from vehicular traffic accidents averaged about 60 during the past three years, as compared with about 20 in the three pre-war years. The practice of cremation gains ground very slowly in Leeds, the numbers for the last four years being 26, 14, 32, and 31, whilst the deaths in each of these years were over 6000.

Dr. Jervis hopes that the unification of the public medical services, consequent on the Local Government Act, 1929, will include the school medical service. There were 53 cases of small-pox without a death. Scarlet fever was extremely prevalent in the second half of the year. The cases notified, 3515, were more than in any previous year. The type was mild, and the deaths numbered 18. Dr. Jervis mentions that parents are slow to avail themselves of the facilities provided for the immunisation of young children against diphtheria. The need for complete immunisation of the staff of the isolation hospital is shown by the fact that 17 of the staff developed scarlet fever and 6 diphtheria. A marked increase of new cases of syphilis and gonorrhœa at the V.D. clinic is noted, succeeding the fall, which took place in Leeds in 1921–23. Dr. Jervis recommends that a trial be given to a scheme for boarding-out the child contacts of "open" cases of tuberculosis in a healthy environment. The "factory-in-the-field," for giving employment to consumptives in firewood-making, brush-making, and printing, is being continued. At the end of 1928 there were 35 tuberculous and 13 non-tuberculous employees. A striking example is given of the danger of tuberculosis being spread among clerks in an office. A junior typist was notified in March, 1927. In October, 1928, another junior clerk was diagnosed. The infecting case was a senior clerk with advanced disease, who was only referred to the dispensary in March, 1928. Artificial light treatment is found to be "of definite value" in tuberculous adenitis, bone and joint disease, and abdominal tuberculosis. Light treatment is also in use at two infant clinics, and is claimed to give good results in rickets, malnutrition, and general debility, for which ailments it is also found useful at the Infants Hospital, Wyther (50 cots). In February an orthopædic clinic was inaugurated for children under five years. Plans are being prepared for the much-needed new hospital at Elmet Hall, which will deal with orthopædics and surgical tuberculosis.

The chief veterinary officer, Mr. J. A. Dixon, M.R.C.V.S., reports that the cow population of the city was 2130 in the first quarter, and increased by 791 when the extension took place. Under the Tuberculosis Order 23 notifications were received from owners and 3 from veterinary surgeons, whilst 39 suspected animals were discovered by routine inspection of the cattle. This confirms the experience of previous years that the Order can only be effective where there is regular routine veterinary inspection. Of the 40 cows condemned 12 had tubercle of the udder, 15 tuberculous emaciation, and 13 were "otherwise" affected. A considerable number of the cowsheds in the added areas were below the standard in sanitation. The cooling of the milk is a difficulty, as many of the farms are without an adequate supply of water. The only Certified Milk herd in the city is that at the City Council's farm, and Mr. Dixon points out "that it would be rather difficult for farmers who recruit their herds by purchase of young stock, in the open market, as do the majority of the local farmers, to secure a regular supply of non-reacting cows."

The West Riding Smoke Abatement Committee has passed a resolution asking the Ministry to urge all the gas-works in the country to produce smokeless fuel by the low temperature carbonisation of coal. Since the war Leeds corporation have built nearly 6000 houses, but the housing of the man with an income of 35*s.* to 40*s.* "has not been touched." He needs a house with an inclusive rental of 6*s.* to 7*s.*, and a few municipal cottage flats are the only attempts to meet his wants. Each has a separate entrance, and they are very popular, and the demand exceeds the supply. It is intended to build more in future. Dr. Jervis also advocates the acquisition by the corporation of back-to-back houses of an intermediate type, to be let at low rentals to slum tenants, who, by being kept under supervision, "might be induced to keep themselves and their families in a fairly clean and healthy condition."

Bradford.

Dr. J. J. Buchan says there are 179 farms and 985 houses not connected to the corporation sewers. There are only 212 houses with privies, the remainder having water-closets, of which about 9 per cent. are of the "waste water" type.

Mr. W. Halstead, M.R.C.V.S., the veterinary inspector, states that there are about 3378 dairy cows stalled in the city, producing 7500 gallons of milk per day. Another 8000 gallons comes in from outside. The daily consumption of milk is given as 0·4 pints per head. As the result of regular inspection, 17 cows were found with tubercle of the udder and 15 otherwise affected with tubercle. Of 718 samples of milk examined, 39 were found to be tuberculous. In the follow-up of 15 outside tuberculous milks, 9 cows were found at nine farms with tubercle of the udder and slaughtered, whilst on six farms the source of the infection could not be traced. A milk purveyor, who failed to provide suitable storage accommodation for his milk and vessels, was convicted of selling separated milk, containing 29·7 per cent. of added water, and of neglecting to label his milk vessels with his name and address, and the words "separated milk," and was removed from the register by magistrate's order.

The Schick test is not employed in Bradford. There were 136 cases of small-pox with 4 deaths, all of old persons debilitated from other causes. It is claimed that the local powers for the compulsory notification of venereal diseases, obtained in 1925, have had a wholesome effect in causing cases to continue until recovered under treatment, either at the municipal centre or by private practitioners. In 1927 an investigation officer was appointed to follow up known cases of cancer, and, with the coöperation of the whole medical profession, it is thought that no case will be lost sight of. The follow-up of the 450 cases which came under treatment during 1928 shows how late cases of cancer come under medical observation. Of 153 cases notified by practitioners, 113 were too advanced for any but palliative treatment. Of 220 operations in hospital, a radical operation was not possible in 124, and in another 118 cases admitted to hospital no operation at all was possible. A table shows that during the last 20 years there has been a slow but quite marked decline in the neonatal death-rate, but that the mortality in the first week of life does not show quite the same improvement. Midwives attended 3157, or 74·4 per cent., of the registered births. Of these the municipal midwives attended 882. The total births were 4421. In the maternity wards of the municipal hospital there were 654 live births and 69 stillbirths, and 11 maternal deaths. The new patients, who attended the antenatal clinic of the hospital, numbered 700. The local authority conducts 11 maternity and child welfare centres, and the main effort of volunteers is to provide skilled instruction in dressmaking, sewing, knitting, cookery, and mothercraft by experienced teachers at four centres. A holiday home and convalescent fund are other features of the voluntary work.

The municipality erected 1260 houses, and at the close of the year 84 were in course of erection and 362 contracted for. There were also 247 private enterprise subsidy houses in course of erection at the end of the year. Nevertheless, many very serious cases of overcrowding come to light, and there is still a great scarcity of houses. On Dec. 31st, 1928, the applicants for new houses numbered 2126, of whom 483 were living in lodgings. The White Abbey improvement scheme is making progress; 95 per cent. of the properties have been acquired and 36 per cent. demolished. In November artificial light treatment was inaugurated at the new central school clinic, and, in order that an accurate opinion may be formed as to its value, exact details of the treatment, dosage, &c., with results, are to be kept, and will be given in future reports.

Portsmouth.

Dr. A. Mearns Fraser reports that diphtheria was unusually prevalent, especially in the last quarter. The notifications were 866 and the deaths 53, a case-fatality of 6·12 per cent. A table shows that there were few fatalities from diphtheria in Portsmouth from 1861 to 1880; in 1881 and 1882 there were 205 and 106 deaths respectively; 1899 and 1900 were again peak years with 120 and 104 deaths respectively; another peak occurred during 1911 to 1915, since which the annual deaths have averaged about 40, and varied from 18 to 66.

The municipal maternity home (14 beds), which is about to be replaced by a combined maternity hospital and child welfare centre in Fratton, admitted 255 patients for their confinements, and the weekly antenatal clinic conducted at the home was attended by 780 new cases, the total births being 4445. The insurance scheme by which expectant mothers pay a premium of 5s. for provision of medical assistance if required has been in operation for two years. In the two years before the scheme the claims for medical services amounted to £1550; in the two years of the scheme's operation the claims have amounted to £2250. Dr. Fraser states that during the two years of the scheme doctors were called upon to conduct the whole confinement in 13 per cent. of the insured cases, but only in 3·3 per cent. of the uninsured. There is an increase in the maternal mortality from childbirth, accounted for by 14 deaths from puerperal sepsis.

A satisfactory feature of 1928 was the large number of new houses erected, but the housing requirements of the population have not yet been adequately met. The municipality erected 220 houses and flats. There were also 429 subsidy houses erected by private enterprise, and £32,400 was advanced under the Small Dwellings Acquisition Act, 1899, for the financing of 73 houses. A start is to be made in getting rid of some of the worst slums in the city during 1929. During the year the selection of tenants for municipal houses was placed under the health department. This entailed the classification and placing in order of urgency of over 1500 applications. Preference is to be given to large families living under unhealthy and overcrowded conditions, but unfortunately a large number of these applicants have had to be refused because they were unable to afford the rent.

Portsmouth came off well with 1923 hours of sunshine, and in this connexion the low death-rate from respiratory diseases with influenza is noteworthy.

Cardiff.

Dr. Ralph M. F. Picken's report contains many special features of interest. Records have been kept of hospital cases of cancer of the breast and uterus since Jan. 1st, 1926, and of the rectum since Jan. 1st, 1928. Of 30 cases of cancer of the breast treated in 1926, 16 were alive at the end of 1928. Of 29 cases of cancer of the uterus treated in 1926, 5 were alive at the end of 1928. In 34 of the 55 cases of cancer of the female genital organs treated by operation during 1924 to 1928, the period between discovery and operation was six months or less, and the average period between the first operation and death was 10·5 months. Dr. Picken comments that although cancer involving the uterus is eminently suitable for operative or radiological treatment in its early stage, only one-third of 167 of such cases received this treatment.

The circumstances of three outbreaks of milk-borne diphtheria, involving 31 cases with no deaths, are described by Dr. C. J. McSweeney. The first outbreak of 13 cases was associated with an unrecognised attack in the farmer's daughter, who slept in the same room with her sister, who was a carrier. The second outbreak was associated with the farmer's daughter, who was a carrier, and in this case virulent diphtheria bacilli were isolated from lesions on the udders of cows, which were diagnosed by a veterinary surgeon as cow-pox. In the third outbreak of 11 cases a carrier was found among the milk roundsmen. In view of the reports from abroad, sera submitted for the Widal reaction since October, 1928, have been tested for agglutination with *Brucella melitensis*. In November one such serum gave a positive result, and the patient in question, after consultations, was decided to be suffering from undulant fever of the *Brucella abortus* type. Since this occurrence milk samples sent to the public health laboratory for other purposes have been examined for *Brucella abortus*, and three positive samples obtained from different animals on a farm in a neighbouring county. Dr. Picken makes the deduction that milk-borne undulant fever may be more prevalent in this country than has generally been supposed. Since June, 1925, pregnant women attending the antenatal clinics have been submitted to the Wassermann test. The results up to the end of 1928 show that of 1967 such tests, 61, or 3·1 per cent., were positive. All those who give a positive result are treated at the auxiliary V.D. centre for women and children.

Cardiff has no large insanitary areas, and slum clearance is not as big a problem as in many towns. A recent investigation has revealed approximately 100 "unfit" houses. Section 8 of the Housing Act, 1925, has proved invaluable in securing the removal of dilapidations, and, when owners have proved difficult, ground landlords have readily brought pressure to bear. Water-closets without flushing cisterns have become a serious problem, to deal with which new powers may be necessary. There are approximately 14,000 such in the city.

The school report shows that of 29 children attending the oral school for the deaf, 14 were born deaf; that zinc ionisation for obstinate ear discharges continues to give good results; and that the Greenhill open-air school (accommodation about 100) and the special classes for stammerers, both recently started, are giving very encouraging results.

Birkenhead.

Dr. D. Morley Mathieson shows the need for the revision of the graded milk scheme. To the man in the street "Grade A must be the best milk, whereas it is really third in the scale." Another matter requiring attention is the compulsory keeping of registers by dealers. During the year one Birkenhead purveyor, licensed to bottle Grade A (T.T.) milk, sold other milk under this guise, and had his licence revoked. Dr. Mathieson points out that the risk of such frauds would be considerably minimised if every retailer were required to keep a register of all graded milk bought and sold. Such a register is required at present for wholesale transactions. During the year 84 samples of milk were examined for tubercle, and nine gave a positive result. This is equivalent to 10·7 per cent. to be compared with 21·0 per cent. for the 1927 samples.

An amended scheme for the welfare of the blind has been prepared by the health committee and approved by the Ministry. Under the scheme the health committee becomes the responsible authority, comprehending within its sphere of activities all aspects of the work, economic, medical, social, financial, and educational (without prejudice to the powers and duties of the Education Committee). The special Blind Persons Act subcommittee, in addition to five members of the health committee, includes representatives of the Education Committee of the Board of Guardians and of the voluntary institutions for the blind in Birkenhead and Liverpool. Full particulars of the new scheme are included in the report. The blind persons coming within the scope of the Act on March 31st, 1929, numbered 219, 118 males and 101 females. None was under the age of 5, 8 were aged from 5 to 16, and 2 from 16 to 21. So far as could be ascertained the age of onset of blindness was below 20 in 62 of the 219 cases—viz., 0–1 year in 29, 1 to 5 years in 9, 5 to 10 years in 7, and 10 to 20 years in 17.

The total births numbered 2923, and the antenatal clinic was attended by 493 expectant mothers. Dr. Mary A. S. Deacon reports that in all 612 new cases attended the clinic. Of 168 who were in their first pregnancy, 4 suffered from venereal disease; of 325 in a later pregnancy, 12 had venereal disease; and of 119 who were not pregnant, 17 had venereal disease. Dr. Deacon is also in charge of the special V.D. clinic for women and children. For the purpose of health education Birkenhead joins in the scheme conducted jointly by the Merseyside boroughs, and Dr. Mathieson states that this campaign has been welcomed by the public.

INFECTIOUS DISEASES IN ENGLAND AND WALES DURING THE WEEK ENDING NOV. 9TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 172 (last week, 168); scarlet fever, 3389; diphtheria, 1743; enteric fever, 66; pneumonia, 1121; puerperal fever, 36; puerperal pyrexia, 94; cerebro-spinal fever, 9; acute poliomyelitis, 29; acute polio-encephalitis, 2; encephalitis lethargica, 16; dysentery, 6; ophthalmia neonatorum, 77. No cases of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 12th-13th was as follows:—Small-pox, 195 under treatment, 9 under observation (last week 173 and 8 respectively), scarlet fever, 2795; diphtheria, 2656; enteric fever, 98; measles, 304; whooping-cough, 113; puerperal fever, 34 (plus 19 babies); encephalitis lethargica, 123; poliomyelitis, 7; "other diseases," 22. At St. Margaret's Hospital there were 9 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (3) from enteric fever, 22 (5) from measles, 9 (4) from scarlet fever, 16 (3) from whooping-cough, 32 (6) from diphtheria, 78 (20) from diarrhœa and enteritis under two years, and 62 (7) from influenza. The figures in parentheses are those for London itself.

No deaths from enteric fever were reported outside London. No large town reported as many as 10 deaths from diarrhœa, the highest figures being Birmingham 9, and Manchester 8. Manchester and Oldham each returned 3 deaths from measles, Liverpool 4 deaths from whooping-cough, Birmingham 10 deaths from influenza.

The number of stillbirths notified during the week was 260 (corresponding to a rate of 38 per thousand births) including 47 in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. P. M. Rivaz is placed on the Retd. List with rank of Surg.-Capt.

The following appointments are notified: Surg.-Comdrs. S. R. Johnston to *Victory*, for P. and R.T. School; and K. A. I. Mackenzie to *President*, for three months' post-graduate course. Surg. Lts. S. Jenkinson to *Royal Oak*; N. J. U. Mather to *Repulse*; H. L. Belcher to *Daffodil*; and F. G. V. Scovell to *Dragon*.

ROYAL ARMY MEDICAL CORPS.

Capt. G. K. Maurice to be Maj., and remains secd.

Lt. G. M. Cooper relinquishes his temp. commn.

The undermentioned to be Lts. (on prob.):—Lt. A. N. T. Meneces, from Supp. Res. of Off., R.A.M.C.; Lt. E. J. Curran, who relinquishes his temp. commn.; F. R. Gedye; and J. E. Snow, who is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

ARMY RESERVE OF OFFICERS.

G. F. Walker to be Lt.

TERRITORIAL FORCE.

The undermentioned Majs. to be Lt.-Cols.: W. H. Fisher, C. V. Bulstrode, H. M. Fort, W. F. Mackenzie, D. S. Sutherland, (Bt. Lt.-Col.) H. F. Wilkin, L. B. Cane, J. B. Stanley, D. W. Boswell, C. Corfield, J. Taylor, W. C. Gunn, G. H. Stevenson, S. F. Linton, W. F. Denning, N. M. Fergusson, J. E. N. Ryan, A. La T. Darley, A. J. Gibson, R. C. Clarke, A. C. Court, A. F. Lee, G. H. H. Waylen, and J. F. Edmiston.

Capt. A. H. Crook resigns his commn. and retains his rank.

Capt. D. C. Maclachlan to be Maj.

Lts. W. T. B. Joss and M. L. Sutcliffe to be Capts.

D. A. McM. Crawford (late Offr. Cadet, Edinburgh Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

Flying Officer H. D. Humphreys (Temp. Lt., General List, Army) is promoted to the rank of Flight Lt. (Dental) on promotion of the rank of temp. Capt. in the Army.

RESERVE OF AIR FORCE OFFICERS.

The undermentioned relinquish their commissions on completion of service: Flight Lt. J. G. F. Heal and Flying Officer H. W. D. Mackenzie.

INDIAN MEDICAL SERVICE.

Temp. Lts. Abdul Majid Khan and Patit Paban Chowdry to be Temp. Capts.

The undermentioned retire: Col. J. N. Walker and Lt.-Col. J. W. Watson.

The undermentioned resign their temp. commns.: T./Capts. Ratan Kumar Misra (and retains his rank), Tabla Ram Birmani, Pritam Varialsing Karamchandani, and T./Lt. Henry Brij. Nath Swift.

NAVAL MEDICAL OFFICERS IN CIVIL HOSPITALS.

Time spent in civil hospital appointments before entry into the Service has hitherto only been allowed to count for the purposes laid down in the Regulations for the entry of Medical and Dental Officers, R.N., if it was of not less than one year's duration for medical officers, or six months for dental officers. It has now been decided to remove this limitation, and consideration will accordingly be given to the grant of additional seniority, &c., to officers who served in such appointments for shorter periods than those hitherto laid down as the minimum. It has also been decided that officers who are permitted to continue to hold civil hospital appointments after entry into the Service may, at Admiralty discretion, be allowed to count for similar purposes the time spent in those appointments, both before and after entry into the Service, subject to the proviso that the total period allowed to count will not exceed one year in all for medical officers or six months for dental officers. The revised regulations will apply to all officers entered for permanent service or transferred to the permanent list on or after July 1st, 1926.

DONATIONS AND BEQUESTS.—Mr. Roger Lewis, of Malberry House, Little Mill, Monmouth, left £500 each to the Pontypool General Hospital and the Royal Gwent Hospital, Newport.—Besides other bequests, Mr. Samuel Crabtree Helm, of Ilkley, left £2000 each to the Bradford Royal Infirmary, the British Empire Cancer Campaign, Dr. Barnardo's Homes, Liverpool University, Manchester University, and the Society for the Prevention of Cruelty to Children; £1000 each to the Alton Cripples' Hospital and College, the Halifax Infirmary, the Ilkley Coronation Cottage Hospital, Liverpool Hospital, the Royal Eye and Ear Hospital, Bradford, the Royal Institution for the Blind, Bradford; the Society for the Prevention of Cruelty to Animals, Saltaire Hospital, the Seamen's Hospital, Greenwich; the Yorkshire Home for Incurables, Harrogate; and the National Association for the Prevention of Tuberculosis.—Miss Charlotte Inston, of Oakhurst, Oxford-road, Moseley, Birmingham, left her residence and furniture to the Birmingham and Midland Free Hospital for Sick Children, £625 to the General Hospital, Birmingham, £500 to the Walsall Cottage Hospital, and £100 to the Birmingham and Midland Hospital for Women.—The Hon. Mrs. (Diana) Newton, of Portchester-road, Bournemouth, left £3000 to the Church Missionary Society for the English Hospital at Jaffa; the balance of a promised sum of £500 to the Derbyshire Royal Infirmary; £200 each to the Queen Victoria Memorial Home of Rest, Derby, and the Victoria and West Hants Hospital, Bournemouth; and £100 each to the Derby and Derbyshire Home for Females, and the Derbyshire Hospital for Sick Children.—Mr. Albert Charles Jones, of Bouncill Towers, Kenilworth, left £1250 to the General Hospital, Birmingham; £1250 to Queen's Hospital, Birmingham; and £500 to St. Dunstan's Hostel for the Blind.

Correspondence.

"Audi alteram partem."

THE CRAFT OF SURGERY.

To the Editor of THE LANCET.

SIR,—Prof. Tonks in his letter speaks of the craft of surgery and no one is better able to view surgery in this light. Being a distinguished artist himself, and having had a medical training, he knows that operative surgery is an art that requires a good deal of craftsmanship in the handling of tools.

The complete success of a surgical operation depends largely upon the experience, judgment, and dexterity of the operator and the facility with which it is carried out is a test of the operator's skill. Some training in this manual aptitude is aimed at in the operative surgery classes of the medical schools, where the student is first taught the principles of the art as illustrated in the classical operations. The pupil, however, can only attain to a limited degree of efficiency, for the cadaver imposes none of the restrictions and complications of the living. What is so often neglected, however, is instruction in the correct use of the common tools of surgery such as the chisel, the gauge, and the osteotome. It is surprising how many who, having passed through the schools, hardly know how to use the chisel. It is true that considerable practice is necessary to enable one to put these tools to their finer uses as anyone knows who has had experience in working on human bone with its varying density of texture in different individuals. But some attempt might be made to teach students the intelligent use of these instruments. The easy handling of tools is a distinguishing feature of the best craftsmen. That fine surgeon Arthur Barker, used to commend to the initiate the sewing of old kid gloves as an excellent practice for bowel stitching. And there is a world-famed surgeon abroad, almost unrivalled in the technique of a certain difficult type of bone surgery, whose skill is attributed to the fact that earlier in his career he was a considerable craftsman in wood. He is, of course, an extreme example of what can be attained by much practice with the implements of a craft. I am, Sir, yours faithfully,

A. ROCYN JONES.

Harley-street, W., Nov. 18th, 1929.

THE ACUTE VULVITIS OF LITTLE GIRLS: IS IT GONORRHŒAL?

To the Editor of THE LANCET.

SIR,—The contribution by Dr. E. Wordley in your issue of Nov. 16th (p. 1035) raises once more the question of the gonococcal nature of the acute vulvitis of infants and little girls. Is the diplococcus found in the discharge veritably a gonococcus? The astonishing rarity of ophthalmia as a complication is difficult to explain if virulent gonococci are present in the profuse discharge. That the discharge is infective and passes from one child to another is doubtless true, yet in my experience the frequency with which cases are detected varies directly with the energy with which the necessary examinations are made. For example, so long as the scare in the ward persists so long does the epidemic continue. It dies down only by the exhaustion of all concerned.

Many little girls are attending venereal departments of hospitals and undergoing prolonged local treatment. Some of them are gravely upset by the worry and anxiety of the whole business. Some lose weight, colour, and appetite, sleep badly, or have attacks of vomiting, entirely due to the nervous upset. Yet I have the feeling that like the leucorrhœal discharges of adult women, the persistence of the discharge is most intimately dependent upon the general health. With improvement in the general health, a discharge which may have been present for months will suddenly cease.

It would ease the situation, at present so distressing both for mothers and children, if the condition could be stated to be not venereal and not gonococcal. At present the position seems to me to be doubtful.

I am, Sir, yours faithfully,

H. CHARLES CAMERON.

Devonshire-place, W., Nov. 18th, 1929.

⁂ S. C. L. writes that Dr. Wordley's case has some points in common with one in his experience, in which a woman, aged 21, contracted a moderately severe urethritis and cystitis three weeks after her marriage. The infection was proved to be due to the coliform bacillus, and in our correspondent's view was an auto-infection dependent upon two factors: (1) the trauma of the initial coitus, and (2) an error of hygiene, the anus after defæcation being cleansed from the rectum towards the vagina, thus facilitating the infection of a part already made susceptible.—ED. L.

THE MEDICAL SICKNESS, ANNUITY, AND LIFE ASSURANCE SOCIETY, LIMITED.

To the Editor of THE LANCET.

SIR,—One must assume that Dr. E. F. Thomas's "reply" in your issue of Nov. 9th to Mr. Bowdler Henry's letter was not deliberately intended to mislead, but he obscures the issue, and the statements he makes are untrue. Not one of my resolutions "directly attacked" any of the recommendations of the board. Neither can Mr. Steadman's nomination for election by any stretch of the imagination be construed as an "attack" on the board's recommendation that the retiring directors should be re-elected since he was nominated three weeks before the board made any recommendations at all.

No, the board cannot make Mr. Steadman's candidature the excuse for sending out proxies. After the notices calling the annual general meeting had been issued, the board sent out a request for proxies in order to defeat my resolution fixing an age-limit for directors, and thus to keep themselves in office. This is the ethical question referred to by Mr. Henry, and I submit that this action of the board is discreditable.

I am, Sir, yours faithfully,

HARVEY HILLIARD.

Clarendon-place, W., Nov. 13th, 1929.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Thomas I should like to say that my remarks were merely the expression of a spectator desiring to see fair play. As such, and in the absence of bitterness or hostile intent, they do not constitute an "attack." I am not concerned per se with the board's reception of Dr. Harvey Hilliard's resolutions; but I am concerned to see that any of us, all equal members in this Society, contesting a vacancy upon the board, shall be ensured an impartial attitude on the part of those fellow members, who, by election, constitute the board for the time being.

Last year, when Mr. R. J. McNeill Love contested a vacancy, the retiring member was compelled by decision of the board—and, as I think, rightly so—to send out his own proxies at his own expense. This year, under the shelter of a general proxy, issued sometime after intimation had been given that there would be a contestant, the board—wrongly as I maintain—took the interests of the retiring members under its (official) protection, making their battle its battle. Thus, using the Society's funds, they converted what should surely be a private contest into one of board *versus* contesting member. By so doing, whatever their intention to the contrary, they placed themselves in the discreditable position of appearing banded together to keep a newcomer out.

I am, Sir, yours faithfully,

BOWDLER HENRY.

Harley-street, W., Nov. 13th, 1929.

To the Editor of THE LANCET.

SIR,—By the courtesy of the Editor I have seen forward copies of the letters of Dr. Harvey Hilliard and Mr. Bowdler Henry with an intimation that if I so desired I might send a reply.

I have nothing to add to the plain statements I made in my previous letter, and I cannot see that anything I have said is affected by the assertions of Dr. Harvey Hilliard or the criticisms of Mr. Bowdler Henry, as continuity of directorate is an essential factor in the successful conduct of a business, and the success of the Medical Sickness Society is self-evident.

I am, Sir, yours faithfully,

E. F. THOMAS.

Oakley-street, S.W., Nov. 19th, 1929.

ROYAL MEDICAL BENEVOLENT FUND CHRISTMAS GIFTS.

To the Editor of THE LANCET.

SIR,—It has been the practice of the Royal Medical Benevolent Fund for many years to give a Christmas gift to each annuitant and some of the most necessitous of the grantees.

The annuitants, who are over 60 years of age, and the grantees are both deprived of those little amenities of life which the more fortunate of us enjoy. Many of our beneficiaries are alone in the world as their friends and relations have passed over, and consequently they will not receive any gift or extra comfort this Christmas. Last year the Fund gave to each 30s.; this meant an expenditure of £500. Many readers will wish that the recipients of this gift in former years should not be deprived of it this year. But unless I am favoured by a generous response to this appeal, our Funds will not allow of this gracious and friendly act.

Will every reader of this letter please consider if he or she cannot send to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, London, W.1, a Christmas donation. I shall be grateful whether the donation be large or small.

I am, Sir, yours faithfully.

THOMAS BARLOW,
President.

Nov. 18th, 1929.

THE SIGNIFICANCE OF VISCEROPTOSIS.

To the Editor of THE LANCET.

SIR,—Your leading article of last week tempts me to suggest a possible explanation of the greater incidence of abdominal invalidism in women. I offer it for what it is worth, since it has formulated itself rather as an impression than a true hypothesis supported by adequate evidence. It depends on the biological fact implicit in the statement that, whereas man possesses a sex organ, woman *is* a sex organ. In other words, the average woman is so completely adapted to one great biological function that her range of adaptation outside it is much less than that of the average man. In a woman of a constitutional inferior type that range may decline to zero and with it her capacity for sublimation. In such a case excessive repression or inadequate functioning result in a lapse into invalidism, the organism withering, as it were, from lack of the essential stimulus necessary to maintain it in health.

I am, Sir, yours faithfully,

Leeds, Nov. 18th, 1929. HARRY BEDINGFIELD.

INTERPRETATION OF FERTILITY TESTS.

To the Editor of THE LANCET.

SIR,—From Dr. Browdy's letter I gather that I did not make perfectly clear the fact that oligozoöspermia indicated a lowered fertility rather than an absolute sterility. Theoretically a man with one spermatazoon per cubic centimetre of semen is capable of paternity. Still less can a man with a count of 60,000,000 be considered sterile, although from the experience of Comber and Sanders he would appear to be much less likely to have children than one with a count of 100,000,000. I also "would hesitate to give a negative reply," I would merely state that a man with a count of under 60,000,000 showed a fertility below what is considered the normal.—I am, Sir, yours faithfully,

KENNETH WALKER.

Harley-street, W., Nov. 19th, 1929.

LATER BREAKFASTS IN HOSPITALS.

To the Editor of THE LANCET.

SIR,—Adverting to the annotation on p. 937 of your issue of Nov. 2nd, may I point out that the custom of not calling any patient before 7 A.M. has now been adopted in this hospital. For many years past it has been the practice for those occupying private rooms not to be awakened before this hour, and this practice has now been extended to all patients with satisfactory results. By a slight adjustment the hours of duty for the nursing staff have been reduced by this innovation.—I am, Sir, yours faithfully,

H. J. SAY.
Secretary, London Fever Hospital.

Liverpool-road, N., Nov. 13th, 1929.

SOUTHEND GENERAL HOSPITAL.—The Duchess of York last week laid the foundation-stone of the new hospital which is being erected upon a site exceeding 12 acres, given by Lord Iveagh, who has also subscribed £20,000 towards the cost of building and is, in addition, adding one-third to the amount subscribed during the present year. The first section, which will provide 100 beds towards the intended total of 400, will include two ward pavilions, a children's wing, an operating and electrical block, an administrative block, and a nurses' home.

RADIOLOGY AT THE CANCER HOSPITAL.—The House Committee of the Cancer Hospital, Fulham-road, last week approved of an advanced course in radiology which has been drawn up by the Medical Committee. It is stated that the course will deal with all aspects of the subject on a larger scale than has before been attempted in London. The course will begin on Jan. 21st, and will be continued on succeeding Tuesdays and Thursdays until April 10th. It will consist of lectures and practical work, with demonstrations in both laboratories and hospital. A new radiological block is to be built which will add about 70 beds, bringing up the total to nearly 200. There will be pay-beds for middle-class radium patients. These developments will cost £150,000 and the hospital is appealing for that sum.

SCHOLARSHIPS AT EPSOM COLLEGE.—A vacancy has arisen for a Leopold Salomons Entrance Scholarship of £50 a year, open to the son of a member of the medical profession either living or dead.

Those may apply (*a*) who were over 11 years and under 14 years of age on Jan. 1st inst; (*b*) who can show an adequate standard of education for their age; and (*c*) whose financial condition is such as to make it impossible or difficult to obtain an education at the College without the help of the scholarship.

A vacancy has also arisen for a Sir Walter Buchanan scholarship of about £38 a year. It is primarily intended for the sons of deceased or prematurely invalided officers of the Indian Medical Service, but failing any such candidates, it may be granted to the sons of medical men of purely British parentage who are in necessitous circumstances and who have practised medicine for at least five years in India. Forms of application for both scholarships may be had from the Secretary, 49, Bedford-square, London, W.C. 1. Applications must be forwarded before Dec. 4th.

Obituary.

THOMAS OPENSHAW, C.B., C.M.G.,

CONSULTING SURGEON TO THE LONDON HOSPITAL.

WE regret to announce the death of Mr. T. H. Openshaw, the well-known orthopædic surgeon, which occurred on Sunday last, Nov. 17th, in a nursing home, after a brief illness.

Thomas Horrocks Openshaw was born in 1856, a Lancashire man, but educated at the University of Durham and the London Hospital. He took the English Conjoint Diploma in 1884, being already L.S.A., and graduated in medicine at Durham in 1883. In 1886 he obtained the diploma of F.R.C.S. Eng., and the degree of Bachelor of Surgery at Durham, where he proceeded to the M.S. He was for a period demonstrator of anatomy at the London and in 1890 was appointed assistant surgeon. Nine years later he became full surgeon, a position which he held for no less than 27 years, being appointed consulting surgeon in 1926. From the beginning Openshaw was a strong personality at the London Hospital. A successful student, a good football player, and a simple nature which manifested itself in strong friendships and strong dislikes, he was inevitably respected on the one hand for his high qualities and on the other was universally known as "Tommy," proving how much his genial characteristics were appreciated. Openshaw had just become full surgeon to his hospital when the South African War broke out and he was appointed surgeon to the Imperial Yeomanry Field Hospital, later becoming P.M.O. at one of the hospitals in Pretoria. He was mentioned in dispatches and was awarded the C.M.G., and was for a time a prisoner in the hands of the Boers.

MR. OPENSHAW.

[*Photograph by Elliott & Fry.*

Although originally elected to the London Hospital as a general surgeon, Openshaw early in his career devoted himself to orthopædics and indeed founded the orthopædic department of the hospital. His accurate knowledge of anatomy, gained as a demonstrator for many years, stood him in good stead here, and he soon became recognised as an authority on the subject, his private practice in the later phases of his professional life being almost entirely orthopædic in character. It was in this connexion that he made for himself an enviable name after the European War. When this war broke out he was too old to serve abroad, but he was appointed consulting surgeon to the Eastern Command with the rank of Colonel, A.M.S., was elected surgeon to King Edward VII. Hospital, and later was attached to Queen Mary's Hospital, Roehampton, where he became senior surgeon and where his special knowledge was of the utmost value to many wounded soldiers. No one who was ever present at the demonstrations which Openshaw would give of the manner in which many exhibiting grave anatomical defect would respond to his invitation to show what they could do with the aid of surgical appliances, can ever forget the scene. It has been described as resembling a ring-master supervising a circus performance, where the performers themselves seemed to enjoy playing their part.

Openshaw, though so enthusiastic about, and well-versed in his specialty, wrote no treatise on this or any surgical subject, but he acted for a time as joint editor of the Catalogue of the Pathological Museum of the London Hospital. He served for an extended period—namely, 1916 to 1924, on the Council of the Royal College of Surgeons, but took no prominent part in medical politics. His medical interests, however, were numerous, for he was consulting surgeon to the Royal National Orthopædic Hospital, the Poplar Hospital for Accidents, and the Cottage Hospitals of Tilbury, Sidcup, and Woolwich, while he was also surgeon to the Royal Surgical Aid Society. His military inclinations were pronounced, for as a lad he had been a keen Volunteer—he held a commission as Surgeon-Lieutenant in the Volunteer Medical Staff Corps when he went to the South African War—he became a Lieut.-Colonel to the Lincolnshire Yeomanry, and received the Territorial Decoration. For his services in the European War he was created C.B. He was a prominent Freemason and had been Master of the Shipwrights Company.

Openshaw married in 1890 Gertrude, daughter of Mr. William Pratt, of Bruern Abbey, Oxford, who predeceased him by a few months. A daughter survives him, but his other child, Major L. P. Openshaw, was killed in a flying accident in the summer of 1927.

SIR ARCHDALL REID, K.B.E., M.B., C.M. EDIN., F.R.S.E.

WE regret to announce the death of Sir Archdall Reid, the well-known authority on heredity, which occurred on Monday last at Southsea, where he had resided for practically the whole of his professional life.

George Archdall O'Brien Reid was born in India, at Roorky, his father being an officer in the Bengal Native Infantry. He received his medical education at the University of Edinburgh, and graduated M.B., C.M., in 1881. But he did not settle down to medical practice until he had undergone varied experiences as a game-hunter, school-master, and prospector, travelling in this way extensively in the Pacific and America, returning also to India and visiting New Zealand. In 1887 he came to reside in Southsea, where he remained until his death.

Throughout his long years of medical practice in one place Reid devoted himself to the study of heredity, basing his long and important treatises and his many public controversies alike on his intimate acquaintance with pathological conditions in a large town and his varied knowledge of primitive life and tropical pathology, while his knowledge was perpetually reinforced by acute and ruthless study of the great literature of the subject. It is as an authority on heredity that he will be remembered, and seeing how essentially the study of heredity is bound up with the study of the passage of time, it is somewhat remarkable that his strongly held views should to a great extent have been contained in a book which he wrote, over 30 years ago, entitled the "Present Evolution of Man." He was young to grapple in a considered volume with the central ideas implied in the word evolution, but he showed at once that he had gained a clear insight into the main hypotheses and was able to judge between them; he was critical whether he was follower or opponent, and could bring independent thought [illegible] to support independent views. His insistence on the predominant influence of education and example went to support his broad inference, at the time much challenged, that most if not all the mental qualities exhibited by man and characterising more especially different races were due to a transmission of the power or capacity for acquisition which had been gained and was not inborn; and in reference to the part played by evolution in a struggle for existence against zymotic disease, he held that, while in the process of time susceptibility to a disease might lessen as the attacks of pathogenic organisms might increase, he brought forward many-sided evidence to support his view that a growing racial immunity would accompany in a satisfactory manner a dying-off of the weaker members. On the question of alcoholism he declared that "if the world is to become more temperate it must be by the elimination not of drink but of the excessive drinker," thus on his first appearance as an author stating what may be termed the principle which in his future writings and controversies he upheld.

In 1901 he published "Alcoholism: A Study in Heredity," an expansion of these views, and a consideration of the phenomena of national drunkenness by the laws of biology, finding the action of alcohol on the race closely analogous to that of the zymotic diseases. Put briefly, this implied that the nation which had not at any time developed national drunkenness would be liable to massive risks from alcohol, which would not be incurred by nations which had passed through stages of national abuse into temperance. The theory was ably advanced and Reid's powers of argument made him an extremely difficult opponent, but he was attacked vigorously by the advocates of legislation against national intemperance, and the controversy, as it appeared in our columns, makes informing reading which is sometimes quite amusing.

In 1905 Reid published the "Principles of Heredity," undoubtedly impelled to do so by the varied nature of the opposition which his previous work had stirred up. He did not confine himself to the subject of heredity, but essayed the ambitious task of unfolding a complete scheme of biological evolution. The work was distinguished alike by incisiveness of diction, originality of thought, and cogency of argument, and it formed, directly and indirectly, a vigorous plea for the education of the public, especially the young, in the subject of heredity. For Reid held that, with the exception of a few organic instincts, man's mental equipment and much of his physical character are essentially acquired, and his message throughout was that proper education in biology was needed to rear a race of capable citizens. His last work was the outcome of the honest efforts and the sincere thinking of one who during the war had realised the dimensions of the menace of venereal disease. His book, "The Prevention of Venereal Disease," was not, and was not intended to be, an impartial statement. Alike from personal experience, the digestion of many reports and conversations with many authorities, he came to the conclusion that the application of simple antiseptic measures ought to be available, and that their use ought to be insisted upon, holding that instruction should be made public, and that neither the fear of infection nor the fear of the pulpit could be relied upon as deterrents.

Sir Archdall Reid married Florence, daughter of Lieut.-Colonel John Mahony, and she predeceased him. He was created K.B.E. in 1919.

CHAS. HAMILTON WHITEFORD, M.R.C.S. ENG.

Mr. Hamilton Whiteford, whose death on Nov. 13th is reported from Plymouth, was well known as a surgeon in the neighbourhood, and came of an old Plymouth family. He was educated at Plymouth College, at that time known as the High School for Boys, and completed his medical education at St. Bartholomew's Hospital. On qualifying in 1892, he took up house appointments at Coventry, and then returned to his home town as resident at the South Devon and East Cornwall Hospital, where he afterwards became honorary anæsthetist. Though he never had an extensive practice he was a capable surgeon, and spared no pains in the study of his profession. He took a lively interest in keeping abreast of the latest methods and put them into practice with care and thoroughness. A somewhat brusque and outspoken manner was only a veneer over a genuine and kindly nature. Those who knew him well were aware of many acts of sympathy and self-sacrifice. Mr. Whiteford was an active member of the Plymouth Medical Society, where his shrewd and outspoken criticism was keenly appreciated, and enlivened many an otherwise featureless discussion. Until his sight became impaired he was an excellent all-round athlete, and at one time was one of the most competent lawn-tennis players in the West of England. His death will be widely regretted, and especially by those who knew him best.

BRIAN MELLAND, M.D. LOND., M.SC. MANCH.

DR. BRIAN MELLAND.

Dr. Melland, who died at his home at Bowdon on Nov. 14th after a short illness, was representative of the best type of practitioner and was responsible for introducing one of the most effective remedies yet available for asthma. Born in Manchester, he was the son of Dr. Frederick Melland, who came to the city in 1839 and studied and practised medicine for the long period of 73 years till his death in 1911. Brian Melland was educated at the Manchester Grammar School and the Owens College, and became Doctor of Medicine of London University and Master of Science of the Victoria University. He held hospital appointments at the Manchester Royal Infirmary and the Children's Hospital. As a student he showed great promise in research work and if his health had been good might have made his mark in the world of science. His work on the histology of striped muscle-fibre, published in 1884, revealed him as a man with original ideas, and a paper published in our own columns in 1910 on the treatment of spasmodic asthma by the hypodermic injection of adrenalin introduced to us what is still perhaps the most potent drug in that complaint. In his younger days Melland, like other members of his family, was a sound athlete in various games but especially in tennis and lacrosse. In the latter game he played for the North and was picked to represent England. An attack of acute rheumatism prevented him playing and a further attack made it advisable that he should go abroad. He settled, therefore, in Grand Canary where he practised for about ten years. His account of the Canaries (*Medical Chronicle*, 1897) is one of the best that has been written. On his return to England he settled in Bowdon, joining the late Dr. W. Owen Jones in practice, and here he remained till his death, winning general affection and respect. He was twice married, first to Florence Trevor-Roper, and secondly to Kathleen Oliphant. His two sons were both killed in the war and he leaves a widow and five daughters.

DANIEL MARTIN BADEN EVANS, M.B., M.R.C.P. LOND., F.R.C.S. ENG.

AT the age of 29 Mr. D. M. B. Evans died on Nov. 9th of septicæmia following a slight injury on the football field. At the time of his death he was surgical registrar at Charing Cross Hospital, where he had received his clinical training. He entered the hospital from Cardiff Medical School in 1921, qualified two years later, became a Member of the Royal College of Physicians in 1926, and a Fellow of the Royal College of Surgeons last year. His career as a student brought him many prizes, and he sought a wide experience in appointments after graduation. These included work as resident medical officer at Queen Mary's Hospital for Children, Carshalton, and at the Bolingbroke Hospital, as senior house surgeon at the All Saints' Hospital for Genito-urinary Diseases, and demonstrator of anatomy at King's College. "By his death," writes Mr. Norman Lake, "Charing Cross Hospital has lost one of its most brilliant students of recent times. For the past two years he had identified himself very closely with the work of the hospital while he held the post of surgical registrar; indeed, it was probably his keen and constant application to the duties of that post which so reduced his resistance as to render him a ready prey to the septicæmia which so rapidly and tragically caused his end. His great ability was obvious to all, and the future had much in store for him. The hospital, the whole profession, is the poorer for the loss of a life so full of promise—a skilful surgeon, a lucid teacher, a musician, and a sportsman."

WE have to record the death of Dr. MATTHEW WILLIAM GAIRDNER, on Oct. 11th, at the age of 79. His father, Dr. Matthew Baillie Gairdner, of Crieff, had seven sons, of whom Matthew was the third. He took up medical study at Edinburgh in 1867, and was one of Lister's dressers. On qualifying as L.R.C.S. Edin. in 1871 he held house appointments at the Royal Infirmary, the Chalmers Hospital, and elsewhere, serving under such distinguished men as *Annandale*, *Heron Watson*, *George Balfour*, and Halliday Douglas. After work as a ship's surgeon and in India he settled in Naples, where he practised for the rest of his professional life. Dr. Gairdner's only remaining brother is Dr. James Gairdner, of Crieff. His son is on the resident staff of the London Hospital.

Dr. FRANK HERBERT SHAW, who died at St. Leonards-on-Sea on Nov. 11th, was a well-known medical practitioner in St. Leonards and Hastings. For over 40 years he was actively associated with the Buchanan Hospital as surgeon. A son of Dr. Archibald Richard Shaw, of St. Leonards, he was born in London in 1858. He studied medicine at King's College, completing his training at Guy's Hospital and in Germany, and became M.R.C.S. in 1881. He first went into practice at Chester, but after a time returned home to assist his father. There were few organisations in Hastings and St. Leonards with which Dr. Shaw was not in some way connected. He was at one time a keen Volunteer, and for a period was surgeon-captain to the old 2nd Cinque Ports Garrison Artillery. Twice married, he leaves a widow and two sons and two daughters.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

ANNUAL HOLIDAY BILL.

ON Friday, Nov. 15th, in the House of Commons, Mr. WINTERTON moved the second reading of the Annual Holiday Bill which, he said, provided that every employed person should be entitled to an annual holiday of not less than eight clear consecutive days on full pay. If any attempt were made to evade the provision with regard to the payment of wages, either by the dismissal of the workman or by his suspension immediately before the annual holiday became due, the penalty on conviction was a fine not exceeding £20. The Bill contained a provision against contracting out by arrangement between the employer and the workman, while in the case of the fixing of wages by piece-work rates it was provided that that should be arranged by regulation. The annual holiday was not in any way to interfere with the existing rights of anyone to the customary bank or other holidays, and it was made clear that the eight days were additional to any rights enjoyed under existing law. An employed person was defined as anyone employed under a contract of service or apprenticeship, and that would cover all the approximately 12,000,000 employed persons in the country. At present 3,000,000 persons enjoyed the privilege of at least a week's holiday with pay, and the Bill would add another 9,000,000. The measure was opposed by certain Members of the House because it was suggested that it would place a burden on industry. But an annual holiday surely meant improved health, and that must mean increased efficiency, which in turn would mean increased output and production. The Bill would have the effect also of bringing more people into employment, and would help the seaside resorts.

Mr. J. HUDSON seconded the motion for the second reading.

An Amendment.

Captain HUDSON moved the following amendment:—

> "This House declines to proceed with a Bill which materially affects every phase of industry, agriculture, and commerce, which interferes with the long-established custom of employers and employed to settle conditions in their own industries, and which is consequently of so far-reaching a character that this House should not entertain it unless it is presented by a Government which is in a position, after full consultation with all interests concerned, to give the House authoritative information on the cost and effects of the proposal and the measure of agreement thereon throughout the industries affected."

He said that he and the other Members of the Conservative party were opposed to the Bill, not because it was bad in principle, but because they believed that in its present form it would have such an upsetting effect upon industry that it would do more harm than good. The mining industry had worked out the cost as being something like £2,250,000 a year, which was estimated to be equal to 2½*d.* per ton of coal. The country was, he believed, moving along the lines of a universal holiday for all workers, and he did not think there was a single Member of the House who was opposed to that, but this Bill would not, in his opinion, bring that about. In any case, a proposal of this kind should be made, if it was to be made at all, not in a private Member's Bill but in a Government measure.

The View of the Government.

After some debate,

Mr. LAWSON (Parliamentary Secretary to the Ministry of Labour) said that the Government accepted the principle of the Bill, but was conscious of the fact that the matter could not be dealt with in such simple terms as it proposed. They felt that there was some need of consulting the industries of the country before anything on a big scale was done. In view of the heavy programme of Parliamentary business, the Government could give no real guarantee that time would be found for its further stages if the measure obtained a second reading. The Government hoped, however, that the industries concerned would assist in the spread of the desirable practice embodied in the Bill.

After the closure had been carried by 184 votes to 63, the amendment was negatived without a division, and the Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 14TH.

Hospital Accommodation for Rhodesian Miners.

Sir ALFRED KNOX asked the Under Secretary of State for the Colonies the present estimated numbers of Europeans and Natives, respectively, at present employed on the copper mines of Northern Rhodesia; what hospital accommodation for these employees was now provided, and where; whether any new schools were now being built to provide for the education of children of employees in these mines; whether any new legislation regarding safety and workmen's compensation had been passed to protect workers in these mines; and whether he would require the furnishing of regular reports on all casualties similar to the returns required from the mines in the Gold Coast.—Mr. **Lunn** replied: For the whole industry, natives 14,883, and Europeans 1118, well-equipped hospitals are now available at the established mines, and are being provided at mines in the development stage. Educational questions and revision of existing protective legislation are under consideration. Regular casualty reports will be required.

THURSDAY, NOV. 15TH.

Charges of Indecency in Hyde Park.

Mr. **Day** asked the Home Secretary the number of charges of indecency brought by the police under the Hyde Park regulations during the months of July, August, and September, 1929; and in how many cases was the police evidence supported by that of private persons.—Mr. **Clynes** replied: The number of charges of indecency brought by the police under the Hyde Park regulations was three in July, seven in August, and five in September. In only one case was the police evidence supported by that of private persons.

Silicosis.

Mr. **Hannon** asked the Home Secretary, in connexion with and in view of the wide scope of the Various Industries (Silicosis) Scheme, 1928, if he would indicate the precise industries, other than the manufacture of pottery and scouring powders and the processes in these industries, in which he had had definite evidence of silicosis, disabling silicosis, or death from silicosis, or of any of these accompanied by tuberculosis, and their number.—Mr. **Clynes** replied: The following are the particulars (so far as it has been possible to trace them at short notice) of ascertained cases of silicosis which have come during the last three or four years to the knowledge of the Factory Department or the Mines Department in the particular industries or processes covered by the Various Industries Scheme, excluding the potteries and the manufacture of scouring powders: One case in each of the following industries or processes—sand-grinding (iron foundry); silica milling (silica flour manufacture); stone crushing (road making); tin mining; and lead mining; two cases in millstone dressing (corn milling); four cases in sandblasting (metal works); ten cases in stonemasons' work; and 25 cases in coal mining. These cases are mostly fatal cases where the cause of death was ascertained through a post-mortem examination ordered by the coroner, and they must not be taken as affording any criterion to the incidence of the disease in the industries or processes concerned or as representing the whole or even the main part of the experience on which this scheme is founded. It must be borne in mind that the disease is not notifiable as other industrial diseases are, and that, as pointed out in the recent report of the Committee on the Medical Arrangements for the Diagnosis of Silicosis, the diagnosis of this disease involves expert examination which has not been generally available. As a consequence, except in those industries under the Refractories Industries Scheme in which special arrangements for expert examination have been instituted, the disease has not been diagnosed as such, but has been set down as some other form of disease of the respiratory system. The disease has, however, been the subject of extensive medical research for a number of years, and much experience has also been gained through the periodic examinations carried out under the Refractories Industries Scheme, and I am advised that the result has been to show conclusively that wherever workmen are subject to certain conditions of exposure to silica dust, they incur a substantial risk of the disease and, in fact, wherever any special inquiry has been held into any process giving rise to such conditions, silicosis has been found to be present to a serious extent. For instance, the inquiry into the sandstone industry in 1928 showed that out of 464 workmen examined 112 were found to have contracted silicosis. The honourable Member will understand, therefore, that in selecting the industries and processes for inclusion in the Various Industries Scheme, regard was necessarily had not only to the ascertained cases of silicosis but also to the degree to which the workers would in fact be liable to be exposed to silica dust in the particular circumstances of their employment.

Medical Referees and Workmen's Compensation.

Mr. **McKinlay** asked the Home Secretary the number of cases submitted to the medical referees under the Workmen's Compensation Act during the past three years in Glasgow, Edinburgh, and Dundee, and the number of such cases decided in favour of the injured persons.—Mr. **Clynes** replied: The number of cases referred were as follows: At Glasgow 179 in 1927, 210 in 1928, and 205 in 1929; at Edinburgh 114 in 1927, 166 in 1928, and 147 in 1929; at Dundee 37 in 1927, 16 in 1928, and 19 in 1929. The information asked for in the last part of the question is not available.

Gifts and Inducements and Panel Prescriptions.

Sir **Kingsley Wood** asked the Minister of Health whether he proposed to make any alteration or amendment in the Medical Benefit Regulations relating to gifts or inducements by chemists of coöperative societies concerning National Health Insurance prescriptions.—Mr. **Greenwood** replied: The matter is engaging my consideration.

Proposed Raising of Insurance Income Limit.

Mr. **D. G. Somerville** asked the Minister of Health if he would consider appointing a committee to investigate the question of raising the present limit of £250 entitling participation in the National Health Insurance Act to a higher figure more consonant with the existing cost of living.—Mr. **Greenwood** replied: I will see that the matter is brought to the notice of the committee which is engaged in a survey of the schemes of social insurance.

Local Authorities and Blind Persons.

Mr. **Tillett** asked the Minister of Health the number of local authorities who had made arrangements for promoting the welfare of blind persons under the powers conferred upon them by the Blind Persons Act, 1920, Section 2.—Mr. **Greenwood** replied: Such arrangements have been made by all the 146 local authorities under the Blind Persons Act.

Application of Artificial Cream Act.

Mr. **Lawther** asked the Minister of Health if his attention had been called to the proceedings at Marlborough Street police-court on July 2nd and 12th, and the subsequent appeal at the London sessions on Sept. 13th, when it was decided that the Artificial Cream Act could not apply as the case had not been brought forward by an official of a local authority but by an outside authority; and if he would be prepared to bring forward legislation empowering individuals to seek protection under the said Act where county or borough councils failed to carry out their statutory duties.—Mr. **Greenwood** replied: I am aware of the proceedings referred to by my hon. friend, but I cannot undertake to introduce amending legislation on this subject at the present time.

Open Spaces in London.

Captain **Austin Hudson** asked the Minister of Health whether he was aware that certain recreation grounds, playgrounds, and open spaces in London were being closed in order that local authorities might utilise the sites for building purposes; and whether, in view of the increasing need for such open spaces in towns and cities, he could take any steps to deal with this matter.—Mr. **Greenwood** replied: I am not at present aware of any case where in London a public recreation ground, playground, or open space has been closed for building. If the hon. Member will give me particulars, I shall be glad to make inquiries.

Vaccination and Small-pox.

Mr. **Freeman** asked the Minister of Health whether his attention had been called to the deaths of five children within one month following vaccination—viz., Terence Kellaher, 5 months, vaccinated August 14th, died Sept. 15th; Ronald Whitehouse, 5 months, vaccinated August 23rd, died Sept. 5th; Leslie Brower, 6 months, vaccinated Sept. 11th, died Sept. 18th; Frederick Wright, 11 years, vaccinated in March, died Sept. 12th; and Jackie Balshaw, 4 months, vaccinated Sept. 12th, died Oct. 1st; and if he would institute inquiries as to whether vaccination was one of the contributory factors in the deaths of these and similar cases.—Mr. **Greenwood** replied: My attention has been called to two of the five deaths referred to which occurred in London, Blackburn, Bolton, West Bromwich, and Somerset. In neither of these two was vaccination one of the certified causes of death. In both cases post-mortem examinations were made and inquests held, and the deaths were found to be due to causes entirely unconnected with vaccination. I have no information as to the remaining three cases beyond the death certificates which show that in two of them post-mortem examinations were made, and in none of the three was there any reason to think that vaccination contributed in any way to the fatal issue. As regards the last part of the question, I may say that all cases in which death is stated to have resulted directly, or indirectly, from vaccination, are reported to my department by the Registrars of Births and Deaths, and are made the subject of investigation.

Mr. **James Gardner** asked the Minister of Health the number of deaths in respect of which the death certificate included the word vaccination, or vaccinia, or vaccine, or similar words, registered during each of the last six months for which figures were available.—Mr. Greenwood replied: The number of deaths are as follow: April, none; May, 4; June, 3; July, 4; August, 5; and September, 1. These figures include two deaths in which the words "vaccination" or "vaccinia" did not appear on the medical certificate or coroner's certificate, but which, on inquiry by the Registrar-General, were stated to be associated with vaccination, and one case in which the word "vaccination" appeared on the medical certificate in the form of a positive denial that the vaccination had any connexion with the death.

Approved Societies and Ophthalmic Treatment.

Dr. Morris-Jones asked the Minister of Health how many approved societies under the National Health Insurance Acts provided facilities for optical and/or ophthalmic advice and treatment for insured persons; whether there were any approved societies that did not provide such facilities; and, if so, whether he would give the names and numbers of such societies.—Mr. Greenwood replied: Consequent upon the second valuation, 5883 societies and branches in England and Wales, comprising nearly 12,000,000 members, have made arrangements to provide ophthalmic treatment, including the provision of optical appliances, as an additional benefit; 1156 societies and branches, with about 1,700,000 insured members, do not provide this benefit, generally because their surpluses have been used for other benefits. I cannot undertake to give the names of these societies and branches.

Approved Societies and Dental Treatment.

Dr. Morris-Jones asked the Minister of Health how many approved societies under the National Health Insurance Acts provided or contributed towards dental treatment for insured persons; whether there were any approved societies that did not provide or contribute towards such treatment; and, if so, the number and names of such societies.—Mr. Greenwood replied: The number of approved societies and branches in England and Wales which contribute towards the cost of dental treatment of their members as an additional benefit is 6645, covering 12,727,000 insured members. Only 494 societies and branches, with approximately 900,000 members, are not in a position to give dental benefit, either because they selected other additional benefits, or because they had no available surplus. I cannot undertake to give the names of these societies and branches.

Plague in British India.

Major Graham Pole asked the Secretary of State for India the number of cases of and deaths from plague in British India in each of the last five years; and whether any progress was being made in India in respect of the methods of effectively dealing with this scourge.—Mr. Wedgwood Benn replied: I have no reliable figures of cases. Plague figures have shown on the whole a marked decline in recent years. Research work on prophylactic methods has yielded valuable results, but I am advised that there is not yet any reliable treatment of the disease. Progress depends largely on the willingness of the people to coöperate with the authorities in making fuller use of well-established measures, especially inoculation. The figures of deaths from plague in British India during the last five years are as follows:—

Year.	Deaths.	Year.	Deaths.
1924	361,843	1927..	32,160
1925	117,717	1928..	82,078
1926	196,249	Total	790,047

Opium Revenue in British Empire.

Mr. Mander asked the Under Secretary of State for the Colonies what States within the British Empire at the present time were deriving revenue from opium; and to what extent.—Mr. Lunn replied: The following statement shows the British Colonies and Protectorates which derived revenue from the sale of opium in 1928: Hong-Kong, $3,382,101·87. Straits Settlements, $12,322,203. Federated Malay States, $11,782,128. Unfederated Malay States: Johore, $4,224,465; Kedah, $3,053,561; Perlis, $200,608; Kelantan, $435,848; Trengganu, $201,570; and Brunei, $70,447. North Borneo, £98,408; Sarawak, $951,118.00; Ceylon, Rs. 807,000 (estimated receipts 1929–30); and Wei-hai-wei, $2,700 (estimated receipts 1928–29).

MONDAY, NOV. 18TH.

Ex-Service Men and Seven-years' Limit.

Mr. Day asked the Minister of Pensions whether he could now make a statement as to the action the Government proposed taking to abolish the seven-years' limit with regard to ex-Service men. Mr. Shillaker asked a similar question.—Mr. F. O. Roberts replied: The operation of the seven-years' time limit on the making of fresh claims for disablement, and of the arrangements made by the late Government for dealing with certain cases affected by it, has been closely investigated by me since I assumed office. At the present time, more than ten years since the men were demobilised, cases in which disablement by war service can now be justifiably claimed for the first time are, as is admitted on all hands, few in number, and will necessarily become fewer. Old war wounds, thought to have been healed, but now giving trouble for the first time since the war, are readily identifiable, and are already dealt with both by medical treatment and pension. New claims in respect of some ailment or disease are the more numerous, but comparatively very few cases are found on investigation to be genuinely traceable to war service. The situation is one that requires to be met by provision for a small and diminishing number of genuine cases only. These cases require to be dealt with on different lines from those that were suitable at an earlier period of pensions administration.

The Government intend taking such action in regard to the time limit as will secure "that all claims shall still be considered." The arrangements made by the late Government do not, in my opinion, fully secure this object, and therefore the Government have decided to amend and extend them in important respects. For the future, the arrangements for dealing with belated claims for disablement will be such as to ensure the following essential points: firstly, that no application is rejected solely on the ground that it is barred by the time limit; secondly, that every applicant is given explicit opportunity to produce evidence in support of his claim; thirdly, that all evidence in support of a claim is fully considered, and every reasonable line of investigation indicated by the claim is pursued to the full, including medical examination wherever necessary. These arrangements will effectively secure that no bar is raised to the making or consideration of a claim. At the same time, I think it important that ex-Service men should feel assured that their claims are considered impartially. I am, accordingly, with this object, arranging to make use of the statutory powers of the local War Pensions Committees to hear and investigate cases of complaint from dissatisfied applicants. I intend, in addition, to secure the assistance of independent advice by the appointment of medical experts (to be nominated by the Presidents of the Colleges of Physicians and Surgeons), who will be associated with the Department in advising on all cases in which there is material conflict of evidence on the claim.

Replying to a question by Sir A. Pownall, Mr. Roberts said there would be no rejection of claims on the ground of the time limit. Every case would be invited to give evidence; that evidence would be investigated through the War Pensions Committees or through the Ministry, and on top of that they would invite the assistance of independent medical experts.

Sir A. Pownall: Is it not the case that no case was turned down by the late Government? Is it not the case that many hundreds of cases were considered by the late Government, although they had gone beyond the seven-years' limit?

Mr. Roberts said that it was true that numbers of cases had been considered.

Dr. Vernon Davies asked if the right hon. gentleman's reference to medical experts applied to London headquarters alone, or would the Provinces also be included?

Mr. Roberts: They will deal with all cases that are submitted.

Small-pox Concealment at Aden.

Mr. Holford Knight asked the Secretary of State for India whether his attention had been called to the sentence of three months' rigorous imprisonment passed on an Arab, Salem Mohamed Yaseen, at Aden, for concealing cases of small-pox; for what reason the Resident ordered the man's release after he had served five weeks of his sentence; whether he was aware that the objection of the Arabs and others in Aden to the notification of small-pox was due to the fact that the so-called contagious diseases hospital was a collection of huts several miles distant, that patients had to be carried on litters by human beings through the burning sun and with dust blown into mouths and eyes by the hot winds, and that subsequently it was decided that the penalty for breaches of the small-pox order should be a fine not exceeding 50 rupees; and whether he would make inquiries into the case of Salem Mohamed Yaseen, in view of the indignation of a large part of the Moslem community in Aden and district at the treatment he and others received at the hands of the medical officials during the recent small-pox scare at Aden.—Captain Wedgwood Benn replied: I have received communications on this subject from the Anti-Vaccination League, but have no other knowledge of the facts alleged. I have seen, however, a report by the Public Health Commissioner with the Government of India on the outbreak of small-pox at Aden which assumed menacing proportions in March last, and in view of the very serious situation with which the authorities were faced, mainly through *concealment* of cases, I should not feel justified in questioning the measures they found necessary to deal with it.

Sun-bathing by the Serpentine.

Mr. SHAKESPEARE asked the First Commissioner of Works what progress he was making with sun-bathing facilities by the Serpentine.—Mr. LANSBURY replied: I propose to permit mixed bathing in the Serpentine next summer, but I do not at present contemplate making any special arrangements for sun-bathing.

Epizoötic Abortion Among Dairy Cattle.

Brigadier-General CLIFTON BROWN asked the Minister of Agriculture whether, in view of the serious losses suffered by milk farmers from epizoötic abortion, he would issue regulations to make it a notifiable disease; and whether research work was being carried out to find a cure for the prevention of this scourge. Mr. BUXTON replied: Epizoötic abortion differs from the diseases of animals which are scheduled, in that this disease may persist in a herd from three to seven years, or even longer, and, therefore, if it were made notifiable and the movement of animals on to and off of the infected farms controlled, stock-farming would be most difficult, and the cost of administering the order enormous. It is possible by means of a test, which is within the means of all stock-owners, to detect infected animals and protect healthy herds against disease. Research work on this subject is being conducted all over the world, and it is the policy of the Ministry of Agriculture to encourage research workers in this country to concentrate on a cheap means of immunisation.

Cases of Anthrax.

Mr. DUKES asked the Home Secretary the number of cases of anthrax infection reported to his department during the present year, giving the places where the disease was contracted and stating also the number of cases in which infection proved fatal.—Mr. CLYNES replied: The number of cases of anthrax reported during the present year in factories and workshops is 35, three of which were fatal. Cases were reported from Dewsbury, Earlsheaton, Heckmondwicke, Saltaire, Kidderminster, Liverpool, Kilmarnock, Chesham (Bucks), Stockport, Warrington, Runcorn, Bermondsey, Derby, Westbury (Wilts), Worcester, Somerset, and Leeds. In addition, four cases occurred among dock labourers, two of which were fatal. These were reported from Millwall Dock, London Dock, and Alexandra Dock, Liverpool.

Institutional Treatment of Ex-Service Men.

Mr. D. G. SOMERVILLE asked the Minister of Pensions how many disabled ex-Service men were still in institutions under his care; and whether he was satisfied that all possible steps were taken to alleviate the weariness of their protracted convalescence.—Mr. F. O. ROBERTS replied: Apart from cases of insanity in public mental hospitals, there are at present 4774 disabled ex-Service men receiving in-patient treatment at the cost of the Ministry. I am satisfied that everything possible is done to provide both interest and amusement for these cases, so far as the exigencies of treatment admit. Suitable occupation is provided in all cases where this is practicable, having regard to the fact that the majority of the cases in hospital are under treatment for less than six months. Outings and other entertainments are also arranged at all hospitals in coöperation with various voluntary associations.

A NEWCASTLE NURSES' HOME.—Sir Walter Runciman, who recently gave £50,000 to the Royal Victoria Infirmary at Newcastle-on-Tyne, last week laid the foundation-stone of the Runciman Wing of the nurses' home. The building will provide accommodation for 150 more nurses at a cost of about £45,000.

MARRIED WOMEN DOCTORS.—Considerable discussion has arisen in Birmingham in consequence of the intention of the Board of Management of the General Hospital to recommend the governors to declare married women ineligible for appointments on the medical staff, save in exceptional cases. The resolution of the board asks that "women members of the staff who marry during their term of office upon the medical staff be required to relinquish their position in view of the disorganisation of the work of the hospital which may be entailed owing to the demand of their domestic duties."

Medical News.

UNIVERSITY OF CAMBRIDGE.—On Nov. 15th the following degrees were conferred:—

M.D.—R. H. Metcalfe and H. R. Youngman.

M.B. & B.Chir.—G. C. Dewes, T. A. A. Hunter, T. S. Read, and J. L. Newman.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council was held on Nov. 14th, with Lord Moynihan, the President, in the chair.

Diplomas of Membership were granted to 120 of the candidates whose names we gave on Nov. 9th as recipients of the L.R.C.P. (excepting O. S. Kah, E. H. Parkinson, M. E. Roberts, D. Sheehan, P. D. B. Spence, and F. R. Stansfield).

The Licence in Dental Surgery of the College was conferred on the following:—

C. S. Anderson, Richard Bayly, H. M. Bruce-Payne, Hyman Cohen, J. R. Cohen, A. F. De Villiers, W. H. Dodd, W. B. Earsdon, R. H. J. Fairney, W. F. H. Frost, Samuel Gorohovsky, H. L. T. J. Hardwick, F. H. Hughes-Jones, I. J. Immelman, H. G. L. Johnson, R. F. Johnson, W. B. Kilpatrick, E. J. F. King, Oliver Lyth, J. C. McNeill, C. E. Maguire, F. F. V. Manfield, H. H. Markovitch, M. E. Minton, C. A. Palk, W. C. Rae, Eric Schofield, Roy Scoggins, E. C. Shaw, W. H. H. R. Smithurst, R. W. Stevens, A. G. Taylor, W. R. Watts, R. J. Wheatley, A. H. V. Williams, I. C. Wilson, and C. J. Woodcock.

Mr. Victor Bonney was reappointed the representative of the College on the Central Council for District Nursing in London. Mr. V. Bonney and Mr. L. C. Rivett were appointed to give evidence on behalf of the College before the Maternal Mortality Committee appointed by the Ministry of Health.

It was decided to hold an evening reception on Thursday, May 29th, 1930, in connexion with the jubilee celebrations of the British Dental Association.

The President reported that he had received an offer from Mr. Louis Baron of a gift of £500 a year for a period of seven years for a research scholarship in the Royal College of Surgeons, to be called "The Bernhard Baron Scholarship." A resolution expressing gratitude was adopted.

A scheme was approved for granting the scholarships for medical students endowed by the late Mrs. Eliza Macloghlin, and regulations were adopted. The approximate value of each scholarship will be £100 a year.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual dinner was held at the Piccadilly Hotel, London, on Nov. 14th, when Dr. J. J. Buchan, medical officer of health for Bradford, presided, and 100 covers were laid. Proposing the toast of "The Society," in the unavoidable absence of the Minister of Health, Sir Arthur Robinson, First Secretary to the Ministry (grand vizier instead of sultan, as he said), began by recalling what had happened since the Society was founded in 1856; the general health services built up since then were admittedly the first in the world, although it was peculiarly difficult to apply the principles of local government to a community like London which was as large as half a dozen nations. The lamented death of Sir John Gatti had delayed the issue of the report which would grapple with this situation. Especially on problems of nutrition had research made progress, but practice lagged far behind, and the Ministry had been called on to lend a hand. The Local Government Act of 1929 was now in being; since 1875 there had been nothing but piecemeal legislation, but the new Act remodelled every department of local government. The primary thing in it was that by next April the new authorities must make efficient arrangements to take over the work of the poor-law guardians who had been at their job for a hundred years. The Ministry had been criticised for not breaking up the poor-law at once, but the right way to set to work, said Sir Arthur, was not per saltum, but gradually, quietly, and in the end surely. Under the Act the control of the health services by the Ministry passed away. Comprehensive surveys of public health would be made in the areas (this was essential in view of the provision in the Act to reduce grants in case of default), and the whole of this information would be at the disposal of local authorities and their medical officers, the Ministry issuing periodic papers to sum up the results of their inquiry. This, he said, was the function of a central health department; not, as had been put to them, to issue "plain rules for plain people," but to ascertain facts, and leave voluntary societies and local authorities to popularise them. Under the Act there would be a resurvey of country areas, for until the areas were sound the functions of local government could not be properly distributed. The medical officer to the local authority must needs be an administrator, for he had to link up his work with the rest of the municipal work; he had to frame a general policy in which health should play a leading part. The health authority was now put in charge of the whole of the health functions; time would show the vast importance of this step in its effect on administration and research. The institutional provision to be taken over from the guardians was variable in standard, from the type of the old poor-law infirmary to that of the first-rate hospital; in the hands of the local authority there would be a gradual tendency upward. This, it had been said, would be a threat to the voluntary hospitals; but take the example of Bradford where, in spite of the existence of the municipal hospital, the voluntary hospital was putting through an important scheme of extension. Medical officers must realise that they could learn a great deal from the voluntary hospitals; it was up to them to see that full use was made of them, so that there should be ample accommodation available in all areas. Until, said Sir Arthur, you got constant consultation between the local authority, the medical officer of health, and the voluntary hospitals, you would never get efficiency. Touching on the question of whole-time service, at the head there must of course be a whole-time administrator; how the principle worked out in the lower grades he would watch with interest. In conclusion, he announced the intention of the Minister of Health to introduce at an early date a Bill which would provide for the superannuation of all local government officers. Dr. Buchan, in responding, said the Society had the most earnest intention of carrying out the great work which had been initiated by the Ministry of Health; they appreciated fully the need for unification of the health services and for the unification of hospital work. His Society had already taken a large part in getting health maxims over to the people, but local differences made this harder in some places than in others. Prof. J. Johnstone Jervis, president of the Yorkshire Branch, proposing "The Guests," pictured with great humour the distressful situation of each body represented and their need for succour at the hands of his own Society. Fourfold response to this toast was made by the Bishop of Sodor and Man, Sir John Rose Bradford, Sir Robert Bolam, and Mr. J. H. Palin, M.P. Sir Robert remarked that medical officers of health had in the Local Government Act an unparalleled opportunity so to alter the minds of legislators as to make the work of the medical profession at large bear fruit. The toast of "The President," proposed by Alderman H. Thornton Pullan, J.P., chairman of the Bradford Health Committee, was accorded musical honours, and after responding Dr. Buchan called on Dr. R. A. Lyster to propose the toast of Mr. G. S. Elliston, Executive Secretary of the Society, who would be resigning that post next September after 11 years' service. In his reply Mr. Elliston made it clear that his retirement from secretarial work was only a prelude to greater activity as a journalist in public health. During the evening Mr. Norman Williams delighted the company with his mellow voice.

ABERDEEN UNIVERSITY CLUB, LONDON. — The eighty-second half-yearly dinner of this club will be held at the Trocadero Restaurant on Thursday, Nov. 28th, under the chairmanship of Dr. T. Wardrop Griffith. The Secretary's address is 9, Addison-gardens, W. 14.

NO. 14 STATIONARY HOSPITAL.—The tenth annual dinner of the medical officers of this hospital will be held at the Trocadero Restaurant, Piccadilly-circus, London, W., on Friday, Dec. 6th. Colonel C. R. Evans will be in the chair. Members of the mess who have not received notice are asked to apply to the Secretary, Dr. H. L. Tidy, 39, Devonshire-place, W. 1.

BRITISH SERBIAN UNITS.—The annual reunion dinner of the British Serbian Units Branch of the British Legion and of all friends of Serbia will be held at the Grafton Hotel, Tottenham Court-road, London, W., on Saturday, Nov. 30th, at 7.15 P.M. Mr. Philip Mitchiner, F.R.C.S., will take the chair. Tickets may be had from Miss C. M. Marx, 24, Melcombe-court, Dorset-square, N.W. 1.

THE BRITISH INSTITUTE OF RADIOLOGY.—The annual conference of the British Institute of Radiology, with the accompanying exhibition, will be opened on Wednesday, December 4th, at the Central Hall, Westminster, by Mr. Arthur Greenwood, the Minister of Health. On Friday, December 6th, the annual dinner of the Institute will be held in the Trocadero Restaurant, Piccadilly, at 7.30 for 7.45 P.M.

DISEASE IN THE TROPICS.—Sir Leslie Wilson, late Governor of Bombay, will speak on the Hospital for Tropical Diseases in London and its Work for the Empire at a meeting at Mrs. F. S. Franklin's house, 44, Lancaster-gate, London, W., at 5 P.M., on Thursday, Nov. 28th. Admission is by invitation cards only, and they may be had from the resident Secretary of the Hospital for Tropical Diseases, Endsleigh-gardens, W.C. 1.

THE IVORY CROSS.—The fifteenth anniversary dinner of this Society will be held on Tuesday next, November 26th, at the Hyde Park Hotel, when the Duke of York will preside.

MERSEYSIDE HOSPITAL COUNCIL.—The report of the first year's working of the Merseyside Hospital Council states that there are already over 210,000 workmen employed in about 8000 business undertakings who are contributing an average of 7*s.* 6*d.* a year to the fund. Employers add one-third to their employees' contributions.

WILLIAM MACKENZIE MEDAL.—This medal "for original work in ophthalmology of outstanding merit," which has been awarded this year to Mr. W. S. Duke-Elder, is to be presented to him at the Glasgow Eye Infirmary at 8 P.M. on Monday, Dec. 2nd, when he will deliver an address on the Clinical Applications of the Newer Conceptions in the Physiology of the Eye.

BIRMINGHAM CHILDREN'S HOSPITAL.—Extensions to this institution opened last week increase the total accommodation to 230 beds. They comprise an isolation block, a new private ward for fee-paying cases, a medical ward, and extra facilities in the out-patients' department. The cost has been £25,000, and a babies' ward and a nurses' home have yet to be added. In the last 12 years the hospital has cost £160,000.

CREMATION IN MANCHESTER.—The number of cremations in Manchester has risen from 265 in 1925 to 436 in the 12 months ending with August. Since the crematorium opened the total number has been 5700. The national statistics of cremation also show an advance, the number for the 12 months ended on June 30th being 4105 as against 3260 in the preceding year. The total number recorded up to date is 40,609. There are now 18 crematoriums in this country, and another at Edinburgh has just been completed.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Nov. 25th.—8 P.M., ODONTOLOGY. Paper: Mr. J. H. Badcock: The Design of Partial Dentures Considered in Relation to the Health of the Oral Tissues. Casual Communications:—Mr. F. St. J. Steadman: A Dentigerous Cyst in Connexion with a Supernumerary Incisor. Dr. E. W. Fish: A Report on Dr. Gottlieb's Histological Study of the Results of Traumatic Occlusion.

TUESDAY.—5 P.M., MEDICINE. Clinical Meeting at the London Hospital, E.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. The Improvement in the Public Milk-supply—Is Pasteurisation Necessary? Speakers: Mr. J. Monton and Mr. H. W. Steele-Bodger. Discussion: To be opened by Dr. R. Stenhouse Williams, followed by Dr. J. F. Halls Dally.

THURSDAY.—8.30 P.M., UROLOGY. Pathological Evening.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Nov. 25th.—8 P.M., Clinical Evening.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Nov. 28th.—8.30 P.M., Mr. F. Llewellyn Jones, M.P.: The League of Nations and the International Control of Dangerous Drugs. To be followed by a discussion.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Nov. 29th.—8.30 P.M., General Meeting. Papers will be read by Dr. N. L. Lloyd and Mr. V. E. Lloyd on Observations on the Urinary Excretion of Novarsenobillon in Syphilis and its Relation to Toxic Effects. A discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Nov. 25th, to SATURDAY, Nov. 30th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture by Mr. T. G. Stevens: Prolapse. No fee.—Tues., 8.30 P.M., Two lectures, especially suitable for M.R.C.P. candidates:—Dr. Kinnier Wilson: Encephalitis; Varieties; Relation to Fevers and Exanthems. Fri., 8.30 P.M., Dr. Kinnier Wilson: Disorders of Movement; Classifications; Pathogenesis.—VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W. Mon., 10 A.M., Demonstration by Mr. Denham Pinnock. No fee.—HAMPSTEAD GENERAL

Hospital, Haverstock Hill, N.W. Thurs., 4.30 P.M. Demonstration on Spinal Manipulation by Dr. T. Marlin. No fee.—Royal National Orthopædic Hospital, 234, Great Portland-street, W. Second week of special course. All day.—St. Mark's Hospital, City-road, E.C. All day course in Proctology.—Further information from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, Nov. 25th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

Tuesday.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

Wednesday.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

Thursday.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

Friday.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, Nov. 27th.—4 P.M., Mr. Maurice Whiting: The Ophthalmoscope in General Practice.

NORTH-EAST LONDON POST-GRADUATE COLLEGE. Prince of Wales's General Hospital, Tottenham, N.

Monday, Nov. 25th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

NATIONAL HOSPITAL, Queen-square.

Monday, Nov. 25th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. James Collier: Muscular Atrophies.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Surgery of Compression Paraplegia.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Vascular Lesions of Nervous System.

Friday.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Clinical lecture.

UNIVERSITY COLLEGE, Gower-street, W.C.

Monday, Nov. 25th.—2 P.M., Prof. Herbert Spencer: Medicine in the Days of Shakespeare. (Public Lecture.)

ST. PAUL'S HOSPITAL, Endell-street, W.C.

Wednesday, Nov. 27th.—4.30 P.M., Mr. Frank Kidd: Radium for Malignant Disease of the Bladder.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

Monday, Nov. 25th.—5 P.M., Mr. J. C. Dawes, M.I. Mech.E.: Disposal of Refuse.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road.

Friday, Nov. 29th.—4 P.M., Mr. C. Gill Carey: Diagnosis of Sinusitis.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Nov. 28th.—9 P.M., Dr. J. L. Livingstone: *Some Points in the Treatment of Phthisis.*

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

Tuesday, Nov. 26th.—3.15 P.M., Mr. G. G. Penman: Diseases of the Eye in Childhood.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

Friday, Nov. 29th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Dr. R. G. Gordon: What is the State Doing for the Individual and the Race, and How Much Efforts may be Amplified.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

Wednesday, Nov. 27th.—4 P.M., Prof. S. L. Cummins: Some Aspects of the Tuberculosis Problem.

ANCOATS HOSPITAL, Mill-street, Manchester.

Thursday, Nov. 28th.—4.15 P.M., Dr. G. E. Birkett: General Principles of Radium Therapy.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, Nov. 29th.—3.30 P.M., Mr. Townrow: The Treatment of Acute and Subacute Media.

ST. MARY'S HOSPITALS, Whitworth-street, Manchester.

Wednesday, Nov. 27th.—4.15 P.M., Mr. Comyns Berkeley: The Teaching of Midwifery. (Lloyd Roberts Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, Nov. 26th.—4.15 P.M., Mr. J. Morley: Hydronephrosis.

Friday.—4.15 P.M., Dr. H. Dove Cormac: Border-line Cases: the Physical Basis of Mental Disorder.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, Nov. 27th.—4.15 P.M. (in the Royal Maternity and Women's Hospital), Dr. A. N. McLellan: Demonstration of Obstetrical Cases.

Appointments.

Bainbridge, W., M.B., Ch.B. Edin., D.P.H., has been appointed Honorary Ophthalmic Surgeon to the Hull Royal Infirmary.

Claye, A.M., M.D. Leeds, F.R.C.S. Eng., Honorary Assistant Surgeon to the Hospital for Women at Leeds.

Gill, J. W., M.B., Ch.B. Aberd., Certifying Surgeon under the Factory and Workshop Acts for the Montrose District of the County of Angus.

Randle, A., M.D. Lond., Medical Superintendent of the Mile End Hospital.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Birmingham City Babies' Hospital.—Res. M.O. At rate of £150.

Birmingham University.—Lecturer in Physiological Dept. £400.

Blackburn County Borough.—Asst. M.O.H., &c. £600.

Board of Education, Whitehall, S.W.—M.O. £776.

Bolton Infirmary and Dispensary.—H.S. £150. Also Asst. H.S. £100.

Brighton, Royal Sussex County Hospital.—H.S. £150. Also Cas. H.S. £120.

Brookfield Orthopædic Hospital, Hale End, Woodford Green.—Anæsthetist. 1 guinea per attendance.

Cairo, Egyptian University, Faculty of Medicine.—Two Surgical Tutors. £E35 monthly.

Cancer Hospital (Free), Fulham-road, S.W.—H.S. At rate of £100.

Cardiff, King Edward VII. Welsh National Memorial Association. Area Asst. Tuber. Physician. £600.

Cardiff Royal Infirmary.—H.S. Also Cas. Surg. O. At rate of £60 and £75 respectively.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. First Assists. for Out-patient Dept.

Charing Cross Hospital.—Surg. Reg. £150.

Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100. Also Registrar. £50.

Chester Royal Infirmary.—Two H.S.'s. Each £150.

Croydon General Hospital.—Cas. H.S. £125.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Ealing Borough.—Asst. M.O.H. £600.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and Cas. O. At rate of £150.

East London Hospital for Children, &c., Shadwell, E.—Surgeon to Nose, Throat, and Ear Dept.

Essex County Sanatorium, Black Notley, near Braintree.—Res. M.O. £650.

Evelina Hospital for Children, Southwark, S.E.—Hon. Surgeon to Out-Patients. Also H.S. At rate of £120.

Freemasons' Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £135.

Grosvenor Hospital for Women, Vincent-square, S.W.—Hon. Anæsthetist. Also Res. M.O. At rate of £100.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also H.P. Each at rate of £100.

Hertford County Hospital.—Hon. Radiologist. Also Hon. Pathologist.

Heston and Isleworth Urban District Council.—Half-time Asst. M.O. At rate of £350.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Part-time Jun. Cas. O. At rate of £150.

Huddersfield, Bradley Wood Sanatorium for Pulmonary and Surgical Tuberculosis.—Res. M.O. £500.

Hull Royal Infirmary.—Hon. Asst. Ophth. S.

Institute of Ray Therapy, 152, Camden-road, N.W.—Jun. M.O. At rate of £150.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also H.P. and H.S. Each at rate of £120.

Leeds City.—Chief Asst. M.O.H. £900.

Lincoln, Bracebridge Mental Hospital.—Third Asst. M.O. £350.

London Hospital, E.—First Asst. and Reg. to two of the five Surgical Firms. £300.

London Lock Hospital, Dean-street and Harrow-road, W.—Second Anæsthetist. 1 guinea each attendance.

London University.—Geoffrey Duveen Travelling Studentship. £450.

Manchester Ancoats Hospital.—H.S. £100. Also Asst. M.O. for V.D. Clinics. 1 guinea per attendance.

Manchester, County Mental Hospital, Prestwich.—Asst. M.O. £500.

Manchester Northern Hospital for Women and Children, Cheetham Hill-road.—Sen. H.S. Also Jun. H.S. £130 and £100 respectively.

Manchester Royal Infirmary.—Res. M.O. £200. Asst. Res. Surg. O. At rate of £150. Asst. Surg. O. for Gynæcological Dept. £35. Also Asst. Surg. O. for Central Branch. £75.
Manchester, Salford Royal Hospital.—H.P. At rate of £125.
Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.
Miller General Hospital, Greenwich-road, S.E.—Hon. Med. O. for Electrical Dept. 20 guineas. Also Out-patient Officer at rate of £150.
Ministry of Health.—Five M.O.'s. Each £887.
Nairobi Municipal Council.—M.O.H. £1100.
National Hospital, Queen-square, W.C.—Res. M.O. £200.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Oxford City Council.—M.O.H., &c. £1100.
Poplar Hospital for Accidents, Poplar, E.—Hon. Visiting Surgeon.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.
Prince of Wales's General Hospital, Tottenham, N.—Hon. Clin. Assts.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £200. H.P. and Cas. O. £150. Also Three H.S.'s and One H.P. Each £120.
Radium Institute, Riding House-street, W.—H.S. £150.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Rochford, Poor-law Hospital.—Jun. Asst. M.O. At rate of £225.
Royal Air Force Medical Service.—M.O.'s.
St. George's Hospital, S.W.—Clin. Asst. in Physio-therapy Dept.
St. Mary's Hospital, W.—Med. Reg. to Out-patients. £200.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—Clin. Assts.
St. Thomas's Hospital, S.E.—Two Surg. Reg.'s. Also Med. Reg. for Children's Dept. Each £350.
Sidcup, Greenwich and Deptford Children's Homes.—Dentist. £74.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Surrey County Council.—Asst. M.O. £600.
Tilbury Hospital, Essex.—Med. Supt. £350. Also H.S. At rate of £150.
University College Hospital, Gower-street, W.C.—Ophth. Reg. £50. Also Hon. Dental Surg.
Wallasey, Victoria Central Hospital.—Jun. H.S. At rate of £100
Walsall General Hospital.—H.S. At rate of £150.
West Bromwich, Hallam Hospital.—Res. H.S. and Res. H.P. Each £250.
Western Australia, Lunacy Department.—Jun. Asst. Res. M.O. £450.
West London Hospital, Hammersmith-road, W.—H.P., H.S. Aural and Ophth. H.S. and Asst. Cas. O. Each at rate of £100.
Wolverhampton, Royal Hospital.—Asst. Pathologist and Pathological Reg. £350.
The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Swindon (Wilts.) and Berkhamsted (Herts).

Births, Marriages, and Deaths.

BIRTHS.

Davidson.—On Nov. 8th, at Square House, Christchurch, Hants, the wife of Dr. A. Whyte Davidson, of a daughter.

Earp.—On Oct. 30th, at the Presbyterian Hospital, Denver, Colorado, U.S.A., the wife of Dr. J. Roslyn Earp, of a son.

Gabb.—On Nov. 16th, at Copthorne, Guildford, the wife of Dr. Harold Gabb, M.C., of a daughter.

Patterson.—On Nov. 16th, at Plas-yn-dre, Ruthin, the wife of S. W. Patterson, M.D., of a daughter.

Roffey.—On Nov. 10th, in London, the wife of Dr. Bernard W. Roffey, of Gillingham, Kent, of a daughter.

MARRIAGES.

Brown—Cory.—On Nov. 9th, at Christ Church, Montreux, Surgeon-Commander Robin Brown, Royal Navy, to Dorothea Grace Cory.

Tom—Eadie.—On Nov. 11th, at Northleach Parish Church, Dr. Arthur Tom, of Bellevue House, Cheltenham, to Marjorie, daughter of Mr. and Mrs. H. G. Eadie, Charlton Park Gate, Cheltenham.

DEATHS.

Clarke.—On Nov. 10th, at "Netherleigh," Thorne-road, Doncaster (very suddenly), Henry Joy Clarke, M.D., J.P., aged 72.

Falkiner.—On Oct. 30th, at Dublin, Ninial McIntire Falkiner, M.D., F.R.C.P.I., late of Tyrone.

Forbes.—On Nov. 14th, at Sierre, Switzerland, Dorothea Christine Forbes, M.R.C.S., L.R.C.P., D.P.H., younger daughter of the late George Forbes, M.D., Blackpool, aged 32.

Hackett-Wilkins.—On Nov. 15th, at Mongeham Lodge, Great Mongeham (near Deal), Colonel Thomas James Hackett-Wilkins, O.B.E., I.M.S. (retired).

Melland.—On Nov. 14th, after a brief illness, Brian Melland, M.D., of The Bower, Ashley-road, Altrincham, in his 66th year.

Openshaw.—On Nov. 17th, at a nursing home, after a few weeks' illness, Thomas Horrocks Openshaw, C.B., C.M.G., F.R.C.S., of Wimpole-street, W., aged 73.

Reid.—On Nov. 18th, at Southsea, Sir Archdall O'Brien Reid, K.B.E., M.D., F.R.S.E., aged 69.

Shaw.—On Nov. 11th, at London-road, St. Leonards-on-Sea, Frank Herbert Shaw, M.R.C.S., F.R.C.P.

Shove.—On Nov. 16th, at Upper Richmond-road, Putney, S.W., Edith Shove, M.B., aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE MANAGEMENT OF PATIENTS SUFFERING FROM CANCER OF THE BREAST.*

By F. Hernaman-Johnson, M.D. Aberd., D.M.R.E.,
RADIOLOGIST TO THE FRENCH HOSPITAL, LONDON; PHYSICIAN IN CHARGE, X RAY AND ACTINOTHERAPEUTIC DEPARTMENT, CROYDON GENERAL HOSPITAL.

The management of patients suffering from cancer of the breast begins in the general practitioner's consulting-room. Every patient who consults her doctor because of trouble in her breast is a possible subject of cancer. The first duty of the doctor is to differentiate, where possible, between the real and the imaginary—between that which has an existence in the external world and that which has its being only in the mind of the patient. Cancer-phobia is a complaint calling for sympathy and tactful handling; otherwise, the mental state of its victim may be worse than that of the patient suffering from the disease itself. A witty friend of mine, asked if cancer was a curable disease, replied: "Of course it is; I have been cured of it myself hundreds of times!" Indeed, there are few of us who have reached middle age who have not been cured of it at least once or twice. For cancer-phobia is an almost universal complaint, though fortunately in most cases the attacks are infrequent and fleeting.

When a patient presents herself complaining of vague pains in the breast and nothing whatever can be found on physical examination, she should be questioned carefully about trauma. If nothing definite can be elicited, it is justifiable to ask her point blank what she fears and why. Generally it will be found that she has recently been in contact with some friend or relative who has cancer, or has been reading literature on the subject. Such patients require the most vigorous reassurance. It should be explained to them that pain is not an early sign of cancer. But it must be remembered that the patient has felt pain—or if one likes to go into fine-spun distinctions—believes that she has felt pain—and requires an explanation. The blessed word "neuralgia," talk about being "run down," and the prescription of a tonic are usually all that is required to make her happy. The doctor should never let her get the idea that he thinks her fussy. Some day she may have real trouble in her breast and nothing should be done which would make her hesitate to consult him a second time.

Even when the breast is absolutely normal to palpation, there are two things which should suggest that an eye should be kept on the patient. If there is a definite history of injury, even years before, caution is necessary; and when there is a pronounced family history of cancer the chances of an individual member developing it are greatly increased.

Next comes the patient with the suggestion of a vague "fullness," scarcely to be called a "mass," somewhere in the breast. If there is tenderness, it is permissible to regard this provisionally as mastitis. Many such cases yield to X rays in small doses, and no more is heard of the trouble. But if any signs or symptoms persist after a few weeks of treatment diagnosis becomes urgent. There is only one certain means, and that is the surgical removal of a section for microscopic examination. To be really effective, and more especially to establish a negative diagnosis, this must be done at leisure; a frozen section at the time of operation is not enough. This again means an interval of days, and some surgeons—notably those of the New York Memorial Hospital—are insistent that such an interval is dangerous, as the exploratory section leads to dissemination. Their view is perhaps extreme, but I am myself terribly frightened of disturbing a malignant growth by surgical trauma, however slight, as I have seen tragedies follow. All risk from the incision can, however, be avoided by using a recently introduced form of diathermic knife which seals the tissues as it passes through them but with a layer of coagulation so thin that healing by first intention is not interfered with. If the incision is large enough to require stitching there is again an element of risk. It should not be difficult to devise a diathermic needle which could sterilise its own track before the suture is pulled through. When such technique is not available, X rays should be administered both before the exploration and in the interval between this and total removal, should it prove necessary.

If a single well-defined lump is felt, no matter how small, it should be remembered that statistics tell us that the chances are at least two to one that it is cancer. It may, of

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* Being the substance of an address delivered at the British Institute of Radiology under the auspices of the Fellowship of Medicine and Post-Graduate Medical Association.

HOSPITAL, Haverstock Hill, N.W. Thurs., 4.30 P.M., Demonstration on Spinal Manipulation by Dr. T. Marlin. No fee.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. Second week of special course. All day.—ST. MARK'S HOSPITAL, City-road, E.C. All day course in Proctology.—Further information from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Nov. 25th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, Nov. 27th.—4 P.M., Mr. Maurice Whiting: The Ophthalmoscope in General Practice.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Nov. 25th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

NATIONAL HOSPITAL, Queen-square.

MONDAY, Nov. 25th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. James Collier: Muscular Atrophies.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: Surgery of Compression Paraplegia.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Vascular Lesions of Nervous System.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Clinical lecture.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, Nov. 25th.—2 P.M., Prof. Herbert Spencer: Medicine in the Days of Shakespeare. (Public Lecture.)

ST. PAUL'S HOSPITAL, Endell-street, W.C.

WEDNESDAY, Nov. 27th.—4.30 P.M., Mr. Frank Kidd: Radium for Malignant Disease of the Bladder.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

MONDAY, Nov. 25th.—5 P.M., Mr. J. C. Dawes, M.I. Mech.E.: Disposal of Refuse.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road.

FRIDAY, Nov. 29th.—4 P.M., Mr. C. Gill Carey: Diagnosis of Sinusitis.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Nov. 28th.—9 P.M., Dr. J. L. Livingstone: Some Points in the Treatment of Phthisis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Nov. 26th.—3.15 P.M., Mr. G. G. Penman: Diseases of the Eye in Childhood.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

FRIDAY, Nov. 29th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Dr. R. G. Gordon: What is the State Doing for the Individual and the Race, and How Much Efforts may be Amplified.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Nov. 27th.—4 P.M., Prof. S. L. Cummins: Some Aspects of the Tuberculosis Problem.

ANCOATS HOSPITAL, Mill-street, Manchester.

THURSDAY, Nov. 28th.—4.15 P.M., Dr. G. E. Birkett: General Principles of Radium Therapy.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Nov. 29th.—3.30 P.M., Mr. Townrow: The Treatment of Acute and Subacute Media.

ST. MARY'S HOSPITALS, Whitworth-street, Manchester.

WEDNESDAY, Nov. 27th.—4.15 P.M., Mr. Comyns Berkeley: The Teaching of Midwifery. (Lloyd Roberts Lecture.)

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CLAYE, A.M., M.D. Leeds, F.R.C.S. Eng., Honorary Assistant Surgeon to the Hospital for Women at Leeds.

GILL, J. W., M.B., Ch.B. Aberd., Certifying Surgeon under the Factory and Workshop Acts for the Montrose District of the County of Angus.

RANDLE, A., M.D. Lond., Medical Superintendent of the Mile End Hospital.

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Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100. Also Registrar. £50.

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Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

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Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P. At rate of £135.

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Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also H.P. Each at rate of £100.

Hertford County Hospital.—Hon. Radiologist. Also Hon. Pathologist.

Heston and Isleworth Urban District Council.—Half-time Asst. M.O. At rate of £350.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Part-time Jun. Cas. O. At rate of £150.

Huddersfield, Bradley Wood Sanatorium for Pulmonary and Surgical Tuberculosis.—Res. M.O. £500.

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anxiety. They almost always disappear under X rays or radium. *Large nodules sometimes prove refractory* and require surgical removal, but it is probable that a freer use of radium would, even in such cases, render operation very seldom necessary. For widespread simultaneous invasion of the skin, with a tendency to ulceration, we must resort to X rays combined with light. This, the most distressing form of recurrence, will often prove largely intractable—but at the worst it is generally possible to keep the patient from becoming the mass of stinking sores which would formerly have been her fate. Radiation, while it may not cure, does have an inhibiting effect upon putrefaction even in the worst cases.

The patient with inoperable recurrence in the cervical glands may present a serious problem, as they are apt to cause great pain. Such patients are often very low in vitality and spirits, and respond poorly, or even adversely, to X ray treatment. I have found from experience that the best thing to do is to put them on a course of ultra-violet light. This usually has a remarkable effect upon their health, weight, and spirits, and enables them to profit by deep X rays to the glands at a later date. There is no doubt in my mind that in some instances patients of this type may be literally snatched back from the edge of the grave by treatment with ultra-violet light. Nor is the effect merely evanescent. It may, to my personal knowledge, prolong life for two years or more. This experience is also that of workers in the light and X ray departments of the Cancer Hospital.

I have known deep X rays in large doses relieve the swollen arm due to axillary recurrences. In its worst form it is a dreadful affliction. Amputation of the fore-quarter has been proposed for it and once or twice carried out. It is admittedly a desperate remedy, but in a really bad case in a relative of my own I feel sure that I should have it carried out if I could find a surgeon to do it. Internal metastases—in the lungs, mediastinum, or liver—defy radiation, but whenever there is pain it should be tried for its sedative effect. Metastasis in bone is a field in which deep or high-voltage therapy gives results which cannot be obtained by less penetrating rays. It is frequently possible to cause the regression of a particular growth of bone, though of course multiple metastases will conquer in the end. Metastatic deposits in the spine frequently cause severe and intractable pain. Deep X rays may relieve this to some extent, but the difficulty is that patients so affected are usually too ill to be brought for X ray treatment.

The Hopeless Case.

As the story of the cancer patient begins with the general practitioner who makes the diagnosis so, as a rule, it ends with him in sole attendance. But his final task, painful though it often is, has been immensely lightened by the aid of the radiologist. When I was in general practice I was seldom without at least one patient dying of cancer. The reason was not the abnormal size of my practice but the length of time these unfortunate patients took to die. Often the whole house was permeated with the smell of them and the odour seemed positively to rush out into the street at once when the front door was opened. Yet they lived for months, a terrible burden to themselves, their families, and their medical attendants. One of the greatest contributions of radiotherapy to medicine has been that such patients are now for the most part kept on their feet, physically unobjectionable, until within a few weeks of the end. Still, *there does inevitably come a time when the patient can* no longer struggle out to attend for X ray treatment. It is wise to forestall this time when one sees it approaching by suggesting a rest. This course is far sounder from a psychological point of view than to wait until the patient herself feels that she can no longer make the effort. To allow her to come to this point is, as a rule, to make her abandon hope, whereas to hold out the prospect of a later return for treatment avoids any abrupt realisation.

When the patient is finally bedridden morphia should certainly not be withheld, but it may be desirable at first to give it by the mouth only and to camouflage it as a tonic. Sometimes heroin causes less general disturbance. I think it is cruel to force highly concentrated nourishment upon these patients against their will, or, at any rate, in the absence of any desire. Under such circumstances the only thing the patient really craves is a little water; this is no doubt nature's way of hastening dissolution.

One drug should certainly be avoided for patients in extremis, even those who, while they have not actually reached this stage, are obviously not far from it. That drug is lead. I say this not because I think that lead has no effect in inhibiting the growth of cancer. Sometimes it has such an effect, and that is why in the moribund case it may delay the final exit. But the risk is, in my experience, that, while life is prolonged, pain is increased. I can express no opinion as to the general value of lead in cancer, but if it is tried at all let it be on those whose general health is good, so that the drug may work in conjunction with the *patient's power of resistance. That the body offers a* resistance to the spread of cancer can scarcely be doubted, and that the resistance may suddenly give way is a matter of clinical observation. Salvarsan and quinine, both at first thought to be specific remedies acting directly on the respective organisms of syphilis and malaria, have been shown to require the coöperation of the body cells in order to effect their purpose. We may be sure that any beneficial action of lead must presuppose reactive power in the system, and its ultimate success cannot be looked for when there is already extreme exhaustion.

General Care.

This is a matter which almost exclusively concerns the family doctor. Is the patient to be told the nature of her complaint? Some years ago it was customary in most cases to conceal the truth; whereas in men suffering from malignant disease, frankness has always been the rule rather than the exception. But times have changed; women have taken their place beside men in almost all the business of life, and there would seem to be no further justification for withholding disturbing knowledge simply because of the patient's sex. Some women would go utterly to pieces if they knew they had cancer, but so would some men. Each case must be judged on its merits. In most instances it is desirable that the patient should know what is the matter. How else can we secure her intelligent coöperation in her after-treatment? It is, fortunately, not necessary that the word cancer should even be mentioned. It is possible to establish a perfect understanding between doctor and patient without any definite statement. When a complete removal of the breast is recommended, most women know, or at least strongly suspect, what this means. *It is a mistake* to give any patient an opening to ask forthwith "is it cancer?" The advice as to operative removal should be coupled with a statement that it will be necessary for some time afterwards to employ X rays at intervals, in order to avoid any risk of return. This suggestion of the possibility of recurrence is in nine times out of ten sufficient to stop the patient from asking a direct question; at the same time, she is comforted by the thought that something will be done to forestall what she dreads. A question as to whether X rays will make certain that there will be no further trouble is not often asked. If it is, I think the practitioner is justified in being very reassuring. At the worst there is one chance in three that she will be alive and well in three years' time, and with proper post-operative treatment my belief is that the odds against survival are reduced to 60 per cent. This is the scientific *forecast* based on *statistics, but the general* practitioner is dealing with an individual, and the mental attitude of that individual to her trouble is going to have an effect upon the survival prospects in her particular case. Recurrence in cancer depends not only upon the malignancy of the growth but upon the patient's resistance to it. It matters little what view we take of the essential nature of neoplasms—whether we regard them as analogous to the manifestation of syphilis or tubercle—or look upon them as collections of atavistic cells which have revolted from civilised restraint and determined to indulge in a primeval orgy of reproduction. In either case the tumour cells do not have it all their own way. Pathology tells us that local barriers of fibrous tissue are set up, and clinical observation makes it abundantly clear that general resistance may suddenly fail, with dramatic consequences. A patient who *has been going along, perhaps for years, without much change,* fails to appear at the clinic. The next day a letter arrives from a relative to say that "Mrs. So-and-So seems to have gone all to pieces in the last week," and in a few days she may be dead. Sometimes, if there is a little warning, the resistance may be restored for a time by purely constitutional means, such as treatment of the whole body by light. Or the re-energising process may be a purely mental one—as when a patient hears that a much-thought of son or daughter is travelling half across the world to see her. Under such circumstances I have seen patients revive in a most extraordinary way, and sometimes survive for months, or even a year or two, when it had seemed to all that the end was approaching. The converse of this is also seen: a patient doing well receives a shock, or undergoes a period of some anxiety, and breakdown occurs. The importance of mental attitude must therefore be fully recognised, and it is not only justifiable but obligatory upon us, while admitting by implication the nature of the disease, to take an optimistic view of the prospect of cure.

Fifty years ago to tell a patient that he had consumption was regarded as a death sentence. Only yesterday I had in my consulting room a man, 60 years of age, who told me that when in his twenties he had had, while out shooting, a sudden attack of pulmonary hæmorrhage. Two of his brothers had died of consumption, and he immediately contemplated using his gun on himself. On second thoughts, however, he decided that it would cause less disturbance if he merely ran full speed up a neighbouring hill. This he did, firmly believing that this violence would produce a fatal rupture; he arrived panting at the top, but the expected flood did not come. It was just at the beginning of the fresh-air cure era. The young man looked around, saw that the prospect was fair, and decided to build himself a hut on the hill top. He did so, lived in it for a year, and has never shown any signs of the disease since. The mention of lung tubercle does not now produce a feeling of despair, though many still die from it. Instead of side-stepping the issue with cancer patients, it would be far better to try to strip the disease of the worst of its terrors. Judged by relative standards, cancer is not among the worst of maladies. Under modern conditions, it is, as a rule, comparatively merciful. Rheumatoid arthritis in its worst forms, tuberculosis, actinomycosis, osteomyelitis, and chronic progressive disease of the nervous system may all be far worse afflictions, yet their names do not inspire the same dread. Many, even in the medical profession itself, are inclined to indulge in a kind of devil-worship, shaking their heads and chanting the words "the cause will never be discovered, and there is no cure," as if they were an invocation. Let us turn our backs on superstition. So long as there is no visible recurrence, the purely precautionary nature of X rays or other treatment should be emphasised. If recurrence actually occurs, it should be made light of and its purely local nature insisted on. If small recurrences are dealt with effectively by radiation, it is astounding to see how little the patient comes to fear them. Faith in the treatment, once established, is fortunately hard to shake. But if misfortune decrees that intractable external lesions become established before internal ones have had time to do their work, the process is usually so prolonged that patients have time to accustom themselves to the idea that they will never be really cured, and for the most part do not trouble the doctor with embarrassing questions. If they do ask, it is no use promising a cure for what is obviously getting worse in spite of treatment.

It is generally admitted that nearly all patients who have had cancer of the breast will show a recurrence if they live long enough. I have myself seen this happen after more than 20 years of freedom. Unless we are to regard such manifestation as cancer de novo, we must assume that malignant cells can lie dormant literally for decades. This means that every patient should be regarded as holding metastases at bay by reason of her natural powers of resistance. Therefore all the recognised means of maintaining good general health should be employed—fresh air, food containing a due supply of vitamins, suitable clothing, exercise, and rest and change when necessary. One must avoid making such patients think they are invalids, but tasks involving excessive strain or worry should not be deliberately entered upon.

Eight Points.

(1) Indefinite resistance or fullness which is not tender calls for exploratory section.

(2) Such exploration is dangerous unless performed with a special diathermy knife, or else preceded and followed by X rays.

(3) Mastitis showing a typical clinical picture may be treated for some weeks by X rays, to see if it subsides.

(4) In the majority of cases, the patient finds a nodule by accident while washing. Of such cases treated by surgery alone, two out of three will be dead in three years, certainly in five.

(5) Pre- and post-operative X rays and light treatment greatly reduce the percentage of external recurrences, and in many instances prolong life.

(6) Operation plus X rays is at present the treatment of choice, but it is possible that in the near future radium will oust surgery as routine treatment.

(7) Trauma is of great importance in the ætiology of breast cancer. Physiotherapeutic treatment at an early stage will reduce the risk of subsequent malignant change.

(8) The successful treatment of patients suffering from carcinoma mammæ is largely concerned with maintaining their resistance to latent foci of the disease. In maintaining the resistance, mental health is as essential as that of the body.

PUBLIC HEALTH IN GIBRALTAR.

ACCORDING to the annual general report for 1928, now issued from the Colonial Office, the estimated total population of Gibraltar at the close of the year was 16,281, of whom 15,719 are fixed residents. These figures represent the population between sunset and sunrise, but some 4500 aliens and 1500 British subjects resident in the neighbouring Spanish town of La Linea come into Gibraltar daily. The number of births during the year was 366, of which 212 were boys and 154 girls. The birth-rate per 1000 was 23·28. The births refer to the fixed population only, as under the Aliens Order in Council no alien may give birth in the Colony. 293 deaths were registered, and the crude death-rate was 17·40 per 1000. Infantile mortality was 122·0 per 1000. Deaths from pulmonary tuberculosis were 1·0 per 1000; 21 persons died from cancer. The general health of Gibraltar continued to be good. The vital statistics are considered satisfactory, and with regard to infectious disease there is nothing of outstanding importance to record, except an outbreak of measles, of which 961 cases were reported, 11 being fatal. The epidemic was of a mild nature, and complications were rare. The sanitary work of the Colony is carried out by the city council, who also have charge of the roads, lighting, water-supply, and hygienic measures in dwellings. A new Ordinance has been enacted to bring local legislation up to the standard required by the International Convention relating to Dangerous Drugs.

The general climate of Gibraltar is mild and temperate, though somewhat hot and oppressive during the months of July and August. The meteorological record for 1928 shows 69·5° F. as the mean maximum temperature, the highest shade temperature being 90·0° F. on July 27th, and the lowest 42° F. on Jan. 1st. The rainy season is spread over the period from September to May; the annual average rainfall is 35 inches, but in 1928 only 25·44 inches were registered, of which 7·06 inches fell in November.

The tourist traffic again showed a slight increase. Various improvements are being carried out which will make it possible for tourists to visit the three principal sights of Gibraltar—the Galleries, the Water Works, and the Moorish Castle—in greater comfort and in shorter time than has hitherto been required. It is also hoped that a first-class hotel will be erected in the near future.

AN AMERICAN INVESTIGATION OF CONTRACEPTION.

THE Holland Rantos Company, dealers in obstetrical and gynæcological materials, 150, Fifth-avenue, New York City, has made a statistical investigation of the efficacy of the contraceptive technique, which it recommends. This consists of the routine combination of an occlusive device, a spermaticide, and a douche. The Rantos type of occlusive pessary resembles the familiar Mensinga type, except that the Rantos has a spiral spring in the rim in the place of the watchspring which maintains the shape of the Mensinga. The spermaticide is a lactic acid-jelly combination, with the trade-name of Koromex. It is put up in a collapsible tube, to the screw nozzle of which a cannula is attachable. The jelly is smeared round the rim of the pessary, and is expressed upon the rubber dome of the pessary, which is worn convexity upwards, from the collapsible tube. The pessary requires to be fitted by a doctor. The Company sent out 2300 questionaires, and received 726 replies. These showed that the combined method of diaphragm and spermaticide gave a satisfactory result in 90 per cent. of all cases. In the hands of specialists in contraception, the percentage of success is claimed to be as high as 97 or 98 per cent. Satisfactory results were recorded with the spermaticide alone in 66·8 per cent. of cases.

RICKMAN'S SECOND SERIES OF EIGHTEENTH CENTURY POPULATION FIGURES.

Two years ago we noticed a book by Mr. G. Talbot Griffiths entitled "Population Problems of the Age of Malthus." Since this date there has come to light in the General Register Office a bound volume of manuscript notes and workings from which the estimates for the pre-census populations were derived. Some of the implications of these notes are discussed in a paper by Mr. Griffiths that has appeared in the *Journal of the Statistical Society* (Vol. XCII., Part 2, 1929). They have an important bearing upon the comparative reliability of Rickman's first and second series of calculations of the pre-census population of England and Wales, appearing respectively in 1801 and in 1841. It has generally been assumed that of these two series the later was the more reliable. Mr. Griffiths's chief aim in his paper is to show that, in fact, the data from which the 1801 series was calculated were more reliable than those that formed the basis of the 1841 series.

ANOTHER LOCAL ANÆSTHETIC.

WE published last week a note under this heading which referred to a drug shortly to be placed on the market by the Clayton Aniline Company, Limited, under the name of Percain. A further reference to it will be found in our Vienna letter this week. The company informs us that the drug is being tried in certain metropolitan hospitals and privately, and can be obtained from their pharmaceutical department at 40, Southwark-street, London, S.E.

QUEEN ALEXANDRA MILITARY HOSPITAL, MILLBANK. The Prince of Wales will open the new wing of this hospital on Nov. 26th at 12 noon. Application for tickets should be made to the Commanding Officer of the hospital.

An Address

ON

PSYCHOLOGY AND MEDICINE.

Given to the Medical Section of the British Psychological Society on Oct. 23rd, 1929,

BY HENRY YELLOWLEES, M.D. GLASG.,
F.R.C.P. EDIN., D.P.M.,
PHYSICIAN AND LECTURER IN PSYCHOLOGICAL MEDICINE TO ST. THOMAS'S HOSPITAL.

IN the closing pages of his text-book William James stated that Psychology was not a science; that it was only the hope of a science, and that it was waiting for some one who would be to it what Lavoisier was to chemistry, and what Galileo was to physics. He added that when such a person arose the necessities of the case would make him a metaphysicist. Such a person has now arisen, and the revolution which James foresaw has taken place. Few will deny that Freud has been to psychology all that Darwin was to biology and that Newton was to mathematics, and more. That is my personal view, and I hold it sincerely. The necessities of the case, however, have not succeeded in making Freud a metaphysicist, though they have gone some distance towards accomplishing that feat with Jung. Apart from this one point James's prophecy has been wonderfully fulfilled.

PSYCHOLOGY AND SCIENCE.

Freud has lifted from psychology for ever the reproach of being only the hope of a science. In spite of the stupendous difficulties in the way of collecting data, and of the unusual and elusive nature of the data when found, he has triumphantly brought order out of chaos by applying the methods and the spirit of science to the deepest and most secret workings of the mind. We may ignore the debatable fringe which is inevitable in every great scientific advance, and is merely the crest of foam which the wave may carry along with it or may leave behind. The fact remains that he has reduced psychology to a system of tested and proven theories which can be applied with helpful and illuminating result to practically every department of human activity.

It is not unfair to say that this system claims to be the only system of truly scientific and practical psychology. It certainly realises and states that it is incompatible with any other. I propose therefore to deal almost entirely with it in what I have to say. I have called this paper Psychology and Medicine, but you will understand that when I use the word "psychology" it is the doctrines, the methods, and the view-point of psycho-analysis that I have in mind. It is with the application of scientific psychology to medicine that we are now concerned, and we may look for a moment in passing at the question: Who is to do the applying?

I need not remind you that new scientific knowledge, once given to the world, becomes the common property of all interested and intelligent people. A very short course of instruction will enable any average student to know more about antisepsis than Lister, and more about political economy than Adam Smith. Each generation begins where its predecessors left off, and the discoveries of a great mind, once added to the stock of human knowledge, become the current coin and the commonplaces of lesser minds who would never have had the genius to make them, and may not have the ability fully to understand or apply them.

This process is well illustrated in the case of psychology. The main outlines of Freud's methods, and the more general and simple of his conclusions, have met with a wonderfully ready acceptance from a large section of the intelligent medical and lay public. One no longer hears the phrase "the new psychology." It has become the ordinary, and, indeed, the only, psychology.

What the modern young person does not know about complexes, projection, sublimation, and all the rest of it seems hardly worth knowing. And why not? It is always something to have the glad tidings accepted at all, and one cannot fairly complain if a convert's enthusiasm occasionally outruns his understanding. In any case it is rather beside the point, because if we are to come to any conclusions about the application of psychology to medicine we must consider the process as it is carried out by the acknowledged psychological experts. To do otherwise would be less than fair.

What scientific psychology has to offer to medicine is the psycho-analytic method of investigation and treatment. I say "investigation and treatment" because, as you all know, the two are inseparable. The investigation is the treatment and the treatment is the investigation. So inseparable are they that, as Dr. Ernest Jones and others have pointed out with proper pride, diagnosis very often comes after treatment and not before it. Though there are those who would object to this state of affairs, I for one have no complaint to make of it. I view it simply as one of those "necessities of the case" which William James, in his innocence, regarded as calling for the services of a metaphysicist. Psycho-analysis must make her contribution to medicine in her own way. She has also the undoubted right to say who shall or shall not preach her gospel, or, at least, to decide what qualifications her missionaries require. She seems to me to be disappointingly reserved in her account of what manner of man her champion must be, but that is her own affair. I suppose that one should not even criticise her requirements, but I have ventured to make a few comments on her list. It is a short list, but after a reasonably careful search I can find nothing to add to it.

THE EQUIPMENT OF THE ANALYST.

Firstly, then, the medical psychologist must undergo "a laborious special training, demanding at least three years incessant practice." I presume that he obtains the special training from books. As regards the three years incessant practice, it is not quite clear where he obtains his material—perhaps from among the deserving poor. In any case the rule seems an admirable one, and I should be glad to see it come into force.

Secondly, he must possess, before beginning this training and practice, "a good knowledge of neurology." The precise reason for this particular stipulation eludes me at the moment, but one can commend it heartily on general principles. At the least it is a graceful courtesy towards the art of medicine. It is indeed the one and only concession which the psychologist is specifically asked to make to the vast subject which he is approaching, and as such it has every claim to honourable mention.

Thirdly, the medical psychologist must himself have been analysed. This, although it is by no means universally observed, seems an eminently reasonable condition to make. It is one more of those "necessities of the case" which keep cropping up. Not being a metaphysicist, I must refrain from dealing with the delightfully interesting questions which it raises. I shall not even propound them. Personally I am entirely in agreement with the poet who says, referring to psycho-analysis, "Only those who brave its dangers comprehend its mystery." It is true that the poet is ostensibly referring to the sea, but, as we all know, the sea is a universal symbol of the unconscious, and his real meaning is thus quite clear.

Finally, the psychologist must have certain personal qualities of which patience, unimpeachable integrity, tact, and sympathetic understanding are those officially recommended. Such qualities are obviously ornaments to any man, though I confess that I had never regarded the two latter ones as being essential to, or characteristic of, a devotee of pure science. I learn *from* Dr. Ernest Jones that without these qualifications the psychologist may fail to "gain the patient's confidence to the requisite degree." But this will never do. If there is one thing with which a scientific method has no concern it is surely the gaining of people's confidence by one's personal qualities. That is work for an unscientific and inferior order of beings.

In the very paper from which I have just quoted, and almost on the same page, we read: "In *suggestion* treatment the physician adds something to the patient's mind—confidence, belief, &c. The psychoanalytic method does not add. It is in almost every respect the reverse of treatment by suggestion." I cannot reconcile these two quotations. It looks very much like more work for our metaphysicist. Perhaps I should say, in parenthesis, that if anyone cares to object that I am quoting from a very old paper, I reply that I freely admit it, and that I hope to *tell* you why before I have finished.

However, if the psychologist really desires the graces of tact and sympathetic understanding it is not for others to suggest that he may put them to such base uses as that of gaining a patient's confidence. Let us rather rejoice that he adds these virtues to his unimpeachable integrity and his good knowledge of neurology, and let us consider how this "verray parfit gentil knight" will fare in his great adventure of applying psychology to medicine. Our knight-errant's venture, I am sorry to say, is a failure. It is rather a splendid failure, because he kills any number of dragons, he does little or nothing that is *actively* harmful, and he does a great deal that is helpful and wise and good. But he fails for all that.

PSYCHOLOGY AND "OBJECTIVITY."

There are various points of view from which the comparative failure of analytical psychotherapy can be discussed. The first one, which is staring us in the face, is the question of the attitude of the psychotherapist to the patient he is about to treat. Scientific psychology has not the slightest hesitation in defining that attitude. The goal to aim at, we learn, is complete objectivity on both sides. This is admittedly difficult for weaker brethren, and it did not greatly surprise me to learn from Dr. Glover that "every psychotherapist at one time or another is aware of a tendency to backsliding." The two commonest wanderings from the straight and narrow path of objectivity are, apparently, "flirtation with endocrinology," and "an impulse to give the benefit of the doubt to organic factors in illness." These are indeed regrettable lapses. I can only say of the first that boys will be boys, and of the second that it looks as if the good knowledge of neurology were already *proving a* double-edged weapon. What happens, by the way, to the tact and sympathetic understanding I cannot tell you. I presume that they fly out of the window as objectivity enters the door.

The purely objective attitude is, of course, the only right and proper one for a scientific inquiry. It is the ideal way to approach, say, a fossil, or—to be strictly accurate—for two fossils to approach each other. As between two human beings, ill or well, I should have thought that its utter *impossibility* would have been obvious to anyone with the very slightest experience either of medicine or of real life. But the psychologist cannot alter his attitude when he comes up against real life. To do so would be to destroy an admirably sound scientific edifice. If the facts of life will not fit in, so much *the worse* for them. And so it happens that his position sometimes comes to resemble that of the research physiologist whose experiments so often work perfectly in a test-tube and fail completely in the human *body*.

But we are in a stronger position than the physiologist. He cannot say, with any hope of being generally believed, that the human body is the same thing as a test-tube, but we can, and do, talk about "the series of events in space-time that constitute the living self." Many people will accept this statement without pausing to inquire what, if anything, it means. A few will realise how it recalls the delicious and polysyllabic fragrance of Herbert Spencer, and hardly any will have the courage to tell us that as a way of looking at medicine or life it is an academic and old-fashioned absurdity. But it certainly helps to justify the attempt at objectivity, which is always something.

Now there is a certain proportion of medicine
of life which comes into the field of vision even of
man who thinks that to study life is to look with
complete objectivity at "a series of events." With
this amenable proportion the psychologist deals
admirably well up to his limits. With the much
greater proportion which he misses he deals in a way
which is hardly so creditable. He ignores it, as far
as he possibly can, and when to ignore it be
impossible then he misinterprets it or explains
away. The attitude of objectivity thus seems to
get us into difficulties from the outset, and I must
refer to some that arise from it before proceeding to
other aspects of our subject. They can be summarised
easily enough. Psychology is a science, medicine
is *an* art. It follows that when psychology has
given all she has to give it is only the purely scienti
aspect of medicine that can possibly benefit. A
in every medical operation, down to the simpl
piece of therapy, there is an inevitable mixture
science and art. There is a scientific basis, there
a scientific technique, and there is—or ought to be
an element which, because it is art, defies analy
but without which results are apt to be comm
place and incomplete.

I need not tell you that psycho-analysis does
accept this view. It cannot see any necess
difference between the attitude of a physician
patient and that of a psychologist to his pr
It will never admit that there can be any el
in any human relationship which is incapable of
scientifically analysed and explained.

PSYCHOLOGY AND "SUGGESTION."

Well, of course, there is, as we all
psychologists included—and it is here that
begins. The psychologist finds before he h
tackled half a dozen patients that by far
vital and potent factor in his relation wit
and his treatment of them, is something abo
his psychology is silent and with which even
knowledge of neurology does not seem to h
Let me digress here for one moment to beg
to misunderstand me on the question of
medicine. For unscientific medicine I have
contempt and I have an even greater one for th
brood of so-called "pseudo-sciences" whic
round it. There is nothing worthy in medici
is unscientific, but there is a very great deal in
which transcends science, and which scien
as yet explain or apprehend. Particularl
true in psychological medicine, and, a
saying, this is a fact which modern p
cannot and will not grasp.

When I said a moment ago that she
on the subject, I was speaking something les
truth. She is, of course, very far from si
forgets that there is nothing unscientific
unable to explain a fact, and that indeed, th
business of science is not to explain facts, bu
and observe them. She puts every single fa
connexion that she cannot fully explain
enormous heap—a rubbish heap—and on the
the heap she plants a banner with the strange
"suggestion."

The thing now proceeds on lines which ps
analysis has itself made only too familiar to
The fact that something exists which we don't
stand is, of course, intolerable, and the
mechanisms come into play. A compreh
explanation of "suggestion" is evolved, which
the psychologist the most ample grounds for
beside his banner the red flag of "danger." Conc
this [illegible] o you [illegible] if I call it "

technical name and say "this rationalisation?"—I have only to say without hesitation and with every hope of violent contradiction that it is probably the most sadly inadequate performance of which any science has ever been guilty.

But the matter does not end here. Though the psychologist has now a respectable "reason" for disliking "suggestion," yet he goes erring after it time and again, partly because he wants to, and partly because he cannot help it: it is a necessity of the case—of every case. This sad but familiar state of affairs may, I think, legitimately be termed a conflict. Officially—or consciously—the psychologist shuns "suggestion" like the plague. Unofficially—or unconsciously—he coquettes with it daily. Need I tell you the inevitable result? I don't mean minor results such as the lapsus calami which I quoted to you, but the main psychological result. It is simply the mechanism of an obsessive fear writ large. Psycho-analysis and its disciples are suffering from a psychoneurosis—a compulsion neurosis. The word "suggestion" is to them precisely what a red rag is to a bull—and for many parallel reasons.

Although I have dealt with this at some little length—the treating of people, however inadequately, with their own medicine being always attractive—it is really only the approach to a number of more important and practical questions which arise when we come to consider the actual treatment of patients by the psycho-analytic method. We have to deal with people who are sick in a particular way: people who may be described generally as suffering from mental disharmony of some kind or other. Our problem is a thoroughly practical and clinical one—what has scientific psychology to say to the victim of mental disharmony?

THE AIMS OF ANALYTICAL THERAPY.

Fr tells him first of all that with his coöperation
repro disentangle and lay bare the very roots of
spite o that it can make him realise the sources from
collectin is thoughts arise and the machinery by which
of the d s. Such a realisation, it continues, will dissolve
order o he inhibitions, the make-believes, and the
spirit of ties which cloud thought and hamper conduct,
of the will become a man who sees himself as others
which i or even more clearly, and who sees life steadily
and is ole. Finally, and best of all, the psycho-
carry a symptoms which were the result and the
remains mental disharmony will disappear as mental
of teste is restored. That is the essence of
with he gy's contribution to medicine; that is its
every d to the sick man. The message is, in the
It is rfectly true, and yet, as I have said, it is a
be the egarded as a contribution to medicine. It
psycholo re, not because it is inaccurate, but because
incompa lequate.
to deal a remind you that for the purposes of this
I have I am freely granting the general soundness
but you nain body of psycho-analytical therapy,
"psychol its efficacy within its own limits and its
the view from harmful effect upon patients. You
It is wit that on all three grounds it has been fiercely
medicine and many of you would agree that some
for a mo ows have been dealt it along these lines.
to do the arrel with it is of a different nature, and as
I need n above points are concerned I am quite
once give without prejudice—to take it at its own
perty of for the present. Besides, I very largely
very sho th that valuation. I believe that in a
average of cases psycho-analysis is more likely than
any other method permanently to remove a given psychoneurotic symptom.

But we shall all be agreed that that is but a poor compliment. The mere removal of symptoms is a small matter—do not even the suggestionists the same? Analytical therapy's self-imposed task and method is the disentangling and rearranging of the whole mental life of the patient, so that psychoneurotic symptoms become an impossibility. Neither is there salvation from neurosis in any other method. The whole thing is admirably logical and scientific. It is like an infinitely skilled workman dealing with some intricate and delicate machinery which has gone wrong.

There is bound to be an ascertainable and remediable cause for the irregular functioning so long as the laws of matter and motion remain. Yes, here it is; the friction is eased, or the foreign body removed, the parts are reassembled, and off we go again. Unfortunately, human beings are not constructed on the lines of a motor-car, or an eight-day clock, and they are just as incapable of completely scientific psychological analysis as they are of purely objective psychological approach.

THEORY AND PRACTICE.

What exactly do we find when we begin to dissect the mind of John Smith? We find, for one thing, that he is a mass of ideas, prejudices, reactions, and beliefs, many of which are utterly irrational and are constructed on similar lines to psychoneurotic symptoms, differing from them, I suppose, only in degree, if at all. In any case, he certainly cannot be analysed and save these things intact. Down must come the entire structure. It was a queer shape, anyhow. True, it made up what he called his personality, but we can't help that. One must break eggs to have an omelette. And then—though we are debarred from giving him advice or assistance in the task—he can always re-educate himself to a more practical sort of personality, just as the omelette re-educates itself into a square egg. I know of but one recorded instance of this double metamorphosis being attempted with an egg—namely, the classical case of Humpty Dumpty. In that case the re-education was a failure, even with military help, but possibly John Smith may be more fortunate.

Let us take down this absurd looking old cabinet. I have borrowed it from another writer for the purpose. It is composed of hundreds of pieces of various woods, many of them very valuable, but its shape is wrong, the drawers work badly, and the mosaic pattern of the inlay has not been symmetrically arranged. As we proceed even graver faults in construction become apparent. The stresses and strains are all improperly distributed. Here is a stout cross-piece bearing nothing, and there is a lid which is only supported at all because two uprights have fallen out of place and are holding a weight for which they were never intended. However, we shall soon ease that. There is the whole thing on the floor at last. *Requiescat in pace*—or to be literally accurate—*in pacibus*.

Now for the reassembling. Strictly speaking, the new design ought to be specified by the cabinet itself and not by us—it should be a self-governing cabinet—but I waive that point. In a very short time we shall be only too thankful to put the thing together to any design at all. And at the end we shall be left, like the boy who analysed his watch, with half a dozen pieces that don't seem to fit in anywhere, but the cabinet somehow is not the same without them.

Is everything a neurotic symptom which is constructed as such symptoms are? Is everything which crumbles during an analysis a neurotic symptom? Is every irrational reaction or idea or belief a neurotic symptom? If so, what exactly *is* a neurotic symptom? If not, is it good that these things should be dissolved away, and is the analysed or unanalysed state the more healthy?

Be these things as they may, it is very certain that, apart from any "symptoms" he may show, John Smith's life is largely composed of irrationalities, which to him and for him are real and practical truth, and upon which his efficiency and health depend. All the logic is on our side, but the man is incorrigible. We put him right on the facts of life before birth in which he ought to believe but does not; we put him right on the legend of life after death, in which he ought not to believe, but does, and he might at least, one would imagine, live and think according to our logic between the cradle and the grave. But will he? By no means. We tell him, for instance, all about the dangers and terrors of authority, we instruct him regarding infantile attitudes and reactions, and we preach the gospel of psychological independence. And all of it is true enough in its way. But John Smith is horribly practical. He knows all about authority—he was once an office-boy. He believes, with Johnson, that "no two people can be half an hour together, but one shall acquire an evident superiority over the other." His common sense tells him that personality needs a soil in which to flourish and a background against which to be displayed, and that unless the world is to be peopled exclusively by Mussolinis authority will be a reality in every department of human life till the end of the chapter. At least it is a reality, and a gladly accepted one, to him. The same is true of many more of his irrational components. They are the left-over pieces. We have proved that he can be reconstructed—after a fashion—without them, but they were real and essential to him, and he knows how to make use of them. They were his—and will we please give them back.

PSYCHOLOGY AND BELIEF.

I want to go just a step further in this connexion before passing on, and to look for a moment at the objects, rather than the mechanisms, of irrational belief. To begin with, we all know that facts are of different orders and natures, and that in any study of facts by scientific method the scientist must begin by defining the nature of the phenomena with which he is going to deal. The phenomena with which the psychologist deals are conveniently grouped as mental. All the activities of mind and their outcome in behaviour are his province, and it is in connexion with those phenomena, and those only, that he should observe his facts, collect his data, and formulate and test his hypotheses. A patient has, let us say, various convictions and beliefs. These beliefs are psychological phenomena which should be carefully studied as such. That is to say, we can show the patient how his belief arose, whether his mental processes were as logical as he perhaps imagines, how he has rationalised, where he has been swayed by emotion, and so forth. We can, in short, expose and explain the entire machinery by which the belief has been produced, and the mental bases on which that machinery rests. What we cannot do, or rather, what we should not do, is to offer any opinion as to the truth or falsity of the thing believed.

When you have said all you have to say about my conviction that nine sevens are 63, and I then say: "Thank you, but as a matter of fact *are* nine sevens 63?" you have only one proper course—namely, to direct me to the nearest mathematician. The debate is now upon a mathematical question, not a psychological one, and has passed out of your domain into his. To that illustration, which, by the way, is borrowed, there is the reply that in it the mental processes are logical and the conclusion demonstrably sound. But neither fact makes the slightest difference to the principle. The principle still holds if I say, for instance, that my school was the best one, or that my university was the most modern one, or that my system of psychology is the only scientific one. If I tell you these things you may very properly draw certain inferences about me and my mental processes, but you have no business, as psychologists, to deny or dispute my conclusions. I may conceivably be right.

It is surely obvious that our concern should be only with the means by which a belief or opinion was reached. However faulty, insufficient, or absurd these means may have been has no bearing whatever upon the objective reality of the thing believed. That is a question for the appropriate department of knowledge: history, or mathematics, or astronomy, or perhaps the universal testimony of human experience. To all this you may reply that I am needlessly elaborating an elementary point, and discussing an error into which no good psychologist would fall. But failure to look carefully at the elementary points and to discuss them fully has been responsible for more misunderstanding than anything else in psychology. That, by the way, is my justification for lecturing on first principles to an audience of experts. The besetting sin of every medical psychologist is that he insists on running before he has learned to walk. He does more than run, he skates, and it is sometimes over very thin ice. As regards the frequency of this particular error I will only say that when we find, as we so often do, that something in which a patient believes is an externalisation of what he wants to believe, and that his conviction of it is produced by the familiar irrational mechanisms, then we are almost irresistibly tempted to deny to the thing believed the possibility of an independent objective existence.

We yield every day to the temptation to pass judgment on matters with which our psychology has nothing to do, and to confuse the mechanism of belief with the object of belief. A mental conception—a phantasy, if you like—can perfectly well have an independent objective counterpart as well. After all, many objective realities began as psychological ones, if you come to think of it. Although I may apprehend a reality in a round-about and fallacious way, it may exist none the less. It is very possible that in the first instance I believe something to be true because I ardently desire it to be true, and because it would meet my psychological needs if it were true. But does that necessarily make it false or non-existent? It is possible, you know, that realities exist which are suited to our psychological needs, and if it is a question of the fundamental psychological needs of every man and every age, then I think the possibility becomes a probability.

PHANTASY AND REALITY.

Things may exist even though we hope for them. Occasionally, even in real life, a story may have a happy ending. There was once, for example, a small barefoot boy who, stimulated by the effects of stones, nettles, and broken glass, told his companions a silly little childish phantasy of some wondrous place where the floors were of smooth rubber, where neither nettle nor glass might enter, and where there should be no more gravel. And in this strange heaven, said he, there lived one who knew about feet and who cared for them, and who would give to his feet and to those of all who came there a wonderful covering, a protection from pain and cold and wet, a foot-joy such as it had not entered into the sole to conceive. And his companions who were psychologists in the making but were not yet perfected in the tact and sympathetic understanding so necessary to their profession, laughed at him. And the boy cried himself to sleep. And in the morning his father took him to a bootmaker's shop. And there he found not only boots beyond his imagining, but, strangely enough, a pair that fitted his feet and might have been made for them alone, as it were from the foundation of the world.

Nobody considers it impossible, or even remarkable, that things should exist which satisfy our bodily needs. Did you ever think of that marvellous and illogical character, the man who, craving for carbohydrates, found and ate the first potato? What a venture of faith! Almost anything might have happened. What did happen was that when he got home his wife, who was a psychologist but had only a fair knowledge of neurology and none of physiology, explained to him that the potato did not really exist, and that if it had existed it would probably have poisoned him. And the man said that he wished it had. The friends of Christopher Columbus told him that America was simply his phantasy, an externalisation of himself which had no objective existence outside his mind. When they found they were wrong they were much disappointed. Some people are a little disappointed still, but the fact remains that America was not an invention; it was a discovery.

We may note, by the way, that a similar kind of error tends to creep into our dealing with symbols.

This has often been pointed out before, and I do not propose to discuss it at length. All I have to say about it at the moment is conveyed by the story—which deserves to be better known—of the precocious little school-girl who laughed and giggled in the class when the teacher announced a lecture on wading birds, of which the first was the stork. When asked to explain her mirth, she replied with a knowing smile: "Oh, but teacher . . . the idea of there really being any storks!"

Father's mashie was several different things at the children's charades last night. It was an oar, and a putter, and a sceptre, and a fishing-rod. Nevertheless it retains an independent existence as a mashie in its own right, and is, in fact, the actual weapon with which father hacked his way to victory at the seventeenth hole on Sunday, though I admit you would never have thought so to look at the charade, or at the mashie, or, for that matter, at father. But this is rather a digression. If I am not becoming wearisome to you, I should like to consider one more aspect—perhaps the *chief* and central one—of the inadequacy of the psycho-analytic method of treatment.

THE INADEQUACY OF ANALYSIS.

Let us return for a moment to our rough analogy of the wooden mosaic cabinet. I do not wish to push it too far, but I may point out that something has eluded us in our analysis of it. The most important thing of all has eluded us—namely, the glue. We can testify to the strength with which it resisted our separation of the pieces, and to the fact that it looks as if it were all there still—but it will not stick the pieces together again. It has ceased to be adhesive. It will never be adhesive any more unless we add something to it, and, as we have learned, "the psycho-analytic method does not add"

Analytical psychotherapy shuts its eyes, of necessity, to many *of the greatest and most powerful realities* in human life. I say of necessity not only because it works, so to speak, on but one plane and by but one method, but also because it will not admit any realities in mental activity and experience unless they exist upon its plane, are amenable to its method, and can be expressed in its terms. Alone among the sciences it claims a universal applicability, and alone among the sciences it is never at loss. Its discoveries and truths are wonderful and helpful and fascinating, but when seen against the background of its own demanding—namely, the everyday life and health of men and women—they cannot help appearing what Mr. Alfred Noyes in some very striking verses calls "little truths." In a certain immortal allegory we read of a man who could look no way but downward, with a muckrake in his hand; a man who would neither look up nor regard, *but raked to himself the straws*, the small sticks, and the dust of the floor.

Now the usual uninformed and foolish criticisms of psycho-analysis are directed against the muckrake and the sweepings, with which I, personally, can see nothing amiss. The man seems to me to have done the most that could be demanded from anyone in his position. He used suitable apparatus, collected just what one would expect with it, and I have no doubt he left the floor a better place than he found it. Both his position and his implement made window-cleaning impossible. The limited nature of his activities was the direct consequence of his attitude, and it is his attitude to which I object. Such an attitude is bound, as I have been trying to show, to lead to misapprehensions, unwarranted assumptions, and incomplete results. But the greatest tragedy of it is the amount that eludes it altogether. The man does not realise the tragedy, because it never occurs to him to question his attitude, to expand his methods, or to admit his limitations. "I cannot see a sky," he says, "and my rake has never brought it along the floor to me. Therefore there is no sky, and that is the end of it." I fear that this attitude is a necessity of the case, both in the analyst and the analysed.

If, as I imagine, nobody has yet made a post-mortem psycho-analysis of Swinburne, in the approved manner, I beg to propose him as the next victim. Alternatively, if sciences have patron saints, I should put him forward for that office. I know of no one whose outlook shows so clearly both the strength and the weakness of the psycho-analytic position. In particular he possesses in almost unique degree the ability to make a desert and call it peace.

> "Though one were strong as seven
> Yet he with death shall dwell
> Nor wake with wings in heaven
> Nor weep with pains in hell."

The good cheer with which he enunciates this demonstrable truth is in quite the best tradition. And then, of course, we have the well-known lines:—

> "From too much love of living,
> From hope and fear set free
> We thank, with brief thanksgiving,
> Whatever gods may be,
> That no life lives for ever,
> That dead men rise up never,"

and so forth. Could the position possibly be better expressed? Note in particular the psychological independence achieved in the first two lines, the brevity of the transference phenomena, and the scientific caution of line four, merging into well-warranted confidence in the simple dogma which follows. Surely this is the sincere milk of the psycho-analytic word.

By way of contrast I should like to introduce to you the outlook of a very different, and, as I think, a more all-round character, whose creator, appropriately enough, is Mr. G. K. Chesterton. He is a knight, who rides "forever seeking after God," or, as we should put it, he is more interested in looking through the window than in cleaning up the floor. The fact that he may not be able fully to analyse or explain what he may see does not trouble him. He will experience it, and the experience will be none the less valid and real. But will he ever see anything? That I cannot tell you—not at present, anyhow. Shakespeare—or Hamlet—thought so, and the possibility is hinted at in an old-fashioned psychological handbook. And I think we must leave it at that. Besides, it is not the important point. We are not concerned with what he may or may not see. What really matters is that he has adopted an attitude and outlook from which vision is at least possible, and that the attitude makes for completeness and sanity and health, and is indeed essential for them. He is rather a fine fellow, this knight, though I fear that his sublimations and transferences need some attention, because there is in his eyes, he says . . .

> . . . . "the star of an unconquerable praise,
> For in my soul one hope for ever sings
> That at the next white corner of a road
> My eyes may look on Him."

Well, of course, if the man is going to talk that way we can't compete. It would be like inquiring the distance from roast beef to the square root of minus two. Our own familiar jargon, lying on the floor beside that rake, at least sounds as if it meant something, but when it comes to souls, and hope singing, then we give in. Unfortunately, we don't give in, as I have just pointed out, but let that pass. This knight of Chesterton's is at least a man, to whom life is a great adventure, surrounded with wondrous and mysterious possibilities, and is not a disgruntled machine to which life is a matter of complete indifference. Breathes there the man with—mind so analysed, that he doubts which is the happier and healthier and saner outlook?

SYMBOLIC AND INTIMATE KNOWLEDGE.

If psycho-analysis recognised any psychology but its own, I do not think it would be really difficult to clear up this matter of the truths which elude the analytic method. Is it not, in essence, a question of the two varieties of truths, about which William [illegible] has so much to say: the "innate" or "a priori" truths, as he calls them, of the sciences, and the utterly different "truths of experience" or, if you prefer to go back to Locke, "mental" truth and "real" truth?

In Dr. Eddington's wonderful book "The Nature of the Physical World" there is a chapter on Science and Mysticism in which he discusses the same question, using the *terms* Symbolic knowledge and Intimate knowledge. "Intimate knowledge," he points out, "will not submit to analysis; or, rather, when we attempt to analyse it the intimacy is lost and it is replaced by symbolism." In that one sentence the necessary inadequacy of psycho-analysis is unanswerably set forth. If only this were admitted, how the value of its great work would be enhanced. Dr. Eddington gives a wonderfully happy illustration. He supposes, he says, that humour and wit can be analysed. Well, we can all assure him that he is quite right there. He then points out that after a sample of humour has been duly analysed and passed as a joke, the next thing to do is to laugh. "But it may *certainly* be predicted," he says, "that as the result of this scrutiny we shall have lost all inclination we may ever have had to laugh at it. It simply does not do to expose the inner workings of a joke. The classification concerns a symbolic knowledge of humour which preserves all the characteristics of a joke except its laughableness." And that is why psycho-analysis, though not of Scottish ancestry, misses the point of every joke it touches.

Now there are very large departments of life where intimate knowledge flourishes and symbolic knowledge is at a discount. It is when it insists on tackling these that the psycho-analytic method is specially apt to make itself look ridiculous. It becomes hope*lessly confused, for example, between the symbolic* knowledge which is theology, and the intimate knowledge which is religious experience. We cannot now discuss this great subject, but I may take a final illustration from it.

A great many years ago a company of working scientists made a singularly complete reductive analysis of Jesus of Nazareth. I do not suppose that as they carefully divided his clothing they imagined it possible that anything had eluded or escaped them. But something did escape them; something which for 2000 years has done more than any other single factor to influence individual characters and national destinies. I am not now concerned with the nature or the value of this something, but with its reality and potency. I merely state a fact which, if any sane person doubts, he can confirm by reading half a dozen biographies or a history book. Modern psychology, however, has but one method to apply to this unique phenomenon. Armed with our sword of science, and strong in our unimpeachable integrity and, of course, our good knowledge of neurology, we march forth to apply our instruments of precision to what is probably the *greatest truth* of experience. We go one better than our Roman predecessors, for we tear into futile
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and mind of that supreme person [illegible] we sa
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PSYCHOLO [illegible]

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out with machine-made uniformity and mathematical precision. Even its deepest researches and truest discoveries have little practical and helpful relation to the life of experience. As far as John Smith is concerned, the Ego, the Super-ego, and the Id have just about as much to do with his life as the three-card trick has to do with the Derby.

John Smith does not want a system that explains everything; he feels that it would cramp his cosmos and make him think that there was nothing worth explaining. He is not thrilled by the prospect of saying "I understand and I am not afraid." He thinks that it is equally fine, and much more likely to be true, to say "I do not understand and I am not afraid." He has no objection to a poet telling him that hope is singing in his soul, though he wouldn't have put it that way himself, and he is quite prepared to add faith and charity to the orchestra. Another poet has referred to this irrational trio as "the music of the dream that never dies," but those to whom the journey from floor to window presents insuperable difficulties find it simpler to call them "transference phenomena."

I would point out, in conclusion, that in the present trend of psycho-analytical writings we find very striking examples and results of its detachment from practical life, and therefore from practical medicine. The writers seem to turn away from the clinical side of the subject as if aware of its incompleteness and sensing its pitfalls, to wander in the happy hunting-grounds of scientific speculation and research. The actual illness of the patient is sometimes referred to in a way which leaves the impression that the writer's main concern is to get busy with a description of what he has learned from the case, or an account of the principles which it illustrates. These are perfectly legitimate topics, and I quite agree that if a writer's medical equipment happens to consist solely of a good knowledge of neurology, one must be prepared to make allowances, but the high proportion of this kind of work is an interesting and significant fact nevertheless.

I said I would tell you why I quoted from an old paper. It was for the good reason that nowadays papers on practical medical psycho-analysis are almost impossible to find. I thought I had found one a few weeks ago, but as I read on it became clear that the author had not so much as seen the patients whose reactions he was describing.

Not long ago I heard two brilliant papers read during a discussion on a strictly clinical subject, but so far removed were they from the matter under consideration that when they came to be published their very titles had to be changed. While I would not go so far as to compare our psychological knight-errant with Sir Andrew Aguecheek who was dubbed, if you remember, with unhatched rapier and on carpet consideration, although a devil in private brawl, yet I do suspect him of spending more of his time over his well-known text-book on "The Principles of Dragon Hunting" than in single combat with individual
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of therapy, and ever more effective and far-reaching and profound as a system of psychology. But if it were never applied to another patient clinical medicine still owes it a debt which it would be hard to overestimate. We need not discuss the reasons why the acknowledgment of that debt has been perhaps somewhat lacking in readiness and cordiality. It is possible that there may be faults on both sides. I should be sorry to leave the impression that I, for one, did not feel the debt keenly and acknowledge it frankly, and I trust that any apparent flippancies in my remarks have not exceeded the amount which is not merely allowable, but needful, if an address of this unconscionable length is to be tolerable at all. As for my more serious criticisms, psycho-analysis is only too well able to look after itself, and, in any case, I respect it too much to be insincere.

PSYCHOLOGY AND MYSTICISM.

Until psycho-analysis can acknowledge and overcome its limitations, it cannot be what it claims to be: a complete, self-contained, effective, independent contribution to—indeed, a synonym and substitute for—the great art of psychological medicine.

Psychology is not an art; it is only the hope of an art. It is waiting for a greater than Freud—not necessarily a greater genius, but certainly a greater—because a more complete—man. When he arises, the necessities of the case will make him what we should now call something of a mystic, because his great work will be to connect scientific truth in some unimagined way with those great realities of experience apart from which mental life is a mechanical rattle, and mental health an impossibility. He will relate the machinery of mind, as never before, to every fact of life and of experience. It may seem a hard thing to say of him, but I expect he will believe in God. Otherwise I cannot conceive how he will succeed in reaching across the gulf between science and mysticism, between symbol and reality. One can hardly imagine that that gulf may ever be bridged and the road run clear from knowledge of mind to understanding of life and of the mysteries that lie in and around and beyond it. But should it conceivably happen, then science will have achieved her supreme triumph, and one need set no limits to its possible results.

One cannot readily picture the lines along which this great scientist will work nor the discoveries he will make. We can be sure, however, that he will *not be false to science as we know it, though he will* so enlarge its vision and scope that it will become a means of apprehending truths at which now we can only guess. When I think about this new and great scientist, I like to remember that new truths sometimes have a way of turning out to be simply old ones, expressed from a different viewpoint and in words more suited to the time. Remembering this, I sometimes wonder whether the wheel might conceivably come full circle after all, and whether science's last and greatest discovery might possibly—just possibly—prove to be a restatement, in much better words, of course, of something which was said by a great mystic long ago: that "God created man for immortality, and hath set eternity in his heart."

An Address

ON

PITFALLS IN UROLOGICAL DIAGNOSIS.

Delivered at St. Mary's Hospital Post-graduate Course on Oct. 6th, 1929,

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ACUTE PYELITIS.

ACUTE pyelitis is an infection of the mucous membrane of the pelvis and calyces of the kidney most frequently caused by the *Bacillus coli*. The severity of the condition varies considerably. An unrecognised acute pyelitis can lead to a chronic condition, which may prove to be most intractable. The great importance of early diagnosis is illustrated by the following case:—

A British officer, while serving in Mesopotamia, was suddenly taken ill with severe pain in his left side, a high temperature, and rigors. The diagnosis was *sandfly fever*, and the local symptoms were referred to an enlarged spleen, which was said to be present. He came to see me in 1924, when he had been overhauled and chronic pyelitis had been correctly diagnosed by many surgeons, but his symptoms had not been relieved. A routine urological examination revealed a left kidney infected with *B. coli*, a right kidney free, and the bladder unaffected. For one year he showed marked improvement and then suddenly relapsed. I asked Mr. Girling Ball to see him and he was advised to have a nephrectomy done as the only hope of clearing up his symptoms. Before this could be arranged he nearly died of hæmorrhage from an acute hæmorrhagic cystitis. Finally, in 1926, a left nephrectomy was performed and the patient is now alive and well. But his history shows what disaster can follow a missed pyelitis.

The symptoms of acute pyelitis are pain, vomiting, high fever, rigors, pyuria, and later frequent and painful micturition.

Pain.—This always starts in the side or lateral part of the abdomen, and is often described by patients as being situated in the iliac fossa. Never at any time is it referred to the central area of the abdomen. When the attack is established the pain is about the level of the umbilicus, extending from the outer edge of the rectus sheath round the loin to the margin of the erector spinæ. There may be typical referred pain in the groin, labium, scrotum, and down the thigh. It is continuous and not colicky. The severity of the condition varies considerably and cases are therefore classified as mild, severe, and fulminating.

Vomiting.—In most cases in the early hours of the attack there will be a single attack of vomiting, usually immediately after the onset of the pain.

Fever and Rigors.—The temperature is always high and may reach 105° F., and rigors are the most important diagnostic sign. I have never seen an acute pyelitis without a rigor.

Frequent and painful micturition are evidence of bladder irritation and are seen only after a few days, and then only in severe or unrecognised cases.

Pyuria.—In every case pus will be found in the urine, but at the beginning of the attack, when the diagnosis is in the balance, pus is in small amount only, and the more severe the case the less will there be at first.

Differential Diagnosis.

The diagnostic pitfalls are many. The right kidney is more frequently affected than the left in every unilateral renal lesion, and it is in the right-sided pyelitis that the difficulties are greatest. The appendix is at hand, the mimicry of its symptoms is not to be questioned, and acute appendicitis is a very common disease. Moreover, since the one condition demands immediate operation and the other is aggravated by unnecessary operation, the diagnosis is really important. We are here confronted with a clear-cut issue. It is not a question of there being something inside which demands exposure, but of the presence of a lesion which can be easily treated medicinally, and which can become a severe menace to health if unrecognised. I submit that if certain principles are kept ever in sight the diagnosis need never be in doubt. The points to remember are:—

1. In acute appendicitis the pain always starts centrally in the abdomen around the umbilicus and spreads in time to exact localisation in the iliac fossa. In acute pyelitis the pain starts in the side.

2. In appendicitis a raised temperature is common, but not to the same height as that which characterises acute pyelitis.

3. No uncomplicated acute appendicitis ever has a rigor. No acute pyelitis is ever without one.

4. The urine should be examined. It may seem futile to discuss the pitfalls of diagnosis in acute pyelitis when an examination of the urine will settle the issue. But all of us can recall cases where the urine was forgotten. A quiet unoffending appendix may have been removed and days later, when frequent and painful micturition is noticed following appendicectomy, the pyelitis is regarded as a complication. But in truth the pyelitis is not a complication but the primary lesion. James Sherren once said that every bed should have a finger-stall suspended beside it; he might have added the suggestion that the abdomen of every patient should have emblazoned on it in the letters of imagination "Forget not the kidney." There are other conditions which may cause difficulties in diagnosis—e.g., gall-stones, cholecystitis, and other renal lesions. But the appendix is the chief villain of the piece.

The fulminating type of acute pyelitis is of so sudden, so dramatic an onset, and so disastrous a severity that it may be mistaken for a perforation of an ulcer, acute pancreatitis, and so on. The following case illustrates this:—

A young woman, who had been married about a year and lived abroad, was in London on a visit and dining with a large party at a restaurant when she suddenly collapsed. She vomited and was removed to a nursing home, where she was found to have a temperature of over 105° F., intense pain, and rigidity on the right side. Several diagnoses were suggested, but the occurrence of rigors and the presence of pus in the urine clinched the matter and the patient's return to health was rapid.

HYDRONEPHROSIS.

The next pitfall in urological diagnosis is hydronephrosis. The well-established type with a large sac presents a classical picture. There are recurrent attacks of pain in the side, followed by a distinct diminution in quantity of urine passed and the gradual appearance of a tumour in the loin. Later, with the relief of the obstruction, comes the passage of great quantities of urine and the subsidence of the tumour. This definite clinical picture is the one described in text-books and manuals of urology whose authors tend to overlook the fact that every hydronephrosis must have a beginning in a normal kidney, and that there is a long way to go before a large sac is formed. The first change in a kidney in commencing hydronephrosis is the obliteration of the indentation of the pyramid into the calyx, which, therefore, becomes clubbed and not cupped. But this gives but little added capacity to the pelvis, and no general enlargement of the kidney occurs. It is well worth diagnosing these cases early, because as the hydronephrosis enlarges, the kidney cortex atrophies and may finally become a mere shell; the earlier the diagnosis the less interference with renal function. In the early cases pain is the only symptom, and they fall into an acute and a chronic type. In the acute type there is a sudden onset of acute pain in the side, a single attack of vomiting, without fever, rigors, or any urinary changes. In the chronic type there are recurring attacks of pain, which is gradual in onset and less severe, and rather a dull aching pain in the loin, with a complete absence of any other symptoms.

The diagnostic pitfalls are numerous, but perhaps the most common is to mistake the chronic hydronephrosis for a chronic appendicitis. I myself am convinced that there is no such condition as chronic appendicitis in the absence of a previous acute attack, but I am aware that all surgeons would not go so far. In any event no case of chronic right-sided pain should be labelled chronic appendicitis until every other possible diagnosis has been adequately explored. If the possibility of a hydronephrosis is thought of, its presence can be proved or disproved by a pyelographic examination, a simple procedure for everyone concerned, including the patient.

SYMPTOMLESS HÆMATURIA.

Blood may be present in the urine in addition to other abnormal constituents, and with symptoms which make diagnosis easy. There is, however, one group of patients in whom hæmaturia is the only symptom. The blood comes either from the bladder, when a simple cystoscopic examination reveals the source and nature of the trouble, or from the kidney. For renal bleeding we are almost entirely dependent on the vision of blood coming from one ureteric orifice for localising the lesion to one side. It is true that X rays, with or without pyelographs, may reveal the cause, but in a large group of cases the blood must be seen by cystoscope, and the problem is to get the patient examined while he is still bleeding. Often he comes to see us bringing with him a specimen of urine full of blood, but a fresh specimen reveals none; in other cases cystoscopy is delayed so long that a negative examination results. Patients must be instructed to come for examination the moment they see their urine becoming red, even if it means leaving work; and when they present themselves a cystoscopy must be undertaken at once. The need for hurry is the fact that many of these patients are bleeding from a renal new growth.

The way in which blood is passed, whether before or after or during micturition, whether pure blood or mixed with urine, is of no diagnostic import. One point, however, should be noted. Occasionally a clot will be passed, long, cylindrical, and worm-like. This is a ureteric cast, and is pathognomonic of a renal neoplasm. The following case shows the difficulties in symptomless hæmaturia.

A man, aged 56, was seen after an attack of blood in the urine. A complete urological overhaul, including a double pyelography, revealed nothing. On four subsequent occasions he came one, two, or three days after bleeding, always with a negative result. At last I insisted upon his coming up the instant he noticed anything. This time he noticed blood in the urine before a luncheon interval at work. He left his office at 1.25 P.M. and was on the table being cystoscoped at 2.5 P.M. Blood was seen pouring from the right orifice, but it now no longer interested us because a nodular tumour of his right kidney could be felt. This proved inoperable, and although he came first at a period when the tumour must have been removable, nothing short of exposure of both kidneys could have given us the diagnosis.

This case shows the urgent necessity of investigating a hæmaturia at once, and not only within 24 or 36 hours.

CONCLUSION.

In conclusion, let me draw your attention to one method of investigation which is of particular interest in renal lesions—viz., the hyperæsthesia of the skin. Head's work mapped out brilliantly and accurately the skin areas corresponding to the different viscera. I must admit I have been singularly disappointed with the value of hyperæsthesia tests for any viscus save the kidneys. Renal lesions give a very high proportion of positive tests, and the areas should always be mapped out if present. No negative hyperæsthesia test is of any value, but a positive one may prove the conclusive piece of evidence needed. I hope I have succeeded in bringing before you a picture of some of our difficulties in urological diagnoses, and I shall be happy if I have succeeded in refreshing in your minds the teaching of your old teachers, that in every case of abdominal pain the urine should be examined, and the kidneys remembered as the possible source of the trouble.

THROMBOSIS OF THE SUPERIOR CEREBELLAR ARTERY.

INCLUDING REPORT OF A CASE WITH UNUSUAL CEREBRO-SPINAL FLUID REACTIONS.

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THE case described illustrates certain interesting points in the clinical syndrome resulting from thrombosis of the superior cerebellar artery, and provides further material upon which the identification of that syndrome can be based. In addition, the changes in the cerebro-spinal fluid are sufficiently unusual to be worthy of attention.

The patient, a female aged 66 years, was admitted to hospital on Dec. 1st, 1928, complaining of loss of power in the left arm and leg, together with spontaneous movements of the left arm. These symptoms had been present for three weeks, but the total duration of the illness was five months. She had been in poor health for 12 months. For five months she had fidgeted with the left arm, had suffered from attacks of giddiness, and had vomited in the morning. During that time she had been very irritable and easily upset; and at times depressed and excited. Five weeks before admission she had complained of pain across the shoulders and in the left arm; then for two weeks she had suffered from "dermatitis" involving the body but not the face. For three weeks there had been gradually increasing loss of power in the left arm and leg, and the spontaneous movements of the left arm had become more severe. Speech had been a little thick during this time. Five years before she had had an attack of pleurisy and "congestion of the lungs." Shortly afterwards she had had an accident in which she cut the left eyebrow. She had been married 24 years. There had been no pregnancies. Of the previous marriage there were two children, one of whom had died of a spinal complaint.

Condition on Examination.

The pupils were small, the left larger than the right; both were irregular and reacted normally. Vision was good in the left eye and slightly deficient in the right eye. There was apparent narrowing of the visual fields on the temporal side, but a perimeter chart of the fields showed that there was moderate concentric contraction of both fields. The temporal halves of both optic discs were pale; the arteries were small and showed a white reflex; the veins were engorged and kinked where crossed by arteries. The ocular movements were normal and there was no nystagmus. In speaking some words were slurred but everything could be easily understood. Hearing was fairly good. Excepting for weakness of all the facial movements, the other cranial nerves were normal.

Cotton-wool, pain, and thermal sensibility were apparently less distinct in the left arm than in the right. The difference between the two sides was much more obvious in the arms than in the legs. Deep pressure was unaffected. In the left arm there was loss of the sense of position, vibration sense was absent, and localisation was defective. The recognition of size and shape was also defective in the left hand, but normal in the right hand. Because of the variability of attention finer changes could not be elicited. In the right arm motor power was fairly good, muscle tone was normal, and the deep reflexes were sluggish. In the left arm motor power was very poor, muscle tone was much diminished, and the deep reflexes were absent. In the right leg motor power was fairly good, muscle tone was normal, the knee- and ankle-jerks could not be elicited, and the plantar reflex was flexor. In the left leg motor power was much decreased, muscle tone was diminished, the knee- and ankle-jerks were absent, and the plantar reflex was flexor. The abdominal reflexes were all absent. The patient could neither stand nor walk.

Wavy, sinuous movements with a definite, slow pattern, but failing to reach an object if directed towards it, occurred in the left arm on attempts at effort or on emotion. There were slow serpentine movements of circumduction at the shoulder, pronation and supination of the forearm, flexion and extension of the elbows and wrists; flexion and extension of the interphalangeal joints with abduction and adduction of the fingers. With the finger-nose test, on the right there was a slight intention tremor with the eyes open, slightly increased with the eyes closed; on the left there was a pronounced intention tremor with exaggeration of the spontaneous movements, apparently resulting from them. It was impossible to test for Rombergism. Repeated alternating movements were performed clumsily in the right hand and arm and were impossible in the left arm. Rebound was fairly good in the right arm but exceedingly poor in the left. The initiation of the slightest voluntary movement in the left arm resulted in the whole range of the movement being carried out suddenly and the hand falling in a flail-like manner against the face, the body, or the side of the bed. There was definite decomposition of movements and dysmetria in the left arm. An attempt to hold the arms horizontally and parallel in front of the body with the eyes closed resulted in a very slight spontaneous deviation of the right hand to the right and the spontaneous movements of the left arm and hand.

The sphincters were normal. The abdomen was full and the anterior abdominal wall rather lax. The bowels were normal. The heart and peripheral vessels were normal but the retinal arteries were arterio-sclerotic. The pulse was regular; the blood pressure was 160 systolic and 115 diastolic. The patient had a frequent, loose cough; there were sonorous rhonchi over the right lower chest behind, and fine crepitations were audible at both bases. The skull and spine were normal.

The cerebro-spinal fluid obtained by lumbar puncture was clear and contained five "small lymphocytes" per c.mm. There was 0·24 per cent. of total protein. Globulin was present in very marked excess, mostly pseudo-globulin, with the faintest trace of fibrinogen and a trace of euglobulin. Free complement was present. The Wassermann reaction was completely negative with the heated fluid. The Lange test produced the curve: 2346444443. The Wassermann reaction in the blood was negative.

Attention could be gained but not maintained for any length of time; perception and orientation were normal; the memory was defective, and the reasoning power was apparently unaffected. On account of the difficulty in keeping the patient's attention, those parts of the clinical examination dependent upon her coöperation were difficult to carry out.

Subsequent Progress.

Dec. 14th, 1928.—All types of sensation were impaired in both the upper and lower limbs and the patient's coöperation and attention were not so good as they had been at the previous examination. The changes were more advanced in the left arm and had appeared in the right arm as well. In the left arm motive power was practically absent, the limb was flaccid and definite movement towards an object was impossible. An attempt to test the rebound of the limb resulted in its falling like a flail. In the right arm motor power was very poor, muscle tone was decreased, and there was definite intention tremor. Rebound was very poor, while dysmetria and decomposition of movements was quite evident. In the left leg motor power was very poor, the limb was flaccid, the knee-jerk was absent, and there was no response on stimulation of the sole of the foot. In the right leg the same changes were evident, except that the loss of tone was not so pronounced. The right pupil was larger than the left, and both reacted sluggishly to light.

Dec. 31st.—The patient had a respiratory infection with a febrile reaction and rhonchi over the whole of the chest. The heart sounds were strong. The condition of the left arm was unchanged, but the right arm had become almost as hypotonic as the left, with pronounced flaccidity, absence of deep reflexes, dysmetria, decomposition of movements, and absence of rebound. There was complete inability to retain either the right or the left arm in one position. The left leg was unchanged, but in the right leg hypotonia was more pronounced. On both sides an attempt to elicit the plantar reflex produced no response. Spontaneous movements were present in both the right and the left arm when movements of the limbs were commenced voluntarily. Local muscle "twitchings" were present in all four limbs. A chart of the visual fields showed moderate concentric contraction of both fields.

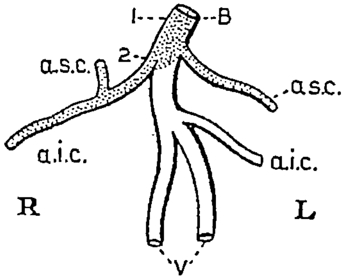
Jan. 1st, 1929.—There were numerous crepitations at both bases.

Jan. 2nd.—The right base was dull on percussion, there were numerous bubbling râles over the whole of the back of the chest, and the heart sounds were failing. Death occurred the following day.

The Pathological Findings.

The autopsy was confined to the brain. There was no evidence of any gross lesion on naked-eye examination. The arteries at the base was examined in detail and found to vary somewhat from the usual anatomical arrangement.

(See figure.) After giving off the posterior inferior cerebellar arteries, the two vertebral arteries united to form the basilar artery at the lower border of the pons. A little above this level a small branch, probably the anterior inferior cerebellar artery, was given off on the left side and distributed to the anterior portion of the inferior surface of the left lateral lobe of the cerebellum. Slightly below the middle of the pons there was a large branch on the right side which immediately divided into two branches, the lower representing the anterior inferior cerebellar artery and the upper the superior cerebellar artery. At the middle of the pons a large branch was given off on the left side—the left superior cerebellar artery. The lumen of the vertebral arteries, the posterior inferior cerebellar arteries, the left anterior inferior cerebellar artery, and the basilar artery as far as the large branch on the right side was quite patent. From the large branch on the right side up to the posterior communicating branches the basilar artery was definitely thrombosed. This thrombus extended into the common stem of the superior cerebellar and anterior inferior cerebellar arteries on the right side and into the superior cerebellar artery on the left. No naked-eye changes were visible in the area of distribution of these vessels.



Diagrammatic representation of the arteries at the base of the brain in the case described. The vertebral arteries (V) unite to form the basilar artery (B) and at once give off the anterior inferior cerebellar artery (A.I.C.) on the *left* side. Above this level and slightly below the middle of the pons, on the *right* side, there arises from the basilar artery a large branch which immediately divides into two branches—the lower (A.I.C.) representing the right anterior inferior cerebellar artery and the upper (A.S.C.) the right superior cerebellar artery. At the middle of the pons a further branch is given off on the left side—viz., the left superior cerebellar artery. The shaded area represents thrombosis. 1 = Recent red thrombus with (microscopically) great excess of leucocytes. 2 = Recent thrombus slightly adherent to vessel wall with more fibrin than 1, and some endarteritis proliferans of inner coat.

Sections of the basilar artery were made (1) midway between the left superior cerebellar artery and the posterior communicating branches; (2) at its junction with the left superior cerebellar artery; and (3) at its junction with the common stem of the right superior cerebellar and anterior inferior cerebellar arteries. Microscopical examination of the first section showed the presence of recent red thrombus with a great excess of leucocytes, both polymorphonuclear and mononuclear cells. The second section showed similar changes, but a little more fibrin was present; the clot was slightly adherent to the wall of the vessel and there was some endarteritis proliferans of the inner coat. The third section was similar to the second, the latter including the left superior cerebellar artery and the former the common stem of the right superior cerebellar artery and anterior inferior cerebellar artery.

Vertical antero-posterior sections were made through the lateral lobes of the cerebellum close to the pons. The sections were examined particularly for evidence of degenerative changes and of any obvious differences between the two sides. Nothing very striking could be made out either in the molecular or the granular layers, excepting perhaps some degenerative rarefaction at the junction of these parts where the Purkinje cells lie, though probably some of this appearance was merely an artefact. In the white matter of both sides of the upper half of the cerebellum there were, however, some small scattered areas of glial rarefaction—"froth-like areas"—probably around or in the neighbourhood of blocked or degenerated vessels, a few of them almost amounting to small degeneration pseudo-cysts. Occasional vessels showed some perivascular "small round-cell" collections, and many had dilated lymphoid spaces around them. Some thrombosis of small vessels was also present in the lower part of the superior cerebellar peduncles and in the lateral parts of the pons.

Commentary.

When the patient came under observation there was probably a number of small thromboses in different parts of the brain, as suggested by the decrease in the patient's mental acuity. The physical signs elicited at that stage would appear to have been due to two distinct groups of thromboses. The spontaneous movements, loss of muscle tone, and the associated changes in the left arm were probably the result of thrombosis of the left superior cerebellar artery, while the sensory changes on the same side were probably the result of thromboses already present in the small pontine branches of the basilar artery on the right side. It appears to be unnecessary to assume that the motor changes and the variations in sensation were the result of the thrombosis of a single artery in a patient in whom there was some evidence of multiple thromboses elsewhere. Such, however, would appear to be the assumption made by Guillain, Bertrand, and Peron in their description of a case of thrombosis of the superior cerebellar artery and identification of the syndrome of the superior cerebellar artery. In their case the three important groups of symptoms were: (1) involuntary movements of the right side and particularly of the arm; (2) a right-sided hemi-cerebellar complex; and (3) left-sided dissociated hemi-anæsthesia of the syringomyelic type. Associated with these symptoms was softening of the superior aspect of the right cerebellar hemisphere and of the lateral aspect of the right side of the pons; disintegration of the right superior cerebellar peduncle and lateral fillet, and no involvement of either the pyramidal system or any of the cranial nerves. It is difficult to see why the entire clinical and pathological picture in this case was included as the syndrome of thrombosis of the superior cerebellar artery. It is more probable that the symptoms and pathological changes referable to the lateral part of the pons were due to thrombosis of the small pontine branches of the basilar artery on that side, and that the symptoms and pathological changes referable to the cerebellum and superior cerebellar peduncle were the result of thrombosis of the superior cerebellar artery on that side. If that were so, the pontine symptoms would have been comparable to those which appear when the lateral arteries of the medulla become thrombosed. The clinical and pathological findings in our case support the view that the clinical picture in Guillain, Bertrand, and Peron's case[1] was the result of two distinct groups of thromboses, for in our case it is impossible to explain the occurrence of sensory changes and cerebellar signs on the same side by postulating that the superior cerebellar artery supplies the lateral aspect of the pons as well as the superior surface of the cerebellum and the superior cerebellar peduncles.

We suggest, therefore, that the syndrome of thrombosis of the superior cerebellar artery might more correctly be defined as: (1) involuntary movements, particularly of the arm on the side of the lesion, together with (2) symptoms of a unilateral cerebellar lesion on the same side. The movements are wavy and sinuous with a definite, slow pattern, failing to reach an object if directed towards it, absent at rest, but appearing and aggravated by attempts at movement or by emotion. The symptoms of a unilateral cerebellar lesion present are those usually associated with such a lesion, but the loss of muscle tone is the most prominent feature. The symptoms are also much more definite in the arm than in the leg.

The pathological changes underlying the subsequent clinical picture in our patient were probably thrombosis of the pontine branches of the basilar artery on the left side as well as on the right, thrombosis of the basilar artery itself and occlusion of the common stem of the superior cerebellar and anterior inferior cerebellar arteries on the right side. The constriction of the visual fields was probably due to interference with the blood-supply to the visual cortex by way of the posterior cerebral arteries; this interference was only partial, partly because of the incomplete occlusion of the vessel and partly because of the anastomotic supply to the visual cortex, particularly to the area for macular vision, through the middle cerebral artery.

It is interesting to note that the so-called syndrome of the superior cerebellar artery was much more extensive on the right side than on the left, in that the leg was affected quite as seriously as the arm. This was due to the unusual anatomical arrangement on the right side—the superior cerebellar and the anterior inferior cerebellar arteries arising from the basilar artery by a common stem. Consequently thrombosis of the stem and of its two branches resulted in interference with the blood-supply of part of the inferior surface of the cerebellum as well as of the superior surface. The difference in the clinical pictures on the two sides strongly supports the localisation of the control of movements of the upper limbs in the upper part of the cerebellum, and of those of the lower limbs in the lower part of the cerebellum.

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[1] Guillain, G., Bertrand, I., and Peron, N.: Rev. Neurol., 1928, ii., 835.

The changes in the cerebro-spinal fluid were unusual and resembled those seen in cases of spinal block. Free complement was present in the fluid, and in the Lange test there was maximum decolorisation of the gold solution in the middle of the series of dilutions. These changes, so common in cases of spinal block, appear to be equally characteristic of cases of cerebral thrombosis in which it is probable that there is some encroachment of the thrombotic areas on the cerebro-spinal fluid system.

We are greatly indebted to Dr. W. E. Carnegie Dickson for the pathological report.

Summary and Conclusions.

1. A detailed description is given of a case of cerebral thrombosis in which the prominent early lesion was thrombosis of the left superior cerebellar artery.
2. The syndrome of thrombosis of the superior cerebellar artery includes spontaneous movements on the side affected, together with the symptoms and signs of a unilateral lesion of the cerebellum on the same side.
3. There appears to be no justification for including the sensory changes frequently present as a part of the syndrome of occlusion of the superior cerebellar artery; they are much more satisfactorily explained as the result of other thromboses in the small pontine branches of the basilar artery.
4. When the superior cerebellar artery arises alone from the basilar artery the clinical picture of thrombosis of the vessel is that described above and involves chiefly the arm; when, however, this vessel arises by a stem common to it and to the anterior inferior cerebellar artery, occlusion of this stem produces changes in the affected leg almost as definite as those in the affected arm.
5. The changes in the cerebro-spinal fluid are similar to those occurring in cases of spinal block; they are probably the result of encroachment of thrombotic areas on the cerebro-spinal fluid system.

AURICULAR FIBRILLATION IN CHILDREN.

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IT is well known that complete arrhythmia is uncommon in children. In the tables of the age-incidence of the disorder which have been published relatively few cases under 20 years occur. Levine found none under 17 out of 128; Brachmann found none under 10, and eight only between 10 and 20, out of 400; Willius had five cases between 11 and 20, out of 500; Mackenzie records five cases under 20, out of 500; Cowan and Ritchie had six between 10 and 19, out of 300; Coombs in 58 cases of rheumatic heart disease had two between 11 and 20; Hart found one under 10 in 300.

In the first decade auricular fibrillation has occurred so rarely that the published records nearly all deal with isolated examples. It has been recorded that fibrillation developed in a child of 3 (Samet and Tezner); digitalis was being given but the authors deny any connexion between the medication and the arrhythmia. No graphic record is published, however, in support of the claim, and as fibrillation is otherwise unknown at this age, the case cannot be accepted as authentic. Resnik and Scott publish the case of a boy of 4 with auricular fibrillation; the ætiology is uncertain, but is probably rheumatic. This is the youngest case in which graphic proof is supplied. Leys and Russell recorded the case of a boy of 6 who came under observation with a large heart. At first there were three distinct rhythms—probably auricular flutter, auricular fibrillation, and normal rhythm—but since then, a period of two years, fibrillation has been present, and the child has had to be kept in bed most of the time on account of cardiac and acute rheumatic symptoms (personal communication). Other solitary cases are reported by Ogden, Ehrenreich, Nobecourt and Pichon, and Sidel and Dorwart. A case recorded by Nadel is quoted by Schwartz and Weiss as an example of fibrillation in a child of 10 or under, but the description of the electrocardiogram, which is not itself published, suggests flutter. Moreover, the child was 11 when the abnormal rhythm was first observed. In the case described by Sutherland and Coombs, the polygram, as Schwartz and Weiss also note, is more suggestive of premature beats than fibrillation. Again, in that of Price and Ivy Mackenzie, said to show fibrillation and complete block, the tracing published leaves the diagnosis of fibrillation uncertain. Neuhof cites the case of a child of 8 whose electrocardiogram is said to show a short paroxysm of fibrillation lasting about three seconds; it is difficult, however, to exclude an instrumental cause for the oscillations which have been taken to indicate fibrillation in this record. In Coombs's series of rheumatic cases with fibrillation there are two under 10, but no details are given. In these 11 reported cases, aged 10 or less, rheumatic heart disease was certainly present in six and probably present in two others. In three of the cases in which the arrhythmia was permanent, death occurred on the average seven months after it was discovered. One patient is still alive two years after the inception of fibrillation, though confined to bed.

Recently Schwartz and Weiss have asserted that fibrillation in children is not nearly so rare as has been supposed. They recorded it with the electrocardiograph in 10 out of 60 patients admitted to hospital with rheumatic heart disease in a period of five and a half years. Six were aged 7½ to 10, and four 11 to 15. Four of their cases died within a week of the onset, and three more within a year. The authors believe that the unusually high incidence of auricular fibrillation in their cases was the result of more careful observation and, as evidence in support of this, they quote the incidence—a much lower one—for a previous period in their hospital. Another factor must be considered, however, and that is the quantity of digitalis which their patients received; in the instances in which the dose is stated, the amounts usually exceed those which in this country would be considered adequate for an adult. All were having digitalis at the time of onset of the arrhythmia. In discussing the causation of the arrhythmia in their cases Schwartz and Weiss consider digitalis as a factor, but only in one case do they regard it as being definitely related to the onset; in the others they regard the relationship as unproved. It remains quite likely, however, that digitalis is the explanation of the high incidence of fibrillation which they discover in children. There is no lack of evidence, both experimental and clinical, that digitalis is able to produce auricular fibrillation. (See Danielopolu, Mackenzie, Reid, and Resnik.)

Thirty-five Cases of Auricular Fibrillation in Children.

In 15 years (1913–28) auricular fibrillation was diagnosed in 1164 cases admitted to the London Hospital; females were twice as numerous as males.

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* Working under the Paterson Bequest.

Those of 17 and under have for the purpose of this investigation been considered as "children." There were 30 "child" cases, or 2·5 per cent.; five have been added from other sources making 35 in all; the sex ratio was three girls to two boys—a smaller female predominance than in the adults. The youngest was aged 12. The diagnosis of fibrillation rests on graphic proof in only 10 cases—an unfortunate fact, due largely to the present reliability of clinical methods which are satisfactory for any but research purposes, and partly to the serious condition of some of the patients, which did not justify interference for non-essential examinations. Where graphic records are lacking the other findings are as conclusive as possible, and in all the following criteria are satisfied: rapid and very irregular heart, persistent irregularity, and response to digitalis by considerable slowing. Rheumatic heart disease was the basis of the arrhythmia in all cases, and a history of the acute illness was lacking in six only. The average age at which the first rheumatic symptom showed itself was not unusually early, though a majority of the cases had suffered from symptoms of heart disease for a considerable period before the onset of the irregular rhythm; in 19 cases this period averaged four and a half years; in four cardiac symptoms appeared for the first time with the onset of fibrillation. As is the rule in adults, failure was a familiar accompaniment of the inception of the new rhythm and occurred in 22 out of 30 in which satisfactory information on this point could be obtained. In five failure had made its appearance while normal rhythm was present, and in the remaining three no failure was observed immediately or shortly after the onset.

Clinically, mitral stenosis was diagnosed in 25 of the 35 cases, four of these having aortic incompetence in addition; in two the aortic valve alone was affected. The heart was enlarged to palpation in all, considerably so in 17 (48 per cent.). Thirty-one cases have now been traced, and of these 23 have died of heart disease after an average duration of ten months with auricular fibrillation, the maximum period being five years and the minimum three weeks. It is interesting to note the fate of three patients in whom reversion to normal rhythm took place after short periods of fibrillation. In one in whom the reversion was spontaneous death occurred five years afterwards from meningitis, normal rhythm persisting till the end. Another, a boy of 16 successfully treated with quinidine, is alive and has normal rhythm six and a half years later, and is able to do light work. The third case merits, perhaps, a description in more detail.

In 1913 a girl, aged 17, was admitted to hospital with mitral stenosis, auricular fibrillation, and failure, the onset of which coincided with that of the abnormal rhythm. Treatment with rest and digitalis gave some relief but she was still very ill at the time of her discharge and the parents were told that she would be unable to do any work. In 1929, 16 years later, she reported at the hospital with normal rhythm. The heart was considerably enlarged, and the signs of mitral stenosis and aortic incompetence were present. She was in fairly good health, and said that from a time six months after her discharge from hospital she had been doing office work, and her only enforced absence from this had been a period of two weeks with "influenza." Moreover, she was able to dance and to play tennis for an hour at a stretch. It is impossible to date the return to normal rhythm in this case, but it probably happened soon after she left hospital as she has never since felt the heart beating rapidly as it did then.

The subsequent duration of life in these three instances of return to normal rhythm forms a contrast with the expectation of life in those with persistent fibrillation, which may not be without significance.

Established fibrillation in young people of 17 and wher must be regarded as a serious condition which probabl long survived. In 23 cases the average duration parts of after the onset of the abnormal rhythm was patient's ths. During those months the patients were at that stage wo with congestive heart failure on which distinct groups is had little effect. This is in contrast movements, loss oonding condition in adults, in whom the average duration of life is much longer (four and a quarter years in a group of 47 rheumatic cases followed up till death),† and appropriate treatment commonly gives rapid relief. No other cause than rheumatic heart disease was found to account for fibrillation in children. It was not found that rheumatic fever had affected the patients at an earlier age than usual, but a history of suffering from heart disease for several years before the onset of the arrhythmia was the rule, although severe symptoms and the signs of congestive failure only appear, in the majority, when the change in rhythm occurs.

I have to thank Dr. John Parkinson for his help and those physicians of the London Hospital who have permitted me to use their cases.

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GLUCOSE INTOLERANCE IN VARIOUS DERMATOSES.

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SINCE 1915, when Pels published his results of an investigation of the blood-sugar content of 50 cases of various dermatoses, several papers have been written on the subject, but, although all the investigators agree that a slight hyperglycæmia occurs, the type of lesion in which the rise is present varies in the different papers.

Pels [1] found the blood-sugar varied from 0·07 to 0·156 per cent., the average being 0·107. These readings showed hardly any increase above the normal, but were approaching the higher limit of normality. He suggested that further research would elucidate the types of lesion in which an alimentary hyperglycæmia could be inferred, and that the treatment of hyperglycæmia would be a useful aid in the treatment of skin diseases.

In 1916, Highman, Schwartz, and Mahnken [2] investigated 149 cases, 89 of which gave no increase, but a group of 60 cases of acne, seborrhœa, and sycosis gave a more or less constant hyperglycæmia. They considered that lesions of the pilosebaceous follicles were more liable to be associated with hyperglycæmia. In 1921, Pick [3] reported an almost constantly increased blood-sugar content in cases of psoriasis, a slight increase in the majority of seven cases of furunculosis, and a moderate hyperglycæmia in six of 12 cases of secondary syphilis. McGlasson[4] investigated a large series of cases but only took one reading of each patient. He did not think that the hyperglycæmia was the only ætiological factor but noted a definite sensitiveness in some cases, and that the hyperglycæmia was higher at each recurrence of the disease. He found a marked improvement in the skin lesion when the patients were given a carbohydrate restricted diet.

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† Unpublished observations.

In England Haldin-Davis, working with Willis,[5] found a definite abnormality in 13 out of 20 cases of eczema but was unable to correlate abnormalities in blood-sugar with any particular type of eczema. He found that diabetic treatment was unsatisfactory. Campbell and Burgess[6] divided skin lesions associated with hyperglycæmia into two groups—namely, those occurring during pregnancy and those developing in patients over 50 years of age. They reported good results following suitable dieting, and pointed out that there is nothing to suggest sugar intolerance in the appearance of a lesion, but that it should be suspected where an intractable dermatitis develops in a person of middle age who was previously quite free.

The Present Investigation.

This paper embodies the result of personal investigation of 120 cases at the Manchester and Salford Hospital for Skin Diseases.

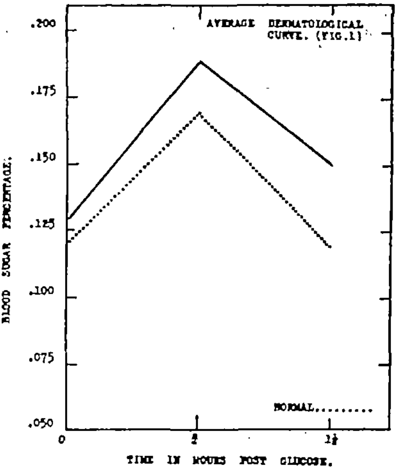
A fasting reading was taken in each case; 50 g. of glucose in 150 c.cm. of water were then given by the mouth and further readings taken three-quarters and one and a half hours later. The normal blood-sugar varies considerably in healthy subjects, so the average for a series rather than individual results have been taken wherever possible, and the highest limits of normality have been taken as 0·12 per cent. for the *fasting level and 0·17 for the maximal reading.*

Of 120 cases of all types of dermatoses only 28 (23·3 per cent.) gave normal sugar readings. The other 92 showed some deviation from the normal, though in many cases the abnormality was only slight. The average curve for the series was a fasting level of 0·13 rising to 0·188 three-quarters of an hour after the ingestion of glucose, and decreasing to 0·15 in another 45 minutes (Fig. 1). From these results it will be seen that a large percentage (76·7) of patients suffering from dermatological lesions show some abnormality in their blood-sugar content. Furthermore, the abnormality is in most cases of the "lag" type, an abnormality which points to some defect in the mechanism by which glucose is stored in the liver as glycogen.

The question next to be considered is the type of lesion in which a hyperglycæmia is liable to occur. To ascertain this a pathological classification was first adopted.

In psoriasis, of which 14 cases were examined, the average blood-sugar curve was raised throughout to a slight extent, rising from a fasting level of 0·13 to 0·19 per cent. in the second reading and falling to 0·16 in the last reading. In the lichen group—a group of diseases characterised by intense itching—the curve was higher throughout, rising from 0·151 to 0·207 and falling to 0·177. In nine cases of pruritus—localised and general—in which no cause for the pruritus could be discovered and which were, therefore, classified as pruritus simplex, the curve rose from 0·134 to 0·206, falling to 0·141 in an hour and a half. Forty cases of eczema showed on the average a very slight increase but some delayed lysis, the three estimations reading 0·131, 0·191, and 0·148. A group of 20 cases of disease of the pilosebaceous follicles, such as acne vulgaris and coccogenic sycosis, gave readings 0·121, 0·173, and 0·130, showing practically no increase at all.

From these figures it will be seen that a slight increase occurred in each group, but a much more marked increase was present in the lichen and pruritic groups. The statement of Highman, Schwartz, and Mahnken that diseases of the pilosebaceous follicles showed the most marked hyperglycæmia was not confirmed. In fact this group of cases showed the least deviation from normal of the whole series. Pathological classification did not point to any one lesion being associated with glucose intolerance. The lesions showing the greatest deviation from the normal—namely, the lichen and pruritic groups—had a common symptom in itching which is most marked in both conditions. It was, therefore, thought desirable to investigate the association of hyperglycæmia with itching.



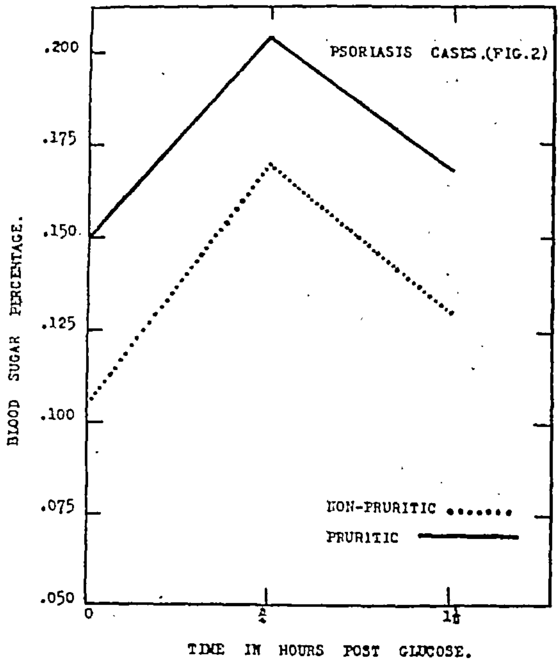
Symptomatic Classification.

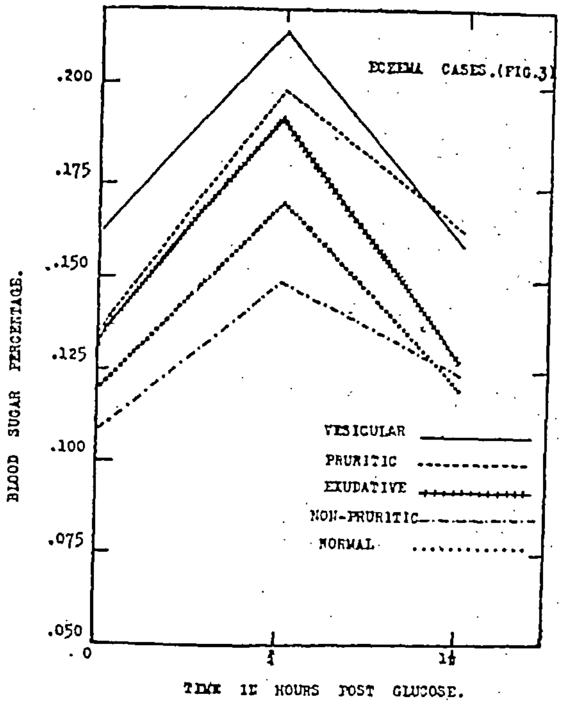
In considering the relation of pruritus to the presence of hyperglycæmia it is useful to have a lesion of definite pathology and clinical appearance in which pruritus is variable. Such a lesion is psoriasis vulgaris, which is a chronic inflammatory disease of the skin characterised by scaliness but in which there is no exudation.

In my series of psoriatic patients the disease was, to all appearances, identical in all the cases. Actively erupting lesions were not tested, since pruritus is present in this form more or less constantly, but in cases of some weeks' duration pruritus is sometimes present, sometimes absent. The cases chosen were clinically in the same stage of the disease—that is, they were of some weeks' duration and the surface of the skin had not been made sore by the application of strong ointments. Eight out of 14 of these cases were associated with pruritus and gave an average curve of 0·151, 0·204, and 0·169 per cent., while the remaining six cases in which pruritus was absent gave a much lower reading of 0·104, 0·17, and 0·13 (Fig. 2).

In the cases of the eczematous group the problem presented more difficulties since the term eczema covers a number of lesions which vary considerably in clinical features. The cases were divided, therefore, into four classes according to the clinical stages of the disease. The first stage consists of an erythema without abrasion of the surface and accompanied by intense pruritus, which is termed the pruritic type of eczema. This may progress to the formation of papules which later become vesicles; pruritus is still intense; this is termed the vesicular type. One or two changes may now take place; either the vesicles become broken giving rise to a "weeping" eczema, or the skin may resolve into a dry, hardened, non-pruritic condition. These types are termed respectively the exudative and the dry non-pruritic type.

In examining the average curves given by these four subdivisions it was found that the vesicular type gave the highest reading with the pruritic type slightly lower in the first two readings and slightly higher in the third reading. The exudative type came next with readings higher than normal, and the dry non-pruritic type lowest, with a response to glucose less than the maximal normal (Fig. 3).





Type of eczema.	Pruritus.	Fasting.	Blood-sugar estimation per cent.	
			¾ hr. post-glucose.	1½ hrs. post-glucose.
Vesicular ..	Present.	0·162	0·217	0·158
Pruritic ..	,,	0·136	0·202	0·163
Exudative ..	Absent.	0·122	0·193	0·127
Dry non-pruritic	,,	0·108	0·148	0·124

The values below normal of the dry non-pruritic type are of interest and suggest a response on the part of the organism to the raised blood-sugar content present in the earlier stages of the disease.

In eczema, therefore, it appears that pruritus and the occurrence of any hyperglycæmia are directly related. In addition, however, the presence of an epidermal exudate is also associated with hyperglycæmia for so long as the exudate is retained in the tissues, but, when the exudate escapes externally, as in "weeping" eczema, the pruritus ceases and the hyperglycæmia disappears. This suggests absorption of the epidermal secretion as a cause of the hyperglycæmia.

In addition, 58 out of 67 (86·6 per cent.) patients who complained of itching showed some intolerance to glucose.

Discussion.

McGlasson found a hyperglycæmia associated with pruritus and the present results confirm this. It is, however, impossible to state dogmatically that hyperglycæmia will or will not be present in any given case.

Previous writers suggest that the hyperglycæmia points to the patients being potential diabetics. Many of the cases in this series were under observation for two or more years, and in no case was a true diabetes or even glycosuria noted; in addition only a few diabetic patients give a history of previous skin trouble. There seems to be no definite evidence, therefore, for the assumption that these patients are potential diabetics.

In America, restriction of carbohydrate in the diet has given good therapeutic results in cases associated with hyperglycæmia. In our hands dietetic treatment has not been satisfactory although restriction of carbohydrate diet does lessen the pruritus in many cases. Some writers have found carbohydrate restriction of use in the treatment of acne vulgaris; this has not been our experience, as might be expected from the fact that such lesions do not show any marked abnormality in carbohydrate metabolism. Whether we should regard the hyperglycæmia as an ætiological factor or as a concomitant condition is the subject of further research.

In conclusion, I should like to express my indebtedness to Drs. G. H. Lancashire, Louis Savatard, and R. Gibson for allowing me the use of their cases, and to Dr. William Dyson, who has given much useful criticism and advice in the preparation of this paper.

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A "UNIVERSITY WARD" AT NOTTINGHAM.—Seven beds in Nottingham General Hospital have already been endowed with money raised by the students of the city's University College, and progress is being made towards the provision of an eighth. The students are ambitious of eventually endowing a complete ward of 20 beds, and it has been arranged that it shall be called "University Ward." The hospital has now received £20,000 on account of this year's Hospital Saturday Fund.

Clinical and Laboratory Notes.

THE ISOLATION OF *BRUCELLA ABORTUS* FROM A CASE OF UNDULANT FEVER.

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Dalrymple-Champneys[1] has collected records of 14 well-authenticated cases of undulant fever originating in England. Recently another case has been reported by Bloxsome and Davey.[2] The diagnosis of these cases has rested on the agglutination of *Brucella abortus* by the patient's serum. The following case is remarkable for the isolation of *Br. abortus* in pure culture from the blood.

Clinical Report by MR. NIGHTINGALE.

The patient, Mrs. B., came under notice first on May 20th, 1929, with slight pyrexia of about 100–101° F. No symptoms beyond a little malaise were complained of. Between April 17th and May 6th she had spent a holiday on the continent, visiting Belgium, Germany, Austria, and Switzerland, the last week being spent in Switzerland.

In view of our ignorance of the incubation period of this disease it is impossible to say whether she contracted her infection abroad or shortly after her return to this country. There is likewise no evidence to indicate how infection occurred; she dislikes raw milk, and takes it only in tea or coffee.

Throughout the whole pyrexial period, lasting for some 13 weeks, there was a striking absence of symptoms and physical signs. The patient never looked ill and lost neither weight nor colour. The pulse-rate never rose above 70–80. When the temperature was at its greatest height she had a feeling of nausea and a great distaste for food, but beyond that there was nothing to note. There was no sweating and no pain.

The blood was tested for a Widal reaction early in the illness and proved negative. On July 12th a sample was sent to Dr. Knyvett Gordon at the Virol Laboratories, and he reported it as giving a negative Widal reaction to all the typhoid-paratyphoid group but as agglutinating *Br. abortus* in a dilution of 1/400. A further test on July 24th made by Dr. Wilson gave agglutination to *Br. abortus* in a dilution of 1/1280. Recovery, though tedious and slow, was complete, and the patient at the end of October was in full normal health. It may be said briefly that no form of medicinal treatment seemed to have the slightest effect on the course of the illness.

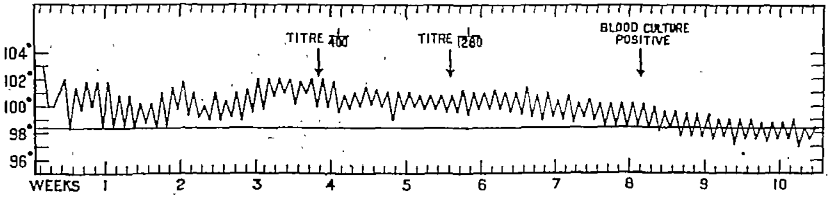
The accompanying chart, which was not commenced for three weeks after the onset of the illness, illustrates the undulant character of the fever, and the very gradual fall to normal.

Bacteriological Report by DR. WILSON.

The patient's blood was collected on August 11th at about the beginning of the twelfth week of illness; 5 c.cm. were taken by Mr. Nightingale into a tube of glucose broth which was sealed with a special rubber cap and despatched by post.

On the next day the blood-broth mixture was distributed as follows: (1) 1 c.cm. into flask A, containing 50 c.cm. of Huddleson's liver extract[3] broth, pH 6·6; (2) 5 c.cm. into flask B, containing the same medium; and (3) 5 c.cm. into flask C, containing 500 c.cm. of glycerol broth, pH 7·2. The three flasks were put in a modified McIntosh and Fildes's jar, and 5 per cent. of the air in the jar was replaced by CO_2 from a cylinder. After incubation at 37° C. for four days the cultures were inoculated on to agar and glycerol agar slopes, which were incubated in 5 per cent. CO_2. As no growth occurred after five days these subcultures were discarded. A second series of subcultures were made from the flasks on the seventh day, using agar slopes only; one set of slopes were incubated in 5 per cent. CO_2, and one set were fitted with paraffined corks.

Two days later the agar slopes inoculated from flasks A and B, and incubated in 5 per cent. CO_2, showed discrete, circular, convex, translucent, greyish-yellow colonies, having a diameter of 0·2–1·5 mm. Microscopically these consisted of small Gram-negative cocco-bacilli, 0·8–1·3 μ long and 0·4 μ broad. Similar colonies appeared after five days in the sealed tubes inoculated from flasks A and B. The tubes inoculated from flask C remained permanently sterile; but in a third series of subcultures on to agar slopes, made after the flasks had been incubated for nine days, growth was obtained from all three flasks.



Temperature chart in a case of *Br. abortus* infection.

The organism that was recovered from the patient's blood was identified as *Br. abortus* for the following reasons. Besides having the typical morphological and colonial characters of this organism, it failed to ferment any of the usual sugars, it rendered litmus milk alkaline, it produced a small amount of ammonia from peptone water, and it blackened lead acetate medium in three days. For the first two or three subcultures it refused to grow aerobically, though it grew in sealed tubes in four or five days, and in 5 per cent. CO_2 in two days. Inoculated intramuscularly or intraperitoneally into guinea-pigs in a dose of about 500–1000 million organisms, it gave rise to no obvious illness; when the animals were killed after four to eight weeks the spleen was slightly enlarged and was covered with tiny greyish gelatinous nodules, projecting slightly or not at all above the surface; in two animals inoculated intramuscularly into the thigh the sublumbar glands were slightly enlarged; in the animal inoculated intraperitoneally two or three mesenteric glands were enlarged, and the testes were acutely congested. A serum prepared against the patient's strain agglutinated to titre a number of *Br. abortus* strains that were recovered from milk in this country by Wilson and Nutt in 1926.[4] Cross-absorption tests put up between the patient's strain and one of the bovine strains, using the sera prepared against these two strains, showed that both organisms were able to remove all agglutinins from both sera.

Four strains, reputed to be *Br. melitensis*, were available for testing; of these only two could be regarded with certainty as belonging to this species. Neither of these two known strains, nor a third strain, whose history was unknown, were agglutinated to titre by the patient's serum, nor were they able to absorb completely the agglutinins from this serum. The fourth strain, whose history was unknown, appeared to be antigenically identical with the patient's organism. A strain of *Br. abortus* of porcine origin, tested against the patient's serum, was agglutinated to only ¼ titre, and was unable to remove more than about 75 per cent. of the agglutinins.

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It appears, therefore, from its morphological, metabolic, and serological properties that the organism isolated from the patient belonged to the species *Br. abortus* rather than to the species *Br. melitensis*, and from its serological properties that it conformed to the bovine rather than to the porcine type of *Br. abortus*.

THE IMPORTANCE OF TRANSFUSION IN THE TREATMENT OF PERNICIOUS ANÆMIA.

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THE introduction of liver therapy has entirely altered the outlook in pernicious anæmia, and the great majority of cases make a satisfactory recovery. In a considerable number, however, liver therapy fails or death occurs before liver therapy could reasonably be expected to succeed. In such cases transfusion of blood may be of the utmost service, either in giving a stimulus to the bone-marrow that liver alone appears to be unable to give, or in keeping the patient alive until response to liver treatment occurs.

We subjoin notes of cases which illustrate these points, and call special attention to Case 1, in which a second transfusion seemed to save the patient's life after a single transfusion and intensive liver therapy had failed and the outlook seemed hopeless. Case 2 illustrates a further point which we have frequently noted in the treatment of pernicious anæmia. That is the hitch in progress which often occurs when the percentage of hæmoglobin has reached a figure in the neighbourhood of 60. This difficulty is surmounted by a temporary massive dosage of liver and liver extract, and some ingenuity may be required in making the requisite quantity of extract acceptable to the patient. In this connexion some of the liver extracts on the market are useless.

CASE 1.—Male, aged 55, gunpowder worker, was first seen as an out-patient on May 30th, 1929, complaining of breathlessness, weakness, and a sensation of numbness of the fingers of seven months' duration. He gave a history of glossitis five months before the onset of his present complaint. He was thin and had a distinct lemon-yellow tint in the skin. His pulse-rate was 90 and his blood pressure 100; hæmic murmurs were audible. Appetite was poor and a test-meal showed entire absence of free hydrochloric acid, and a profuse growth of streptococci was obtained from the meal. No lesion of the nervous system could be detected. Blood examination revealed changes typical of pernicious anæmia, a striking feature being anisocytosis. He was sent home to be treated by his own doctor and ordered half a pound of liver a day.

The patient was seen again on June 11th, 1929, obviously much worse, and was admitted to hospital. The pallor of his lips and conjunctivæ and the lemon-yellow tint in the skin were very pronounced. Examination of the blood showed 1·15 million red corpuscles with 23 per cent. of hæmoglobin and reticulocytes 1 per cent. He was put on a dose of liver extract equivalent to 1 lb. of liver daily, but gauged by enumeration of reticulocytes there was no response, and on June 10th the red corpuscles had fallen to 0·89 million with hæmoglobin 15 per cent. and reticulocytes 1 to 2 per cent.

It was decided to transfuse him. The donor was the patient's nephew and the citrate method was employed. One pint of blood and one pint of saline were given. The patient had a slight rigor 1¼ hours later with a maximum temperature of 100° F. During the next few days he suffered from gastro-enteritis and it was impossible to get him to take his full dose of liver extract. He steadily became worse. The reticulocyte count never exceeded 2 per cent. and the hæmoglobin fell to 12 per cent. on the 24th.

At this stage it was decided to transfuse him again. The same donor, the same method, and the same amount of blood and saline were used. One hour after the transfusion the patient had a severe rigor and the temperature reached 104°. On examining a film the day after transfusion the most striking feature was an invasion of nucleated reds, a feature which had been entirely absent up to this point. The reticulocytes rose steadily from 1–2 per cent. on the day of transfusion to 44 per cent. on June 28th, and then fell again to 2 per cent. on July 6th. The patient improved from the date of the second transfusion on extract equal to 1 lb. of liver per day. The following table shows the blood counts at different stages.

Date in 1929.	Red corpuscles in millions.	Hæmoglobin percentage.	Colour-index.	Leucocytes in thousands.	Reticulocytes per cent.	Notes.
May 30th.	1·04	35	1·1	2·8	—	Out-patient.
June 11th.	1·15	23	1·0	2·0	1–2	Admitted.
" 19th.	0·89	15	0·9	—	1–2	Transfused.
" 24th.	0·52	12	1·2	—	1–2	"
" 26th.	0·75	18	1·2	—	10	—
" 28th.	1·075	21	1·0	—	44	—
July 6th.	2·15	35	0·83	2·8	2	—
" 25th.	3·35	66	0·9	3·0	—	—
Aug. 26th.	4·8	90	0·9	6·2	—	Discharged.
Sept. 25th.	4·9	98	1·0	7·8	—	Out-patient.

CASE 2.—A married woman of 37 was admitted on June 10th, 1929, with a history of progressive anæmia with intermittent attacks of metrorrhagia and gastro-enteritis. On admission she was unconscious, with a heart-rate of 130, an imperceptible pulse, and a blood pressure too low to record. Blood examination revealed: red corpuscles 355,000, hæmoglobin 8 per cent., colour-index 1·14, leucocytes 1200, reticulocytes nil. She was immediately transfused. The citrate method was employed and two and three-quarter hours were occupied in passing one pint of blood and a pint of saline into the vein. During the transfusion she recovered consciousness and was able to talk in a confused manner. From the day of her transfusion she received liver extract equivalent to half a pound daily and steadily improved. The table shows the blood counts at various stages.

Date in 1929.	Red corpuscles in millions.	Hæmoglobin per cent.	Colour-index.	Leucocytes in thousands.	Reticulocytes per cent.
June 19th.	0·355	8	1·14	1·2	Nil*
" 22nd.	0·67	12	1·0	1·4	1–2
" 25th.	1·04	18	0·9	2·0	30
July 3rd.	1·86	32	0·9	—	5–6
" 7th.	2·025	36	0·9	3·6	1
" 22nd.	3·36	62	0·9	—	0·5
Aug. 2nd.	—	62	—	—	—
" 5th.	4·2	75	0·9	—	—
" 19th.	4·51	82	0·9	—	—

* Transfused.

The interesting feature is the fact that progress was arrested with the hæmoglobin at 62 per cent. When this occurred the dose of extract was doubled and raw liver added to the diet, after which the patient resumed her steady improvement and was discharged on August 19th, 1929, with 82 per cent. hæmoglobin.

CASE 3.—A married lady, aged 28, was seen by one of us in consultation with Dr. Fergus Hewat. She had become anæmic in the late stages of pregnancy and there was excessive bleeding at her confinement and some bleeding continued. The anæmia increased, and when seen three months later she was yellow, dyspnœic, distressed, and almost inarticulate. The red corpuscles numbered only 0·46 million. Megaloblasts were fairly numerous. The leucocytes were increase and included a few myelocytes. The diagnosis was pernicious anæmia complicated by hæmorrhage. As the condition seemed desperate an immediate transfusion was decided upon, and this was carried out by Mr. J. M. Graham. The result was most gratifying. Next day the anxiety and dyspnœa had gone and the patient was able to take liver extract. Films made four days after transfusion showed a remarkable picture of megaloblasts, many in mitosis, and some normoblasts with budding nuclei. For the last blood count we are indebted to Dr. Hewat, who tells us that the patient made a complete recovery.

Date in 1929.	Red corpuscles in millions.	Hæmoglobin per cent.	Colour-index.	Leucocytes in thousands	Reticulocytes per cent.
May 23rd.	0·45	15	1·8	18	2
,, 27th.	1·39	28	1·08	10	20
June 24th.	4·1	82	1·0	—	—

Summary.

(1) Cases are recorded illustrating the importance of transfusion and, if necessary, of repeated transfusion in the severest examples of pernicious anæmia. (2) Progress in pernicious anæmia under liver therapy is often interrupted when the hæmoglobin percentage is in the neighbourhood of 60. This interruption may be tedious but can be overcome by massive doses of liver and liver extract. (3) It is important that only liver extracts of known activity should be used.

Medical Societies.

TUBERCULOSIS ASSOCIATION.

At a meeting of this Association held at the British Institute of Radiology, Welbeck-street, W., on Nov. 15th, a discussion took place on the ætiology and treatment of

SEROUS EFFUSION IN ARTIFICIAL PNEUMOTHORAX.

Dr. W. **Stobie**, opening the discussion on ætiology, said that the question presented many intricate problems, for the final elucidation of which a good deal more experience than he himself possessed was necessary, especially on the laboratory side. He had tackled the question from two aspects: from the point of view of the literature, and from his own personal experience. Many causes were adduced for the occurrence of serous effusion in artificial pneumothorax—the local anæsthetic, the cold air, too rapid filling, irritation of the gas, too much gas, pressure on the pulmonary vessels at the root of the lung, intercurrent affections, the introduction of minute portions of the tissues through which the needle has passed, over-exertion, menstruation, stage of the disease, injury of the visceral pleura, separation of adhesions, and so on. It was generally agreed, however, that age, sex, type of disease, or even the resistance of the patient, had little or nothing to do with the onset of an effusion. The speaker was convinced that the frequency of this complication was much greater than was generally believed, and was probably in the neighbourhood of 50 per cent. Many of these effusions could not be diagnosed without the help of the X rays. They should be on the look-out for a possible effusion when a slowing was noticed in the usual rate of absorption, or when on the manometer an unusually quick return occurred to the positive side. Among exponents of artificial pneumothorax there were extremely wide variations in technique, but there did appear to be one common factor—the separation of the pleural surfaces by the inflowing gas, whatever it might be. Moreover, in looking through a recent series of cases of his own, the one outstanding feature in those where fluid had developed was the presence of adhesions, generally in the upper part of the lung. It was more than likely that these adhesions were, as Dr. Gloyne had suggested, disease-bearing surfaces, which, undisturbed, were doing Nature's work of limiting the disease. Once they were stretched they were involved in the complication of hydrothorax. The stretching resulted as a rule from a combination of two closely allied forces—too large a volume of gas at too long an interval, especially a rapid jump from—e.g., 600 c.cm. to 1000 c.cm. after the lapse of several weeks. It was well to remind themselves from time to time that the original procedure in artificial pneumothorax was collapse of the lung and not compression—two very different things. The speaker also drew attention to the frequency with which fresh signs in the better lung or pleura had preceded the appearance of an effusion. Another point brought out was that the complication of serous effusion was more apt to occur in out-patients, who, freed from close medical care, were apt to take undue liberties in various directions.

The pathological examination of the fluid should theoretically give a good deal of help in determining the cause of an effusion in any given case. For example, where there was obvious extension of the disease the hydrothorax should be of the nature of an inflammatory exudate; while in the case of the compression of the vessels at the root of the lung the effusion should be of the passive transudate variety. The speaker hoped that in view of the importance of this side of the problem other speakers more competent to discuss it than himself would take it up.

Treatment.

Dr. F. G. **Chandler** followed with a paper on the treatment of pleural effusion in artificial pneumothorax. He pointed out that his remarks referred only to effusions of considerable size, since a small one, discoverable only by screening or a splash, he would always leave alone, unless there were some special reason for replacing it. Aspiration repeated two or three times frequently appeared to make the effusion thicken and become yellow. Moreover, even after the lung had been compressed for a long time by fluid it would re-expand, though it would often be smaller than formerly. The special reasons for interference included, in the speaker's opinion, the following:—

(1) If the effusion appeared to be producing a fever, after sufficient time had been allowed to give the pleurisy causing the effusion a chance of settling down.

(2) If in a case of moderate but progressive disease there was a fear, with a long-standing effusion, that the pleura would become so much thickened that the lung would never re-expand.

(3) If the effusion increased to such an extent that radiological control of the collapsed lung was no longer possible.

(4) If obliterative pleurisy was threatening.

(5) If a tuberculous empyema began to form, as evidenced by a thickening of the fluid and the appearance of large numbers of tubercle bacilli.

In group (4) replacement, though it might be tried, would probably prove ineffective and oil replacement should be undertaken. A complete oleothorax would not be necessary if the disease were in the upper part of the lung, for as the obliteration of the pleura proceeded from below upwards, the oil was driven to the upper part of the thorax where it was wanted. The oil generally used by the speaker was olive oil containing 5 per cent. gomenol, although for greater permanence liquid paraffin might be used. The amount of oil injected at a sitting varied from 5 or 10 c.cm. in cases of recent effusion up to two pints in cases where the fluid had been present for some time. Patients appeared to like an oleothorax and to be quite unconscious of the presence of the oil. Cases of tuberculous empyema were also best treated by replacement by antiseptic oil.

Discussion.

Dr. L. S. T. **Burrell** said that effusion was most uncommon in artificial pneumothorax for any case but tuberculosis. For example, effusion was practically unknown in abscess of the lung or bronchiectasis. The fluid was therefore a true tuberculous effusion, and was not caused by hot air, cold air, or factors of this kind. Practically every tuberculous patient was found *post mortem* to have adhesions, due to a previous pleurisy, and on theoretic grounds, therefore, they would expect to find pleural effusion in an overwhelming number of tuberculous cases. There were two groups of spontaneous pneumothorax cases: one of these cleared up quickly without the formation of effusions; the second group was complicated by fluid. These last were probably tuberculous. Dr. Burrell went on to discuss why one of the earliest sounds of fluid in the chest should be a metallic tinkle. Pressure at first was not raised, but on the introduction of a little gas it was raised. When fluid appeared in a case of artificial pneumothorax, a lung previously partly collapsed became completely collapsed. This was probably due to the fact that in the recumbent posture the fluid squeezed the air out of the cells and the lung did not then so readily re-expand. The presence of fluid was almost always associated with complete collapse of the lung.

Dr. S. R. GLOYNE said that the subpleural lymphatics were practically always infected in tuberculosis, and he suggested that this might account for the occurrence of an effusion and have a bearing upon the difficulty of absorption of the fluid. He thought that they were apt to undervalue the importance of the parietal pleura. Another point brought forward was the possible rôle of saprophytic organisms. It was difficult from a pathologist's point of view to believe that a needle could be inserted fortnightly over a long period without producing some degree of infection. He did not suggest that much harm was necessarily done, but he did think that these organisms might possibly be responsible for a certain amount of effusion, especially in lungs that were already damaged.

Dr. S. VERE PEARSON drew attention to a class of case, difficult to treat, in which the fluid appeared at two, or even three, levels, in different "pools." These cases required careful study by percussion and by stereoscopy, to ascertain which of the pools was of most importance, where it should be tapped, and so on.

Dr. G. MARSHALL suggested that effusions might be caused by trauma, especially in cases in which no local anæsthesia was used. With regard to the production of the coin sound he had found that it never could be produced in the cadaver, owing probably to the absence of tension in the walls.

Dr. G. T. HEBERT, speaking on the frequency of effusions in artificial pneumothorax, said that more than 80 per cent. of his patients probably developed this. In two cases of serous effusion in non-tuberculous patients, both of bronchiectasis, the fluid showed 70 to 80 per cent. of lymphocytes. The coin sound, he said, could be obtained wherever there was a big space and fairly rigid walls.

Another speaker drew attention to the value of infra-red rays in aiding the absorption of pleural effusions.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting on Nov. 14th a note on the

Treatment of Lupus Erythematosus by Bismuth

was read by Dr. R. M. B. MACKENNA. The consensus of opinion, he said, was that this disease was the manifestation of a chronic toxæmia. Three forms were commonly found to-day: the first exhibited erythematous scaly lesions; in the second there were indurated lesions with little scaling or erythema but with horny plugs in the orifices of the sebaceous and sweat glands; whilst the third type showed marked erythema but with few scales. Metallic bismuth and oxychloride of bismuth were, he thought, of equal therapeutic value in the treatment of lupus erythematosus. Intramuscular injections of sodium bismuth thio-glycollate had not yielded better results than those of other preparations. Bismuth given by the mouth and in an ointment basis were not of much value. It was impossible to say how much bismuth any given case would require, or for how long treatment would have to be continued. Of 24 cases treated by intramuscular injections of bismuth since March, 1929, about a quarter were discharged as cured, a quarter would shortly be discharged as cured, and the remaining half were making variable progress. He had no proof that the cases discharged as cured were really cured, and it was possible that bismuth injections might only cause a temporary intermission in the course of the disease; unfortunately he could not give any information about the mode of action of bismuth in lupus erythematosus.

Eruptions due to Fungi.

Dr. ELIZABETH HUNT gave a brief report on some forms of cutaneous eruption due to fungi. The organisms isolated on culture were yeast-like fungi (including red, white and pink cryptococci, monilia, endomyces, torula), and trichophytons, including epidermophytons. It was clinically impossible to distinguish the type of lesion due to the different organisms. Cases occurred, as a rule, as isolated instances in a household and indirect infection seemed most likely responsible. An individual susceptibility of the skin might be inferred, but required investigation. Temporary reduction of Fehling's solution by the urine was sometimes observed in the acute stages. Four clinical types of lesion were described: vesiculo-pustular, erythematous vesicular, irregular scaling patches, and thick scaly patches with fissuring. The common characteristics of these lesions were that they were superficial, localised, circumscribed, very chronic, and very intractable. Dr. Hunt described acute attacks in which the vesiculo-pustular type of lesion predominated. The eruption might be localised, but was often widely distributed or associated with a generalised eruption of lesions of the erythematous and scaly types. In these cases the same organism had been cultured from lesions on scalp, arm, and a nail. This kind of case usually showed a yeast infection. Some of the cases were typical examples of cheiropompholyx, and in these no generalised eruption was observed. Infection of the nail was common in about one-third of the cases. Dr. Hunt emphasised the importance of recognising the nature of these cases where the question of an occupational dermatitis was involved.

PATHOLOGICAL SOCIETY OF MANCHESTER.

AT the opening meeting of the session Mr. GARNETT WRIGHT delivered a presidential address to this Society on the subject of

Linitis Plastica.

He related how he had operated on two cases of this disease. At the time of operation he had considered them to be undoubted cases of cancer of the stomach, and he had done a partial gastrectomy on each case. He was surprised in both cases to get a preliminary pathological report stating that the condition was one of extensive fibrosis chiefly affecting the submucous layer of the stomach with no sign of malignancy. The first patient died shortly after operation and the second died nine months later from secondary growths in the peritoneum. Brinton, said the President, had been the first to give a clear and full description of the disease, which he regarded as an atypical form of cancer in which there was an excess of fibrous tissue strangling the invading epithelial growth. It was possible to demonstrate the carcinomatous nature of the disease by staining the epithelial cells with mucicarmine. Most of the cases that had been followed up had died from carcinomatous metastases.

Prof. SHAW DUNN showed an interesting series of microscopic sections of linitis plastica stained with mucicarmine.

A discussion followed.

Reviews and Notices of Books.

PHARMACOLOGY.

An Introduction to Pharmacology and Therapeutics. By J. A. GUNN, M.D., D.Sc. Edin., M.A. Oxon., Professor of Pharmacology in the University of Oxford and Fellow of Balliol College. London: Humphrey Milford, Oxford University Press. 1929. Pp. 220. 5*s*.

"WERE angels to write books," wrote Oliver Goldsmith, "they would never write folios." Prof. Gunn had this thought in mind when he applied himself to the task of writing his little book. Many writers of text-books, in their desire to make their work exhaustive, become diffuse, or, on the other hand, achieve brevity by compressing into smaller space the contents of the larger books rather than by writing eclectically. Prof. Gunn has skilfully avoided both pitfalls, and in brief compass has set forth a presentation of pharmacology and therapeutics. It is wonderfully complete for an introduction to the subject, and can be warmly recommended to the student.

Applied Pharmacology. Third edition. By A. J. CLARK, *M.C.*, B.A., M.D., F.R.C.P., Professor of Materia Medica and Pharmacology in the University of Edinburgh. London: J. and A. Churchill. 1929. Pp. 529. 15*s*.

IN the preface to the first edition of this book, published in 1923, Prof. Clark stated that his principal aim was to try to bridge the gap between pharmacology and therapeutics, and to demonstrate as clearly as possible the connexion between the two subjects. That there existed a considerable demand for such a book is plain, since a second edition appeared in 1927, and now within two years we have to welcome a third. All the chapters have been revised, and some of them rewritten in the light of the knowledge obtained from recent investigation. Two new chapters have been added, one on the pharmacology of the skin, written in collaboration with Dr. G. H. Percival, and one on inorganic metabolism. The latter deals with the "milieu intérieur" of the body, and discusses the interesting question of water intoxication, which is at present regarded mainly as a laboratory phenomenon, but may have some bearing on the symptomatology of nephritis. The book gives a clear account of the most up-to-date physiological and pharmacological opinions. It gives a summary rather than a critical survey of modern views, and in some sections we would have appreciated a more judgmatical tone from a pharmacologist of such authority. But the book has achieved great popularity in its present form and thoroughly deserves further success.

CEREBRO-SPINAL FLUID IN HEALTH AND DISEASE.

Third edition. By ABRAHAM LEVINSON, B.S., M.D., Associate in Pediatrics, Northwestern University Medical School; Attending Pediatrician, Children's Hospital of the Cork County Hospital, Chicago. London: Henry Kimpton. 1929. Pp. 380. 35*s*.

THE fact that this edition is enlarged by more than 100 pages is an index both of the growth of our knowledge of the cerebro-spinal fluid since 1923 and of the author's endeavour to incorporate this new knowledge in his book. Among the additions we note particularly a considerable enlargement of the chapter dealing with the characters of the cerebro-spinal fluid in various diseases, and a new chapter on the fluid in infants and children. Additions have also been made to most of the other chapters, notably those on the anatomy of the structures associated with the cerebro-spinal fluid and on methods of examination of cerebro-spinal fluid for diagnostic purposes. Several gaps, however, remain to be filled. For example, there is no mention of the perivascular channels or Virchow-Robin spaces which, according to recent work, contribute largely to the cellular content of the fluid in various forms of encephalitis and myelitis; and although many new tests are described only one method for estimating the total protein and only three of the many colloidal tests are given. The omission of De Thurzo's bicoloured mastic and benzoin reactions, which are a distinct improvement on the original form of these tests, is a matter for regret. The subject of neurosyphilis merits more than the scant three pages which are devoted to it in this as in previous editions of the book. Apart from these omissions, criticism may be directed to the author's theory of the pathogenesis of the changes which occur in the fluid in diseases other than meningitis. Most of these changes are assumed to be due to "irritation of the meninges," which may be caused by chemical poisons, by the toxins emanating from a focus of encephalitis or brain abscess, or by the pressure of a cerebral tumour. This is one of those apparently simple explanations which become more difficult the more deeply they are probed. It leaves out of account many physical factors, such as venous obstruction and œdema of the brain, which produce changes in the fluid but which have no relation to the meninges. And it gives no help in any attempt that may be made to deduce from the changes in the fluid the nature or situation of the pathological condition which is causing intracranial hypertension.

These defects are, however, balanced by the large amount of information which the book contains in a very readable form, and by the numerous tables which supplement the text, and make the book a convenient work of reference. The bibliographies which follow each chapter are large and detailed and must prove of great assistance to those who wish to inquire more deeply into the many unsolved problems connected with the cerebro-spinal fluid.

THE NERVOUS SYSTEM.

An Introduction to the Study of the Nervous System. By E. E. HEWER, D.Sc., Lecturer in Histology and Assistant Lecturer in Physiology, Women's School of Medicine, London; and G. M. SANDES, M.B., B.S., Demonstrator of Anatomy at the Women's School, and Surgical Registrar at London Lock Hospital for Women. London: William Heinemann, Ltd. 1929. Pp. 104. 21*s*.

THIS book is primarily intended for students, and seems to be admirably fitted for its purpose. The clearness and simplicity of its description, and in particular the excellent grouping of connexions and tracts, will do much to obviate the dissatisfaction which must accompany the learner's search for facts throughout the multiplicity of authoritative works. The subject is treated from the physiological rather than from the anatomical standpoint. There appears to be a disposition on the part of the authors to send more traffic across the dorsal commissural bridge of the cord than it was built to carry. Whether this suspicion is well founded or not, however, makes no difference to our keen appreciation of the book. It is well produced, clearly printed, and illustrated by many good diagrams of the physiological type.

NUTRITION OF HEALTHY AND SICK INFANTS AND CHILDREN.

Second edition. By E. NOBEL, C. PIRQUET, and R. WAGNER. Translated by BENJAMIN M. GASUL, B.S., M.D. Philadelphia: F. A. Davis Company. 1929. Pp. 243. $3.50.

IN reviewing the second edition of this work last year we paid tribute to its originality and thoroughness, while expressing doubt as to whether the Pirquet system of nutrition was destined to penetrate beyond academic circles in other countries. In the meantime it has received some further measure of attention as a result of the tragic death of its originator, and the recognition throughout the world of his great services to pædiatrics. Dr. Gasul has now placed this work, originally published by Dr. Nobel, within the reach of all English-speaking readers, and we feel sure that his labour will be justified by the number of doctors who will find interest in its pages. Certain facts remain as a bar to the adoption of Pirquet's system in England and in America. First, one of the ideas which underlies Pirquet's hypothesis—that the balance of fat and carbohydrate is unimportant—is not in accordance with current opinion. Secondly, the fear, probably well founded, that the adoption of a far more complicated method of calculation would lead to diminished practical efficiency will deter teachers from advocating the general use of this system, much though they may find in it to admire. Nevertheless, those who are interested in nutrition, and in the treatment of alimentary disorders, cannot neglect the school of thought exemplified in this work, and will find in the arguments set out much common sense.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

Was muss der Praktische Arzt von der Chirurgischen Behandlung der Lungentuberkulose Wissen? By Dr. HANNS ALEXANDER. Munich: J. F. Lehmanns. 1929. Pp. 60. M.3.

THIS monograph, which is one of a series issued by the *Münchener Medizinische Wochenschrift*, gives a clear and concise account of the modern surgical methods of dealing with pulmonary tuberculosis. It is designed to help the practical physician who is not an expert in tuberculosis. There is a fairly full description of artificial pneumothorax with an account of the technique and complications, and a discussion on the types of case. Bilateral collapse therapy is given but little space. The operations of thoracoplasty and phrenic evulsion are described at some length; the combination of phrenic evulsion and artificial pneumothorax treatment is briefly noticed, as is the older operation of pneumolysis with paraffin wax. In all cases indications for particular forms of treatment advocated are clearly given. Numerous illustrations are included. Amongst these are four very instructive radiograms showing the after-results of spontaneous healing with retraction, and the good results after phrenic evulsion, artificial pneumothorax, and thoracoplasty.

SYMBOLIC PROCESS.

Its Integration in Children. By JOHN F. MARKEY, Research Professor in Sociology at the Connecticut Agricultural College. London: Kegan Paul, Trench, Trübner and Co., Ltd. Pp. 177. 10*s.* 6*d.*

THAT the child is the father of the man is amply demonstrated in the most recent approaches in psychology. Prof. Markey's book on the growth and elaboration of symbols in human behaviour—individual and social—is almost entirely expressed in behaviouristic terms and should thus prove attractive to physiologists, particularly neurologists. There is a simplicity in the behaviouristic approach to mental activity and human behaviour which appeals to those who show a single-needed devotion to laboratory technique and a trust in the results that it gives. But behaviourism cannot stand on that alone. It must be subjected to the logical categories inherent in the material with which it deals, and it has selected only part of the material—that is objective data without reference to those facts which are called mental. Prospective reference and persistence with varied efforts—terms we owe to Stout and Lloyd Morgan—enter, we think, into all mental growth, and therefore into the creation of symbols, individual and social. It is equally a matter of doubt whether the theory will survive the devastating criticism of Koffka and others of the Gestalt school of psychology. No discussion of ultimate principles, however, will diminish the practical value of this book. There are chapters on personal symbol formation and the influence of social relations which are altogether admirable, and to all those who engage in the study of the child mind the essay will repay close study for the facts and investigations alone, quite apart from the difficulties in theory which rise like spectres in every chapter.

MAN AND ANIMALS IN THE NEW HEBRIDES.

By J. R. BAKER, M.A., D.Phil. London: George Routledge and Sons, Ltd. 1929. With 43 plates and text-figures. Pp. 200. 12*s.* 6*d.*

THIS is a gay and most interesting account of the author's experiences and observations in the South Seas. Apart from the more purely zoological parts, which are chiefly for specialists, he discusses two subjects of wide interest. Following Rivers, Buxton, and others he has investigated the depopulation which has been so marked a feature of these islands in recent years, and has advanced on the work of his predecessors by getting a good deal of numerical information. He finds a remarkably high proportion of males to females (160 to 100), which is a contributory cause, and the rest he attributes to diseases brought by Europeans and to abortion; he gives no support to Rivers's conclusion that the chief reason for depopulation was the lack of interest in a life which had by white man's government been pruned of its ritual and excitements. The other curiosity is the hermaphrodite (intersex) pigs which are quite common and play a large part in determining the owner's rank in the social scale. Dr. Baker naïvely assures us (p. 39) that his qualification for dealing with such subjects as depopulation is "a thorough education in biology and scientific method," which is perhaps why he says (p. 115) that all snails are hermaphrodite!

DENTAL INFECTION AND SYSTEMIC DISEASE.

By RUSSELL L. HADEN, M.A., M.D., Professor of Experimental Medicine, University of Kansas. Philadelphia: Lea and Febiger. Pp. 165. $225,

MUCH has been written on the subject of dental infection and systemic disease but comparatively little of it has dealt with the experimental side, while this book is mainly concerned with the experimental basis for the theory of dental focal infection as a factor in general disease. Dr. Haden reviews the subject in a moderate spirit, and records the results of his own extensive experiments with critical judgment. An important feature of the work is the correlation of the radiographical, histological, and bacteriological aspects of dental infection whereby Dr. Haden succeeds in conveying an all-round conception of dental sepsis and its sequelæ. He uses the bacteriological technique advised by E. C. Rosenow and has succeeded in confirming Rosenow's experimental findings on elective localisation. These results have been much debated and most bacteriologists regard elective localisation as still unproven. Dr. Haden states that failure to produce Rosenow's results is due to a disregard of certain fundamental technical details, especially a correct oxygen tension and the use of special culture media. The comparison made between the bacteriological findings in cases of infected teeth with positive radiographic changes on the one hand, and pulpless teeth with negative radiographic evidence on the other, is interesting. Quantitative cultures show that a high percentage of the teeth in the last-named group are heavily infected, although the radiograms may show no evidence of bone changes. The last part of the book consists of 35 case reports illustrating various forms of systemic infection associated with dental sepsis. In all cases the diagnosis was based on careful bacteriological examination followed by animal inoculation. They form a group the more striking because all the data available have been carefully evaluated. We recommend this book both to doctors and dentists.

THE LANCET.

NDON: *SATURDAY, NOVEMBER 30, 1929.*

IE ROYAL COLLEGE OF SURGEONS OF NGLAND: THE POSITION OF MEMBERS.

WE notice in another column the occurrence of the aual meeting of the Fellows and Members of the yal College of Surgeons of England which was ld on Nov. 21st; the spirit and temper of the eting was such as to encourage the hope that a form, which has been pressed for in the columns THE LANCET for over 80 years, may come up for rious consideration by the authorities of the llege. In the early days of THE LANCET e frequent text of editorial articles was the istence of certain abuses in the College, and when e Charter of 1843 was obtained, changing the name the College to its present style and instituting the der of Fellows, criticism was not abated, although me of its earlier grounds were removed by the new ct. For it was perceived that, although the new arter had abolished the absurdity in a progressive d scientific calling of a small and self-elected verning body who could hold, and who alone could ld, perhaps for life, the examinerships designed to the tests of proficiency among their juniors—though this vestigial trait of a trading corporation d now disappeared from the constitution of the llege, there remained an illiberal provision, depriving e mass of the corporation from any voice in the nduct of their affairs. The officers of the College der the new Charter were, under altered titles, the me authorities as those who had previously been in wer, and to them the discretion was given of selecting e first body of Fellows. It is true that it was ovided that no more persons, after the lapse of e year, should be elected Fellows except after amination, but the examinerships remained in the nds of legitimate descendants of the old Governors, hile the new rulers were only to be chosen by the te of the Fellows and from out their own body. ranted that the senile examiner no longer inquired to the proficiency of the new recruits, still the new uncil represented the old Court of Assistants, d the new Council selected the first body of Fellows, d the Charter gave to the Fellows, and to the Fellows ly, the right of filling up vacancies in the Council they occurred. The Charter invited criticism, d has obtained it since its birth.

Now it is a remarkable testimony to the way in which e affairs of the College have been managed since 1843 at, although the weakness of the constitution has en pointed out with reiteration, and although from me to time individual and group remonstrances ve been addressed to the rulers and voiced in the edical and lay press, nobody has been found to say at the affairs of the College have been badly managed that the Council has been other than a competent d representative group of men, true and just in eir dealings. So much is this the case that ccessive Presidents have been able to point out, hen challenged, that the reluctance of the Council secure for the Members a place in the management College affairs has been due to lack of evidence at either the conduct of the College or the status of the Members has been injured by the provision of the Charter leaving the election of the Council in the hands of the Fellows. But it is one thing to say that an institution has not suffered through a loss of something and another thing to say that that institution would not have gained under modification. The College authorities have certainly been open to the accusation of self-satisfaction in taking no steps to consider what measure could be taken, within the provisions of the appropriate Act, to give to the Members an adequate expression of their desire to play their part in the activities, policy and development of the College. It may be said that at one time the Council has been asked to consider the extending of voting powers for seats upon the Council to the Members, and at another to arrange that a certain proportion of Members should have seats upon the Council; and that the two things not being the same no regulations of a reforming character would provide for both. But the difficulty has been pointed out many times, and could be removed at a meeting between the College and properly accredited leaders of reform, the one side saying exactly what they wanted, and the other what could be granted without the hideous task of securing a new Act of Parliament.

Alike because surgery is so living a thing and because the bulk of English practitioners are Members of the Royal College of Surgeons of England, it seems right that this question should receive serious attention with a view to settlement. In past times various Presidents of the College have had no difficulty whatever in refusing to listen to the claims of the Members, because sometimes those claims were put forward in a manner entirely prejudicial to those who were making them, and because on other occasions the vaunted support of numbers could not be proved. But to-day things are altered, for one of the main reasons for instituting an order of Fellows is disappearing. It was the abuse of the senile examiner that led to the institution within the College of an order of higher academic position, designed to form the material whence a court of examiners could be chosen, whose equipment should be level to the progress of their science. To-day this argument has no force, when all degree- and diploma-granting bodies have to choose examiners who have no internal connexion with the particular university or corporation, but who possess the paramount claim of familiarity with their subjects. With the disappearance of this argument for maintaining a deep gulf of distinction between the Fellows and the Members, the road to rapprochement becomes plainer. Frankly we wish that some overt move towards that road could be taken.

SUSCEPTIBILITY TO CANCER.

ALL who are interested in the cancer problem will welcome an authoritative statement on the present state of this problem which appears in the Twenty-seventh Annual Report of the Imperial Cancer Research Fund for 1928–29. In previous years comments on general aspects of cancer research have been included in the Director's Report. It is now intended to make such discussions a special feature of the annual reports, and this year Dr. W. CRAMER supplies a critical commentary on Experimental Carcinogenesis. Here is reviewed, in non-technical language, the work of the last ten years on the experimental production of cancer. Dr. CRAMER points out that some of our fundamental conceptions of cancer have been modified as the results of recent experimental work. Thus t [illegible] idence of cancer was formerly interpreted as showing that cancer arises in an organ or in tissues which are senescent. Experimental investigation of carcinogenesis has shown that the development of tar cancer requires a long period of induction. In the mouse the period of induction is hardly ever less than three to four months, but may be much longer—eight to nine months. In man the period of induction can be estimated from cases of occupational cancer; the minimum is seven years, the maximum as high as 20 years. At first sight there seems to be no obvious relationship between the figures for mice and men. But when one considers that the maximal span of life is three years for a mouse and 90–100 years for man, it becomes clear that three months represent approximately the same fraction of its span of life as seven years of human life—an example of a relationship for which Dr. Cramer suggests the name of biological relativity. This relationship may be found to hold good for many biological processes, which proceed more quickly in the cells of the short-lived animals than in cells of long-lived organisms. That the long period of induction is the correct explanation of the peculiar age incidence of cancer is now fairly generally held by those who have followed recent experimental work on cancer. A conception which is more revolutionary and far-reaching and is likely to meet with some opposition is the doctrine put forward by Dr. Cramer that susceptibility to cancer is a determining factor in its incidence. The implications involved in this doctrine will be made clear by its comparison with the orthodox view. In a recent rather pessimistic paper Prof. James[1] Ewing expresses the opinion that the problem of the ultimate nature of the cancer problem is "one of those types of information which will long escape the human mind." But he regards as one of the most important steps made in the investigation of cancer the recognition of the fact that cancer is not a single disease but a whole host of diseases. "We know," he says, "that there are just about as many clinical entities in the group of cancer as there are outside of them." There exists also a considerable body of knowledge regarding the various forms of chronic and specific irritation which are known to be necessary to the incidence of cancer. The difference between a person who develops cancer and one who remains free from it is that in the former person one organ has been subjected to chronic irritation while the habits and mode of life of the latter have been such as to avoid chronic irritation. On such a conception it is reasonable to expect that the incidence of cancer could be diminished if we traced for each organ the forms of chronic irritations which lead to cancer and, having gained the knowledge, took steps to avoid them.

Dr. Cramer advances statistical, clinical, and experimental evidence to show that such a view is too simple. The statistical data given in last year's annual report show that the total mortality from cancer in women is approximately the same in different countries, from which statistics of equal reliability are available, although the organ incidence varies greatly. Similarly, the total mortality in men and women of the same country is approximately the same, although the organ incidence necessarily shows considerable differences. If cancer were a whole host of diseases, each organ having a separate ætiology and representing a self-contained unit, the total incidence of cancer would have to be regarded merely as the sum of the incidence in the different individual organs and should increase or decrease as the incidence on this or that organ increases or decreases. The statistical evidence shows that this does not happen, but that some mysterious law of compensation appears to be at work, which provides that whenever in a comparison of two populations there is a markedly lower incidence of cancer in one organ, there is a correspondingly higher incidence of cancer in at least one other organ. This mysterious law of compensation finds an explanation in the fact, which can be demonstrated experimentally and which also appears from the clinical evidence provided by occupational cancer, that the same forms of chronic irritation applied in an approximately equal degree do not produce the same effects in different individuals. In some cancer appears after a relatively short interval, in others after a much longer period, while a third group remains free from cancer. In occupational cancer, for instance, the number of individuals who develop cancer are only a fraction of the number who have been exposed to the specific chronic irritation. Cancer and freedom from cancer are, therefore, not merely a question of presence and absence of chronic irritation. The susceptibility of the organism to respond to chronic irritation with cancerous growth enters as an important factor. It determines the number of people who, as the result of the various forms of chronic irritation incident in our lives, will develop cancer. That approximately the same number of men and of women develop cancer while the organ incidence in the two sexes shows considerable difference is, from this point of view, the expression of an equal susceptibility in the two sexes. Since in women breast and uterus are two organs particularly exposed to chronic irritation, a considerable number of women die as the result of cancer of these two organs and therefore the number of susceptible women who can develop cancer of the other organs are correspondingly diminished, as compared with the number of susceptible men. The argument is closely reasoned and should be carefully studied. It leads naturally to the conclusion that "freedom from cancer is more likely to be attained by diminishing the susceptibility to cancer than by trying to hunt down the various forms of chronic irritation to which we are exposed and devising means to avoid them." Investigations are being carried out to determine, if possible, the factors on which susceptibility depends.

The Director of the Fund, Dr. J. A. Murray, F.R.S., in his report summarises the work published from his laboratories in the year under review. The work on the filtrable tumours of the fowl by Dr. A. M. Begg has been recently reviewed in our columns.[2] Mr. H. G. Crabtree has continued his studies on the metabolism of cancer cells by applying O. Warburg's method to a great variety of strains of transplantable mouse tumours. The result is a confirmation of Warburg's discovery that malignant cells possess the faculty of splitting sugar into lactic acid to a far greater extent than normal cells. This property, however, is not specific for malignant cells, so that it cannot be applied as a criterion of malignancy. But since the type of metabolism possessed by cancer cells must determine to some extent their biological behaviour, it is an explanation of some features of malignancy. It would be a mistake to underrate the importance of this discovery because it does not reveal the whole secret of cancer. Of considerable interest is the work of Mr. R. J. Ludford, D.Sc., on vital staining of malignant cells. Cells are said to be vitally stained when they are able to take up certain dyes and segregate them in the form of droplets during the lifetime of the animal. The idea underlying Dr. Ludford's investigations is that there is an essential similarity between the process of vital staining by certain dyes and the chemotherapeutic action of metallic colloids. These colloids, when injected intravenously, are taken up by a certain type of cell, the macrophage, which also has a high capacity for becoming vitally stained. The cells of malignant new growths do not stain vitally to the same extent as their normal prototypes. This raises the interesting question whether the action of metallic colloids is not an indirect one, exercised through the macrophage type of cell. The point is of importance in view of the therapeutic results obtained by means of colloidal lead. Dr. MURRAY, referring to the work of Dr. A. T. TODD of Bristol, who has worked out a modification of the colloidal lead treatment originally introduced by Prof. BLAIR BELL, states that Dr. TODD's results "prove conclusively the possibility of bringing about the disappearance of some tumours, definitely malignant, with prolongation of life by the intravenous injection of certain colloidal lead preparations." This result could be obtained only in a percentage of the cases to whom this treatment was applied, and in some cases in which regression of the primary tumours took place some of the metastatic growths proved resistant to the action of lead colloid. The evidence indicates that the action of the lead colloid is not a direct toxic one but that a more complicated mechanism is at work.

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[1] Cancer as a Public Health Problem. Public Health Reports, 1929, xliv., 2093.

[2] The Lancet, Oct. 26th, 1929, p. 886.

In recent years the literature of cancer has not been free from a sensationalism unfitting to this grave subject. Observations have been offered on the problems of the treatment and the ætiology of cancer which are based on inadequate evidence. On the other side there has to be fought the sterile pessimism of those who believe the problem to be unsolvable. The annual report of the Imperial Cancer Research Fund always steers a safe course between these two extremes. The difficulties inherent in the problem are admitted; the failures are not concealed; credit is given to successful work done in other laboratories; and the general tenor of the report shows the steady advance in our knowledge which is the reward of patient work.

WHAT SCHOOL-CHILDREN DIE OF.

THERE seems to be a fairly widespread opinion among the laity at the present time that the commonest cause of death among school-children is the motor-car. And indeed, in Sir GEORGE NEWMAN's report on the Health of the School Child[1] for 1928, violence—presumably most frequently received in street accidents—ranks second only to tuberculosis as a cause of death between the ages of 5 and 15 years. Yet nowhere in the book are preventive measures discussed or recommended; "violence" seems to be regarded by the authorities as an act of God, and is treated with the same respect as that which the ancients accorded to epilepsy. Surely protection of life against this danger is as important as against any other, and should equally be the concern of educational authorities. It is with the prevention of disease, however, and especially infective disease, that the report is especially concerned.

Tuberculosis in its various manifestations accounted for 2173, or 16·4 per cent., of the total deaths and remains the chief menace to life among children of school age, but the report includes tables showing the marked decline in this disease since 1907. That variations in conditions and food have an important bearing is indicated by the rise in mortality due to this disease during the four years of the late war. An efficient school medical service is the most valuable factor in obtaining early diagnosis as a preface to thorough preventive and therapeutic measures. Meningitis and other diseases of the nervous system were responsible for 1116, or 8·4 per cent., of the total deaths of the year. The problem of fatal nervous disease following vaccination has attracted considerable attention; in 1928 out of a total of 55 "post-vaccinal nervous diseases" in the whole country, 30 occurred in children between the ages of 5 and 14 years, and of these 19 were fatal. It was pointed out by the Rolleston Committee that this manifestation was extremely rare after revaccination and after vaccination in early infancy. The danger is to the child between 5 and 15 years who has not been previously vaccinated. Measles remains a serious danger to childhood by reason of its complications; much has been done to avoid these by instructing parents in the dangers of the disease, by health visiting, and by the power of the local authorities to provide nursing and medical assistance in epidemics. But the incidence is unaffected by these measures, and is greatest in overcrowded and insanitary slum districts, and among children under 5 years of age. As the mortality is much less among children above this age, the attention of the school authorities at present is directed to postponement of incidence to later ages, to provision of early and adequate nursing treatment, and to early diagnosis of the disease and removal of the infected child. The case-mortality per cent. of diphtheria, since the introduction of antitoxin in 1895, has decreased from 30 to 3 per cent., but, as if partly to balance this enormous gain, the incidence has remained higher during the last nine years than for many years before the war, and in 1928 the disease was responsible for 1565, or 11·8 per cent., of the deaths at school age. Sir GEORGE NEWMAN advises a wider use of the Schick test for determining susceptible individuals; over 90 per cent. of children under 5 years are susceptible, but immunity increases with age. Immunisation has been much improved during the last few years, and three doses of toxoid and antitoxin will now secure complete immunity in 80 to 90 per cent. of children. As the immunity takes a few months to develop the method should not be employed during an epidemic, and 17 local authorities in and around London are offering facilities for immunisation. The immunity lasts for not less than seven years in 95 per cent. of persons. It is obvious what a valuable protection would be offered by a wider use of this preventive measure. The experimental and investigational diphtheria carrier clinic at Guy's Hospital has lately produced its first report. In this the cure of carriers by means of operative

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[1] Annual Report of the Chief Medical Officer of the Board of Education. Stationery Office. 1s. The principal causes of death among the children of England and Wales aged 5–15 in the year 1928 are given as:

Disease.	Number of deaths.	Per cent. on total deaths.
1. Tuberculosis	2,173	16·4
2. Violence	1,607	12·1
3. Diphtheria	1,565	11·8
4. Bronchitis, pneumonia, and other respiratory diseases	1,528	11·5
5. Meningitis and nervous system ..	1,116	8·4
6. Heart disease	822	6·2
7. Measles and whooping-cough ..	551	4·2
8. Rheumatic fever	513	3·9
9. Appendicitis	473	3·6
10. Acute and chronic nephritis ..	276	2·1
11. Acute infective osteomyelitis ..	255	1·9
12. Influenza	237	1·8
13. Scarlet fever	231	1·7
14. Tonsillitis, &c., adenoid vegetations	200	1·5
15. Other conditions	1,733	12·9
	13,280	100·0

is not an easy matter to excuse. Even in the larger towns the works are often either obsolete or of insufficient capacity; few produce a satisfactory effluent.

The Rivers Pollution Act of 1876 and the Salmon and Fresh Water Fisheries Act of 1923 are either ineffectual or insufficiently applied. The difficulty, of course, is that the treatment of sewage and the prevention of pollution are the responsibilities of the local authorities, and these are frequently in too weak a financial position to carry out the reforms required. In the case of trade effluents the problem is not so straightforward; many manufacturers regard the river as a legitimate outlet for waste products, especially if they made use of it with impunity before the 1923 Act was passed. Others, while prepared to take steps for the purification of the effluent, have been at no pains to discover the most suitable method, and either make use of some inappropriate means, or are content with half measures. Occasionally the manufacturer is ignorant of the damage resulting from his waste products, more especially if these are in the nature of food material, such as beet-sugar or condensed milk. An instance in which this occurred was responsible for considerable damage to fish life; the milk products in the process of decomposition gave rise to various highly toxic substances while at the same time they robbed the water of dissolved oxygen. In a case occurring last July, a farm on the River Gipping became unsaleable, and certain of the stock died as a result of pollution of the stream by an acetate silk factory. The situation becomes intolerable if, in order to encourage industry, such an important essential as unpolluted waterways is to be sacrificed. There is no necessity for this objectionable state of affairs; nearly all trade effluents can be rendered harmless, and most of the rest can be substantially improved by chemical means. It is difficult, however, to enforce these measures when manufacturers are aware of the defective treatment of sewage. It will be remembered that at the summer meeting of the British Medical Association Dr. H. McLean Wilson, chief inspector to the West Riding River Board, advocated the formation of more river boards as the best method of attacking the problem. These can supervise the rivers and their tributaries, paying particular attention to sources of possible pollution. The cost of such boards is comparatively small; that of the West Riding amounted only to a rate of one-seventh of a penny. Whether such organisations would be sufficient to control the nuisance is not quite certain. They could undoubtedly do much by way of detection of pollution and advice on its elimination.

The problem of catchment areas for large towns, and the guarantee of water-supply for new town-planning schemes enlarge the scope of inquiry. Joint committees for town-planning can do much in conjunction with the water authorities to prevent pollution of rivers and underground sources of water which may supply more distant areas. The protection of catchment areas, as in the case of that of Manchester, can be enforced by suitable regulations. Various minor points all play a part in the question of maintaining unpolluted streams. In some cases effluents do harm by being introduced into a relatively stagnant part of the river—that is to say, in the shallows close to the bank. It is essential that an effluent should be introduced where the flow is rapid in order that it may be diluted as quickly as possible. This result can be obtained even more satisfactorily by mixing the effluent with river water prior to its introduction into the stream. Again, it is preferable to provide for the cooling and aeration of effluents before discharging them, more especially if the stream is small and the effluent of considerable volume. Hot non-aerated condenser water can be responsible for serious damage to fish life in a small stream.

To sum up, pollution of streams cannot be excused on the grounds of insufficient investigation of origin or ineptness of corrective measures. The work of those who have interested themselves in the problem all goes to show the entirely unnecessary nature of the evil. "The chief hindrances," said Dr. Firth, "are legislative and administrative." The annual report of the Ministry of Health for 1928–29, though making no proposals for amending the law, admitted that the growth of population and the improved standard of sanitation call for capital expenditure in the treatment of sewage which sanitary authorities may be unable to meet. Clearly the matter cannot be effectively controlled while it rests in the hands of small local authorities.

POST-VACCINAL ENCEPHALITIS.

RECENT figures published in Holland concerning the epidemic of "alastrim" in that country show that 15 deaths occurred among 578 cases. In relation with this outbreak, and between July 28th and Sept. 29th of this year, 8239 primary and 146,787 revaccinations were performed. Among these there were 59 cases of post-vaccinal encephalitis with 15 deaths between the beginning of August and Oct. 5th. Eight children believed to be suffering from this affection were treated by one, two or three intravenous injections of 10 c.cm. each of the serum of adults who had recently been vaccinated. Seven of these patients made a complete recovery. The treatment recalls the successful case published by Sir Thomas Horder in THE LANCET (1929, i., 1301), in which a child received 5 c.cm. of the serum of his mother who was vaccinated at the same time as he was. In this case the serum was given intrathecally, a route which theoretically holds out more hope of success. Netter,[1] in a commentary on the present epidemic of alastrim, is inclined to attribute the post-vaccinal encephalitis to the action of vaccinia alone. He does not, however, bring forward any fresh explanation of the very irregular distribution of the cases in different countries and parts of the same country when the same or very similar vaccine has been used, nor does he show any reason for distinguishing these cases from those following other diseases, such as measles and chicken-pox. He also returns to the hypothesis that passage of vaccine lymph through the rabbit in the process of lymph production is the origin of the cerebral complications, though there is evidence that post-vaccinal encephalitis may occur following the use of lymph which has never passed through the rabbit. A new feature in the Dutch report by Kuenen, Kniper, and von Loghem[2] is the occurrence of 14 cases of post-vaccinal encephalitis following revaccination, an event which was almost unknown previously.[3] Netter urges in support of the essentially vaccinal nature of the disease the experiments by Bijl and Fraenkel, 1929, which suggest that vaccine virus becomes more active after contact in vitro with normal brain tissue, and instances the curative effect of the serum of vaccinated persons. The former experiments do not seem sufficiently cogent to have much importance, but the latter might be significant if they were corroborated by further trial. Generalisation of neurovaccine virus in the rabbit and its propagation with production of lesions in viscera have been described by several workers, especially Douglas, Smith, and Price,[4] and Ledingham and Barratt in our issue of Sept. 7th. The experiments by C. Armstrong and R. D. Lillie[5] who produced pneumonia in rabbits by instilling vaccine lymph into the nares or trachea, provide further evidence of localisation in unwonted organs. In these rabbits the virus increased locally in the lungs, which it presumably reached directly, whereas in post-vaccinal encephalitis in man it has only been recovered from the brain with great difficulty, and is not more constantly present there than in other organs. There is no evidence so far of the production of specific lesions in the central nervous system of rabbits even after the intravenous injection of the most active strains of vaccine.

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[1] Bull de l'Acad. de Méd., 1929, cii., 225.

[2] Ned. Tijd. v. Geneesk., Oct. 19th, 1929.

[3] See Rep. Vaccination Committee Report, 1928.

[4] Jour. Path. and Bact., 1929, xxxii., 99.

[5] U.S. Public Health Reports, November, 1929, p. 2635.

THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

THE report for the year ending July 31st, 1929, presented to the Court of Governors on Nov. 27th, is the first report to be issued from the new building which was opened by the Prince of Wales on July 18th. Naturally it records a year of great activity. A division of public health has been inaugurated under the directorship of Prof. W. W. Jameson. It has been staffed on special lines, and its members represent various aspects of public health life and activity. A scheme of study in public health, framed on novel lines, has been drawn up. It is hoped that the scheme will succeed in coördinating the different branches of study into a combined and logical exposition of the whole subject of the public health. A new course has also been drawn up for tropical medicine and hygiene. One feature of the new arrangement in this subject is that the summer course ends before the beginning of July—a "stale" month, and one much occupied with congresses and meetings. The division of epidemiology and vital statistics has moved into the School from the National Institute of Medical Research. The study of experimental epidemics is being continued in conjunction with the division of bacteriology and immunology. An interesting feature of the School's work is the informal instruction given for short periods to medical officers proceeding abroad and the liaison work with other nations. Dr. Andrew Robertson has left the department of protozoology to work with the United Fruit Company of New York, in Tela, Spanish Honduras, and the School has been visited by teachers of tropical medicine from Berlin, Hamburg and Shanghai. A system of library services has been organised to supply information on any branch of the School's work to members of the staff and outside inquirers. The library has been expanding very rapidly, as has also the museum, which contains many interesting exhibits supplied by commercial firms. Research work, as always, plays an important part in the year's activities, and investigators have contributed from all over the world. The appendix gives a list of about a hundred original papers published during the year. One group of research is financed mainly from the Milner Research Fund, and another through the Ministry of Agriculture. Meanwhile the teaching work has continued with success. During the year, 166 students attended courses; they came from the Colonial and Indian Medical Services, the Royal Army Medical Corps, other Government services and missions, and they went to every part of the world, the majority to Africa and India.

The full programme of activities is not yet in operation, and the Governors look forward to an early expansion of the department of biochemistry, the section of applied physiology and the work of the School in relation to industrial hygiene.

COMING OF AGE OF THE TRELOAR HOSPITAL.

Sir William Treloar personally received the first patients at Alton on Sept. 7th, 1908, and the annual report for 1928–29 is therefore the "coming-of-age" report of this institution. It records 21 years of successful work, and declares proudly that few institutions can claim to have done so much for national health and efficiency in so short a time. The success is ascribed to the spirit of personal service inspired by the founder, a spirit which has earned for Alton the name of "The Happy Hospital," and secured a record of 95 per cent. success in treatment. Sir Henry Gauvain, in his medical report, traces the development of the work and the gradual changes in method and technique. Particular attention was first paid to the treatment of abscess and the prevention of sinuses, and next to appliances for the prevention and correction of deformity. Research of all kinds has always been a prominent feature of the work at Alton and has produced results, both positive and negative, which have been of great practical importance. On the whole, conservative treatment is regarded as the treatment of choice, and with it are included such adjuvants as heliotherapy and balneotherapy. The seaside branch at Hayling Island was inaugurated in 1912 to make full use of natural sunlight and natural bathing, and the artificial light department supplements the deficiencies of the climate. Intermittent light treatment has been found more beneficial than continuous exposure, so that the South of England may be held to offer better conditions than districts with continuous sunshine. The more exhausted and toxæmic a child is, the less is the indication for exposure to light, and much harm may follow the irradiation of unsuitable cases. Artificial light at Alton is chiefly used for lupus vulgaris. Where surgical interference is necessary it is supplied by the orthopædic department, which works in conjunction with the Portsmouth public health authorities.

Education has always been an outstanding element of the work at Alton. All children from the age of 2 receive daily instruction, and in intelligence and resourcefulness the sick often outstrip the healthy. Year by year discharged patients return to their schools none the worse educationally for their long absence. Special handiwork classes are a great boon to the dull children, and advanced handicrafts are taught to convalescents who will be too old for school when discharged. An early investigation showed that patients with healed tuberculosis could safely resume normal activities, and the boys at the College are not treated as invalids in any way. The cricket and football teams play on equal terms with village clubs, and secure a very fair average of wins. The College trains crippled lads to earn their own living, and succeeds in 80 per cent. of cases. The boys are taught leather work, bootmaking, and tailoring. Senior boys take a course of bookkeeping, and are prepared for open examinations. The combination of vocational and educational training is of great value, and the report claims that a selfish boy does not exist in Treloar College. It was at Alton, moreover, that it was proved that suitable heliotherapy can evoke an increase of nearly ten per cent. in mental activity.

It is gratifying to learn that financial support has been well maintained. The cost per bed per week is £2 1*s.* 7*d.*, and a good deal of rebuilding has become essential, as the buildings conveyed to the institution in 1908 were the old wooden structures of the Princess Louise Military Hospital. For this purpose a rebuilding fund has been opened and a special appeal issued. During the 21 years, to the end of last March, 4871 patients were admitted and 4528 discharged. The average length of stay was 405·2 days, and the total mortality 2·9 per cent. The Alton Hospital has a record of which it may well be proud, and we congratulate it on the attainment of its majority, and trust that it will go on in its maturity from strength to strength.

THE DENTISTS AND THE HAIRDRESSER.

Is the scaling of teeth an operation which amounts to the practice of dentistry, and which therefore cannot be lawfully performed except by a registered dentist? This question was put last week to the stipendiary magistrate at Bow-street, and seemingly was answered in the affirmative. Where an offence is not very grave, magistrates have a wholly praiseworthy habit of refusing to convict, even though satisfied that the prosecution has made out its case; they make the defendant pay something by way of costs rather than by way of penalty. The only disadvantage of this course is that it sometimes prevents the public from getting an authoritative ruling on a nice point of law. The facts in the Bow-street case were clear. A hairdresser in Lamb's Conduit-street had hung up in his saloon a notice saying "Teeth cleaned and scaled." Customers who came in to have their hair cut were invited afterwards to have their teeth scaled for half-a-crown. A summons was issued at the instance of the Dental Board. On receiving it the hairdresser wrote to the Board that he did no more than clean his customers' teeth with a match-stick and peroxide; this he regarded as beauty culture rather than dentistry. At the police-court he reiterated the contention that he merely cleaned teeth for the purpose of improving the appearance. He kept, he said, no dental instruments on the premises; if a customer had bad teeth requiring attention, he always referred him to a dentist; he was quite unaware that he was doing wrong, and he had now removed the notice from the wall of his saloon. Counsel prosecuting on behalf of the Dental Board had no difficulty in producing a definition of dentistry. Section 14 of the Dentists' Act of 1921 says explicitly that, for the purposes of that Act, the practice of dentistry shall be deemed to include the performance of any such operation and the giving of any such treatment, advice or attendance as is usually performed or given by dentists. Mr. A. T. Pitts, who was called by counsel to give evidence as to the process of scaling teeth, explained that tartar on the teeth was an injurious substance containing a number of germs which might set up pyorrhœa; the removal by scaling was a difficult matter requiring special instruments skilfully handled. This evidence, unrebutted, was presumably conclusive of the fact that the scaling of teeth is an operation usually performed by dentists. The magistrate said he thought the defendant had held himself out as being prepared to practise dentistry, but he dismissed the summons on payment of three guineas costs. It may be noted that the maximum penalty under the Act is a fine of £100. No doubt the magistrate was justified in taking a lenient view. At the same time, the Dental Board has no alternative but to bring such cases before the courts. If teeth-scaling by unqualified persons is to be sandwiched in between a shave and a hair-cut, it may soon become arguable that it is not exclusively a practice of dentistry. The mischiefs at which the Dentists' Act of 1921 was aimed will revive if amateurs are to be allowed to attack tartared teeth, and to decide whether or not the mouth is bad enough to justify reference to a dentist. If Parliament had —as nobody doubts it had—good reasons or conferring on the registered dentist a monopoly of practice which it refuses to the registered medical practitioner, the Dental Board would be false to its trust if it failed in vigilance.

DR. SAMUEL RIDEAL.

Dr. Samuel Rideal, whose death has been announced as occurring recently in South Africa, is well known by name to all chemists and many members of the medical profession as the inventor of the Rideal-Walker coefficient, a convenient method for the ascertainment of the comparative antiseptic power of disinfectant preparations. Dr. Rideal, who was a D.Sc. of London University and a Fellow of University College, was at the beginning of his public career lecturer on chemistry at St. George's Hospital; but he later devoted himself mainly to the study of disinfection problems and those of food preservation, to water purification, and to the chemistry of sewage. On all these subjects he wrote carefully and because of his familiarity with the difficulties of their study, and also because for a time he served as public analyst at Chelsea, he became president of the Society of Public Analysts as well as on different occasions examiner in chemistry at the English Conjoint Board. The Rideal-Walker method, immediately upon the publication of its technique, became commonly employed where it was necessary to compare the germicidal power of any preparation with that of some other disinfectant under carefully standardised conditions. Later, a method of accomplishing the same purpose was designed by the late S. A. Vasey, then chemist to THE LANCET, and this method has been much employed even while it became obvious in certain directions that it was open to criticism. A summary of the position was written in our columns by Rideal, and those who are interested in what at the time was a very live controversy will find the story set out by Rideal in a perfectly impartial way [1] in our pages. Dr. Eric Rideal, Humphrey Owen Jones lecturer in physical chemistry at Cambridge, is a son of the late Dr. Samuel Rideal.

THE ROYAL DENTAL HOSPITAL.

FOR very many years it has been the custom of the Royal Dental Hospital to hold an At Home on the same day as the annual dinner for old students and their friends. On this occasion clinical demonstrations are given by members of the staff, while a large number of interesting cases of rare conditions are collected. This year on Nov. 23rd over 300 former students and their friends attended the hospital. In the morning Mr. S. F. S. Steadman demonstrated the technique of regional anæsthesia; Mr. Bowdler Henry the preparation of the mouth for artificial dentures; and Mr. F. Talbot, the dental surgeon in charge of the newly established electro-therapeutic department, showed some patients under treatment. In the department where children with cleft palates are trained to speak, under the direction of Miss van Thal, several patients chatted to the visitors, and their clear enunciation testified to the value of the teaching. In the afternoon clinical cases were shown, also exhibitions of work in the various departments carried out by the students. Among the cases shown were several of dental and dentigerous cysts, including two examples of a very rare form of the last-named tumour—namely, a cyst arising in connexion with supernumerary teeth. Two cases of diffuse hypertrophy of the maxilla were shown. One patient who attracted some attention was a man of 40, with several unerupted teeth; two sisters of this patient showed a similar condition, and, in addition, defective ossification of the clavicles. The association of cranio-cleido-dysostosis with unerupted teeth as a familial disease has been noted in the literature, but cases are very rare. The orthodontic department was represented by a large number of children showing the results of treatment. The comparison of the original models of the jaws with the present condition of the patients showed how remarkable is the æsthetic improvement which can be obtained, and the boon which treatment can confer on children with unsightly irregular teeth. In the prosthetic department were a number of patients for whom unusual forms of dentures had been made. Obturators designed for cleft palate or to restore the maxilla after extensive operation for malignant disease were shown. The advances in substances available for dentures were illustrated by dentures made of new translucent materials, which reproduce the appearance of the gum in a way not possible with vulcanite. In the radiological department a large number of beautiful radiograms were displayed, and in the pathological department microscopic slides, specimens, and cultures. The John Hampton Hale research department was open to inspection, and visitors manifested especial interest in the investigations by Dr. E. W. Fish into dental caries and the nutrition of enamel and dentine. Many of the past students who visited the hospital in the afternoon reassembled at the Trocadero Restaurant at 7 P.M. to dine together and to greet their guests. Mr. W. J. May, who presided at the dinner, proposed the toast of the past and present students of the hospital and school, commenting on the wealth of clinical material available in the out-patient departments, which hitherto had constituted the whole of the hospital's clinical activities. From January next, however, ten beds would be reserved for Royal Dental Hospital cases at the new annexe of Charing Cross Hospital. Dentistry was not a soft job, but a hard and exacting profession, which nevertheless brought great rewards to its followers. Mr. E. D. Davis, in response, spoke of the determination shown by the authorities governing the hospital to keep up to date. They were fully conscious that dental surgery in modern times was not confined to the teeth, and that all diseases which had origin in the mouth should be considered in relation to it. The provision of beds and the use of an operation theatre at Charing Cross Hospital would help to show dental students how closely their activities were connected with those of the medical profession. Mr. F. F. V. Mansfield spoke of the revival of the Students' Society, and of the loyalty to the hospital, and the keen desire of the students to be well equipped for their future work. In two directions greater facilities were desirable; some of the students left the hospital without ever having extracted a deciduous tooth, and others had had little or no experience in giving gas. Mr. H. Stobie, the dean, spoke of the academic successes achieved. The examination results taken all round showed 70 per cent. of passes. A department of electro-therapeutics had recently been installed, and research work was in progress in all departments. Full advantage was taken of the facilities provided for post-graduate work. The Dean regretted the resignation from the staff of the honorary anæsthetists, Dr. Harvey Hilliard, Dr. C. J. Loosely, and Dr. E. H. Drinkwater, and announced that Dr. Lionel Smith, Dr. R. G. Karn, and Dr. F. P. de Caux had been appointed to succeed them. After a pleasant interlude of light music, supplied by Dr. Karn, the speeches were resumed. Mr. S. A. Riddett proposed the visitors in graceful terms, and Mr. W. Malcolm Scott, in reply, expressed concern at the diminished number of entries into the dental profession, in view of the possibility that dental benefit under the approved societies would become statutory. Mr. A. T. Pitts, in proposing the health of the chairman, recalled his own student days when Mr. May was a popular member of the honorary staff, always accessible and helpful to the students. Visitors to both the functions organised by the hospital on Nov. 23rd must inevitably have carried away the impression that this dental school is alive to its responsibilities, not only to students but to the general public, and is fulfilling them with zeal and success.

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[1] THE LANCET, 1913, ii., 826.

POST-OPERATIVE TETANUS.

It has long been recognised that the germination and development of spores of *B. tetani* which have gained access to the tissues depends on adjuvant factors. The mechanism whereby the defence of the tissues is maintained when the bacillus is injected in small quantities and appears to be ruptured in the presence of other organisms, certain chemical compounds, an accumulation of blood, or particles of foreign material embedded in the wound, is not clearly understood. Recent observations made in the department of bacteriology of the University of Edinburgh [1] show that the effect even of massive doses varies in different animals and in individuals of the same species. This experimental study was the corollary of a prior investigation into a series of cases of post-operative tetanus attributed to contaminated catgut. Catgut with spores embedded in it was introduced into various tissues and tetanus occurred with great regularity, but only provided a sufficient quantity of the material—i.e., the inoculum—was implanted. In the presence of a small inoculum a variety of agents are capable of predisposing to a tetanic infection, but the majority act somewhat irregularly. The influence of other infecting organisms in promoting the development of *B. tetani* was clearly illustrated. *B. welchii* exerted an adjuvant influence with great regularity, and a strain of *B. coli*, injected in large doses along with *B. tetani* spores in sublethal doses, evoked tetanus, though when smaller doses of *B. coli* were used results were negative. The peculiar relationship of post-operative tetanus to abdominal and gynæcological operations may be due to the fact that intestinal organisms favouring the development of the tetanus bacilli have gained access to the operation area. The authors discuss the nature of the inhibitory and adjuvant influences concerned in tetanus infection and suggest that these are complex. They seem to depend not only on phagocytosis and the oxygen tension of the tissues, but also on factors intimately related to the parasitic properties of the organism and the humoral and cellular defences of the body. The irregularity with which tetanus appears in animals subjected to experimental infection is well in accord with clinical experience. A batch of catgut afterwards proved to be infected has been used for a large number of operations with only a very small resulting incidence of tetanus. Experiments with iodised catgut demonstrated the efficiency of aqueous iodine in the sterilisation of this form of ligature for surgical use. Since, largely owing to the work of Prof. Mackie, sterilised surgical catgut can now be added to the substances in the Schedule of the Therapeutic Substances Act, 1925, this small but tragic group of post-operative fatalities should in the future be prevented.

We have to announce that Lieut.-General Sir Arthur Sloggett, who was Director-General A.M.S. on the western front from 1914 to 1918, died on Nov. 27th in his seventy-third year.

We have also to record the death of Sir John Cockburn at the age of 79 on Nov. 26th. He was a medical graduate of the University of London and practised medicine before taking up the political career which led to his becoming Premier of South Australia and afterwards Agent-General in this country.

In a report of the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow allusion was made to Mr. Freeland Fergus as late instead of past president of the Faculty. We regret the slip, and are happy to say that the suggestion was entirely without foundation.

The annual meeting of the British Institute of Radiology, incorporated with the Röntgen Society, will be opened by Mr. Arthur Greenwood, Minister of Health, at 2.30 P.M. on Wednesday, Dec. 4th, at the Central Hall, Westminster. The Mackenzie Davidson lecture will be given at 3.15 P.M. on the same day by Prof. Gösta Forssell, whose subject will be the Radiotherapy of Malignant Tumours in Sweden. At 6 P.M. on Dec. 5th Prof. A. S. Eddington, F.R.S., will give the Silvanus Thompson lecture on X Rays in the Stars. Further particulars of the meeting will be found in our medical diary. The annual dinner will take place at 7.30 for 7.45 P.M., on Friday, Dec. 6th, at the Trocadero Restaurant, Piccadilly-circus, London. Mr. C. Thurstan Holland, F.R.C.S., the President, will take the chair, and application for tickets should be made to Major D. B. McGrigor, 32, Welbeck-street, London, W.1.

Derby City Hospital.—This poor-law hospital, which, when completed, will have 360 beds in 11 wards, has been opened by the Mayor of Derby, Alderman J. H. H. Grant. It is claimed that the building is the last word in hospital equipment, and that the X ray plant is "superior to that in any London hospital." By the movement of a lever the beds can be transformed into wheeled stretchers; 4000 pieces of crockery an hour can be washed and sterilised; and the medical officer is connected by telephone with every part of the building.

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[1] Certain Factors that Promote the Development of the Tetanus Bacillus in the Tissues, with Special Reference to Post-operative Tetanus—an Experimental Inquiry. By T. J. Mackie, M.D., D.P.H., D. G. S. McLachlan, M.B., and E. J. M. Anderson, B.Sc. A Report to the Department of Health for Scotland. Edinburgh: H.M. Stationery Office. 1929. Pp. 31. 2s.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LIV.

INTERPRETATION OF RADIOGRAMS OF THE ALIMENTARY TRACT.

PART I.*—GENERAL TECHNIQUE: THE ŒSOPHAGUS.

IN the radiological investigation of the alimentary tract there are certain fundamental difficulties to the uninitiated:—

1. X ray pictures are the result of the obstruction to the passage of the rays. They represent the shadows cast by all the substances through which the rays pass irrespective of their distance from the surface or from the X ray tube. There is no perspective.

2. The opaque food outlines cavities only in so far as they are filled—the actual wall of the cavity is not represented by any distinguishable shadow.

3. The whole of the alimentary tract is a living muscle. To understand it we must forget the cut-and-dried anatomical descriptions which give us the impression of an inert organisation of tubes which pass the food from the mouth to the anus. A living conception, especially as regards the stomach and duodenum, is fundamental. The possible variations within the limits of the normal are sometimes surprising, even to those with long experience.

Success or failure in diagnosis depends so largely on technique that one cannot eliminate it, even in a short article. It is not just the exposure of one or two films after an opaque meal—to imagine that a reasonably accurate diagnosis can be arrived at by such methods is as futile a conception as suggesting that one photograph can represent an ataxic gait. To arrive at accurate diagnostic results involves a tedious and well-thought-out examination which consists of: 1. Preparation of the patient. 2. Taking a brief history from the patient himself. 3. A series of fluorescent screen examinations, before and after the opaque food has been given, in which manipulation and palpation are freely employed. As many radiographs as may be necessary are taken of the appearances noted on the screen for record and demonstration purposes. 4. Summing up the evidence—that is, detailed examination of all the films, weighing up the notes of the screen examinations and also the clinical notes that have been taken. 5. Issuing the report.

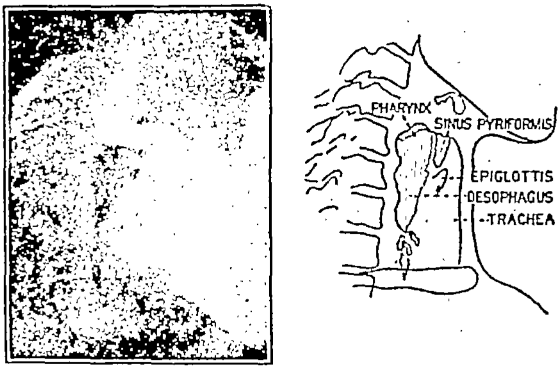
Preparation.

A purgative, two days before the examination and possibly an enema the day before, are necessary precautions against delay in the passage of the opaque food from mechanical causes. If the purgative is still acting when we examine the patient, it will give an impression of hurry that is as artificial as would be the delay of the opaque food by the stagnation in the cæcum or elsewhere in costive patients if no preliminary clearing had been carried out. In order that the stomach may be empty, no food is allowed for some hours before the examination. Apart from these precautions, the patient should live his usual life, for we wish to examine the alimentary tract under the least abnormal conditions we can arrange. During the period of examination purgatives should be avoided and the patient should conform as nearly as possible to his usual routine of life. When the examination is complete it is very advisable to ensure the voiding of the opaque food before it sets into a hard mass, as is liable to happen if no action of the bowels takes place for a day or so.

Technique.

The actual technique employed will differ according to local conditions—it must be so arranged that by a minimum of observations practically the whole alimentary tract will be observed. If the examination, therefore, starts early in the morning, the single opaque meal can be followed straight through till the evening; but if the first observations are made at, say, 2 o'clock, only a few hours are available and recourse is had to a system of double feeding. In these circumstances the first meal is watched from time to time for a couple of hours till all information as to the œsophagus, stomach, duodenum, and proximal small intestine is obtained. The patient comes for further observation on the following day, having had another opaque meal five hours before his appointment, preferably a real food mixed with opaque salt in order that, if there is a residue in the stomach, it will be a test under comparatively normal conditions. This method has decided advantages, both from the point of view of the convenience of the observer, and also because it gives greater opportunities for confirmations of observations, which are of the first importance.

FIG. 1.



Paralysis of the upper third of the œsophagus. The food sticks in the lower pharynx, particularly in the sinus pyriformis on either side of the larynx in the laryngeal pharynx and in the upper œsophagus. Forcible swallowing acts with difficulty and incompletely passes the food on.

Clinical History.

By taking the clinical history three main objects are obtained:—

(*a*) The radiologist can obtain personal knowledge of the history; frequently his experience indicates leading questions which bring out suggestive data, entailing variations in routine without which diagnosis would not be possible. As a simple example, a note that only certain types of food produce a sensation of œsophageal obstruction at once suggests that the opaque food employed should as nearly as possible correspond to the food that gives rise to the trouble.

(*b*) It gives the opportunity of getting to know something of the patient's mentality.

(*c*) An opaque meal cannot but be an ordeal to some patients, and a chat beforehand gives the radiologist the chance of allaying quite natural nervousness.

Screen Examination.

Presuming that the observer's eyes have been thoroughly prepared, either by the use of special goggles or by a period of waiting in the dark, the screen examination proceeds with the observation of the passage of the opaque food through the œsophagus and the rest of the alimentary tract, a number of observations being necessary at intervals determined by the rate at which the food passes and by other factors. This, however, is far from the whole story, for in addition to the use of his eyes the observer can manipulate the abdominal organs and judge from the movements of the shadows such things as undue fixation, laxity, or the cause of displacements. Even more important is the combination of the sense of touch with that of sight, from which combination he may obtain invaluable evidence as to the presence, site, and perhaps also the nature of any resistance that is detected, the reason for incomplete filling of any portion of the gut, the exact site of pain on deep pressure. It is essentially the work of a trained medical radiologist.

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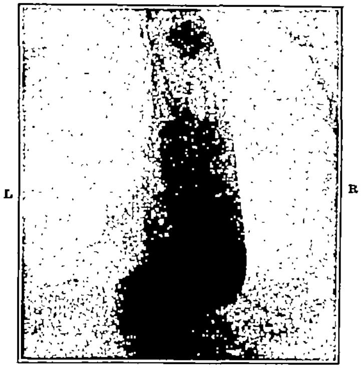
* Articles in this series on the other parts of the Alimentary Tract will appear in subsequent issues of THE LANCET.

A thorough screen examination is a very complicated and intense method of investigation. It requires absolutely undivided attention, for the observer may be put on the track of the cause of the symptoms by one transient observation which, of course, he must always attempt to confirm. In these observations it is essential for his own safety that he must be speedy, otherwise he is unduly exposed to radiations which will ultimately lead to disastrous results. In using his hands for palpation, whether bare or clothed in X ray proof gloves (which not only interfere with his sense of touch but also give him a false sense of security), he must never allow them to be in the direct beam of the rays. This can only be accomplished by using a very adaptable apparatus with which the illuminated area can be rapidly and easily cut down to a small focus and moved about over the organs that are under investigation, his palpating hand being always outside the illuminated area.[1] It is a complicated and delicate method of investigation that is as valuable as it is difficult, and it requires long experience to obtain the best results.

During the course of the screen examination X ray films are exposed as a record of what is seen on the screen. These are complementary to and cannot replace the screen examination. They record as far as possible such things as the radiologist notes on the screen. In this combined screening and filming technique it is seldom that the radiographs give the clue to the diagnosis—they merely confirm and record what has been noted on the screen. It very frequently happens, however, that the radiologist sees things on the screen which he is unable to record on the films—e.g., a duodenal cap which is irritable and can only be maintained normally filled for a brief period, a period that is quite sufficient to convince him that it is normal, even though his films show an apparent deformity, due to the partial filling of the cavity.

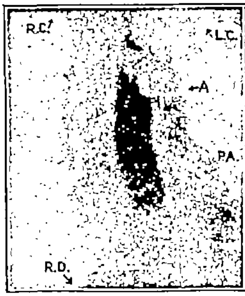
The technique of radiography should be absolutely standardised so that the radiologist need have no doubt as to the quality of the films he will have to examine when he makes his report—the exposing of the films is just an incident for record purposes in the course of his screen examination. He may, however, need a series of films to confirm the persistence or otherwise of certain conditions—e.g., that peristaltic waves miss out a certain section of the stomach, probably indicating an early growth, or that the deformity of the duodenal cap is persistently the same in character. Such serial radiograms need not be taken in very rapid succession, in fact they are of more value if they are made at intervals of a few seconds, since the average rate of peristalsis in the stomach is about three a minute.

FIG. 2.



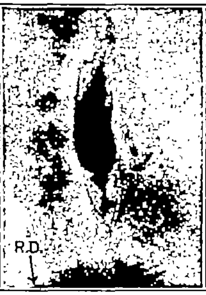
Old-standing case of cardiospasm in which the œsophagus has become much dilated and tolerant to holding large quantities. The act of vomiting—comparable to and very like the gush of pyloric obstruction—only partially empties the cavity. Note the thin tail of the little opaque food (indicated by a dart) that is passing the cardiac orifice. Also note that the increase in width of the œsophagus is accompanied by increase in length, so that the last few inches lie nearly flat on the diaphragm, forming an angle around which it is practically impossible for a bougie to find its way. Blind bougies should therefore never be used under any circumstances.

FIG. 3.



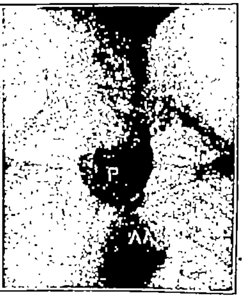
Œsophageal obstruction. The funnel-shaped lower end of the shadow suggests spasm—i.e., that the lesion is one affecting the mucous membrane. The film is taken in the semi-lateral position, but the patient is not sufficiently rotated to show whether the mediastinum is clear or not.

FIG. 4.



Œsophageal obstruction due to growth. Note the tortuous course but no displacement and a suggestion that the channel is in the middle of the growth. It is probably a growth in the wall of the œsophagus and its outline can just be detected on the film. It is indicated on the tracing by the dotted outline.

FIG. 5.



Typical œsophageal pouch. Note the rounded outline of the lower part of the shadow and the absence of any outlet.

R.C. = right clavicle; L.C. = left clavicle; A. = aorta; P.A. = pulmonary artery; R.D. = right diaphragm; P. = œsophageal pouch; AA. = aortic arch.

Interpretation of Observations.

It is most unwise, even in an apparently straightforward case, to attempt to arrive at a diagnosis without mature consideration. The radiologist should first carefully go through the notes that he has made of his screen examinations, examine all the films in detail, and then write out a précis of his observations which will form the first part of his report. This entails time and concentration. Not until he has done this should he attempt to draw conclusions and complete his report on the case. Having made up his mind as to the interpretation of the observations he has recorded in his précis, he should return to his original clinical history and see how his conclusions fall in with the clinical picture. Only when he has duly considered these things is he in a position to complete his report by adding his interpretation of the observations that he has recorded in his précis. It is mainly with the report and the grounds on which it is based that we are concerned in this brief outline.

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[1] See the Dangerous Art of Palpation, British Journal of Radiology, (B.I.R. Sect.), October, 1926, xxxi., 365.

For the radiographic illustrations I am indebted to my late partners Dr. R. S. Paterson, Dr. E. W. Twining, and Dr. E. D. Gray of Manchester. These are not selected as show specimens but are the type of film that should be produced by any competent and properly equipped radiologist in reasonably easy cases.

For practical purposes the abnormalities that are met with in the alimentary tract are: (1) anatomical peculiarities and displacements; (2) disturbed function; (3) ulceration and the results of ulceration; (4) adhesions; (5) new growths; (6) the formation of diverticula. Various other lesions are occasionally met with, but they are comparatively so rare that we may almost neglect them—nor is it possible here to consider the displacements due to causes outside the alimentary tract.

Œsophagus.

When the patient is screened during the act of swallowing, the food is seen to pass over the back of the tongue straight down through the pharynx and into the œsophagus. Naturally, fluids and thin foods pass much more rapidly than thick. With fluids the process looks like the action of gravity, and the time taken to reach the cardiac orifice is not more than one or two seconds, whereas with thick pasty food, such as we use for œsophageal examinations, it takes perhaps 10 or 15 seconds. No indication of peristalsis is seen in the upper third and it is only when there is obstruction that we can definitely note peristaltic activity in the lower two-thirds. Normally the food bolus that is swallowed passes in an elongated mass at a more or less even pace all the way down, perhaps pausing momentarily at the cardiac orifice. When there is an obstructive lesion, particularly low down, we see the peristaltic wave pass down the column of opaque food as a ring of contraction and, as this approaches the obstruction, the opaque food regurgitates upwards through the wave of contraction, unless the pressure exerted is sufficient to canalise the obstruction. The appearance on the screen is almost as if the wave of contraction was passing from below upwards, as its effect on the shadow food is to shoot it upwards, leaving the immediate region of the obstruction empty. This appearance has given rise to descriptions of reverse peristalsis, which condition, so far as I know, is not actually to be seen in the œsophagus.

In the œsophagus there are no anatomical peculiarities, but displacements due to aneurysms, enlarged glands, and various chest conditions are common. Function is sometimes impaired owing to interference with nerve-supply. Normally a bolus of opaque food should pass down at an almost regular speed, fluids passing more rapidly than solids, and leaving practically no traces. When there is interference with the nerve-supply, the opaque matter tends to stick to the walls of the laryngeal pharynx and upper œsophagus. It is usually a case of repeated acts of deglutition, often accomplished with difficulty, before the food is passed down, perhaps with the help of a draught of water. Such an appearance indicates *interference with the nerve-supply* (Fig. 1).

The not uncommon condition known as *cardiospasm* (achalasia of the cardia) (Fig. 2) is also probably an example of disturbed function. There is marked obstruction at or just above the cardiac orifice that ultimately leads to enormous dilatation of the œsophagus. The character of the food seems to make little or no difference and, in extreme cases, one can fill the œsophagus up to the level of the clavicle with large quantities of food. A portion of this is usually vomited, the rest may pass on in time whenever the orifice relaxes. Twenty-four hour residue is, however, not very uncommon.

Simple ulceration of the œsophagus is rare, and gives rise to obstruction by reason of induced spasm from the irritation of certain foodstuffs. It is therefore important to make up an opaque food that is likely to set up the spasm or, as a routine stand-by, to give a mouthful of dry toasted crumbs before the opaque food is swallowed. The patient will always tell the observer when the spasm has been induced and he can then give the opaque food and note the position and nature of the obstruction (Fig. 3). Malignant ulceration may also be investigated by this bread-crumb method, and the obstruction due to the spasm may be noted long before there is organic narrowing of the passage. Naturally it is not possible to distinguish malignant from simple, specific, tuberculous, traumatic, or other ulcerations, except on purely clinical grounds, but the observer will take films and will also screen extremely carefully, in the upright semi-lateral position, to see whether or not there is abnormal shadowing around, and particularly below the site of the obstruction. Intrinsic growths with ulceration of the œsophagus seldom give any detectable shadow; those that extend to the œsophagus from the mediastinum are usually quite well seen on the screen. These *extrinsic growths*, however, are seldom associated with spasm, and the resulting X ray picture is one that suggests a narrowed, displaced, or tortuous passage of the opaque food through the obstruction (Fig. 4). It is a rather different type of picture from that of ulcerative obstruction, where spasm plays a large part and the lower end of the food shadow ends abruptly in a funnel-shaped tail.

The *œsophageal pouch* (Fig. 5) originates at the junction of the pharynx and œsophagus. As it gradually enlarges it sags down from this position, and the lower end of the shadow comes to a considerably lower level. The lower outline of a pouch is always rounded, with no suggestion of an outlet at the lower end. They are seldom detected before they are the size of a walnut. Diverticula also occur lower in the œsophagus, but they are very rare.

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A NEW CLINIC AT BIRKENHEAD.—Sir George Newman, chief medical officer of the Ministry of Health, on Nov. 20th, in opening a new clinic for children in Birkenhead, said that children to-day are healthier, better, stronger, weigh more, and are taller than children of 1907. The clinic represented the opening of the golden age of health. In the 1520 clinics throughout the country almost a million children received medical treatment last year, while another million had dental treatment. The Birkenhead clinic is the first in the country to be equipped with a cinema to educate mothers. It has a nursery and an artificial sunlight room, a sand pit, and a lawn.

ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND.—Our Dublin correspondent writes:—The report for 1928–29 of this Society furnishes sad example of the need that exists among near relatives of deceased members of the medical profession, as well as of the inadequacy of the Fund to meet the demands made on it. The Fund was fortunate during the year in obtaining a windfall in the form of a bequest of some £3500 from the widow of the late Mr. W. J. Hepburn, F.R.C.S. Edin., in addition to another smaller bequest. The actual increase from subscriptions, however, was a little less than £700, while the direct disbursement of grants came to £1644. The number of grants made was 83, and the average amount was £22 6s. 6*d.* How inadequate this is may be judged from the fact that in one case, in which a grant of £30 was made, the recipient's means from other sources were nil, while in some other cases the recipient was, apart from the grant from the Fund, dependent on the old age pension. The Fund is administered with great care and economy and deserves a more widespread support than it receives.

Special Articles.

GENERAL MEDICAL COUNCIL.

President's Address.

At the winter session of the General Medical Council, which opened on Nov. 26th, the President, Sir Donald MacAlister, recalled the fact that it was 40 years since he was admitted to membership of the Council, and 25 years since he was first entrusted with the responsibilities of the President's chair. "The time is drawing near," he said, "when I must resign into your hands the trust you have so long and so loyally reposed in me; but if you are good enough to consider that prolonged experience may in some measure compensate for lack of youthful vigour and initiative, I am willing for a little longer to continue my endeavours in your service."

A Retrospect.

"Forty years' retrospect," said Sir Donald, "satisfies me that, amid divers changes of operation and vicissitudes of public appreciation, there has been a steady advance, both internally in the Council's practical efficiency, and externally in its general estimation by the Government, the Judicature, the public, and the profession of medicine at home and abroad. The Council has not failed to respond to the progressive demands of the changing years, and, by those qualified to criticise and to judge, its efforts have been approved and encouraged. In the light of my long and intimate knowledge of its working I cannot but pronounce the Council to be to-day a better instrument for fulfilling in the public interest the duties laid upon it by the Medical Acts than it was 40 years ago. It is more harmonious, more zealous, better informed, and more happily inspired now than then."

Changes in Membership.

The President went on to record changes in the personnel of the Council. "Death has," he said, "taken from us Sir Thomas Jenner Verrall, a direct representative of English practitioners since 1912, an eager and fluent contributor to our discussions, of ripe experience in professional affairs, and zealous for the honour and welfare of the profession. Prof. Arthur Thomson has retired from the representation of the University of Oxford, after faithfully serving his university on the Council for nearly a quarter of a century. He carries with him our esteem for his sturdy independence of character, and our respect for his keenly critical intellect and his wide scientific knowledge. Mr. William Guy has completed his term of office as an additional member for dental business, originally appointed by the Privy Council in 1921. To his energy and his familiarity with dental education and policy the Dental Board owes much of its success in establishing itself as a new organ of professional government. Though Sir Edward Farquhar Buzzard has retired from his seat as representative of the Royal College of Physicians of London, we happily do not lose the benefit of his counsels. For the University of Oxford has done us the grace to appoint him its member here, and we heartily welcome him back. The Royal College has appointed in his room Dr. Henry Letheby Tidy, of St. Thomas's Hospital, and honorary secretary of the Royal Society of Medicine, whose repute as a physician and a scientific investigator has preceded him, and from whose enlightened coöperation we promise ourselves much profit in every way. As additional members the Privy Council has appointed two members of the Dental Board, Mr. John William Alexander McGowan, of Glasgow, and Mr. Edward Leo Sheridan, of Dublin, elected by the qualified dentists of Scotland and of Ireland respectively. With Mr. Dolamore for England we have now for the first time a dental member for each of the three countries. This readjustment removes from the Council one English additional member, Mr. William Robert Ackland, appointed last year; but he will still continue to serve his profession on the Dental Board, as he has been re-elected by the qualified dentists practising in England and Wales.

"The recent election of direct representatives to the Council has resulted in the unopposed return of Sir Norman Walker by the medical practitioners of Scotland, and of Dr. Leonard Kidd by those of Ireland, north and south. In the English constituency Dr. Brackenbury is assured of a fresh term of office dating from Jan. 1st, 1930; and Sir Jenner Verrall's place is filled by the election of Mr. Nathaniel Bishop Harman, who has approved himself highly competent in matters of professional administration."

Indian Medical Degrees.

The President then referred to the position of Indian medical degrees, and their recognition by the Council, as furnishing guarantees for efficient practice in this country, under the provisions of the Medical Act, 1886, Section 13. "In previous addresses, and in the minutes of the Executive Committee, you will," he said, "find particulars of the inherent difficulties of this question, and of the patient efforts we have made since 1922 to overcome them. I pointed out to you last May that the period for which recognition of Indian medical degrees for registration here was provisionally granted, pending the appointment of a Government Commissioner of Medical Qualifications and Standards, was fast running out. I stated that the evidence of separate inspectors, appointed ad hoc by the Government of India, had been received; but that their reports lacked reference to any common standard comparable with our own, and moreover disclosed individual deficiencies in regard to Indian methods of training and testing which could no longer be overlooked. I expressed the Executive Committee's earnest hope that the Government of India would not delay further its assumption of the responsibility, which rests upon it by law, to maintain such standards of medical qualification as would be acceptable for purposes of recognition outside of India. I endeavoured to make it clear, once again, that the Council is not concerned with the standards deemed sufficient for practice in the several Indian provinces. It is concerned solely with the standard which it is required by law to guarantee as in fact sufficient for efficient practice in Great Britain and Ireland. Qualifications admitted to the British Register must reach that standard.

"On behalf of the Council, on June 12th, 1929, I addressed a letter to the Secretary of State for India setting forth in detail the grounds for these conclusions, and pointing out the essential services both to India and to the Council, which fell to be rendered, in the absence of an All-India Medical Council, by a full-time Commissioner appointed by the Indian Government. His reports, authoritative, fully informed, and impartial, transmitted through the Indian Government, would be received by the Council with full confidence as a basis of action, and would furnish it with the guarantees that are indispensable for the due fulfilment of our statutory duties in respect of recognition. This letter was followed by communications from the India Office, stating that, as a temporary measure, the appointment of a whole-time Commissioner of Medical Qualifications and Standards had been agreed to by the Central and the Provincial Governments, pending the settlement of the permanent machinery required to enable the General Medical Council to discharge its obligations.

"These intimations were laid before the Executive Committee on July 22nd, when they agreed that, pending the confirmation of the appointment of the Commissioner, the recognition of Indian Medical degrees, which would otherwise cease on July 31st, would be continued until the meeting of the Committee in February, 1930. In August we were asked whether we agreed with the Secretary of State in thinking it desirable to offer the appointment to Colonel Needham. The reply was to the effect that, from our experience of the value of Colonel Needham's unique qualifications, we deemed the proposed appointment in every way desirable. In September we learned that Colonel

Needham had accepted the appointment, had made arrangements to leave for India on Nov. 1st, and was prepared to make his inquiries and report to the Executive Committee in time for its meeting in February. On Oct. 15th the India Office informed the Council that owing to action taken in the Legislative Assembly on Sept. 25th, the Government of India and the Secretary of State had felt obliged to cancel the appointment already intimated, and that Colonel Needham's departure for India was countermanded. The India Office further stated that the Legislative Assembly will meet again in January, and it was proposed to ask it to reverse its decision, and to explain to it, "not only the unfortunate results on the prospects of Indian students that would follow from a definite refusal to appoint a Commissioner of Medical Standards and Qualifications, but also the genuine desire of the General Medical Council to help India consistently with the obligations which British statutes impose on them."

"These perplexed and perplexing communications," said Sir Donald, "came before the Executive Committee yesterday, and I was instructed to inform the India Office that the final decision thereon must be postponed until the Committee's meeting in February next. But the inevitable absence of authoritative reports on the actual standards of study and examination for Indian medical qualifications would be of the most serious import. The Committee would in fact be deprived, by action taken in India, of the necessary guarantees of sufficiency, on the basis of which alone it would be in a position to extend recognition of Indian medical degrees beyond the period now current."

Qualifying Examinations.

"The Executive Committee, charged by the Council with making arrangements for the cycle of inspections of qualifying examinations to begin in 1930, have carefully considered the appointment of inspectors in medicine, surgery, and midwifery respectively. They have agreed to invite certain eminent and experienced members of the profession to undertake the important duty of inspection, and hope shortly to make definite appointments which will meet with the approbation of the Council. Visitations and inquiries have continued, at the instance of the Education and of the Examination Committee, in reference to the courses of study, and to examination requirements, bearing on important subjects of the professional curriculum. The visitations of recognised examinations for registrable diplomas in public health, sanitary science, and State medicine have been actively proceeding, and are indeed nearly completed."

The Pharmacopœia.

"This Committee," said the President, "will report on steps taken, and to be taken, with reference to the adhesion of this country to the proposed international agreement on the pharmacopœial unification of potent drugs, following on the International Conference held at Brussels in 1928. At this conference the Council was represented by the late Sir Nestor Tirard. The Committee will also transmit to the Council a report of progress made by the Pharmacopœia Commission since our last session. It will be found that the Commission has been diligently and fruitfully engaged in preparing for the issue of the British Pharmacopœia due in 1930, and has opened up communications with the British Dominions and with the United States which are likely to extend its usefulness."

At the conclusion of his address a vote of thanks to the President was proposed by Prof. J. B. Leathes, and seconded by Sir Norman Walker. The Council then passed to the consideration of penal cases.

HOSPITAL SAVING ASSOCIATION.—The annual report shows that the contributions during the past year amounted to £320,714, as compared with £248,878 in the preceding 12 months. There are now 6711 groups and 651,713 members, and during the year 172,467 contributors and dependents were treated at voluntary hospitals on the list of the association.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ANNUAL MEETING OF FELLOWS AND MEMBERS.

THE annual meeting of Fellows and Members of the College was held on Nov. 21st, with Lord MOYNIHAN in the chair.

The PRESIDENT referred to points of special interest in the annual report of the Council, such as the examination for primary Fellowship held in Canada for the first time this year; the establishment of a research scholarship; and the formation of a British College of Obstetricians and Gynæcologists. With reference to certain provisions in its Charter which appeared to conflict with the powers and functions of the Royal Colleges no satisfactory compromise had, he said, yet been reached.

Dr. E. W. D. KITE asked whether it was true that in the examination for the Fellowship the examiners decided beforehand the proportion of candidates to be passed, and that once the number determined had been reached the remaining candidates inevitably failed.—Dr. F. W. COLLINGWOOD suggested that the Fellowship examination was no true test of operative skill, and that it should be revised in such a manner that this could be gauged.

The PRESIDENT said that it was not true that the proportion of successful candidates was decided before the examination. Every candidate was passed who reached the required standard; the proportion of successful candidates was small because the standard was high. Dr. Collingwood's criticism he considered was just; but unfortunately it was not possible to assess operative ability by means of an examination; it was possible only to judge whether the candidate had had a reasonable opportunity of acquiring it.

The report was then adopted.

Mr. SOMERVILLE HASTINGS then moved:—

> "That this forty-first annual meeting of Fellows and Members again affirms the desirability of admitting Members to direct representation upon the Council of the College, in view of the fact that there were 18,687 Members as against 1945 Fellows."

He apologised for repeating an appeal which had now been made annually for over 40 years. In refusing to admit Members to the Council the Fellows were exercising a legal right, according to the Charter of the College. But that legal right had been obtained originally in an unjust manner, and he was calling upon the Council to right a previous wrong. If the Charter was examined, he said, it would be seen that in 1800 the Royal College of Surgeons of London was founded by Royal Charter, and the governing body of that day was elected by the Members. In 1843 the name was changed to the Royal College of Surgeons of England, and at the same time the degree of Fellowship arose. It was decided that the first Fellows should elect a Council, and needless to say they elected themselves, retaining the power to elect others without examination. The Members had suffered under a sense of injustice ever since. It was not, he said, that the Members were dissatisfied with the College; on the contrary, they wished to contribute to it. Most of the Members were general practitioners, a body of men essential to the coördination of medical services. The Council at present was in danger of becoming archaic; the Fellows did not encounter the general run of patients and were in danger of losing touch with the times. The examinations of the College, he thought, stood in need of revision. Was all the physiology included in the primary Fellowship of value to the surgeon? He appealed to the members of the Council not to harden their hearts against a reform which would be to their advantage.

Dr. H. S. STRATFORD, in seconding the motion, said that the arguments in favour of admitting

Members to the Council were both historical and practical. THE LANCET in 1845 had described the Charter, which "deprived members of the right to sit on Council," as "mischievous and iniquitous." He reasserted that Members wished to be represented on the Council not for their own profit but that of the State and community at large. During the war Members of the College had done an enormous amount of work, and the mortality among them had been relatively much higher than among the Fellows. The franchise had been accorded to women on account of their war-work. Members of the College needed a representative to voice their views and difficulties on the Council. The examination for the Fellowship was, he considered, not practical enough. Students should be signed up by their teachers for simple emergency operations such as tracheotomy, amputation, appendicectomy, before qualifying. In obstetrics practically all normal cases nowadays were attended by midwives; students were only trained to treat abnormal cases, and saw few that were normal. He was glad to see that a College of Obstetrics and Gynæcology was being formed.

Dr. REDMOND ROCHE said that the Council in 1907 had sent a circular letter to all Fellows and Members stating that although the Council had decided to admit women to the College, they were anxious to obtain the opinions of Fellows and Members. Now, in the report for 1929, the Council declared that, in view of the postal vote of the Fellows, it was not prepared to give Members direct representation. On the previous occasion the Council had made a decision and was ready to carry it out. Now the only reason given for refusing Members representation was the vote of the Fellows.

Dr. C. W. BROOKE opposed the motion. Members, he said, who really desired this reform should approach a Member of Parliament with a view to revision of the Charter. In the meantime, if the Royal College of Surgeons was an antique, it was at least a priceless antique, and should be preserved intact. He suggested that the President should rule this resolution out of order at future meetings.

Dr. ARTHUR HAYDON suggested that six Members should be elected to the Council and created honorary Fellows. If representation of Members on the Council was to remain impossible he was prepared to contemplate the formation of a new College.

In putting the motion the PRESIDENT said that, historically, the facts of Mr. Somerville Hastings were inaccurate; Members had never been in a position to elect the governing body; the original body had been self-elected. The large bulk of the Fellows were in general practice, so that the Council was in fact elected by general practitioners. Judging by the small numbers of Members who attended this annual meeting, the desire for representation in Council by Members was not widespread. Changes in the form of examinations had to be made gradually in order to be fair to the candidates. If there were any earnest desire among the Members for a change in the Charter, it could no doubt be altered legally, but until the Council was assured of that desire both Fellows and Members must continue to act under its clauses.

The motion was then put and carried, and the President announced his intention of submitting it to the Council.

BUCKSTON BROWNE ANNUAL DINNER OF FELLOWS AND MEMBERS.

The dinner held at the Royal College of Surgeons on Nov. 14th was the second of a series of functions to be held at the College, and due to Mr. Buckston Browne's generous gift of £5000, the interest of which is expended in providing an annual opportunity for friendly intercourse between Fellows and Members. In accordance with the terms of the trust, half of the company present at the dinner were Members of the College. Lord Moynihan presided, and the following is a list of those present, among whom it will be seen are several laymen whose personal connexion with the function was explained by Lord Moynihan in a few words.

Mr. W. R. Ackland, Dr. C. M. Anderson, Dr. H. T. Ashby.

Mr. Louis Baron, Mr. C. J. Bond, Mr. Victor Bonney, Mr. G. Buckston Browne, Mr. A. H. Burgess, Mr. R. H. Burne.

Mr. J. E. G. Calverley, Mr. H. W. Carson, Mr. Eustace Carter, Mr. T. Carwardine, Mr. D. K. Cassels, Dr. F. William Cock, Mr. Sydney Cockerell, Mr. Arthur Cooke, Mr. S. Forrest Cowell, Mr. S. C. Cresswell, Mr. V. A. Crinks.

Mr. Bernard Darwin, Dr. W. L. M. Day, Dr. John Dixon.

Mr. W. McAdam Eccles, Dr. H. Muir Evans, Dr. J. W. H. Eyre.

Mr. C. H. Fagge, Mr. J. Herbert Fisher.

Mr. H. Courtney Gage, Mr. Leonard Gamgee, Mr. A. J. Gardham, Dr. A. D. Gardner, Mr. G. E. Gask, Dr. Lewis G. Glover, Dr. R. N. Goodman, Sir Charles Gordon-Watson, Mr. Albert Green, Mr. C. H. Greenwood, Sir Wilfred Grenfell, Mr. Ernest W. Hey Groves.

Dr. George Hall, Mr. Sampson Handley, Prof. H. A. Harris, Mr. Ravensworth Hart, Rt. Hon. Arthur Henderson, Mr. R. G. Hogarth, Dr. G. H. R. Holden, Sir Thomas Horder, Dr. N. G. Horner, Mr. C. H. Howkins, Dr. William Hunter.

Mr. Leonard Isaac.

Dr. Thoresby Jones.

Mr. R. E. Kelly, Mr. Geoffrey Keynes.

Viscount Lee of Fareham, Mr. W. R. Le Fanu, Mr. E. K. Le Fleming, Mr. Hugh Lett, Mr. V. Warren Low, Sir John Lynn-Thomas.

Mr. C. E. A. MacLeod, Mr. W. Ernest Miles, Dr. J. L. Morton, Lord Moynihan.

Dr. F. E. Nichol.

Mr. Carlton Oldfield.

Mr. Herbert J. Paterson, Dr. C. J. Penny, Sir D'Arcy Power.

Mr. H. J. Relph, Dr. W. S. Richardson, Mr. Frank Romer, Dr. Thomas Rose, Mr. R. P. Rowlands.

Sir Percy Sargent, Mr. Graham Simpson, Colonel T. Sinclair, Prof. G. Elliot Smith, Dr. Alfred R. Spencer, Sir Squire Sprigge, Mr. F. J. Steward, Dr. C. A. Stidston, Mr. W. T. Storrs.

Dr. Edward S. Tait, Mr. Herbert Tilley, Mr. F. B. Treves, Mr. Thomas Turner.

Mr. Cecil P. G. Wakeley, Dr. F. J. Waldo, Sir Cuthbert Wallace, Sir H. J. Waring, Mr. James Watts, Mr. Russell Wilkinson, Mr. F. J. Willans, Mr. Henry Wilson, Mr. William Wyllys.

After the toast of the King, and allusion to the munificence of the donor, Lord Moynihan stated that the rule had already, he was glad to say, been laid down that no other toast would be proposed at this dinner, and that no response would be expected from anyone, but certain present, he thought, should be mentioned by name as having a connexion either with the function or with the College generally. To Mr. Louis Baron, he said, the College owed the foundation of the Bernhard Baron Research Scholarship of £500 per annum for seven years. They were all glad, he said, to welcome Lord Lee of Fareham, Chairman of the National Radium Commission, and Sir Wilfred Grenfell ("Grenfell of Labrador"), who had asked that no mention of the sort should be made of him, but his request was disregarded as the occasions were so few when he was seen at gatherings of his colleagues. Further, the President called attention to the presence of Mr. Arthur Henderson, Minister of Health; Dr. John Dixon, the Senior Member of the College, who obtained his diploma in 1854, and was 98 years of age; and Mr. Bernard Darwin, the well-known exponent of golf on the links and in the *Times*, and grandson of Charles Darwin. Lord Moynihan then requested the company to drink to the health of Mr. Buckston Browne.

After dinner Mr. Buckston Browne showed a film of Down House, Darwin's old home, which, it may be remembered, he presented to the nation at a meeting of the British Association in 1927, in response to an appeal from Sir Arthur Keith. Mr. Buckston Browne acquired the property from a grandson of the great naturalist, and transferred its possession to the British Association with an endowment for its upkeep and preservation, the condition being that the property should be regarded as a gift to the nation and open to visitors without charge. The film pictures included a view of Down House from the south, the lawn, the entrance to the Sand Walk, the study where Darwin worked, and the chair in which he wrote large portions of the "Descent of Man." In the course of demonstrating these pictures Mr. Buckston

Browne expressed the hope that Down House would be a centre of scientific research in connexion with the pursuit of surgery.

The guests on leaving were presented by Mr. Buckston Browne with a coloured reproduction of the portrait of John Hunter, which he had given to the College, and which is ascribed to Gainsborough. This portrait represents the plain, not to say ugly, Great John Hunter whose features Sir Joshua Reynolds idealised in his intellectual presentation.

ROYAL SOCIETY OF MEDICINE.

THE ANNUAL DINNER.

THE annual dinner of this Society took place on Nov. 21st at the May Fair Hotel, Lord Dawson of Penn, the President of the Society, occupying the chair. About 400 Fellows were present, and the guests included the Prime Minister, the Minister of Health, the French Ambassador (M. de Fleuriau), the Presidents of the Royal College of Physicians of London, the Royal College of Surgeons of England, the British College of Obstetricians and Gynæcologists, and the Medical Society of London; the President, Chairman of Council, and Medical Secretary of the British Medical Association; the President of the Medical Women's Federation; the President of the Royal Academy; and the Dean of Westminster. Among others supporting the Chairman were Commander L. C. Bornacchi, Sir James Berry, Sir John Bland-Sutton, Sir Walter Fletcher, Sir Arthur Robinson, Lord Lee of Fareham, Prof. Sidney Russ, Sir Albert Levy, Sir Alfred Lewis, Mr. Hugh Macmillan, and Dr. Kay Menzies.

The King's Health.

The toast list opened auspiciously, for the chairman, in proposing the loyal toast, took occasion to make a welcome pronouncement on the King's health. He said: "Upon this day last year there began that grave illness which nearly cost the King his life and the nation a beloved Sovereign. This is a suitable gathering in which to state that the King, in his recovery, goes from strength to strength."

The Prosperity of the Society.

The toast of the Royal Society of Medicine was proposed by the Prime Minister, who offered a tribute of praise to the medical profession, speaking as a private individual and as a public servant. He would leave to the Minister of Health the task of entering into details which, he believed Mr. Greenwood had discovered, occasionally raised somewhat thorny questions between the profession and himself. It was one of the great demands made upon a Prime Minister's time and intelligence to shift difficulties upon other shoulders, and to take smoother paths than his Ministers were sometimes able to choose. Comparing the modern doctor with the modern politician he found certain resemblances. Both were now less interested in cures than in maintaining the general health of the community. He had noted, also, that the medical profession was becoming much less interested in close and detached examination and consideration of an organ than it was in the harmonious and healthy inter-relation of the organs promoting the general health of the body, and here, again, was a point of contact with the politician. Standing in front of this gathering he felt that he was speaking to those who belonged, in some mysterious sort of way, to a common brotherhood. He had to couple with this toast the name of Lord Dawson, who was an old acquaintance of his. They had first met during Lord Dawson's student days, at a most respectable supper, issuing together towards midnight, both bound for the north of London. Their combined wealth that night was insufficient to save them from walking from the south end of Gower-street to Holloway station. A third party present at that meeting, however skilled in prognosis, would hardly have forecast that it would be their fate not to meet again until 40 years later they were fellow-guests at Buckingham Palace.

Lord Dawson, in response to the toast, claimed the Prime Minister as an apostle of the art of healing, for had he not recently been engaged in trying to allay and heal international strife? More than that, he had had the skill and understanding to try to institute a state of immunity amongst nations against the virus of war. It fell to the President of the Society to give an account of it. It was faring well; its finances were such as would satisfy even the Chancellor of the Exchequer. Beyond the Society's ordinary Budget, there was instituted, a little more than a year ago, a "Royal Society of Medicine Trust," the object of which was to further learning and to help young men who were engaged in research, especially by placing before them such works as would help them to pursue it effectively. An anonymous donor had recently given a donation of £1000 to this fund. Lord Dawson spoke of the advances made during the past year, especially the wider knowledge gained of the applications of radium and the organisation of its availability. The researches which had revolved round radium, vitamins, and hormones had revolutionised thought in the same way that, years ago, bacteriology had revolutionised it. We had got away from the conception of mass and weight, and had moved from matter to influence, from the static to the dynamic. The recent outcome of research into distemper was especially satisfactory, since its credit would fall to this country, where friendship between man and dog was a matter of national pride. The research was a fine exemplification of team-work. With regard to the application of medicine to the services of the country, the Local Government Act had opened up a new chapter in the relations of the medical profession to the Government. It was a satisfaction to medical men to know that the Minister of Health shared the belief that the secret of progress in health services depended on a responsible relationship between the medical profession and the local authorities. In that part of medicine which abutted on administration and on the interpretation of knowledge for the public good, the profession sought close relationship between themselves and the administrative bodies. In the territory which concerned itself with knowledge, education, and research, medicine must remain for ever unfettered.

Possibly the best way of bringing knowledge to the service of the people would be to set up semi-autonomous bodies with members having administrative and specialist knowledge sitting together, which would bring about quickness of decision and flexibility of thought. It would be the most rational form of delegation. The experiment had already been tried in respect of broadcasting, and of electricity; and the best and the latest example of all was the organisation of the nation's supply of radium, which organisation would commend itself to the consideration of all thoughtful people.

The Maintenance of Voluntary Hospitals.

Dr. A. P. Thompson submitted the toast of the guests. He said that statesmen, like physicians, were great borrowers; they had to acquaint themselves with all sorts of advances in human knowledge and ingenuity, in order that they might be brought to fruitful use in the community. On the subject of the voluntary hospitals, he said that to him people who talked glibly and cheerfully about the disappearance of great free institutions like the voluntary hospitals appeared as reckless of the future of this country as they must be ignorant of its history and character. The spirit of disinterested work manifested in voluntary hospitals was one of the treasures of our race, tradition, and inheritance. The sources of weakness of the voluntary hospitals seemed to be two-fold: (1) their lack of coöperation with one another and with established public health services, (2) their poverty. He believed the working man would make sacrifices to preserve the voluntary hospitals. In Birmingham, a coöperative scheme had been established, which, in two years, had resulted in a membership of 300,000, and in the collection of £200,000, all the work having been done by voluntary effort. Great changes affecting the profession of medicine in its relation to the public were everywhere being discussed, and were mostly acknowledged to be inevitable. It would be idle to deny that certain tendencies had given cause for uneasiness, even alarm. It had been said that the day was approaching when the State would control all the medical services in this country, and that the first great step to this end would be taken with the fall of the voluntary hospitals.

Mr. Arthur Greenwood (Minister of Health), in responding, said that the view that the Ministry of Health had no regard for the voluntary hospital system of this country was utterly mistaken. From two points of view, the voluntary hospital system in this country was vital to the progress of public health. First, it was interwoven with the growth of knowledge on problems affecting the lives of our people; secondly, there was need of every hospital bed existing in this country. His only object was to form a great brotherhood of people who would serve the common ends of humanity. In the effort to understand the problems which doctors felt were fundamental in the public interest, he had gathered to himself the heads of the profession, in a spirit of friendship, and the response had been whole-hearted. He was appalled, as he dug deeper and deeper into the problems of public health, by our lack of knowledge, which only the medical profession could remedy. There remained much to be learned, and, when it had been learned, much to be applied. He welcomed, without reservation, the fullest coöperation of the medical profession, and would do all in his power to help that profession in its work. He asked—was entitled to ask—the members of the profession that they in their turn would assist His Majesty's Government, and would believe that the Government was as much concerned with the problems at issue as medical men were themselves, because they had got to face the results of lack of knowledge. He hoped that, as this Government grew from strength to strength, and as it was succeeded by others of similar intensity of purpose, the bond between this great profession and the Government would also grow from strength to strength. He claimed the assistance of the profession that there might issue a magnificent people, people of fine calibre and tremendous spirit, a body of citizens which would lead the world.

Mr. H. P. Macmillan, K.C., expressed his conviction of the great mutual benefit which results from association with members of other professions. Professional men were apt to get into ruts—and a rut, as had been happily said, only differed from a grave in being narrower. Sir Alfred Ewing had once suggested that we all needed "re-potting" at intervals. We got pot-bound in our professional routine, and an occasional transplantation into fresh soil was wonderfully reviving. It was only within the last hundred years that medicine, like law, had finally emerged from the fogs of mediæval mysticism. The earlier London pharmacopœias read like inventories of an alchemist's spells and potions. Even in 1824, neither morphia, iodine, nor quinine was to be found in the official Pharmacopœia. The great strides recently made in the direction of preventive medicine in the department of public health emphasised the fact that in the treatment of mental disorder alone the public was still excluded by an antiquated system from the benefit of preventive treatment. Mr. Macmillan hoped that this restriction would soon be removed. To the need for preserving the voluntary hospitals system, the Minister of Health had referred with a fitting emotion. All would rejoice that the Minister recognised the value of these institutions, and that apprehension of peril to them was not likely to be realised under his guidance.

SOUTHPORT HOMŒOPATHIC HOSPITAL.—This hospital has been purchased for £3500 by the Southport Town Council. It is in future to be used for the treatment of aged and infirm patients.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Critical Condition of the Medical Profession.

Prof. Schlossmann, of Düsseldorf, lately read a paper before the German Society for Social Hygiene on the crisis in our profession. The liberty of the medical man, he said, is a dream of days gone by and the profession cannot longer resist a progressive nationalisation. Apart from some specialists with a large income the majority of doctors earn their livelihood from the fees paid them from institutions under the State Insurance Act. This Act provides them with 250,000,000 marks every year. Moreover, the individual practitioner has to observe so many rules and regulations issued by the government and by insurance authorities that he cannot be described as a free worker. Prof. Schlossmann does not at all agree with the leaders of the profession in their fight against sick clubs and other institutions of State insurance, for he holds that it only embitters their mutual relations. It would be better, he thinks, to coöperate with them so as to get over certain abuses.

According to Prof. Schlossmann, the profession is suffering from an economic crisis, an ethical crisis, and a crisis of confidence. The position of the younger generation who have to wait several years before admission to club practice is desperate financially, but still worse is the fact that they are obliged to be without work at a time when it is most desirable that they should be gaining experience and consolidating what they have learnt. The present method of study does not create medical practitioners; two years are spent in learning chemistry, physics, botany, zoology, physiology, and anatomy, and during this time the medical student does not see a single patient. Furthermore, clinical teaching is much too theoretical. What is worst of all is the public lack of confidence in doctors. The Insurance Act leads the patient to look upon the practitioner as more of a sick club officer than a medical adviser. Medicine has changed from an empirical to a technical science. The individual practitioner is not in a position to know all the technical methods of treatment and still less to provide for himself all the technical apparatus; this is the reason why patients are often sent to dispensaries, hospitals, and clinics, which have modern equipment. The increasing number of unqualified persons and the afflux of patients towards them bear further witness to the critical state of the profession.

Prof. Schlossmann suggests not that social insurance should be limited but rather that it should be extended. The object of sick clubs should be not only to cure their members but also to keep them in good health. If this were done, and if those classes of the population who are still outside national insurance were admitted to its benefits, a great number of the profession would find employment. His address has created a sensation, for he is a man who is well known in his specialty and also as president of the successful exhibition of hygiene held in Düsseldorf in 1926. The *Ärztliche Vereinsblatt*, the official organ of the Vereinsbund, says that his opinion that the representatives of the profession are hostile to State insurance is absolutely erroneous. But the medical profession, it continues, wishes to remain a free profession whose rights and duties as to insurance practice are limited by free agreement, and it is not inclined to become a mere collection of insurance employees.

Treatment of Congenital Dislocation of Hip-joint.

The German Congress of Orthopædics discussed the results of the treatment of congenital dislocation of the hip-joint. Prof. Lange, of Munich, reported the results obtained by the bloodless method of Lorenz which has been generally adopted for 30 years. At Munich and elsewhere, he said, he had studied the results of 2200 cases in which the reduction was performed between 3 and 25 years ago. Only in 5 per cent. had reduction proved impossible, but the difficulty was to retain the reduced joint in position, especially after the dressing had been removed. Redislocation may take place and sometimes a deforming arthritis or coxa vara may develop in the course of years. In 50 per cent. a full anatomical and functional cure was obtained, but to get this result the children had to remain under care for several years. Functional troubles rarely developed in cases where the deformity was reduced within the first two years, and the moral was that this should be done as early as possible. Dr. Spitzy, of Vienna, described a method of producing an acetabulum in cases where the reduction had been only temporarily effective. He makes the joint accessible without opening it and drives a splint, taken from the tibia, into the region above the head of femur. In this way an impediment to dislocation is provided. He has operated on 15 cases with good results.

Abandonment of a Medical Qualification.

The question whether a medical man may renounce his qualification has lately been decided by the Bavarian High Court. A doctor was being prosecuted for a crime, and, expecting to be sentenced to imprisonment and loss of civil rights, which includes the loss of the qualification, he informed the Government that he wished to renounce his qualification. Nevertheless, after being discharged from prison, he continued to describe himself in his prescriptions and on his door-plate as a qualified medical man, and was therefore prosecuted for wrongfully assuming that title and making the public believe that he was duly qualified. In the trial he pleaded that his letter to the Government had been voluntary, that he had not been deprived of the right to revoke it, and that he thus had the right of describing himself as qualified. The supreme court, however, found him guilty. It held that a medical man has the right to renounce his qualification, but only on condition that he does not intend to use it again. The defendant had been punished for his crime with the loss of civil rights which include the qualification; if he wished to regain it he would have to petition the Government for an act of grace.

Leaf Silver as a Dressing for Wounds.

Dr. Moritsch recommends leaf silver as a covering for fresh injuries, wounds, excoriations, and bruises. This material has been used by Prof. Lexer, of Munich, to cover sutures in plastic and cosmetic operations. Moritsch has noticed that under the silver leaf the wounds become cleaner and the discharge is less than under the usual ointment dressing, also the change of dressing is less painful. Owing to the bactericidal action of leaf silver the sutures may be left longer in the wound, which is of special importance with wounds under a plaster-of-Paris dressing.

Gonococcal Meningitis.

Dr. Lorentz has recently observed in the Berlin Westend Hospital a case of gonococcal meningitis. Such cases are very rare and it has seldom been demonstrable that meningitis occurring during gonorrhœa was due to the infection. In the case under his care the gonorrhœa was complicated by arthritis. The organism cultivated from the cerebro-spinal fluid was shown to be Neisser's gonococcus by microscopical, biological, and serological examination.

An international exhibition of hygiene is to be held in Dresden. It is the purpose of the exhibition to instruct the public in health matters and to give a full picture of what has been done in this direction. Whereas the exhibition of Düsseldorf was universal and included every branch of hygiene, social medicine, and gymnastics, the Dresden exhibition will be limited to personal hygiene. It is expected that the German States and Provinces, and all the bodies concerned in health, will take part, as they did in the last Dresden exhibition in 1911. Foreign countries have shown great interest in the exhibition and several governments have already declared their readiness to contribute.

In the past year 100,000 former combatants have made claims for the first time for damage done to their health by the war. In the past nine years 2½ million certificates have been given under the law for the care of the victims; 900,000 combatants receive pensions; and there are 100 offices for the care of the injured, with 500 full-time medical officers.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Clemenceau.

THE medical profession in Paris claims the great patriot as one of themselves. Georges Eugène Benjamin Clemenceau was born in 1841 at Mouilleron-en-Pareds in the Vendée, was educated at the Lycée of Nantes, and became a docteur-en-médecine. Migrating to the United States in 1865 he returned to Paris in 1870 and practised as a physician in Montmartre before he was elected mayor of the eighteenth arrondissement and a member of the National Assembly.

X Rays and Neighbourliness.

Some time back one of the great Paris dailies foreboded all sorts of troubles for the unhappy people who live in the neighbourhood of X ray installations. It was not the first time that Mr. Coutremoulins, the distinguished physicist, obtained a hearing for some of his ideas in the lay press and in official circles. Mr. Coutremoulins was one of the X ray pioneers in this country, and though he is no physician he is still at the head of the Rontgen service at the Necker. Much sensation was caused by his discovery that a photographic film is affected by the rays from a tube 100 yards away. In his experiments it was, of course, a naked tube. Mr. Coutremoulins draws the deduction that X ray installations are dangerous for the neighbourhood. Most of his medical friends would say: No, not if the tubes are protected. But their evidence is held to be biased because it is in their own interest to minimise the risk. Some years ago the Académie des Sciences of Paris appointed a special committee to study the question, and its answer was that in actual X ray work no danger exists for neighbours. Now a committee has been appointed by the préfet of police, of which Mr. Coutremoulins is a member. It is somewhat remarkable that with the exception of Dr. Zimmern and Dr. Lobligeois no other member of the committee has special knowledge of X rays. So everyone wonders what authority its decisions will have.

The Confédération des Syndicats Médicaux has sent to every member of both Chambers, senators and deputies, a formal letter containing the solemn decision of the medical profession to refuse collaboration if the social insurance law is not modified. Amendment is indeed probable, but when? The law is due to come into force on Feb. 5th. The budget discussion is only just started and will scarcely be finished by the New Year. Then come the holidays, which are sacrosanct, and January will be over.

Prof. Netter, of the Institut Pasteur, has given the Académie de Médecine his views on the ætiology of post-vaccinal encephalitis as a result of his study of a campaign of vaccination at Rotterdam. He lays the responsibility on the preparation of vaccine lymph by passage through the rabbit.

César Roux, professor of surgery in the University of Lausanne, has been awarded the diploma of doctor hon. caus. of the University of Paris. The same distinction has been granted to Dr. Egas Moniz, of Lisbon, the originator of arteriography by injection of sodium iodide, by the University of Lyon.

LONDON CLINIC AND NURSING HOME.

THE ceremony of laying the foundation-stone by the Duchess of Atholl of the London Clinic and Nursing Home, Limited, was held at the Devonshire-place entrance of the building now rapidly rising at the corner of Devonshire-place and the Marylebone-road.[1]

After the ceremony the Chairman and Directors entertained a large number of supporters and friends at luncheon at the Trocadero Restaurant, Piccadilly, when the Duke of Atholl presided.

After luncheon and the loyal toasts, Lord Moynihan, President of the Royal College of Surgeons of England, proposed Prosperity to the Scheme, which he referred to as a necessary development of modern medicine. He pointed out that, while the art of the Middle Ages still left us marvelling, the progress of science, especially in relation to medicine, during the last fifty years at any rate, had developed in an unlimited manner. Lister had ensured, he said, that a large range of cases previously termed medical should pass to the sphere of surgery, while operative surgery meant the institution of nursing homes. The scheme whose prosperity he was advocating he described as the first concerted effort to supply in London a nursing home where not only accommodation but specialised service could be obtained, with the important additions of resident medical officers, adequate nursing, and direct provision for the association of the general practitioner with the cases. Alluding to the financial support from laymen, which had made the scheme possible, he said that, while pecuniary dividends might be absent, dividends in terms of moral worth would be credited to them by the Recording Angel. In wishing heartily for the success of the scheme, he warned its supporters that criticism was ahead of them on the grounds either of their motives or of the practical nature of their plans, but that criticism, he had found, was a proof of success.

Mr. Allan Hepworth, the Managing Director, said: The ceremony we have witnessed to-day marks a further stage in the development of a scheme upon which certain doctors and laymen have been working for some few years, and which, when carried into full effect, should have far-reaching and beneficial results for paying patients, especially those of moderate means. So far as these patients are concerned there is a pressing need for provision more adequate in quantity and quality and more in harmony with present-day demands. We are not overlooking the increasing effort now being made by many of the hospitals for providing pay-beds, but only a limited number of these can occur—that is to say, that certain patients availing themselves of the service of the hospitals and being in a sufficiently satisfactory financial position are expected to pay. But when the hospitals have extended to this class the fullest provision they can, there will still remain a large section of the public demanding such a service, and on such reasonable terms and conditions as our clinic and nursing home will make an effort to furnish. We believe there is a great opening, not only in London, but also in the provinces, for many such clinics and nursing homes as the one we are now establishing, for already our scheme, and the ideals governing its working, have created widespread interest, and in two or three of our largest provincial cities a similar project is under consideration.

The advancement of our scheme has necessarily called forth criticism, favourable and adverse; we welcome both, especially adverse criticism, when it is constructive and well informed. Both on the medical and the business side we have for a long time been convinced, from facts, experience, and requirements, that there is a pressing need for a clinic and nursing home governed by the ideals, and with such service and administration as we are adopting; it is our intention to open out a wide field of valuable service for the benefit of sick people, and if this may mean the breaking down of some of the old fences, we hope to replace these with something better and more in harmony with present-day necessities.

Dr. Moreland McCrea, Chairman of the Medical Group, who also responds to this toast, will explain the position of the doctors identified with the Clinic. As Managing Director I will refer to the financial, administrative, and service side of the nursing home. Whilst the responsibility for the management of the home will rest upon the Directors of the Company, there will always be the closest coöperation with the Medical Group, and between the two there is a complete unity of views. In all our long deliberations goodwill and perfect understanding have prevailed. May I emphasise the point that this nursing home is not a hospital, it will not be administered on the usual hospital lines, and we shall in no way attempt to compete with the hospitals. Our nursing home can perhaps be better described as an hotel for sick people—that is to say, it will be directed more on the lines of hotel than a hospital, or than many existing nursing homes—especially as regards the freedom of the patients and the facilities for visiting by relatives and friends.

With reference to the financial side of the Nursing Home scheme, may I first publicly express appreciation of the services rendered by certain gentlemen in the City of London, who being actuated by a true public spirit, and considering the establishing of this nursing home a matter of great public importance, not only subscribed themselves for a large amount of the capital, but influenced other shareholders to subscribe. Without this valuable help the necessary capital would not have been obtained. It is a great pleasure to be in a position to state that the necessary capital has been found, and that our financial resources enable the Company to complete, furnish, and equip the building while retaining a working capital equal to our requirements. The Clinic and Nursing Home is a public limited company, the shares being held by about 800 shareholders, but the Company has not been brought out as primarily a money-making concern. Those in the City who were responsible for finding a large amount of the capital did not put up their money with the object of making it a remunerative financial operation, but are prepared to sacrifice their own financial interests for the sake of what they consider an important and much-needed public movement. None of them hope or expect to make money out of it. Notwithstanding this fine and magnanimous public spirit, the Directors of the Company recognise that there are two interests to look after: (1) the shareholders as investors in the Company, and (2) the patients. We are convinced we can serve the interests of both when the detailed plans and arrangements, carefully thought out, are put into operation. We expect to give the shareholders a reasonable return on their investment, whilst for the patients there will be a nursing home and a medical service which for efficiency, comfort, satisfaction, and reasonable charges will certainly not be *surpassed by any first-class nursing home* in London.

With regard to the charges for the various patients' rooms and the service, patients will have an alternative choice as to which they will be asked to pay: (1) a fixed price for the room, plus what are understood to be charges for the usual extras, and our charges for such extras will be based on an exceptionally moderate scale; or (2) an all-inclusive price (*a*) for the room, (*b*) fee for operating theatre, (*c*) dressings, (*d*) drugs, (*e*) special nurses if required,

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[1] THE LANCET, 1928, ii., 720.

The patients will thus know, before they enter the Home, the exact cost of their stay per week, with no bill for extras on leaving. It is expected that the nursing home will contain about 200 patients' bedrooms, and each room has received careful consideration in the matters of lighting, heating, ventilation, and equipment. Representatives of the Medical Group, and the Directors of the Company, including the Architect, Mr. Biddulph-Pinchard, have visited numerous clinics, hospitals, and nursing homes in Sweden, Denmark, Holland, France, and also in this country to find the latest and best of everything for the good of the home in general and the patients, nursing and other staff in particular.

In harmony with the statement published in the prospectus issued to the shareholders last April, certain provision will be made for a number of rooms for people of moderate means. The *non-inclusive* charges for the more well-to-do patients will range from about £12 12*s*. or £14 14*s* a week, and up to about 30 and 35 guineas a week, and for this larger amount a patient will be provided with a private suite of rooms, so that if any relative desires to stay, or live in the home for a time with a patient, this can be arranged. Where an *all inclusive* charge per room is desired these prices will, of course, be increased.

The most careful attention is being given, by the Management Board and the Medical Group, to the service in the home. The choice and variety of the food to be provided, and its proper cooking and serving will be entrusted to members of the management whose technical skill, ability, and wide experience justifies full confidence, and as to the proper cooking we have already secured on our executive staff certain ladies of recognised standing in household and domestic science, with a wide range of practical experience in dietetics to meet the needs of any patients who are ordered special diets by their medical advisers. We shall also engage experienced chefs, and in making these appointments we have already been promised the help and advice of certain friends of our nursing home who are in a position to give practical effect to their advice. In fact these friends have promised to procure them for us.

It remains to refer to the appointment of the matron and the selection of nurses. As to the appointment of matron we shall have a wide choice, for already we have received applications from many candidates. With regard to the nursing staff, of a total number well over 120, we think there is need to strike out on new and better lines to secure the best and most experienced nurses for whom there will be a hostel in a suburb within a reasonable distance of the home. In the general running of the hostel we shall aim at making the nurses comfortable and creating such an atmosphere as will make it less of the usual institution and more of a home from home.

In Greater London we have a population of 8 to 10 millions of people constantly swelled from the provinces and by foreign visitors; with the resources to draw upon, which I have mentioned, we think that the service we shall provide will command success.

I thank you, Lord Moynihan, on behalf of the Company and the Medical Group for the toast you have so kindly and gracefully proposed, and to you, my Lords, Ladies, and Gentlemen, for the way you received the toast.

Dr. Moreland McCrea, Chairman of the Medical Group, said: It is a curious fact that while we have in London establishments unsurpassed in the world in efficiency and comfort for the treatment of the sick poor, no such provision has been made for those who are able to pay for treatment, though the latter provide the necessary funds. However creditable it may be to our charitable instincts that we provide in our hospitals, as a free gift, every resource that modern methods can devise for the investigation and treatment of disease, it is scarcely a tribute to our common sense that we exclude all but the objects of benevolence from these very resources. With the advance of medical science there has arisen a demand for an elaborate equipment which can scarcely be provided by individuals, and for a coöperation, never thought of in the older methods of practice, between specialists in different branches. The introduction of such an equipment and coöperation into private practice is everywhere recognised as imperative to practical progress. It is just ten years since some of us met to discuss this difficult problem. The obvious answer was to erect a building fully equipped for the investigation and treatment of disease, on the lines of a modern hospital, with rooms to suit the means of all classes of paying patients, and with adequate laboratories. If to such a building there could be attached a block of consulting-rooms occupied by consultants representing every branch of medicine and surgery we felt that an ideal solution would be obtained. We imagined that we had only to give to a cause so meritorious our blessing for the financiers in the City of London to open their coffers and supply the necessary funds. We were, however, soon disillusioned. No matter how meritorious our scheme the City would not take us on trust, and we found that it was useless to expect their help unless we were prepared to take some financial risk in the undertaking. As this was contrary to all medical ethics in this country our negotiations came to an end.

The fact that we are to-day in a more fortunate position is due to the enlightened enterprise of a distinguished group of business men, who have been able to grasp both the importance of our objects and the difficulty of our professional position. They have generously taken upon their shoulders the whole financial responsibility of the undertaking, only asking us to take the 99 years' lease of the block of 36 consulting-rooms in a building closely adjoining the nursing home. To them we owe the fact that our dreams are about to be realised and that we shall shortly see in actual being the great building of which your Grace has to-day so kindly laid the foundation-stone. The statement I have just made concerning the financial position represents the only monetary transaction undertaken by members of the Medical Group. They have also agreed to supply a committee to work in an honorary and advisory capacity with the Company, in a similar manner to the medical committee of all our large hospitals.

Speaking for the benefit of those who are unable to be present at to-day's ceremony, I may say that the site chosen for the building is situated on the south side of the Marylebone-road, and is bounded on the west by Devonshire-place and on the east by Harley-street. We have been asked why such a site should have been chosen in preference to one further afield, and we have been told that in such a position it will be impossible to eliminate noise. But a site in the chosen neighbourhood was essential, and we are satisfied that the rooms occupied by patients will be quiet and free from disturbance. These rooms will face not on the Marylebone-road, but on the south, south-east, and south-west frontages. The rooms facing on the Marylebone-road will be used for administrative purposes. Between the latter and the former there will be a long corridor 10 feet wide, and in this way the patients' rooms will be entirely protected from the noise of traffic. The goods entrances, including that for milk, will be on the Marylebone-road side. To secure privacy for the admission of patients by ambulance a special entrance has been arranged on the south side. The entrance of the nursing home will be in Devonshire-place.

The building will contain 200 beds. It has been designed with the utmost care, after literally years of study, by an architect who is unique in the attention which he has devoted to this particular problem, in constant consultation with the Medical Group and with the directors of the company. In order to obtain the very latest information on modern hospital practice, a committee of the directors and the members of the medical group has visited the most modern hospitals in Sweden, Denmark, Holland, and France, and we are convinced that this hospital will set an entirely new standard in design and equipment. A wide range of accommodation between small single rooms and large suites will meet the varying requirements of patients, but in every single instance the standard of comfort will be the highest attainable, and special attention has been paid to small amenities. Two features in the staffing of the hospital will add greatly to the comfort of the patient. The nursing staff will be sufficiently large to enable us to supply special nurses, usually a costly item, at a very low charge, and there will be two resident medical officers who can be called upon at any moment of emergency. In regard to the latter we desire it to be clearly understood that these resident medical officers will in no way usurp the authority of the patient's own medical adviser. It is an essential part of our conception that the patient should still remain in contact with his regular medical adviser, for we consider this of the utmost importance for the continuity of treatment.

The hospital will be open to the patients of any medical man whose name is on the Register of the General Medical Council, but it will be appreciated that the Group must have the first call upon empty beds. Should consultation be required, there will be the perfect freedom of choice which exists elsewhere to-day. The laboratories, X ray department, and dispensary, all of the highest class, will be at the service of all surgeons, physicians, and general practitioners who have patients in the hospital, on an equal footing with the members of the Group. The occupants of the consulting-rooms will see all their patients on the usual basis of individual practice, having the advantage of proximity to the hospital, its X ray equipment, and its laboratories. There is no moral, legal, or verbal agreement in existence or contemplated for any tenant to employ in a consultative capacity any other tenant in the building. There will be absolute freedom of choice in every respect as it exists to-day. A plan is under consideration by which the combined efforts of these tenants can be placed at the disposal of the medical profession for that large class of patients which is just outside the limit for receiving hospital benefits. The Company have agreed to place at our disposal some beds for this purpose at a low figure. It would be possible to arrange a composite fee in order to include all form of examination and treatment for these patients, and in this way all the advantages of combined work could be brought within the reach of a large deserving class of patients.

Such, Your Graces, My Lords, Ladies and Gentlemen, is our policy and our scheme. May your good wishes be fulfilled, and on behalf of the Group I thank you.

"The health of the Duchess of Atholl" was proposed by Sir Lenthal Cheatle, and was drunk with acclamation, after which Mr. B. H. Binder proposed the toast of "The Guests," to which Lord Greenwood replied. The proceedings closed with a toast proposed by Dr. Beddard, wishing prosperity to the Chairman of the scheme.

SECOND INTERNATIONAL MALARIA CONGRESS.

IN 1925 a committee of Italian malariologists including Drs. Marchiafava, Ascoli, Bignami, Bastianelli, Dionisi, and Gosio, initiated and organised a "*First International Malaria Congress*" which was held at Rome in October of that year under the patronage of the Italian Government. One of the resolutions passed was that there should be a second International Congress in 1930, which would be the fiftieth anniversary of Laveran's discovery of the malaria parasite, and that it should be at Algiers, where the discovery was made. Arrangements for this Congress have now been completed under the authority and patronage of the French Government. It will be held at Algiers from May 19th to 21st, with Prof. Mesnil as president. The following subjects will be discussed: (1) the parasitology of malaria (including therapeutic malaria from the parasitological point of view), (2) anopheles mosquitoes, (3) epidemiology and endemiology, (4) pathology, (5) quinine and other alkaloids and drugs in therapy, and (6) prevention and control. Communications should be in English or French and should be sent so as to arrive at the general secretariat of the Congress (Pasteur Institute, Algiers) before Dec. 31st. They will be printed and distributed to members before the opening of the Congress. Members of the Congress will include, in addition to representatives of Governments and institutions, all medical men, biologists, biochemists, and engineers who desire to participate. Applications for membership of the Congress should be sent before Jan. 15th, 1930, to the secretary-general of the Congress (Dr. L. Parrot, Pasteur Institute, Algiers, Algeria), accompanied by a postal order for 100 French francs. This subscription will entitle the member to take part in all meetings and official receptions of the Congress, to receive a printed copy of the Transactions, and to benefit by the reduction of fares allowed by the French railways and shipping companies. There will be optional excursions on May 22nd, 23rd, and 24th.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. M. Gordon is placed on the Retd. List with rank of Surg. Capt.

Surg. Lt.-Comdrs. F. L. H. MacDowel and A. W. McRorie to be Surg. Comdrs.

The following appointment is notified: Surg.-Lt. T. W. Froggatt to *Devonshire*.

ROYAL ARMY MEDICAL CORPS.

Lt. A. T. H. Marsden is secd. for serv. with the Sudan Def. Force.

ARMY DENTAL CORPS.

Capt. D. H. W. Williamson to be Maj.

Lt. J. J. Seaton to be Capt.

ARMY RESERVE OF OFFICERS.

Lt.-Col. G. J. S. Archer, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

SUPPLEMENTARY RESERVE OF OFFICERS.

G. F. Walker to be Lt.

TERRITORIAL FORCE.

Lt.-Col. F. G. Lescher to be Bt. Col.

Maj. D. S. Martin, R.A.M.C., to be Divl. Adjt. 46th (N. Midland) Div.

Maj. W. C. MacKinnon, R.A.M.C., to be Divl. Adjt. 50th (Northumbrian) Div.

Capt. J. D. Hart to be Maj.

D. M. Dunlop to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capts. A. N. Smith, H. Miller, and H. S. Allen, from Active List (supern. for serv. with O.T.C.), to be Capts.

ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: D. A. Wilson, F. E. Lipscomb, M. Clancy, C. P. O'Toole, G. H. J. Williams, S. B. S. Smith, V. V. Brown, J. F. McGovern, and W. Heron.

Lt. C. M. Leckie (General List, Army, Dental Surgeon) is granted a temporary commission as a Flying Officer (Dental) on attachment to the R.A.F.

Capt. R. E. Edwards (Army Dental Corps) is granted a temporary commission as a Flight Lt. (Dental) on attachment to the R.A.F.

Flight Lt. P. P. Hogan (Capt. Army Dental Corps) relinquishes his temporary commission on return to Army duty.

INDIAN MEDICAL SERVICE.

Capt. Ajab Singh Garewal to be Maj.

The probationary appts. of the undermentioned officers are confirmed:—To be Capt.: S. Hartley. To be Lts.: J. Acheson (now provl. Capt.), K. H. A. Gross, Shankar Sahai Bhatnagar, Bijeta Chaudhuri, E. V. Claydon, C. F. J. Cropper, V. H. Sarland, J. P. J. Little, E. A. O'Connor, and P. L. O'Neill.

Obituary.

LAURENCE BALL, M.C., M.D., F.R.C.P. Lond.

We regret to announce the death of Prof. Laurence Ball, which occurred at his consulting-rooms in Birmingham on Nov. 20th from an attack of angina pectoris which was the first and only manifestation of any cardiac disease.

DR. LAURENCE BALL.

[*Photograph by Whitlock.*

Laurence Ball was born in Birmingham in 1884, his father being an architect in that city. He received his medical education at the University of Birmingham, and in 1907 graduated in Medicine in the University of London, where he later secured the gold medal in the examination for the M.D. After holding resident appointments, both medical and surgical, at the Birmingham and Midland Hospital for Sick Children, he served for a year as house physician at the Queen's Hospital, and for another year as resident medical officer at the General Hospital. He then went to London for post-graduate study in medicine, and took the diploma of M.R.C.P. in 1911. Not long afterwards he was appointed pathologist and assistant physician to the Queen's Hospital, where, in 1926, he became full physician. At the time of his death he was also physician to the Children's Hospital and to the Birmingham and Midland Hospital for Diseases of the Nervous System. At one time he was lecturer in pathology in the University, and in 1926 he was appointed joint professor of medicine. Two years later he was elected a Fellow of the Royal College of Physicians of London.

Dr. Ball took a keen interest in pathology, and his sound practical knowledge in this department was often of great benefit to his colleagues. He was also much interested in medico-legal matters. Mr. Bertram Lloyd, to whom we are indebted for biographical details, says of him that he "was throughout devoted to his work, and took the greatest delight in it. The freshness and enthusiasm with which he would enter into the consideration of a knotty case or medico-legal problem was a constant source of stimulation to his colleagues. Although a very busy physician, he could always find time for another duty, and never appeared to be in a hurry. His patients had an affection for him which it is difficult adequately to describe. His professional manner inspired at once confidence, respect, and admiration for his wise judgment. Although much in request as a physician, it was as a teacher in the Medical School that he was pre-eminent. An eloquent speaker and a lucid teacher, his knowledge never seemed to fail him on any point. The students of the school crowded to his classes and held him in the highest regard. On personal grounds he was immensely popular. He was entirely devoid of vanity or affectation, and was possessed both of a deep fund and a keen appreciation of humour. Although temperamentally of a quiet and studious nature, he was constantly sought after by colleagues and students because of his attractive personality."

Dr. T. L. Hardy writes: "May I add my tribute to the memory of Laurence Ball, whose untimely death has removed from the ranks of the profession a sound physician and teacher of medicine, and a most lovable personality. I have enjoyed the privilege of his friendship for a matter of ten years, time enough in which to appreciate his many sterling qualities, for he combined in rare measure great modesty, charm of manner, and a love of the beautiful things in life and no less of its simple pleasures. He had a great capacity for friendship, a generous tolerance of the shortcomings of others, and he spoke ill of no man.

"Ball was a man of retiring disposition, rarely obtruding his opinions, but never failing those—and they were many—who sought them... He undoubtedly enjoyed life to the full, loving especially the big open spaces, and was never so content as when tramping among the hills of Cumberland or Wales with his friends. On such holidays his companionship was a thing of delight, for he was a man of wide culture and could talk with learning on many topics. He was, too, an amateur photographer of distinction, and his keen sense of beauty resulted in work of very high artistic merit. With children he possessed something akin to genius, and the joy his company brought to many families is a thing not easily forgotten.

"Ball contributed but little to medical literature and to research, holding the view that these things interfered with the proper discharge of his teaching duties, and it was to these that his energies were mainly devoted during the all too brief span of life allotted to him. As a teacher he was outstanding, whether in the lecture theatre, at the bedside, or in the post-mortem room, while his presentation of a case at a medical society was a model of lucid exposition. He was no specialist, indeed he heartily disliked the term, but was possessed of a wide knowledge of medicine in all its branches, knowledge which had been built up during many years in the post-mortem room. He was in the fullest sense of the term a general physician possessed of a maturity of judgment remarkable for one of his years. Yet though he has been taken at the outset of a brilliant career and has left behind him no written record of endeavour, his memory will endure in the hearts of his many friends, the students he loved to teach, and the patients, old and young, whom he delighted to serve."

In the course of service abroad in France and Italy during almost the whole of the late war, Dr. Ball was awarded the Military Cross, and was mentioned in General Plumer's dispatches for gallant and distinguished service in the field. He was unmarried, and is survived by his father.

Tenbury Cottage Hospital.—This institution, founded in 1867, has been closed, and the building, which is expected to produce £1000, is to be sold. A committee has been appointed to consider the application of this sum and the £2000 of invested funds with a recommendation to give preference to home nursing purposes. The reason assigned for the closing of the hospital is the reduction in the number of patients caused by the introduction of the Worcester Hospital Contributory Scheme.

Queen Mary's Hospital for the East End.—There was an unusual incident at the annual festival dinner of this hospital at which the Duke of Gloucester presided last week. It was desired to raise £10,500, and the donations announced amounted to £10,478. It was suggested that two of the guests should toss for the privilege of providing the balance of £22. The Lord Mayor and Sir Leonard Lyle, the chairman of the hospital, tossed for £10 and the Lord Mayor lost. The Duke of Gloucester and Sir Leonard then tossed for the remaining £12, and the Duke had to pay.

Correspondence.

"Audi alteram partem."

MALARIA TREATMENT OF GENERAL PARALYSIS.

To the Editor of THE LANCET.

SIR,—Before the introduction of Wagner von Jauregg's treatment of general paralysis a terminal stage of this disease, characterised by extreme emaciation in spite of adequate nourishment, was common. I have seen as many as four cases exhibiting this condition in bed in hospital at one time. Kraepelin attributed the condition to endocrine disturbance. Reichardt is more definite and attributes it to a specific degeneration in the vegetative trophic centres in the hypothalamic region. It is our experience at Whittingham that this "conspicuous body-wasting termination" of general paralysis never occurs following malaria treatment. In the mass of medical literature on this subject I do not find this fact mentioned, and think our experience worth recording as it may, or may not, be confirmed, and the observation may help to explain the mode of action of malarial therapy concerning which so many theories have been advanced.

I am, Sir, yours faithfully,

R. M. CLARK.

Whittingham Mental Hospital, Lancashire, Nov. 25th, 1929.

ROSS AWARD FUND.

To the Editor of THE LANCET.

SIR,—Those of your readers who have subscribed to the Ross Award Fund will be interested to hear that the officer commanding the First Battalion, the Sikh Regiment at Razmak, Waziristan, India, has kindly sent a cheque for £15 towards the Fund, the amount having been chiefly subscribed by the men of that Battalion who willingly gave it from their pay (which is scarcely large). The O.C. goes on to explain that this fund is of particular interest to the Battalion because not only did Sir Ronald's father—General Sir Campbell Ross—command the Battalion as Colonel, when it was known as the 14th Sikhs, when Sir Ronald was born in India, but also Sir Ronald's brother—Captain C. Ross—was killed while serving with this Battalion in connexion with the Chitral Campaign. This Sikh Corps has been always celebrated as an extremely fine body of men who have faithfully helped this country in many campaigns.

Your readers will be further interested to know that the Fund has now reached £10,010 3s. 7d., of which the *Straits Times*, Singapore, have contributed £3302 19s. 10d., and the *Malayan Daily Express* Fund £75 15s. 4d. Donations should be sent to Lloyds Bank, Ltd., 110, High-street, Putney, S.W.15.

I am, Sir, yours faithfully,

JAMES BARR,

Chairman of the Ross Award Fund Committee.

Hindhead, Surrey, Nov. 24th, 1929.

THE ROYAL FREE HOSPITAL V.D. CLINIC.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of Nov. 16th (p. 1053) speaks of the Royal Free Hospital Female V.D. Clinic as dealing with a considerable number of prostitutes. This belief about the Clinic is fairly widespread, I have met it in one quarter and another during the past five years, and it is quite wrong. If we can be said to specialise in any type of case, it is that of the unmarried mother, infected or probably infected, and for this reason referred to us by various social workers and philanthropic agencies from all parts of the country. The overwhelming majority of such cases are servants, domestic or hotel, and waitresses, and one of the rules of our hostels to which such cases are admitted is: "Save under exceptional circumstances remand cases or prostitutes are not suitable for admission to these hostels"—this for the guidance of social workers sending up cases.

We have, of course, a very considerable family attendance of married women and their children and a special clinic is held on Wednesdays from 2 to 4 P.M. for doctors' cases referred particularly to myself. During these hours married women only are seen. This is *not* to prevent their mixing with prostitutes, as may be suggested, but so that they may not be kept waiting on their first visit, especially as many of these are pregnant or recently delivered.

I apologise for intruding on your valuable space but must endeavour to remove this misconception, lest doctors fear to refer married women and children to the department in case they be offended by the type of patient waiting to be seen at the same time. There does not seem to be any V.D. clinic to which professional prostitutes go in any numbers. Whether this is because they have other arrangements or because, save in the richer circles of the demimonde who can, of course, afford private treatment, they are being ousted almost entirely by the amateur I do not know; but the fact remains that the professional prostitute is very rarely indeed met with in my clinic.—I am, Sir, yours faithfully,

MARGARET RORKE,

Director of the Female V.D. Department,
Royal Free Hospital.

Nov. 25th, 1929.

THE TEACHING OF RADIOLOGY.

To the Editor of THE LANCET.

SIR,—"Seeing is believing" is almost a fetish among Americans; they are always seeking means of visualising disease. In England we rely almost exclusively on clinical methods, employing such a magnificent aid to vision as radiology only when destitute. The radiologist's or radiographer's task is to correlate, revise, and if necessary correct the clinical diagnosis in the *early* stages of disease.

Why does radiology persist in taking a back place here in England? Surely it is because the general practitioner has no means of learning what it will do that he does not seek its aid. For those specialising in the science there are excellent courses; these courses, like most text-books, deal chiefly with technique, which is just what the general practitioner does not want. There is a sharp distinction between those who know what radiology will do and those who can actually take the films. The most striking advances during the last ten years have not been by technicians but by clinicians with a knowledge of the capabilities of radiology; vide the use of lipiodol and sodium phenoliodophenolphthalein. One has only to scan the last few years LANCET's to realise what a price surgeons put on radiology. Morriston Davies's "Surgery of the Lung and Pleura" is essentially clinical but half the illustrations are radiograms demonstrating pathological processes; one can see the progress of a disease in these radiograms in a most beautiful manner. This is the "pathology of the living."

The British Institute of Radiology is the proper and obvious place for such lectures to post-graduates; it is doubtful whether the student should be burdened with more lectures. Half a dozen lectures are all that are necessary to learn the principles on which to build up one's knowledge. The Council of the Institute, however, are afraid that there would be a mushroom growth in the number of installations to the detriment of radiology. This need never happen, since technique need not and should not be mentioned. The word "technique" is a perfect bugbear to the general practitioner. It alarms and deters him; he imagines that all sorts of abstruse electrical problems beset him. Technique should and will always be left in the hands of those who are prepared to undergo the

Obituary.

LAURENCE BALL, *M.C.*, M.D., F.R.C.P. LOND.

WE regret to announce the death of Prof. Laurence Ball, which occurred at his consulting-rooms in Birmingham on Nov. 20th from an attack of angina pectoris which was the first and only manifestation of any cardiac disease.

Laurence Ball was born in Birmingham in 1884, his father being an architect in that city. He received his medical education at the University of Birmingham, and in 1907 graduated in Medicine in the University of London, where he later secured the gold medal in the examination for the M.D. After holding resident appointments, both medical and surgical, at the Birmingham and Midland Hospital for Sick Children, he served for a year as house physician at the Queen's Hospital, and for another year as resident medical officer at the General Hospital. He then went to London for post-graduate study in medicine, and took the diploma of M.R.C.P. in 1911. Not long afterwards he was appointed pathologist and assistant physician to the Queen's Hospital, where, in 1926, he became full physician. At the time of his death he was also physician to the Children's Hospital and to the Birmingham and Midland Hospital for Diseases of the Nervous System. At one time he was lecturer in pathology in the University, and in 1926 he was appointed joint professor of medicine. Two years later he was elected a Fellow of the Royal College of Physicians of London.

DR. LAURENCE BALL.

[*Photograph by Whitlock.*

Dr. Ball took a keen interest in pathology, and his sound practical knowledge in this department was often of great benefit to his colleagues. He was also much interested in medico-legal matters. Mr. Bertram Lloyd, to whom we are indebted for biographical details, says of him that he "was throughout devoted to his work, and took the greatest delight in it. The freshness and enthusiasm with which he would enter into the consideration of a knotty case or medico-legal problem was a constant source of stimulation to his colleagues. Although a very busy physician, he could always find time for another duty, and never appeared to be in a hurry. His patients had an affection for him which it is difficult adequately to describe. His professional manner inspired at once confidence, respect, and admiration for his wise judgment. Although much in request as a physician, it was as a teacher in the Medical School that he was pre-eminent. An eloquent speaker and a lucid teacher, his knowledge never seemed to fail him on any point. The students of the school crowded to his classes and held him in the highest regard. On personal grounds he was immensely popular. He was entirely devoid of vanity or affectation, and was possessed both of a deep fund *and a keen appreciation of humour. Although* temperamentally of a quiet and studious nature, he was constantly sought after by colleagues and students because of his attractive personality."

Dr. T. L. Hardy writes: "May I add my tribute to the memory of Laurence Ball, whose untimely death has removed from the ranks of the profession a sound physician and teacher of medicine, and a most lovable personality. I have enjoyed the privilege of his friendship for a matter of ten years, time enough in which to appreciate his many sterling qualities, for he combined in rare measure great modesty, charm of manner, and a love of the beautiful things in life and no less of its simple pleasures. He had a great capacity for friendship, a generous tolerance of the shortcomings of others, and he spoke ill of no man.

"Ball was a man of retiring disposition, rarely obtruding his opinions, but never failing those—and they were many—who sought them. . . He undoubtedly enjoyed life to the full, loving especially the big open spaces, and was never so content as when tramping among the hills of Cumberland or Wales with his friends. On such holidays his companionship was a thing of delight, for he was a man of wide culture and could talk with learning on many topics. He was, too, an amateur photographer of distinction, and his keen sense of beauty resulted in work of very high artistic merit. With children he possessed something akin to genius, and the joy his company brought to many families is a thing not easily forgotten.

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post-mortem examinations were made in 90·8 per cent. of cases. The death-rate from tuberculosis is 2 per cent. lower than it was in 1927, having come down to 6 per cent. The recovery-rate was 21 per cent., the lowest for many years. The medical superintendent attributes it to the large number of incurable patients admitted during the year. No less than 14 per cent. were idiots, imbeciles or epileptics. The number of patients usefully employed has been maintained, and the privilege of parole has been extended; a number of discharged patients were granted money allowances. There were three cases of typhoid and twelve of dysentery. General paralysis was treated with malaria for the first time last year, and six out of thirteen patients were improved, four being discharged. A visiting dentist has been appointed. All the patients admitted now have their blood examined by the Meinicke turbidity and Wassermann tests. The Meinicke reaction gave the same number of positive results as the Wassermann in 96 per cent. of cases, and seems to be a valuable auxiliary. The laboratory is now equipped to undertake all necessary investigations, and works in close correlation with the wards. During the year twelve attendants and nine nurses passed the final examination for the R.M.P.A. certificate. Of the present staff, 41 attendants and 21 nurses are certificated, and four attendants and five nurses are registered.

Wilts. County Mental Hospital.—There were 1146 patients on December 1st, 1928. The death-rate was 8·2 per cent. and the cause of death was verified by post-mortem examinations in 81·2 per cent. of cases. The recovery-rate was 25·8 per cent.; all but four patients discharged had a preliminary period of trial, 23 of them with a money allowance. The general health was good and there was no epidemic disease, but there were 23 cases of dysentery, one of paratyphoid B, and six of erysipelas. The out-patient clinics at Swindon and Trowbridge served 52 and 27 patients respectively. The housekeeper has had very good results in occupational training for the low-grade female patients. Eight nurses obtained their R.M.P.A. certificate during the year.

The *Inverness District Asylum* housed 720 patients on May 15th, 1929, while another 16 were out on probation. The recovery-rate for the year was 25·4 per cent., and the death-rate 10·7 per cent. Phthisis and senile decay accounted for more than half the deaths. On the whole the health of the patients was good, but there was an epidemic of influenza in the spring, and some cases of scarlet fever. The drought caused a very serious water shortage, but the new reservoir, completed last year, saved the situation. The medical superintendent expresses anxiety about the state of the hospital building, and thinks that the further hospitalisation of the institute requires careful consideration. A cinematograph apparatus was installed last October, and has been much appreciated. The visiting commissioner urges the provision of a workshop for occupational therapy, and of a comfortable detached home for the nurses, ten of whom gained their R.M.P.A. certificate during the year.

Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded.—The 30th annual meeting of the Society was held this year. There are now 103 women and 84 girls in the colony, and 132 men and 94 boys. One girl and two boys died during the year. There was a succession of epidemic diseases, but most of the patients made a good recovery. Sandlebridge receives patients from all over the country, and 234 of its patients have been in residence since they were small children.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 16TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 172 (the same last week); scarlet fever, 3227; diphtheria, 1759; enteric fever, 51; pneumonia, 1102; puerperal fever, 59; puerperal pyrexia, 109; cerebro-spinal fever, 10; acute poliomyelitis, 12; acute polio-encephalitis, 3; encephalitis lethargica, 17; dysentery, 15; ophthalmia neonatorum, 89. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 19th–20th was as follows:—240 under treatment, 17 under observation (last week 195 and 9 respectively), scarlet fever, 2838; diphtheria, 2080; enteric fever, 96; measles, 306; whooping-cough, 114; puerperal fever, 31 (plus 12 babies); encephalitis lethargica, 125; poliomyelitis, 8; "other diseases," 17. At St. Margaret's Hospital there were 9 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (3) from enteric fever, 20 (8) from measles, 9 (1) from scarlet fever, 12 (2) from whooping-cough, 38 (5) from diphtheria, 82 (16) from diarrhœa and enteritis under two years, and 76 (12) from influenza. The figures in parentheses are those for London itself.

The single death from enteric fever outside London was reported from Birmingham. Diarrhœa accounted for 7 deaths at Manchester, 6 at Birmingham, and 4 at Liverpool. There were 5 deaths from diphtheria at Liverpool; 3 deaths from measles at Bolton and Oldham, 2 each at Wolverhampton and Manchester.

The number of *stillbirths* notified during the week was 274 (corresponding to a rate of 47 per 1000 births), including 38 in London.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

HIGHLANDS AND ISLANDS MEDICAL SERVICE.

THE House of Commons went into Committee on Nov. 19th on the following money resolution in connexion with the Highlands and Islands (Medical Service) Additional Grant Bill:—

> That, for the purposes of any Act of the present session to make provision with respect to an additional special grant for the purpose of improving medical service in the Highlands and Islands of Scotland, it is expedient to authorise the payment to the Highlands and Islands (Medical Service) Fund, in addition to the sum of £42,000 payable to the Fund under Sub-section (1) of Section (1) of the Highlands and Islands (Medical Service) Grant Act, 1913, of such sum as may be annually voted by Parliament for the purpose.

Mr. YOUNG, Chairman of Committees, was in the chair.

Mr. ADAMSON (Secretary of State for Scotland), in moving the resolution said that in 1913 Parliament made special provision for the payment of a fixed amount of £42,000 per annum for the purposes of the improvement of the medical service in the Highlands and Islands and for other purposes connected therewith. Since that date the fund had been of inestimable benefit to the people in the remote parts of Scotland. It has been found that an additional sum of money was necessary and this resolution was being proposed for that purpose.

Major ELLIOT said that the Members of the Opposition fully agreed with the object of the resolution, and in view of the lateness of the hour, and on the understanding that fuller opportunity would be afforded, if necessary, for a discussion on the matter at a later stage, they were willing to agree to the resolution. The services which the resolution covered extended to a little more than half the area of Scotland and those services had been kept up in recent years by utilising balances unexpended during the war. The time had come when a larger amount was necessary.

Mr. ERNEST BROWN signified approval of the resolution on behalf of the Liberal Party.

The resolution was agreed to.

On the following day the resolution was agreed to on Report, and the Highlands and Islands (Medical Service) Additional Grant Bill was brought in and read a first time.

ILLEGITIMATE CHILDREN (SCOTLAND) BILL.

On Wednesday, Nov. 20th, the Illegitimate Children (Scotland) Bill was read a second time.

EDUCATION (SCOTLAND) BILL.

On Tuesday, Nov. 26th, Major ELLIOT asked for leave to bring in the Education (Scotland) Bill, a measure to enable education authorities in Scotland to incur expenditure in supplying milk to children attending schools within their area. He said that the Bill followed out the rather remarkable series of tests and experiments upon the value of adding small quantities of vital substances to the ordinary diet or food, more particularly of growing animals and persons, which had been one of the features of research in the last few years. The last few years had shown most clearly that although the diet might be adequate in amount, and even contained all that was usually supposed to be necessary to produce a healthy full-grown creature, yet if certain small quantities of substances were lacking, the growing creature, be it child or animal, would not be fully formed, would not reach full maturity. All the work that had been done on what had been known as the vitamins was a striking example of that. Carrying out that line of investigation in the United States and elsewhere, experiments were made on the value of adding a small quantity of milk to the daily ration, first of all of animals, and then of growing children, and very remarkable and interesting results were obtained. These experiments were carried further in this country by the Medical Research Council, which in 1926 carried out a series of tests on boys under more or less controlled conditions, and under the management and scientific supervision of Dr. Corry Mann. Those results showed quite clearly that a remarkable increase in growth and in health, and even if he might say so in intelligence, was the result of the addition of a small quantity of milk to the daily ration of growing children.

Scientific Tests.

In the autumn of 1926 the Scottish Administration, in which he had the honour then to play a certain part, brought this to the notice of the Empire Marketing Board on the ground that they should attempt to apply these results in Scotland and elsewhere in the United Kingdom, since here was an admirable chance of encouraging the use of home products. In the case of fresh milk particularly the home producer had a natural advantage and preference over all other producers of which it is impossible really to deprive him. There was thus an excellent chance of improving health and of stimulating home production, particularly in the field of agriculture in which stimulation was highly desirable and very necessary. Accordingly a grant was made from the Empire Marketing Board and the tests were conducted over two years, in 1926 and 1927. The results were really very striking and remarkable. They thought it desirable not to publish them at once but to verify the 1926 results by the 1927 repeat tests. The tests were carried out in seven large centres—Peterhead, Aberdeen, Dundee, Edinburgh, Glasgow, Greenock, and Paisley, and also in Northern Ireland in the City of Belfast. There were some 2000 children under observation. It was under full scientific supervision, conducted in the first case by Dr. Orr, of the Rowett Institute, and Dr. Cruickshank, of the Board of Health, and in the second case by Dr. Leighton and his assistants, also of the Board of Health, now the Department of Health for Scotland. The results showed that adding a small additional ration of milk to the diet of the ordinary school child in Scotland led after a seven months' addition of this small ration to the surprising result that the ordinary child which had received milk was a quarter of an inch taller and three-quarters of a pound heavier than the child which had not received the ration. This was not due simply to a deficiency in feeding, because the children who were not receiving an additional ration of milk were given an additional ration of biscuit to make up for the food value of the milk which had been given, so that the excellent results obtained by milk were, so far as one could see, purely due to the small additional quantities of vital substances found in milk, but not found in the biscuit ration given as an alternative. It was a further interesting point that the additional biscuit ration did not lead to any increase of growth, either in height or in weight, over the children who received no additional ration at all, which seemed to point quite clearly to the fact that those children, take it by and large, were receiving sufficient food—that was to say an extra biscuit did not increase either their height or weight—but that they were receiving food which was deficient in some respects and the making up of that deficiency by a small ration of milk produced this surprising result of greater growth in height, increase in weight, and improvement in health. It was very striking that all observers said there was a sleekness of the hair, a polished condition about the nails, and there was a certain boisterousness and rebelliousness about the children on the milk diet which was not found in the cases of the children receiving the biscuit diet.

The children were of all ages from the beginning of school age to the end of it, from children of 5 and 6 up to children up to 13. The interesting thing was that this applied not merely to necessitous children, but practically to all the children, and therefore it seemed that it was scientifically proved that the diet of the ordinary child could be greatly improved by a small alteration of quality. The ordinary law just now only applied to the giving of substances in the case of children who were actually necessitous, and the full necessitous provisions had to be observed—that was to say, there was a compulsion on recovery of cost and many semi-penal provisions with which no doubt Members of the House were well acquainted. Milk obviously occupied a position something between a drug and a food, and a great many parents who came under no definition of necessity might quite reasonably find that by working in with a scheme of a local authority it would be possible either on payment of a proportion of the cost, or on payment of all the costs, or on payment of none of the costs, as the flexible nature of the scheme which he (Major Elliot) desired to introduce would permit, that their children would be greatly improved in health, although in fact they would not come under any category of necessity. The Bill would have the immediate effect of modifying the rigid provisions requiring and demanding recovery of all the costs and the supply only in cases where the parent was proved to be absolutely negligent in his care of the health of his child.

A Sound Investment.

The cost of these things tried out experimentally ran to something like 1*d.* per child per day. That was the full cost, but he would not suppose for a moment that the full cost in the case of every child would be borne by the local authority. He could not imagine any better form of investment, or anything that would be of more immediate value to a child's chances in life. Necessitated no doubt by the profession to which he and some other hon. Members belonged, he was a little sceptical about the brain, but he was perfectly solid about the brawn. If they could make a healthy child, he was certain it would pick up a great deal of its own education, whereas an unhealthy child might receive no advantage from the most careful schooling they could possibly give it. There had been other experiments of a converging kind, proving the benefit of this one. They were able to carry out a certain amount of milk feeding in Africa, where the same criticism of boisterousness and even of rebelliousness was brought against the children who had the milk ration as against those who had not. He therefore said that here they had a chance of something which could be immediately put into operation, something which would, for the expenditure of every penny of it, benefit home production, benefit agricultural production, and which would be as these tests had shown, of considerable and lasting benefit to the children of this country. In Scotland they had perhaps a more convenient area for the further examination which he proposed than in England. In Scotland agriculture, education, and public health were all under one Minister. The Bill proposed that the local authority could incur expenditure for this purpose by submitting a scheme which would have the approval of the Department of Health and of Education. It was a practical and immediate step. It was not an extravagant step, but one which they could reasonably ask the House to give a first reading to in order to get the Bill printed. He hoped thereafter at an early date they might be able to remit the Bill to the Scottish Grand Committee to amend as necessary, and that eventually it would be placed on the Statute Book.

Leave was granted to bring in the Bill, which was then read a first time.

HOUSE OF COMMONS.

WEDNESDAY, NOV. 20TH.

Visits of Medical Experts to the Colonies.

Dr. MORGAN asked the Under Secretary for the Colonies how many medical experts, as the result of organisational departmental changes, had visited and reported on particular colonies; how many colonies had been so visited; what special health and medical problems were investigated; and if any reports based on these visits or investigations were available to Members of Parliament.—Mr. LUNN replied: I am not clear as to what organisational departmental changes are in the mind of my hon. friend, but I give the following list of visits to the colonies by medical experts which have been arranged by the Colonial Office during the last few years: Sir Wilfred Beveridge, Bahamas and other West Indian Islands; Dr. A. E. Horn, Cyprus; Dr. J. Hope Reford, Falkland Islands; Dr. A. T. Stanton (Chief Medical Adviser to the Secretary of State), Nigeria, Gold Coast, Sierra Leone, and Gambia; and Lieut.-Colonel S. P. James, Kenya, Uganda, and Tanganyika. The reports of Sir Wilfred Beveridge and Dr. Horn are available to any hon. Member who may desire to see them, and the report of Colonel James on his visit to East Africa, which was specially concerned with malarial problems, will be available shortly. In the other two cases no special report was issued. I may add that a Commission of the League of Nations recently investigated the general health problems of the Western Pacific Islands, and it is understood that their report will be published shortly.

Yellow Fever and Malaria.

Dr. MORGAN asked the Under Secretary for the Colonies whether the Rockefeller Foundation was still continuing in different colonies, in coöperation with the Colonial Medical Service, its investigations into yellow fever and also its malarial surveys; how many of the latter had been completed; and if any extension of the survey system was in contemplation.—Mr. LUNN replied: Yes, sir. I am happy to say that the International Health Division of the Rockefeller Foundation is continuing to coöperate with the local medical authorities in investigations into yellow fever in Nigeria and other West African Colonies. It is also coöperating in malarial surveys in various West Indian and Western Pacific Islands and in Palestine, and this work is still proceeding. I hope that it will be possible to extend the system of malarial surveys in coöperation with this organisation as opportunity offers.

International Commission on Sleeping Sickness.

Dr. MORGAN asked the Under Secretary for the Colonies whether the special International Commission on Sleeping Sickness was still continuing its investigations in Uganda; whether any report had been received or issued; what were the names of the present members of the Commission; and what was the total staff working under that Commission.—Mr. LUNN replied: The International Sleeping Sickness Commission appointed by the League of Nations for work in Uganda completed its labours in June, 1927, and its final report was published by the League in March, 1928. The latter part of the question does not therefore arise. I may state that an International Conference held in Paris a year ago to review the Commission's work approved the principle that the lines of investigation opened up by the Commission should be followed up by the Governments concerned with their own resources. Special organisations are now investigating problems in connexion with sleeping sickness not only in Uganda, but in the Tanganyika Territory, Nyasaland, Nigeria, and the Gold Coast.

Vitamin Contents of Cod-liver Oil.

Mr. REMER asked the Under-Secretary for the Colonies what steps he was taking to make widely known the favourable report as to the vitamin contents of cod-liver oil, as the result of investigations by the Empire Marketing Board.—Mr. LUNN replied: The Empire Marketing Board has not yet received the report upon these investigations, and I am therefore not in a position to say what steps may be found suitable for making the results known.

Dispensing in the Army.

Dr. VERNON DAVIES asked the Secretary for War if he was aware that his department was the only service department which employed men who were not trained pharmacists for the dispensing of medicines; and, seeing that such men could not be employed to dispense for the civil population under the National Health Insurance Act and were not employed by the Admiralty or Air Force, would he look into the matter.—Mr. T. SHAW replied: The hon. Member is under a misapprehension. Although some pharmacists are employed under the Admiralty on this duty, all three Service departments employ dispensers who are not pharmacists but who are trained as dispensers and carry out their duties under the general supervision of medical officers. I am advised, so far as the Army is concerned, that the present arrangements are satisfactory.

THURSDAY, NOV. 21ST.

Accused Persons Suffering from Encephalitis Lethargica.

Mr. SORENSEN asked the Home Secretary whether he intended to take action to see that accused persons known to have suffered from encephalitis lethargica received appropriate medical treatment and were not treated as criminals.—Mr. CLYNES replied: As regards accused persons sent to prison on remand or awaiting trial, if the medical officer has reason to believe that they have suffered from encephalitis lethargica a report on their medical history and present condition is made to the court, and the decision as to the action to be taken rests with the court.

Mr. OLDFIELD: Will the right hon. gentleman look into the matter of the amount of institutional treatment available for children over 14 years of age?

Mr. CLYNES: That is a very different question.

Dr. VERNON DAVIES: Are any steps taken to inquire into the previous medical history of these people or do the authorities wait for some evidence to be given to them that the case is encephalitis lethargica before making inquiries?

Mr. CLYNES: I think that my answer implies that something in the nature of a medical history is brought into the court.

Mr. SORENSEN asked the Home Secretary how many persons were convicted of moral offences during the last 12 months; and how many of that number were known to have suffered from encephalitis lethargica.—Mr. CLYNES replied: The figures available do not fit in exactly with the terms of the question, but perhaps they will serve the purpose of my hon. friend. In the two years ended March 31st, 1929, 114 prisoners were found, or suspected, to be suffering from the after-effects of this disease. As regards 16 of them, whose first conviction was before the onset of the disease, only one was in prison for a sexual offence; as regards the other 98, whose first conviction was after the onset of the disease, 22, or nearly one-quarter, were in prison for sexual offences.

Prevention of Water Famine.

Mr. REMER asked the Minister of Health what steps he proposed to take to deal with the serious shortage of water in many localities during the drought of last summer.—Mr. GREENWOOD replied: I have already issued a memorandum urging water authorities to examine their position, in view of the drought and possible difficulty in the future, and indicating the measures to be taken. In my opinion, the most practicable procedure is the formation of Advisory Regional Water Committees, who will systematically survey the needs of their districts and recommend the best and most economical means of meeting them, and I am constantly urging the formation of such committees.

Superannuation of Local Government Officers.

Mr. RAYNES asked the Minister of Health how many local authorities had adopted the Local Government and Other Officers' Superannuation Act, 1922; how many had adopted it for officers and workmen and the number of each included in designated posts; and how many officers and workmen over 65 years of age were still employed respectively by local authorities who had adopted the Local Government and Other Officers' Superannuation Act, 1922, and by local authorities who had not adopted that Act.—Mr. GREENWOOD replied: On Nov. 1st, 1929, 633 local authorities had availed themselves of the provisions of the Local Government and Other Officers' Superannuation Act, 1922, and the number of posts designated as established posts by these authorities was approximately 127,500. No exact information is available as to the numbers of officers and workmen occupying such posts, but the Departmental Committee on Superannuation estimated that on Nov. 1st, 1927, the 102,000 employees then occupying established posts included 35,000 officers and 67,000 servants. I have no information as to the number of employees of local authorities whose age exceeds 65 years.

Mr. THORNE: Has the right hon. gentleman power to compel those local authorities who are refusing to put this into operation to do so?

Mr. GREENWOOD: Under the present law I have no power to compel local authorities. That matter was raised by the Departmental Committee which reported two years ago and is now under my consideration.

Approved Societies and Additional Medical Treatment.

Mr. MANSFIELD asked the Minister of Health whether he proposed to make any alteration or amendment to the National Health Insurance Act to enable approved societies to give financial assistance towards the cost of any form of treatment, benefit, or otherwise, that a member might require, with less than five years' membership.—Mr. GREENWOOD replied: An approved society which is found on valuation to have a disposable surplus may adopt a scheme for contributing towards the cost of various forms of remedial treatment required by its members, such as dental, ophthalmic, hospital, or convalescent home treatment. Hitherto such assistance has been restricted to persons who have been members of the society for about five years, but a regulation has already been made under which the qualifying period of membership will from January next be reduced to two and a half years on the average.

Local Authorities and Rheumatic Diseases.

Dr. VERNON DAVIES asked the Minister of Health what grants, if any, were paid by his department to local authorities for the investigation or treatment of rheumatic diseases, especially among children.—Mr. GREENWOOD replied: Grants are available under the Maternity and Child Welfare Regulations for the experimental investigation and treatment of acute rheumatism in children under school age, but I am advised that this condition is rare amongst very young children. I understand that the Board of Education pay grants for similar purposes in the case of children of school age, and that the Medical Research Council make grants for researches into rheumatism.

Viscountess ASTOR: Does the right hon. gentleman not think that the best way to deal with delicate children is to establish nursery schools?

Lieut.-Colonel FREMANTLE: Have the efforts of these three departments been coördinated in any way?

Mr. GREENWOOD: They are within the knowledge of the three Ministers concerned.

Lieut.-Colonel FREMANTLE: Cannot the three Ministers coöperate?

No further answer was given.

Bacteriological Examination of Milk.

Sir RENNELL RODD asked the Minister of Health whether, in view of the large number of deaths of infants from bovine tuberculosis, traceable to milk, recorded annually in medical reports, he was satisfied that the powers of supervision and control vested in local councils were duly exercised by them; and, if not, whether he would consider measures for their stricter application.—Mr. GREENWOOD replied: I am satisfied that local authorities generally are exercising their powers of supervision and control in an efficient manner, having regard to such difficulties as are caused by the mixing of milk and the delays necessarily involved in obtaining reports on bacteriological examinations. The matter will, however, continue to receive my careful attention.

Dr. VERNON DAVIES: Is the right hon. gentleman aware that the bacteriological examination of milk for tubercle is hopelessly inadequate in this country?

No further answer was given.

River Pollution.

Mr. FREEMAN asked the Minister of Agriculture whether, in view of the growing and serious menace of river pollution all over the country and of the inadequacy of existing powers to deal with it other action was contemplated.—Mr. GREENWOOD (Minister of Health) replied: The whole question of river pollution is at present under consideration by the Joint Advisory Committee on River Pollution, and in particular they are considering measures to prevent pollution by trade effluents. They have issued a preliminary report in which they express the opinion that much more can be done, under existing powers, through the appointment of joint committees by the councils of counties and county boroughs. I am urging the authorities to set up such bodies.

Vaccine Lymph.

Mr. FREEMAN asked the Minister of Agriculture where and how Government lymph was now prepared; what animals were used in its preparation; and how many animals were so treated in 1928.—Mr. GREENWOOD (Minister of Health) replied: Government lymph is prepared at the Government Lymph Establishment at Hendon. My hon. friend will find a full statement of the technique and procedure on pages 15 to 17 of the Report of the Vaccination Committee, 1928. During 1928 438 calves and 38 rabbits were used in the preparation of the lymph.

MONDAY, NOV. 25TH.

Medical Experts and Seven-year Pension Cases.

Major COHEN asked the Minister of Pensions (1) whether he would give the House more information regarding the arrangements made for securing the assistance of independent advice in over seven years' cases from medical experts nominated by the Presidents of the Colleges of Physicians and Surgeons; whether the advice of the experts would be accepted and acted on by the Ministry; and whether all cases recommended, after investigation, by local war pension committees where he was not able to agree with the Ministry decision would be referred to the independent experts. (2) What was the method he intended to adopt in order to ensure that applicants for pensions outside the seven years' limit were given explicit opportunity to produce evidence; and (3) whether, in view of the fact that it was proposed to make use of the statutory powers of the local war pension committees to hear and investigate causes of complaint from dissatisfied applicants in connexion with the over seven years' cases, he would take steps to ensure that the fullest possible information was placed at the disposal of the war pension committees, especially where their recommendations were not accepted by headquarters, in order that the committees might be in a position to deal with and investigate cases of complaint.—Mr. F. O. ROBERTS replied: It is not in my judgment practicable or desirable at this stage to define minutely the procedure on points which experience alone can properly determine. I may say, however, that all applicants will be expressly invited by the area offices of the Ministry to state their own cases in writing and to furnish evidence in support of them. Free use will be made of the advice of the independent medical experts alluded to in all cases where there is material conflict of evidence, including cases recommended after due investigation by war pensions committees, and the fullest weight will be given to their advice, though I am naturally unable, consistently with my own responsibility in the matter, to bind myself to accept their opinion in every case. War pensions committees will, as far as possible, be made acquainted with the grounds for rejection of any case recommended by them after investigation where they may find this information necessary in order to assist them in dealing with renewed applications.

Narcotic Drugs for Medical Purposes.

Mrs. HAMILTON asked the Home Secretary the total amount of opium and other narcotic drugs required annually for medical needs in Great Britain in accordance with the formula worked out by the Health Committee of the League of Nations; the actual amount of opium derivatives and narcotic drugs of all categories manufactured in Great Britain in the latest year for which figures were available; and the actual amount of narcotic drugs of all categories exported from Great Britain in the latest year for which figures were available.—Mr. CLYNES replied: The Health Committee of the League of Nations estimated (but with some qualifications) that in countries possessing a highly developed system of medical assistance the maximum requirements of opium and its alkaloids and derivatives for medical and scientific purposes were, in terms of raw opium with 10 per cent. morphine, 4·50 milligrammes per head per year, and of cocaine 7 milligrammes per head per year. Upon the basis of this calculation and with an estimated population of 45,625,000 the maximum requirements of Great Britain and Northern Ireland were in 1928: 45,263 lb. of raw opium and 704 lb. of cocaine. The quantities manufactured in Great Britain in 1928 of the drugs to which the Dangerous Drugs Act apply were as follows:—

Medicinal opium	6,859 lb.
Morphine and its salts	9,056 ,,*
Diacetylmorphine and its salts	675 ,,
Cocaine and its salts	308 ,,

* Including 4868 lb. used in the manufacture of derivatives of opium or morphine which are not within the Dangerous Drugs Acts.

The quantities exported in 1928 were:—

Raw opium	15,956 lb.
Medicinal opium	3,394 ,,
Morphine and its salts	3,114 ,,
Diacetylmorphine and its salts	377 ,,
Cocaine and its salts	278 ,,

Figures are not available in regard to opium derivatives which are not subject to the provisions of the Dangerous Drugs Acts.

Cocaine and Cocaine Hydrochloride.

Mr. DAY asked the Home Secretary whether he had any information as to the amount of cocaine and cocaine hydrochloride that had been manufactured in Great Britain under the authority of the Home Office during the three years ended to the last convenient date.—Mr. CLYNES replied: Since the coming into force of the Dangerous Drugs Acts no cocaine was manufactured until 1928, when 1047 oz. of cocaine and 3887 oz. of the salts of cocaine were manufactured under Home Office licence.

MILLER GENERAL HOSPITAL.—This Greenwich hospital, which was founded in 1783 as a dispensary, is in danger of being compelled to close a considerable proportion of its beds. Its debt to the bankers amounts to £40,000, no more money can be borrowed, and at least £50,000 is needed to remove existing difficulties. In the last 17 years the number of beds has increased from 22 to 169, including 18 at the seaside for children. In the same period the number of out-patients has nearly doubled, and is now close upon 200,000. The hospital serves a large portion of south-east London.

DONATIONS AND BEQUESTS.—The late Sir William Towle, of the Midland Railway Company's hotels, left, among other bequests, a sum to provide an "Elizabeth Towle Bed" at the Middlesex Hospital.—The Cancer Hospital, Fulham, has received an anonymous donation of £5000.—Mr. Theodore Pim, of Snowdenham Hall, Bramley, Surrey, stockbroker, left, among other bequests, £2000 to the Royal County Hospital, Guildford; £1000 each to the London, St. Bartholomew's, and Charing Cross Hospitals; and £500 each to the Dreadnought Seamen's Hospital; Treloar's Cripples' Home, Alton; the Royal Free Hospital; the Royal London Ophthalmic Hospital; and the Meath Hospital, Dublin.—Mr. Percy Crossman, of Great Bromley Hall, Colchester, left £1000 each to the Essex County Hospital and the London Hospital.

Medical News.

UNIVERSITY OF OXFORD.—On Nov. 23rd the following degrees were conferred:—

D.M.—G. P. Wright (in absentia).
M.Ch.—C. W. Flemming.
B.M.—J. A. Eyres.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—W. J. D'Rosario, Guy's Hosp.; L. F. W. Edwards, St. Mary's Hosp.; W. J. Frith, London Hosp.; B. C. Ghose, Durham; W. A. R. Maller, St. Bart.'s Hosp.; I. W. H. Mansfield, Middlesex Hosp.; E. J. O'Loughlin, Birmingham; and S. Ramadas, St. George's Hosp.

Medicine.—R. Gilmore, Manchester; J. Gordon, St. Mary's Hosp.; M. Naylor, Sheffield; A. Schor, Basle and London Hosp.; and L. J. P. Sonomenho, Lisbon.

Forensic Medicine.—J. Britanbschki, Berlin and London Hosp.; R. F. M. Child, St. Mary's Hosp.; A. Kellner, London Hosp.; E. E. Le Feuvre, St. Mary's Hosp.; M. Naylor, Sheffield; A. Schor, Basle and London Hosp.; L. J. P. Sonomenho, Lisbon; and G. W. Sturgess, St. Bart.'s Hosp.

Midwifery.—P. S. Balachandran, Middlesex Hosp.; K. C. Bhattacharyya, St. Thomas's Hosp.; A. Buch, St. Mary's Hosp.; W. J. D'Rosario, Guy's Hosp.; L. F. W. Edwards, St. Mary's Hosp.; A. D. H. Hugo, Guy's Hosp.; T. C. Koble, St. Mary's Hosp.; W. A. R. Maller, St. Bart.'s Hosp.; C. G. Nicol, St. Mary's Hosp.; and D. Ram Annamalai, London Hosp.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: P. S. Balachandran, K. C. Bhattacharyya, R. Gilmore, and E. J. O'Loughlin.

UNIVERSITY OF DUBLIN: *Trinity College.*—At recent examinations the following candidates were successful:—

M.CH.

J. C. Fouché and H. E. Murray.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Medicine.—E. F. St. J. Lyburn, W. R. Johnston, Arnold Rose, Josephine M. Enright, Lilla M. Spiller, W. B. Hamilton, D. G. M'Caully, W. A. Y. Knight, F. O. Pilkington, A. J. Garde, G. F. West, Dora G. Bradley, R. P. M'Carrigle, Aaron Rakoff, R. E. Hemphill, F. M. Lyons, and F. S. Mackenna.

Surgery.—*G. B. Thrift, G. R. Beare, Kathleen A. Wilson, E. S. Tweedy, M. E. Kirwan, G. K. Graham, E. J. M. Bam, J. N. U. Russell, Frances E. Wilson, Dora G. Bradley, J. F. K. MacCarthy-Morrogh, and J. M. M'Elligott.

Midwifery.—*A. H. Thompson, *P. L. O'Neill, *Reginald Bowesman, J. M. Gibbon, Daniel Nolan, F. P. FitzGerald, Annie E. Thompson, T. H. Dockrell, H. H. G. Dorman, D. G. M'Caully, A. A. Lisney, J. T. Robinson, and Ruth R. Armstrong.

FINAL EXAMINATION FOR B. DENT. SC.

Dental Surgery and Pathology, &c.—D. D. Craig.

* Passed on High Marks.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Nov. 20th Dr. G. A. Harrison was appointed as from Oct. 1st to the University Readership in Chemical Pathology tenable at St. Bartholomew's Hospital Medical College.

Dr. Harrison was educated at Oundle and Caius College, Cambridge, where he took a first-class in Part I. of the Natural Sciences Tripos in 1915. After clinical work at Ancoats Hospital, King's College Hospital, and elsewhere, he qualified in 1917, and went out to Mesopotamia, where he gained experience of tropical diseases. From 1919 to 1924 he was biochemist to King's College Hospital, after which he spent two years as biochemist to the Hospital for Sick Children, Great Ormond-street. Since 1926 he has been chemical pathologist to St. Bartholomew's Hospital. He was awarded the Raymond Horton-Smith prize on graduating as M.D. Camb. in 1925.

Sir Cooper Perry was appointed a member of the Board of Management of the London School of Hygiene and Tropical Medicine.

The Senate invites applications for the University chair of social biology tenable at the London School of Economics.

UNIVERSITY OF CAMBRIDGE.—The Raymond Horton-Smith prize given for the best M.D. thesis of the academic year, has been awarded to Mr. Wilfred Shaw for his thesis on Irregular Uterine Hæmorrhage. Mr. Shaw contributed a paper on this subject to the Spring number of the *Journal of Obstetrics and Gynæcology of the British Empire.*

ROYAL PHOTOGRAPHIC SOCIETY.—An exhibition of radiography will be held at 35, Russell-square, W.C., from Dec. 4th to Dec. 21st (10 A.M. to 5 P.M. daily except Sundays.) At 7 P.M. on Monday, Dec. 9th, Prof. W. L. Bragg, F.R.S., will give a popular lecture on X Ray Optics.

INSTRUCTION IN PSYCHOLOGICAL MEDICINE.—A programme of lectures and practical courses of instruction for a diploma in psychological medicine, beginning on Jan. 7th, 1930, has now been issued by the Maudsley Hospital, and may be had from the director of the Central Pathological Laboratory at the hospital, Denmark Hill, London, S.E. 5.

LONDON HOSPITAL MEDICAL COLLEGE.—The Liddle triennial prize for 1929-30, of the value of £120, will be awarded for an essay on the Cause and Incidence of Duodenal Ulcer. The prize is open to public competition, and the conditions of entry may be obtained from the Dean of the Medical College. Essays must be delivered at the hospital not later than May 31st.

OLD EPSOMIAN CLUB.—The annual general meeting of this club will be held at the Hotel Great Central, Marylebone, N.W., at 6.30 P.M. on Thursday, Dec. 12th, and will be followed by the annual dinner at 7.15 for 7.30. The chair will be taken by Brigadier-General G. T. Mair, and all Old Epsomians, whether members of the club or not, are invited to be present on this occasion. Attention is directed to the change of restaurant on this particular occasion.

YORKSHIRE ASSOCIATION OF GLASGOW UNIVERSITY GRADUATES.—The annual dinner of this Association will be held in the Great Northern Hotel, Leeds, at 7 P.M. on Friday, Dec. 6th. All graduates resident in Yorkshire or the surrounding areas are eligible for membership and are invited to the dinner. The guest of the evening will be Prof. J. Graham Kerr, F.R.S. Further information may be had from the hon. secretary, Dr. W. MacAdam, 40, Park-square, Leeds.

INFANTS' HOSPITAL, VINCENT-SQUARE.—Mr. Robert Mond, who has been a constant and generous benefactor to the hospital, has made a gift of £25,000 to the extension fund. The gift will be payable over the next seven years, and will bring up the total amount given or promised to the extension fund to well over £100,000.

ROYAL SURGICAL AID SOCIETY.—The sixty-seventh annual meeting of this Society will be held at the Mansion House, London, at 4 P.M. on Tuesday, Dec. 3rd, with the Lord Mayor in the chair.

HUNT MEET AT A HOSPITAL.—The South Oxfordshire hunt met recently at the Wingfield Orthopædic Hospital among the patients in the open air. The hounds are stated to have "enjoyed the novelty almost as much as the young patients."

ROYAL MEDICAL BENEVOLENT FUND.—A meeting of the Vice-Presidents was held at 10, Wimpole-street on Nov. 6th in response to invitations from Sir Thomas Barlow, who explained the position of the Fund, the financial details being added by Sir Charters Symonds. Various speakers in the room made suggestions for the increase of the regular income, and the general conclusion was that, while the work of the Fund is and had been of unspeakable value, and while its management was admirable, the objects for which it existed were insufficiently appreciated by the medical profession. Various steps were proposed to make the Fund better known.

QUEEN ALEXANDRA HOSPITAL, MILLBANK.—A new wing, consisting mainly of a spacious out-patient department, was opened on Nov. 26th by the Prince of Wales. The Prince was received by the Director-General, Lieut.-Gen. H. B. Fawcus. Certain members of the staff of the hospital were presented to the Prince: Bt. Col. Ryan, O.C. Hospital; Lieut.-Col. Garforth, Engineer Officer; Col. Purser, London Dir. A.D.M.S.; Maj.-Gen. Ensor, D.D.M.S. East. Cd.; Miss Osborne, Matron-in-Chief; Major Johnson, Registrar; Captain Baxter, Quartermaster; Miss Mackay, Matron; Col. Harrison, Col. Kennedy, and Col. De La Cour, Consultants. The civilian consulting staff presented included Mr. Victor Bonney, Mr. E. D. D. Davis, Sir T. Crisp English, Prof. E. H. Kettle, Sir Wm. Lister, Dr. H. MacCormac, Dr. A. G. Phear, Mr. S. Gilbert Scott, Sir John Thomson-Walker, and Mr. A. E. Webb Johnson. The Prince then proceeded to inspect the three floors of the new wing. This contains X ray rooms, departments for eye, ear, nose, and throat, dentistry work, and massage. At the top of the building, which is admirably designed, spacious, and light, is a well-arranged and equipped pathological laboratory. The Prince spent over half an hour in the building, and expressed himself as delighted with what he had seen. The commandant and officers of the R.A.M.C. Headquarter Mess received the visitors in the mess after the ceremony.

EXTENSION OF HARROW HOSPITAL.—This hospital is to be extended at a cost of £25,000. There will be accommodation for a further 30 patients and 15 nurses.

Dr. T. N. Kelynack, after nearly 28 years as physician to the Mount Vernon Hospital, has been appointed consulting physician and a member of the council of management.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Dec. 3rd.—8.30 P.M., ORTHOPÆDICS. Discussion on Minor Injuries about the Elbow-joint. Opener: Mr. W. H. Ogilvie. To be followed by Mr. Watson Jones, Mr. Jenner Verrall, and others. 8 P.M., PATHOLOGY. Meeting at the Royal Army Medical College, Millbank, S.W.

WEDNESDAY.—5 P.M., HISTORY. Sir William Hale-White: The Medical Boswells. Dr. G. C. Peachey: The Book-plates of Medical Men (with lantern slides). 8.30 P.M., SURGERY. Pathological evening.

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) The Diagnostic Value of X Ray Examination of the Temporal Bone, and the Diagnosis of Eighth Nerve Tumours. Papers by Dr. Elsie Mann, Dr. Graham Hodgson, Mr. T. H. Just, Dr. W. T. Gardiner, Dr. T. B. Jobson, and Mr. T. B. Layton. Cases and radiograms will be shown by Mr. C. Gill-Carey, Mr. E. Watson-Williams, Dr. Imrie, and Dr. Gardiner. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Cases will be shown by Mr. L. G. Brown, Dr. Dan McKenzie, Sir StClair Thomson, Sir James Dundas-Grant, Mr. V. E. Negus, Mr. H. A. Kisch, Mr. J. D. McLaggan, Mr. Archer Ryland, and others. 8.30 P.M., ANÆSTHETICS. Discussion: Anæsthesia in Rectal Surgery. Opener: Dr. J. K. Hasler.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Dec. 2nd, to SATURDAY, Dec. 7th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., lecture by Mr. Harold Kisch: Aches and Pains in the Throat. No fee. Tues., 8.30 P.M., M.R.C.P. lecture by Dr. Kinnier Wilson: "Fits"; Varieties; Pathogenesis; Relation to Narcolepsy, Catalepsy, Syncope, &c. Fri., 8.30 P.M., at 10, Bedford-square, W.C., M.R.C.P. lecture-demonstration by Dr. Knyvett Gordon: Diagnosis of Bacterial Infection (illustrated by the epidiascope, followed by a laboratory demonstration).—HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale. Thurs., 2 P.M., demonstration by Dr. Russell Brain. No fee.—ROYAL FREE HOSPITAL, Gray's Inn-road, W.C. Fri., 4 P.M., lecture-demonstration by Mr. C. A. Joll: The Early and Late Results of Operations for Exophthalmic Goitre. No fee.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Practitioner's Course, 4 to 5.45 P.M.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road, S.E., and THE INFANTS HOSPITAL, Vincent-square, S.W. Afternoon courses for two weeks. Further particulars from the Fellowship of Medicine.

UNIVERSITY OF LONDON.

THURSDAY, Dec. 5th.—5 P.M. (in the Lecture Hall of the Royal Society of Medicine), Dr. Harris P. Mosher (Harvard): The Lower End of the Œsophagus at Birth and in the Adult. (The Semon Lecture.)

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

MONDAY, Dec. 2nd.—5 P.M., Mr. J. C. Dawes, M.I.Mech.E.: Disposal of Refuse.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Dec. 2nd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Dec. 2nd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Dec. 5th.—9 P.M., Mr. C. P. Wakeley: Diseases of the Breast and Their Treatment.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 3rd.—5 P.M., Dr. A. C. Roxburgh: Cutaneous Syphilis (1).

THURSDAY.—5 P.M., Cutaneous Syphilis (2).

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
(Intensive Week.)

MONDAY, Dec. 2nd.—2.15 P.M., Mr. Kenneth M. Walker: Urinary Calculi. 3.15 P.M., Mr. A. M. Zamora: Some Points About Mastoid Infection.

TUESDAY.—2.15 P.M., Mr. T. T. Higgins: Use of Sodium Morrhuate in the Injection Treatment of Varicose Veins. 3.15 P.M., Dr. A. Lisle Punch: Bronchiectasis.

WEDNESDAY.—2.15 P.M., Dr. Bernard E. Schlesinger: Ward Demonstration of Cases. 3.15 P.M., Dr. H. C. Semon: The Problem of the Trade Dermatoses in General Practice.

THURSDAY.—2.15 P.M., Mr. Frederick Roques: Some Modern Obstetric Methods. 3.15 P.M., Mr. E. Wolff: Headache.

FRIDAY.—2.15 P.M., Dr. Bruce Williamson: The Arrhythmias in General Practice. 3.15 P.M., Dr. C. Gouldesbrough: Osteo-arthritis.

TUESDAY.—3.15 P.M., Dr. P. O. Ellison: Investigation of Disease.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.

TUESDAY, Dec. 3rd.—4 P.M., Mr. L. E. Phillips: Disorders of the Menopause.

CHADWICK PUBLIC LECTURES.

TUESDAY, Dec. 3rd.—8.15 P.M. (in the Inner Temple Hall, entrance from Strand and Fleet-street), Mr. W. A. Robson, Barrister-at-Law: Public Health Law and Administration.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

FRIDAY, Dec. 6th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Sir Thomas Oliver: The Mechanised Age of To-day and its Probable Effect on the Human Race.

BRITISH INSTITUTE OF RADIOLOGY.

WEDNESDAY, Dec. 4th.—2.30 P.M. (in the Central Hall, Westminster), official opening of the Exhibition and Annual Meeting by the Rt. Hon. Arthur Greenwood, the Minister of Health. 3.15 P.M., Prof. G. Forssell: Radiotherapy of Malignant Tumours in Sweden. (Mackenzie Davidson Memorial Lecture.)

THURSDAY.—6 P.M., Prof. A. S. Eddington: X Rays in the Stars. (Silvanus Thompson Memorial Lecture.)

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 4th.—4 P.M., Dr. A. C. Jordan: Dress in Relation to Health and Disease.

ANCOATS HOSPITAL, Mill-street, Manchester.

THURSDAY, Dec. 5th.—4.15 P.M., Dr. G. J. Langley: The Treatment of Empyema.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Dec. 3rd.—4.15 P.M., Dr. Crighton Bramwell: Coronary Thrombosis.

FRIDAY.—4.15 P.M., Dr. H. Dove Cormac: Some Common Forms of Mental Disorder.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

TUESDAY, Dec. 3rd.—3.45 P.M. (in the Physics Lecture Room), Dr. Maurice Davidson: Intrathoracic and Pulmonary New Growths (preceded by an exhibition of pathological specimens). (Cancer Lecture.)

FRIDAY.—3.30 P.M., Mr. Ferguson Wilson: Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Dec. 4th.—4.15 P.M. (in the Ear, Nose and Throat Hospital). Ear, Nose and Throat Cases by the Staff.

Appointments.

ELLISON, DOROTHY, M.B., Ch.B. Edin., has been appointed Junior Resident Medical Officer, Worcester Infirmary.

ROSS, A. T., M.D., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Mevagissey District of Cornwall.

SHARMAN, A., M.B., Ch.B. Glasg., Surgical Research Officer, Royal Samaritan Hospital for Women, Glasgow.

SNELL, W. E., B.Sc. Lond., L.R.C.P. Lond., M.R.C.S., Tuberculosis Officer, Royal Northern Hospital Dispensary.

Stafford General Infirmary:—CAMPBELL, A. V., M.D. Liverp., D.P.H., and GILL, A. W., M.D. Edin., Hon. Visiting Physicians.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital, 91, Finchley-road, N.W.—Hon. Radiologist. Hon. Surg. Reg. Also Two H.S.'s. Each at rate of £150.

Barnstaple, North Devon Hospital.—H.S. At rate of £150.

Birmingham, Queen's Hospital.—Res. H.S. to Ophth. and Ear, Nose and Throat Dept. Res. H.S. to Cas. Dept. Each £70. Jun. R.M.O. £100. Also Res. Anæs. £70–£100.

Blackburn County Borough.—Asst. M.O.H., &c. £600.

Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £100.

Bristol Royal Infirmary.—H.S. to Ear, Nose and Throat Dept.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Cairo, Egyptian University, Faculty of Medicine.—Two Surgical Tutors. £E35 monthly.

Cancer Hospital (Free), Fulham-road, S.W.—H.S. At rate of £100.

Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. First Assists. for Out-patient Dept.

Charing Cross Hospital.—Surg. Reg. £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.

Colonial Medical Service.—M.O.'S. East Africa, £600. Malaya, $500 per month.

Dewsbury and District General Infirmary.—H.S. £200.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110. Also Med. Supt. £300.

Dudley Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.P. and Cas. O. At rate of £150.

Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250. Also Phys. for Electro-Therapeutic Dept.

Great Yarmouth County Borough.—Asst. M.O.H., &c. £600.

General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. At rate of £100.

Grosvenor Hospital for Women, Vincent-square, S.W.—Hon. Anæsthetist. Also Res. M.O. At rate of £100.

Hampshire County Council.—Asst. County M.O. £600.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.S. Also H.P. Each at rate of £100.

Harrogate Infirmary.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.

Hertford County Council.—Asst. M.O.H. for Maternity and Child Welfare Services. £600.

Hertford County Hospital.—Hon. Radiologist. Also Hon. Pathologist.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100. Also Part-time Jun. Cas. O. At rate of £150.

Huddersfield County Borough.—Asst. M.O.H. £500.

Institute of Ray Therapy, 152, Camden-road, N.W.—Jun. M.O. At rate of £150.

Italian Hospital, Queen-square, W.C.—Two Hon. Surg.

Leeds City.—Chief Asst. M.O.H. £900.

Liverpool Hahnemann Hospital.—H.S. At rate of £100. Also Hon. Path. £25.

Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. Med. Supt. £250.

London Hospital, E.—Cardiographic Dept.—Paterson Research Scholar. £400.

London Lock Hospital, Dean-street and Harrow-road, W.—Second Anæsthetist. 1 guinea each attendance.

London Skin Hospital, Fitzroy-square, W.—Hon. Physician and Hon. Pathologist.

London University.—Geoffrey Duveen Travelling Studentship. £450.

Manchester Ancoats Hospital.—H.S. £100. Asst. M.O. for V.D. Clinics. 1 guinea per attendance. Asst. Pathologist. Also Med. Reg. and Surg. Reg. Each £100.

Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500.

Manchester Northern Hospital for Women and Children, Cheetham Hill-road.—Sen. H.S. Also Jun. H.S. £130 and £100 respectively.

Manchester Royal Infirmary.—Res. M.O. £200. Asst. Res. Surg. O. At rate of £150. Asst. Surg. O. for Gynæcological Dept. £35. Also Asst. Surg. O. for Central Branch. £75.

Manchester, Salford Royal Hospital.—Res. Surg. O. £200. Also Two Res. H.S.'s to Special Depts. Each at rate of £125.

Metropolitan Hospital, Kingsland-road, E.—Asst. S. Also Two Anæsthetists.

Ministry of Health.—Five M.O.'s. Each £887.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

Nuneaton Borough.—Asst. M.O.H. £600.

Plaistow Fever Hospital, E.—Jun. Asst. M.O. At rate of £300.

Poplar Hospital for Accidents, Poplar, E.—Hon. Visiting Surgeon.

Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Clin. Assts.

Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £200. H.P. and Cas. O. £150. Also Three H.S.'s and One H.P. Each £120.

Radium Institute, Riding House-street, W.—H.S. £150.

St. Bartholomew's Hospital, E.C.—Physician.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—Clin. Assts.

Salisbury General Infirmary.—Two H.S.'s.

Sheffield Royal Infirmary.—Clin. Asst. to Medical Depts. £300.

Southport General Infirmary.—Jun. H.S. £100.

South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s £200 and £150 respectively.

Sutton, Surrey, Downs Hospital.—Jun. Asst. M.O. £500.

Tilbury Hospital, Essex.—Med. Supt. £250. Also H.S. At rate of £150.

Torquay, Torbay Hospital.—H.P. £175.

Western Australia, Lunacy Department.—Jun. Asst. Res. M.O. £450.

West London Hospital, Hammersmith-road, W.—H.P., H.S. Aural and Ophth. H.S. and Asst. Cas. O. Each at rate of £100.

Westminster Hospital, Broad Sanctuary, S.W.—Asst. Pathologist. £250.

Wigan Infirmary.—Third H.S. £150.

Willesden General Hospital N.W.—Clin. Asst. for Surgical Out-Patient Session.

Wilts County Council.—Asst. M.O.H. and Asst. School Med. Inspector. £600.

York County Hospital.—Hon. M.O. for Massage and Electro-Therapeutic Dept.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at King's Cliffe (Northants).

Births, Marriages, and Deaths.

BIRTHS.

BLACKER.—On Nov. 10th, at The Châlet, Esher, the wife of Carlos Paton Blacker, M.C., M.A., M.R.C.P., of a son.

JACKSON.—On Nov. 21st, at Mount Jocelyn, Crediton, Devon, the wife of L. N. Jackson, M.D., of a daughter.

RICHES.—On Nov. 10th, at 4, Walton House, Longford-street, Regent's Park, the wife of E. W. Riches, M.C., M.S., F.R.C.S., of a daughter.

SCOTT.—On Nov. 21st, at Stagsden, Bournemouth, the wife of Dr. Maitland Scott, of a son.

MARRIAGES.

ADAM—LLOYD.—On Nov. 10th, in London, Major Walter Eustace Adam, M.C., R.A.M.C., to Phyllis Joan, elder daughter of the late Captain Walter Lloyd, Royal Welsh Fusiliers, and of Mrs. Lloyd, Queen Anne's-mansions, St. James' Park, S.W.

BRUCE—MYERS.—On Nov. 19th, at St. John the Baptist's, Chester, George Bruce, M.A., M.B., C.M., Fairford, Cults, Aberdeen, to Frieda Elizabeth, younger daughter of the late Rev. Arthur Myers, M.A., and of Mrs. Myers, The Cottage, Melbourne, Derby.

WARD—NICHOLS.—On Nov. 14th, at Westminster Cathedral, Dr. Howard Ward, of Southampton, to Elsie, third daughter of the late Arthur and Mary Nichols, of Melbourne, Australia.

DEATHS.

GRAY.—On Nov. 19th, at "Little Haven," Ealing, of heart failure, John Alfred Gray, M.D. Lond., in his 72nd year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

NATIONAL BABY WEEK COUNCIL.

SOME CRITICAL ISSUES DISCUSSED.

AT a meeting of the Council held at Carnegie House on Nov. 20th, under the presidency of Mr. E. B. Turner, discussions on "A National Maternity Service" were based on issues arising out of the report of the Departmental Committee and the memorandum of the British Medical Association. Dr. T. Eustace Hill did not agree with the Association that the need for antenatal clinics would be reduced by the introduction of a satisfactory maternity service; if the clinics were suitably situated and equipped, and staffed by women medical officers, the demand would increase as the mothers became better informed. Miss E. M. Doubleday was of opinion that these clinics would tend to be rather in the nature of consultant centres, while Dr. J. W. Bone considered their principal function should be that of sorting patients into groups, and advising the women on such matters as general health and mothercraft. Dr. Hill and Miss Doubleday were in accord in believing that the Association's financial estimate of the scheme was far too low, and in the opinion that if a midwife was to be limited to about 100 cases a year a fee of £2 10s. a case would not provide an adequate income to attract the best type of woman. The first of the basic principles of the memorandum—"that the normal case can be safely treated at home"—was accepted by Dr. Bone and Miss Doubleday, but not by Dr. Hill, who felt there were many normal cases which required institutional treatment; he made light of the possible danger to the patients by aggregation in maternity institutions if these are "suitable so far as accommodation and staff are concerned."

Opinion was divided in regard to the proposal by the Departmental Committee to transfer the duties of inspection and the laying down of the training curriculum for midwives from the Central Midwives Board to the Ministry of Health. As a member of that committee, who had heard and read all the evidence, Dr. Hill said it had been made clear that inspection by the C.M.B. had been inadequate and perfunctory, while he himself had frequently been impressed by a tendency on the part of the Board in penal cases to show leniency which was not justified by the evidence laid before it by the local supervising authority. The C.M.B. as constituted was, he said, in no sense representative of midwives, and he was satisfied that not one per cent. of women would be deterred from entering the service because it was proposed to transfer certain minor duties to the Ministry of Health. Miss Doubleday, representing a group of midwives, agreed that the constitution of the C.M.B. needed amendment in order to make it more representative of the midwives of the country. They felt, however, that no profession could be controlled by a Government department and remain a profession, and that they ought to be governed, as the medical and nursing professions were, by an independent body. The vital point was that midwives should be supervised by people with a long practical experience of midwifery, and it was open to question whether a Government department could keep up to date in its knowledge of the professional side. The Departmental Committee's proposal amounted, it seemed, to leaving only the penal work in the hands of the Board.

THE FUTURE OF GREATER LONDON.

On Nov. 26th Mr. Arthur Greenwood, Minister of Health, accompanied by Earl Russell, Parliamentary Secretary of the Ministry of Transport, received a deputation from the Greater London Regional Planning Committee, under the chairmanship of Sir Banister Fletcher, P.R.I.B.A.

The first object of the deputation was to ask that the Government would take steps to check the evils of ribbon development on arterial roads, and it was suggested that these evils might be lessened by the following means: (1) purchase of the frontage lands by the State or the highway authority; (2) suitable agreements with the owners; (3) control of the lands adjacent to the road through town-planning schemes. A further question with which the committee had been concerned—the reservation of land for recreation grounds and other open spaces—was closely connected with that of ribbon development, since much the same difficulties arise with regard to the control over he land in question.

committee were of opinion that these difficulties t be largely solved by amendments in the Town-plan- Act, and they submitted a memorandum on the ility of reserving a green belt around London, together ome specific suggestions for the amendment of the anning Act, calculated to facilitate the reservation of land from buildings and the provision of open spaces, without imposing heavy burdens on the ratepayers. It was further suggested that additional town-planning powers should be given to county councils, which should be the authorities to acquire and hold regional open spaces, and that a body should be constituted for the Greater London area with power to prepare a master plan and scheme. This scheme should not, however, be carried beyond a provisional stage until those of the various town-planning authorities within the area were complete.

The Minister of Health said, in reply, that he was in full agreement with the general objects which the committee had set before themselves. The proposals for the reservation of open spaces and, in particular, of a green belt around London, were of great interest, though the methods to be adopted in practice would need careful examination. He was also interested in the suggestion that a special regional planning body should be constituted for the Greater London area, but he thought that local authorities would have to be consulted about this.

Lord Russell said that he fully sympathised with the views which the deputation had expressed upon the undesirability of ribbon development, from considerations both of economy and of traffic requirements. He could assure the deputation that the committee would have every support from the Minister of Transport in any practical scheme for mitigating the evil.

THE BUSCH OPTOMETER.

AT a meeting of the Optical Society, held at the Imperial College of Science and Technology, South Kensington, on Nov. 14th, Mr. A. G. Frewin, of the Emil Busch Optical Co., gave a demonstration of the Busch optometer, an instrument designed by Prof. Thorner for measuring refractive errors. By its means can be measured in diopters the hypermetropia or myopia of a symmetrical eye, or the ametropia in the two meridians of an astigmatic eye together with the directions of the meridians. The patient looks with one eye into the exit pupil of the instrument, while the observer looks into the eyepiece and focuses on the patient's macula the image of the straight filament of a small electric bulb. The focusing hand moves a scale relatively to a fixed pointer; when the side edges of the filament are sharp the ametropia may be read off at once. Freedom from glare and corneal reflections is secured by semi-circular stops which ensure that the illuminating rays are incident on the top half of the patient's cornea, whilst the light reflected from the fundus and reaching the observer issues from the lower half of the cornea. The vertex of the correcting lens is placed 12 mm. in front of the patient's cornea.

GLAXO MALTED FOOD.

IN recent articles upon the London Medical Exhibition we referred to a preparation supplied from the Glaxo Laboratories (56, Osnaburgh-street, London, N.W.) as Glaxo Malted Milk. It has been pointed out to us by the proprietors that the right name is Glaxo Malted Food, a cereal product for use as a supplementary when infants require something more than a milk diet. The preparation consists of malted barley and wheat flour, freed from bitter taste.

A HOSPITAL FORMULARY.

THE official formulary of eight Belfast hospitals has been printed and issued by the North Irish Pharmacists' Association of Belfast. It has been compiled with the consent and assistance of the medical staffs of the hospitals attached to the Belfast Medical School, and includes the prescriptions which are in common use in the out-patient departments and wards of the various hospitals. The formulary is divided into six sections beginning with general prescriptions and going on to those suitable for children, for gynæcological, throat, eye, and skin cases. Appended is a price list drawn up as a guide for hospital patients, the price of prescriptions (not including container) varying from *4d.* to a maximum of *2s. 2d.* In the addendum is a list of formulæ considered suitable alternatives to the more expensive preparations. The price of the Belfast Hospitals' Pharmacopœia is *2s.* (plus postage), and copies may be had from any of the hospitals. Many old members of the medical school may desire to possess a copy.

DIFFUSION ANÆSTHESIA OF THE PERITONEAL CAVITY.

UNDER this heading we published last week a paragraph from our Vienna correspondent describing Dr. Mandel's experiments with percain as an abdominal anæsthetic. The Clayton Aniline Company, who supply this drug, inform us that the doses mentioned were too large. The amounted inserted in the peritoneal cavity should read "350 c.cm. of a ¼ per 1000, and in later cases 250 c.cm. of a ⅛ per 1000, solution of percain."

An Address

ON

INTRATHORACIC AND PULMONARY NEW GROWTHS.

*Delivered at the University of Sheffield on Dec. 3rd, 1929,**

BY MAURICE DAVIDSON, M.D. OXF.,
F.R.C.P. LOND.,

PHYSICIAN AND DEAN OF THE MEDICAL SCHOOL, BROMPTON HOSPITAL, LONDON.

IN common with many of my colleagues I have been greatly impressed with the apparent increase during recent years in the number of cases of primary malignant disease of the lung which present themselves both in hospital and in private practice.

The appearance of cancer in the lungs in the form of secondary or metastatic deposits from tumours originating in other portions of the body is, of course, well known and calls for no special comment. The occurrence of primary growths in connexion with the lungs or bronchi has hitherto been regarded as a rarity. That the increased frequency of pulmonary carcinoma is real and not merely apparent is a fact of which I have not the slightest doubt. It has been borne in upon me by the clinical impressions of the last ten years and I know that a similar view is held by many competent observers who are in a position to form a judgment. Such a statement, however, demands at least some sort of proof, and I have, therefore, endeavoured to collect a few of the more reliable statistical observations to put forward as a basis for my contention.

A short reference to the literature of this subject may be useful, since it has now grown to such considerable dimensions. An admirable general account is given by Huguenin[1] in his recent book which includes an interesting résumé of the historical side. Of the principal authors in the last 50 years he quotes especially Fuchs and Pässler, who in 1896 collected together as many as 76 cases. In 1912, Adler[2] wrote a long treatise which has long been regarded as one of the classical sources of information. The names of Ménétrier[3] and Letulle[4] in France are specially mentioned as being always associated with the problem of pulmonary cancer. For a summary of the main pathological and statistical data reference may be made to Ewing[5] and for morbid histology to MacCallum's well-known text-book.[6] It is mainly since the war that the subject has come into great prominence, and most of the recent literature of importance is from Germany and America. Some of the most convincing evidence is summarised in Tables I. to III. and in the illustration.

TABLE I.—*Incidence of Pulmonary Cancer.*

(Figures quoted from Huguenin.)

Autopsies—number of.	Pulmonary cancer—cases of.	Author and dates.
11,400	40	Wolff.
21,000	17	Fuchs (1854 to 1896).
7,006	6	Norwiski (Lemberg) (1830 to 1903).
16,017	61	Lavrinovic (Petrograd) (1905 to 1914).

Compare with the above figures those of Berblinger (Jena) in regard to 8056 autopsies performed between 1910 and 1924. Of these 5773 were on persons over 20 years of age. Of the latter 987 had died of cancer (i.e., 17·1 per cent.). Forty-one of these cancers were primary growths of lung—i.e., 4·2 per cent. of all the cancers.

Table I. giving some of the earlier statistics and Table III. giving later figures, are quoted by Huguenin, and so striking are the details that I have thought it well worth while to reproduce them. Table II. and the figure are taken from a very instructive paper by Hanf[7] whose figures are based entirely on post-mortem records, as indeed are the Jena statistics and other recent observations. Hanf observes that an increase in lung cancer might be accounted for by fluctuations of the yearly post-mortems, or of the relative reduced post-mortems, and also by an increase in cancer generally. She seems to think that yearly fluctuations of post-mortems is an important point and remarks that very critical examination of figures is essential in this question. It appears, however, undeniable that the figures based on the percentage of total cancer cases have risen considerably and that this is definite evidence of the increase in lung cancer not only absolutely but relatively.

TABLE II.

Year.	Total autopsies.	Over age 20.	Cancer.		Cancer of the lung.						
			Total.	% of autopsies.	Total.	Male.	Female.	% of autopsies.	% of autopsies over 20 years of age.	% of cancers.	Average age.
1903	1272	914	80	6·3	3	2	1	0·2	0·3	3·7	62·3
1904	1408	948	95	6·7	4	3	1	0·3	0·4	4·2	67·7
1905	1328	959	135	10·2	1	1	—	0·08	0·1	0·7	74·0
1906	1324	911	113	8·5	5	5	—	0·4	0·5	4·4	54·0
1907	1364	843	150	11·0	6	6	—	0·4	0·7	4·0	55·3
1908	1356	702	112	8·3	4	3	1	0·3	0·5	3·6	61·5
1909	1480	671	141	9·5	6	6	—	0·4	0·9	4·3	61·5
1910	1422	688	136	9·6	10	9	1	0·7	1·5	7·3	54·0
1911	1419	763	139	9·8	9	7	2	0·6	1·2	6·5	54·7
1912	1431	768	131	9·4	6	3	3	0·4	0·8	4·5	49·7
1913	1348	731	203	15·3	6	3	3	0·4	0·8	3·0	49·8
1914	1257	692	170	13·5	8	6	2	0·6	1·2	4·7	47·0
1915	1042	657	154	14·8	8	8	—	0·8	1·2	5·2	60·4
1916	974	613	160	16·4	4	3	1	0·4	0·7	2·5	57·8
1917	1060	716	152	14·3	6	5	1	0·6	0·8	3·9	46·5
1918	1278	612	217	17·0	8	8	—	0·6	1·3	3·7	52·0
1919	1309	790	218	16·7	12	9	2(11)	0·9	1·5	5·5	51·0
1920	1500	851	209	13·9	7	6	1	0·5	0·8	3·3	50·4
1921	1367	794	241	17·6	15	12	3	1·1	1·9	6·2	53·0
1922	1400	808	246	17·6	18	15	3	1·3	2·4	7·3	48·4
1923	1317	755	222	16·9	20	18	2	1·5	2·6	9·0	47·0
1924	1281	783	220	17·0	13	11	2	1·0	1·7	5·7	58·2
1925	1437	875	265	18·5	21	17	3(11)	1·5	2·4	7·9	50·4

Statistics of cancer of the lung at the Charité Hospital, Berlin, from 1903 to 1925 (Dr. D. Hanf).

TABLE III.—*Proportion of Lung Cancer to Total Cancer.*

(Showing Increase in Recent Years.)

		Per cent.		Total cancers.
Jena statistics	1910 to 1914	2·2	Pulm.	363
	1915 to 1919	2·9	"	337
	1920 to 1924	8·3	"	287
Basle (Staebelin)	Before 1906	1·76		
	1906 to 1914	2·9		
	1914 to 1924	5·0		
Berlin (Wahl)	1917 to 1922	6·0		
	1922 to 1927	13·0		
Zürich (Probst)	1906 to 1910	1·13		
	1911 to 1915	3·34		
	1916 to 1920	6·12		
	1921 to 1925	7·17		
	1926	7·56		

ÆTIOLOGY AND PATHOLOGY.

There are, so far as I can determine, no facts of which we are at present aware which would indicate to us definitely any peculiar ætiology in the case of pulmonary cancer as distinct from that of cancer generally. The average age of incidence appears to be round about 50, and all statistics agree that males suffer much more than females. As regards race, Huguenin points out that the condition is less frequent in coloured races than among whites, and quotes an

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* Under the joint auspices of the Yorkshire Council of the British Empire Cancer Campaign and the Clinical Medical Studies Committee of the University of Sheffield.

Notes, Comments, and Abstracts.

NATIONAL BABY WEEK COUNCIL.

SOME CRITICAL ISSUES DISCUSSED.

AT a meeting of the Council held at Carnegie House on Nov. 20th, under the presidency of Mr. E. B. Turner, discussions on "A National Maternity Service" were based on issues arising out of the report of the Departmental Committee and the memorandum of the British Medical Association. Dr. T. Eustace Hill did not agree with the Association that the need for antenatal clinics would be reduced by the introduction of a satisfactory maternity service; if the clinics were suitably situated and equipped, and staffed by women medical officers, the demand would increase as the mothers became better informed. Miss E. M. Doubleday was of opinion that these clinics would tend to be rather in the nature of consultant centres, while Dr. J. W. Bone considered their principal function should be that of sorting patients into groups, and advising the women on such matters as general health and mothercraft. Dr. Hill and Miss Doubleday were in accord in believing that the Association's financial estimate of the scheme was far too low, and in the opinion that if a midwife was to be limited to about 100 cases a year a fee of £2 10*s.* a case would not provide an adequate income to attract the best type of woman. The first of the basic principles of the memorandum—"that the normal case can be safely treated at home"—was accepted by Dr. Bone and Miss Doubleday, but not by Dr. Hill, who felt there were many normal cases which required institutional treatment; he made light of the possible danger to the patients by aggregation in maternity institutions if these are "suitable so far as accommodation and staff are concerned."

Opinion was divided in regard to the proposal by the Departmental Committee to transfer the duties of inspection and the laying down of the training curriculum for midwives from the Central Midwives Board to the Ministry of Health. As a member of that committee, who had heard and read all the evidence, Dr. Hill said it had been made clear that inspection by the C.M.B. had been inadequate and perfunctory, while he himself had frequently been impressed by a tendency on the part of the Board in penal cases to show leniency which was not justified by the evidence laid before it by the local supervising authority. The C.M.B. as constituted was, he said, in no sense representative of midwives, and he was satisfied that not one per cent. of women would be deterred from entering the service because it was proposed to transfer certain minor duties to the Ministry of Health. Miss Doubleday, representing a group of midwives, agreed that the constitution of the C.M.B. needed amendment in order to make it more representative of the midwives of the country. They felt, however, that no profession could be controlled by a Government department and remain a profession, and that they ought to be governed, as the medical and nursing professions were, by an independent body. The vital point was that midwives should be supervised by people with a long practical experience of midwifery, and it was open to question whether a Government department could keep up to date in its knowledge of the professional side. The Departmental Committee's proposal amounted, it seemed, to leaving only the penal work in the hands of the Board.

THE FUTURE OF GREATER LONDON.

On Nov. 26th Mr. Arthur Greenwood, Minister of Health, accompanied by Earl Russell, Parliamentary Secretary of the Ministry of Transport, received a deputation from the Greater London Regional Planning Committee, under the chairmanship of Sir Banister Fletcher, P.R.I.B.A.

The first object of the deputation was to ask that the Government would take steps to check the evils of ribbon development on arterial roads, and it was suggested that these evils might be lessened by the following means: (1) purchase of the frontage lands by the State or the highway authority; (2) suitable agreements with the owners; (3) control of the lands adjacent to the road through town-planning schemes. A further question with which the committee had been concerned—the reservation of land for recreation grounds and other open spaces—was closely connected with that of ribbon development, since much the same difficulties arise with regard to the control over the land in question.

-committee were of opinion that these difficulties t be largely solved by amendments in the Town-plan- Act, and they submitted a memorandum on the ility of reserving a green belt around London, together me specific suggestions for the amendment of the 'anning Act, calculated to facilitate the reservation of land from buildings and the provision of open spaces, without imposing heavy burdens on the ratepayers. It was further suggested that additional town-planning powers should be given to county councils, which should be the authorities to acquire and hold regional open spaces, and that a body should be constituted for the Greater London area with power to prepare a master plan and scheme. This scheme should not, however, be carried beyond a provisional stage until those of the various town-planning authorities within the area were complete.

The Minister of Health said, in reply, that he was in full agreement with the general objects which the committee had set before themselves. The proposals for the reservation of open spaces and, in particular, of a green belt around London, were of great interest, though the methods to be adopted in practice would need careful examination. He was also interested in the suggestion that a special regional planning body should be constituted for the Greater London area, but he thought that local authorities would have to be consulted about this.

Lord Russell said that he fully sympathised with the views which the deputation had expressed upon the undesirability of ribbon development, from considerations both of economy and of traffic requirements. He could assure the deputation that the committee would have every support from the Minister of Transport in any practical scheme for mitigating the evil.

THE BUSCH OPTOMETER.

AT a meeting of the Optical Society, held at the Imperial College of Science and Technology, South Kensington, on Nov. 14th, Mr. A. G. Frewin, of the Emil Busch Optical Co., gave a demonstration of the Busch optometer, an instrument designed by Prof. Thorner for measuring refractive errors. By its means can be measured in diopters the hypermetropia or myopia of a symmetrical eye, or the ametropia in the two meridians of an astigmatic eye together with the directions of the meridians. The patient looks with one eye into the exit pupil of the instrument, while the observer looks into the eyepiece and focuses on the patient's macula the image of the straight filament of a small electric bulb. The focusing hand moves a scale relatively to a fixed pointer; when the side edges of the filament are sharp the ametropia may be read off at once. Freedom from glare and corneal reflections is secured by semi-circular stops which ensure that the illuminating rays are incident on the top half of the patient's cornea, whilst the light reflected from the fundus and reaching the observer issues from the lower half of the cornea. The vertex of the correcting lens is placed 12 mm. in front of the patient's cornea.

GLAXO MALTED FOOD.

IN recent articles upon the London Medical Exhibition we referred to a preparation supplied from the Glaxo Laboratories (56, Osnaburgh-street, London, N.W.) as Glaxo Malted Milk. It has been pointed out to us by the proprietors that the right name is Glaxo Malted Food, a cereal product for use as a supplementary when infants require something more than a milk diet. The preparation consists of malted barley and wheat flour, freed from bitter taste.

A HOSPITAL FORMULARY.

THE official formulary of eight Belfast hospitals has been printed and issued by the North Irish Pharmacists' Association of Belfast. It has been compiled with the consent and assistance of the medical staffs of the hospitals attached to the Belfast Medical School, and includes the prescriptions which are in common use in the out-patient departments and wards of the various hospitals. The formulary is divided into six sections beginning with general prescriptions and going on to those suitable for children, for gynæcological, throat, eye, and skin cases. Appended is a price list drawn up as a guide for hospital patients, the price of prescriptions (not including container) varying from 4*d.* to a maximum of 2*s.* 2*d.* In the addendum is a list of formulæ considered suitable alternatives to the more expensive preparations. The price of the Belfast Hospitals' Pharmacopœia is 2*s.* (plus postage), and copies may be had from any of the hospitals. Many old members of the medical school may desire to possess a copy.

DIFFUSION ANÆSTHESIA OF THE PERITONEAL CAVITY.

UNDER this heading we published last week a paragraph from our Vienna correspondent describing Dr. Mandel's experiments with percain as an abdominal anæsthetic. *The Clayton Aniline Company*, who supply this drug, inform us that the doses mentioned were too large. The amounted inserted in the peritoneal cavity should read "350 c.cm. of a ¼ per 1000, and in later cases 250 c.cm. of a ½ per 1000, solution of percain."

evidences of pressure is more likely to be met with in growths of the mediastinum than in bronchial or pulmonary lesions. *General weakness* is usually complained of, but loss of weight, though of great importance in differential diagnosis, is by no means a constant symptom, and the general nutrition and healthy appearance of some patients who are known to have an intrathoracic growth is occasionally a remarkable feature. A point in the history which is worth noting is the frequency with which the patient will mention an attack of so-called influenza, from which he will often date the onset of his more obvious feeling of ill-health. I have mentioned the word influenza because this is the expression most commonly used by patients themselves, but occasionally there will be a *history of pneumonia or possibly bronchitis*. The explanation, I believe, is that in the very early stages pulmonary cancer is, like many other cancers, symptomless; at a certain period in the development of the disease the involvement of lung tissue results in a definite reaction of some sort within the body—in many cases owing to secondary infection—and this is interpreted in terms of its more superficial manifestations, the true underlying cause being unrecognised. I think that it is at this stage that the cardiac displacement seen so often in the radiographic appearances takes place; but this is a point of conjecture and one which it is difficult to establish.

Physical Signs.

The physical signs in the chest of necessity vary considerably according to the size and situation of the lesion, the same being true of the appearances seen in a radiogram. Growths in the mediastinum, like some aneurysms, may give rise to no appreciable signs on examination and may show an equally negative picture with X rays and diagnosis may not be possible until a later stage, when involvement of the recurrent laryngeal nerve may give rise to a typical abductor paralysis of one vocal cord, or pressure on other structures cause symptoms which reveal the real nature of the trouble. Where the growth bears a closer relation to the surface of the body, dullness to percussion is the most common sign, the degree of dullness depending on the size of the growth and the extent of lung and pleural involvement. In the case of a growth which has not spread far beyond the bronchus, quite definite dullness to percussion as well as opacity of the corresponding area in the skiagram may appear, owing to the relative atelectasis of that area of lung supplied by the obstructed division of the bronchus in question. I shall refer in a moment to some of the details of radiological examination, but it is convenient at this point to call attention to the early effects of bronchial obstruction upon both the clinical and radiological signs. Golden,[9] of New York, has shown in a series of radiological studies the development of bronchial carcinoma in two stages, a stage of invasion and a stage of bronchostenosis, the latter being characterised by bronchiectasis, infection, atelectasis, and pleural thickening, with or without fluid. According to his observations it seems that these changes probably occur in the order *in which they have just been mentioned, and this is*, I think, very much in accord with our own experience in this country.

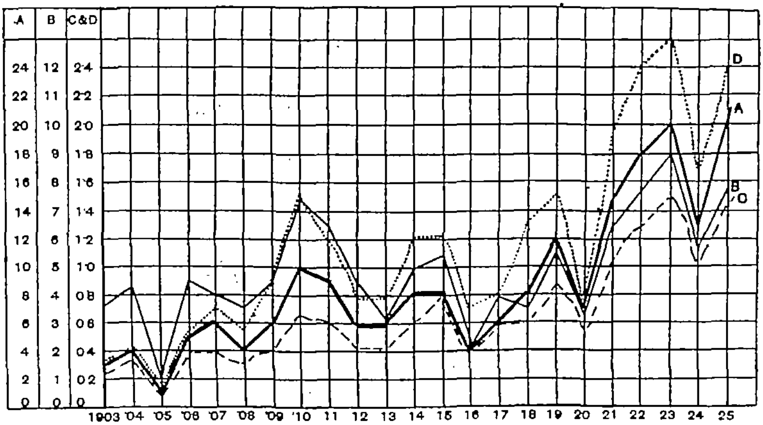

Chart showing incidence of pulmonary cancer at the Charité Hospital, Berlin, from 1903 to 1925. (D. Hanf: Virchows Archiv. f. Path.-Anat., 1927, cclxiv., 307.) A—Absolute figures for cancer of the lung. B—Percentage based on total cancer. C—Percentage based on post-mortem examinations on persons of all ages. D—Percentage based on post-mortem examinations on persons over 20 years of age.

Radiological Examination.

I now come to the radiological aspect of this matter, and although I do not want to say anything which might seem to lessen one's conception of the primary importance of accurate case-taking and methodical physical examination, I must emphasise the paramount importance of radiology in the differential diagnosis of such lesions as we are now considering. I have already indicated the variation which one may expect to find both in the symptomatology and in the physical signs, and the same is true of appearances presented to the radiologist. This once again emphasises the necessity of adequate coöperation between radiologist and clinician in the study of disease of the chest. Often radiographic examination alone is insufficient, and one has recourse both to the intratracheal injection of lipiodol and the introduction of air or oxygen into the pleural cavity as aids to radiological diagnosis.

I need not spend time in the discussion of the technical details of artificial pneumothorax induction of which a full description may be found in the late Dr. Rivière's admirable book.[10] The technique of lipiodol injection is simple enough, the main difficulty being due to the extreme viscidity of the oil. Burrell[11] uses a syringe with a screw piston and injects the lipiodol through the cricothyroid membrane. I myself have used the ordinary type of serum syringe and prefer injecting just below [illegible] into the

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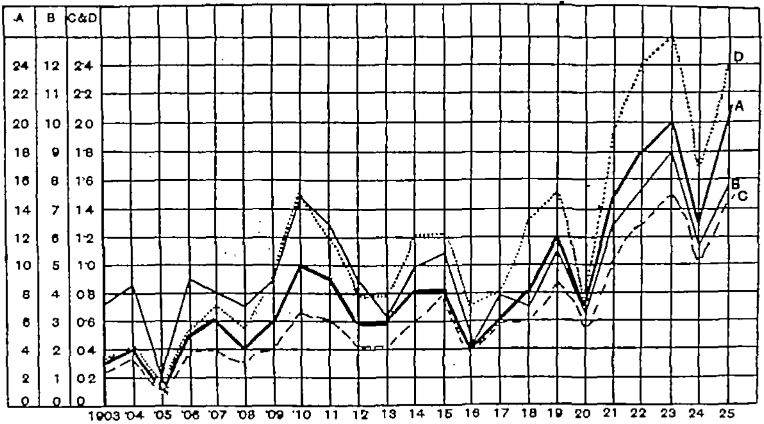

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BRONCHOSCOPY, THORACOSCOPY, AND EXPLORATORY THORACOTOMY.

Of bronchoscopy I would say that it is a means of examination, the possibilities and value of which have not received in this country the recognition which they deserve. It is true that the results of bronchoscopic examination may be entirely negative, but used in conjunction with other methods it should not be neglected, especially in those cases in which clinical and radiological examination have failed to establish a diagnosis and where definite evidence of stenosis of the bronchus may be furnished by direct vision through the bronchoscope.

Thoracoscopy may be of the greatest value. Some of the illustrations which I have exhibited here were made during the examination of one of my own cases at Brompton by Mr. Tudor Edwards[12] in which the cauterisation of adhesions was considered necessary. In cases of new growth the results of endoscopic examination may often furnish no information of diagnostic value; on the other hand, they may be of the greatest assistance. Like other methods of examination thoracoscopy must not be regarded alone, but in conjunction with other sources of evidence.

The final diagnosis of an intrathoracic lesion may, as in abdominal conditions, only be determined by an exploratory operation, although invaluable help may have been afforded to the surgeon by the previous examination if this has been carefully carried out. History repeats itself, and between the surgery of the abdomen and the surgery of the chest it is possible to make an interesting comparison. While at the present time one is bound to admit that the possibilities in regard to the treatment of intrathoracic neoplasms have considerable limitations, the successes of modern surgery in the removal of some of the less malignant forms have justified an attitude of determined expectancy. The use of radium in the treatment of pulmonary or mediastinal tumours, either alone or in combination with surgical measures, is to be encouraged, since no one can yet say the last word as to its possibilities or its limitations. I would deprecate very strongly the tendency to premature statements in respect of radium therapy, for I can conceive of no greater disservice to the public on the part of the medical profession than the broadcasting of optimistic encouragement which is not fully justified by scientific facts. The therapeutic aspect of intrathoracic and pulmonary new growths has indeed many disappointments, but I feel it no exaggeration to say that the advances of the last ten years have led those of us [illegible] are concerned with this work to regard it [illegible] increase of confidence and with a vast [illegible]sonable hope.

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AN ELECTROCARDIOGRAPHIC STUDY OF THE HUMAN HEART DURING AND AFTER NITROUS OXIDE ANÆSTHESIA.

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THE changes which take place in the human heart during and after nitrous oxide anæsthesia have been studied by means of the electrocardiograph. All the observations were made on healthy young students who volunteered for the purpose. The patient was placed in the recumbent position and control electrocardiographic curves were first taken from all three leads. Anæsthesia was then induced with nitrous oxide, and curves from lead II. only were taken at short intervals during the induction period and for several minutes afterwards. In most of the experiments pure nitrous oxide was given in the usual dental fashion, using a well-fitting face-piece connected to a gas-bag and cylinder. In some cases, however, air was given deliberately or inhaled accidentally during the induction. Deep anæsthesia was always obtained, and the gas was discontinued as a rule just before the onset of jactitation; in some instances slight or severe convulsions took place. Considerable cyanosis usually developed. The duration of the induction period varied from 47 seconds to 90 seconds, the average time being about 1 minute in the 16 subjects studied. In addition, a small number of observations have been made under gas and oxygen.

The results with pure nitrous oxide were as follows.

Stage of Induction.

1. *Rate of Heart.*—There is an acceleration at the commencement of the induction which is emotional in origin. A further increase in rate occurs as consciousness is lost, and the maximum heart-rate is observed when the anæsthesia is at its deepest. The final rates varied from 106 to 145 per minute.

2. *Auricular Complex.*—The behaviour of the P wave showed considerable variation in the different individuals. In most cases it was not appreciably affected. In a few subjects it increased markedly in height, the largest rise being from an initial value of 3·5 mm. to 9·5 mm. (Fig. 5). In one subject the P wave decreased from 5 to 3·5 mm. during the induction, while in another subject (who had shown at first augmentation of the wave) the P wave disappeared completely at the depth of the anæsthesia.

3. *P–R Interval.*—The P–R interval was surprisingly stable in our experiments. In only one case was it prolonged, and then did not exceed 0·2 seconds. In a few subjects there was slight shortening of the interval; this was most obvious in the subject with the longest initial interval.

4. *Ventricular Complex.*—The most striking and constant changes were noted in the T wave which was affected in all subjects. In every case a decrease in height was observed. In seven cases it was abolished completely or reduced to negligible dimensions (Fig. 1); in one subject the T wave was completely inverted (Fig. 2). In several instances the S wave was followed by a long iso-electric period which ended in a small positive deflection (Fig. 5).

The R wave was decreased in almost every case. The reduction in the size of R did not necessarily run parallel with the changes in T. Thus in Fig. 2 the T wave was abolished after 20 seconds' inhalation of nitrous oxide, but the R wave was only reduced from 29·5 to 27 mm. The largest reductions were of the order of 25 per cent.—e.g., from 21 to 16 mm., 25 to 20 mm., or 18 to 14 mm. In one instance an increase in the wave was obtained. Out of six subjects with a well-marked S wave, a reduction was noted in five—e.g., from 7 to 5·5 mm., or 5·5 to 4·5 mm.

Recovery Period.

Soon after the nitrous oxide is discontinued recovery sets in,

1. Reduction in the rate of the heart takes place very rapidly, as is clear from the subjoined table.

Subject.	Rate at end of anæsthesia.	Interval.	Rate at end of interval.
1	131	18 sec.	92
2	142	27 "	109
3	118	47 "	97
4	130	25 "	86
5	133	1 min.	80

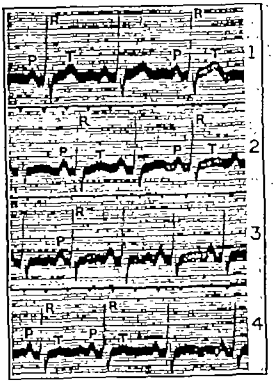
After three or four minutes the rate is usually less than it was before the administration was commenced.

2. After air was given, the P wave underwent reduction in five subjects to less than its height in the control curves.

3. The P–R interval if it had been previously modified soon became normal. (Fig. 1, curve 4, however, shows slight shortening of the P–R interval after administration of air.)

4. In three subjects the R wave was further definitely decreased. Thus in subject Ro. the initial height of the wave was 21·5 mm., at the depth of anæsthesia 17·5 mm., and after breathing air for 25 seconds it was 14·5 mm. In nine subjects the R wave had not completely recovered at periods of four to eight minutes after the anæsthetic was discontinued—e.g., initial height 28 mm., at depth of anæsthesia 18 mm., 6 minutes 25 seconds later 23 mm. In two cases the R wave finally definitely exceeded its level in the control curves (Fig. 2, curve 5).

FIG. 1.



Subject B. In this and the other figures all records are from lead II; the time is shown in 1/5th secs. and the height of waves in curves in mm. (1 millivolt = 1 cm. on original records). Pure N_2O inhaled for 47 secs. During administration, heart-rate increased from 94 to 133 per min. T wave abolished after 37 secs.; R wave decreased. After administration heart-rate rapidly returned to below its original level. Recovery in T wave noticeable after breathing air for 15 secs. But after 2 min. (not illustrated), neither T nor R has fully recovered.

Curve 1 is a control curve taken before anæsthesia. Rate 94 per min. P 5+. R 25. T 6+. S 7. Induction with pure nitrous oxide commenced at 0 min. 0 sec.

Curve 2.—After 20 secs. Rate 120 per min. P 5+, 6. R 19, 20. S 4, 6. T almost abolished.

Curve 3.—After 37 secs. Rate 133 per min. P 5, 5+. R 19, 22. S 4, 6 (8). T abolished. Anæsthetic discontinued at 47 secs.

Curve 4.—After 1 min. 2 secs. (after 15 secs. air). Rate 104 per min. P 5, 5+. R 18, 20. S 5, 6. T just returning. P–R interval *decreased* slightly.

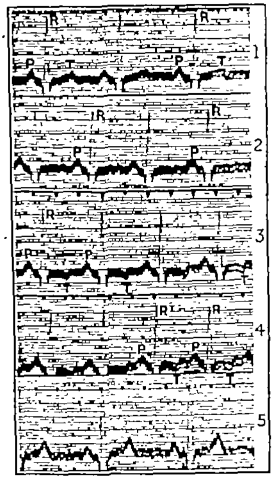
5. The T wave invariably began to return as soon as air was given. The recovery may be obvious after 15 seconds or less. Complete recovery took place in all but two subjects, the shortest time taken being 67 seconds. In two cases the T wave finally exceeded its height in the control curves (Fig. 2, curve 5).

Discussion.

These results show that striking functional changes take place in the heart during the inhalation of pure nitrous oxide. There is marked tachycardia; the auricle shows variable changes, but conduction in the bundle of His is but little altered. When pure nitrous oxide is breathed, oxygen is washed out from the alveolar air and from the blood, so that an extremely severe anoxæmia is acutely produced, as is indicated by the development of cyanosis. Some decrease in the alveolar and arterial CO_2 probably takes place too, owing to the hyperpnœa which often occurs. The changes in the heart illustrated in the electrocardiographic curves might be due to the direct action of the nitrous oxide or they might be secondary to the accompanying anoxæmia.

This problem can be decided to a considerable extent by comparing the electrocardiographic changes under pure gas with those under gas combined with sufficient oxygen to prevent anoxæmia. Fig. 3 shows that in the subject Ro. after 25 seconds' inhalation of pure gas, the T wave was abolished, the R wave reduced from 21·5 to 16·5 mm., and the rate increased from 90 to 124 per minute. At 53

FIG. 2.



Subject G. Pure N_2O administered for 90 secs. During the administration the heart-rate increased from 90 to 124 per min. After 20 secs. the T wave was abolished. After 45 secs. T was definitely inverted; P–R interval was unchanged. Following administration the rate decreased to 77 per min. The T wave became upright again. Finally both R and T exceeded their amplitude in the control curve. The string was carefully restandardised before curve 5 was taken.

Curve 1.—Control curve taken before anæsthetic. Rate 90 per min. P 5½. R 20, 30. T 4, 5. S 2, 3. Induction with pure nitrous oxide commenced at 0 min. 0 sec.

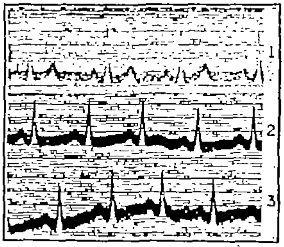
Curve 2.—After 20 secs. Rate 108 per min. P 5½, 6. R 20, 28. S 2, 3. T abolished; long iso-electric period after S terminating in deflection which is first diphasic and then negative.

Curve 3.—After 45 secs. Rate 110 per min. P 5½, 6. R 27, 29. S 3, 4. T inverted. P–R interval unaltered.

Curve 4. After 1 min. 30 secs. Anæsthetic discontinued. Rate 124 per min. P 5, 6. R 28. T inverted. P–R interval unaltered.

Curve 5.—After 6 min. 40 secs. Rate 77 per min. P 5½, R over 30. T 7, 8.

FIG. 3.



Subject Ro. Pure N_2O inhaled for 53 secs. During administration the heart-rate increased from 90 to 130 per min. The T wave was abolished after 25 secs. The R wave decreased from an average value of 21·5 mm. to 17·5 mm. After administration further reduction in the height of the R wave to 14·5 mm. occurred. After 25 secs. breathing air the rate had fallen to 85 per min. and considerable recovery of T had taken place. In this subject after 4 min. 15 secs. R and T had not fully recovered.

Curve 1.—Control curve before anæsthetic. Rate 90 per min. P 5. R 21, 22. T 6½, 7. Induction with pure nitrous oxide begun at 0 min. 0 sec.

Curve 2.—After 25 secs. Rate 124 per min P 5, 6. R 16, 17. T trace or abolished.

Curve 3.—After 53 secs. Anæsthetic discontinued. Rate 130 per min. P 6. R 17, 18. T absent at first, then recovery commenced.

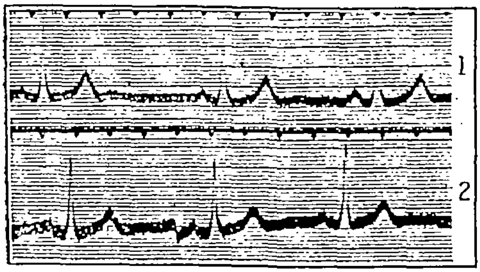
seconds the anæsthetic was removed; the pulse-rate was 130, the T wave was absent at first and then showed commencing recovery, and the R waves averaged 17·5 mm. At 68 seconds (25 seconds later) the T wave had recovered to 5 mm., though further decrease in the R (to 14·5 mm.) had occurred. Fig. 4 shows the effects of gas combined with adequate amounts of oxygen. After 4 minutes 15 seconds anæsthesia was present and the conjunctival reflex was lost; the pulse-rate, however, was only 73 per minute and the ventricular complex was not markedly different from that noted in the control curves.

Schneider and Truesdell[1] produced acute anoxæmia in normal subjects by inhalation of nitrogen for periods of 47 to 112 seconds (average 82 seconds). None of their subjects completely lost consciousness, though in some cases twitching was noted. The pulse-rate was found to increase from an initial level of 95 per minute to a final value of 120 per minute. When air was again breathed the pulse-rate returned to normal or below normal in 40 seconds. It seems justifiable to conclude that the tachycardia observed under pure nitrous oxide anæsthesia is wholly due to the accompanying anoxæmia.

Greene and Gilbert[2] observed changes in the T wave (similar to those noted by us) in chronic anoxæmia in man. In their experiments the oxygen-content of the inspired air was gradually lowered so that after 20 to 30 minutes a final value of 5 to 10 per cent. was reached.

Some reduction in the height of the T wave may occur during simple emotional tachycardia. In our experience the extent of such reduction for an increase in heart-rate of about 30 per minute is of the order of 1 to 3 mm. only.* The marked reduction, abolition or inversion of the T wave which we have described must be mainly due to the anoxæmia affecting the heart otherwise than through simple acceleration. This view is confirmed by the record shown in Fig. 5, which shows the effect of accidental inhalation of a breath of air during the induction period. The heart-rate is 124 per minute in Fig. 5 (curve 2), compared with 120 per minute in Fig. 5 (curve 3) after the air was breathed. Although the tachycardia persisted, immediate partial recovery of the T wave is noted in Fig. 5 (curve 3) which is presumably due to the beneficial effects of the oxygen breathed.

FIG. 4.

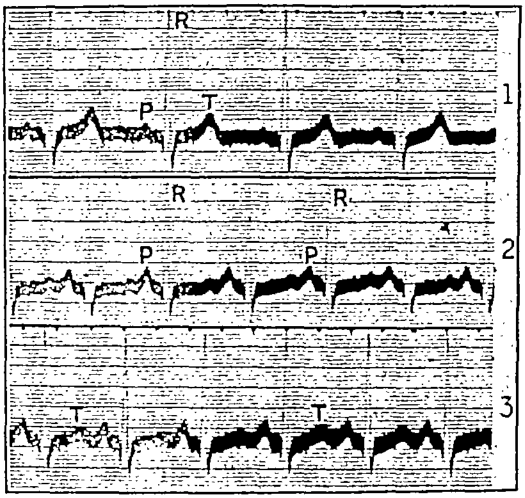


Same subject as Fig. 3. on another occasion. Curve 1 is a control curve taken before anæsthetic. Rate 57 per min. P 4, 5. R 20, 21. T 7½, 8. Gas and oxygen were given for 4 mins. 15 secs., in the proportions of about four parts N_2O to one part O_2 approximately: the conjunctival reflex was absent. At this point curve 2 was taken. Note that the heart-rate was only 72 per min. and that little decrease in the height of R or T had occurred. (P 4, 4½. R 20, 22. T 6, 7.) Compare with Fig. 3.

The cause of the changes in the R wave is not so clear. Marked decrease in the R wave usually occurs during pure nitrous oxide anæsthesia, and is absent with gas and oxygen. It must be pointed out, however, that further decrease in the height of the R wave may take place after air is administered.

Lewis and Mathison[3] observed heart-block from acute anoxæmia in the cat. In their experiments the heart-block developed after a latent period of 1½ to 4½ minutes. The absence of heart-block in our experiments may have been due to the shorter duration of the anoxæmia.

FIG. 5.



Subject S. 1 is control curve taken before anæsthetic. Rate 82 per min. P 3, 4. R 34, 35. S 5, 6. T 7. Pure N_2O was then inhaled for 55 secs. After 20 secs. (curve 2) the heart-rate increased to 124 per min. The P was 6·5 mm. compared with 3·5 mm. originally. T was abolished and replaced by a small positive deflection at the end of a long iso-electric period which followed S. At 37 secs. a breath of air was inhaled (curve 3). The heart-rate was scarcely altered (120 per min.) but considerable recovery in T immediately took place. (T variable in height up to 5.) P still exaggerated, 6½, 7.

Conclusion.

There is still considerable difference of opinion about the significance of the normal T wave of the electrocardiogram (for discussion see Katz[4]). It is widely held that the T wave represents the "stage of retreat"—i.e., the disappearance of the excitation process at the apex and its persistence at the base of the heart. There is a general consensus of opinion that abolition or inversion of T in lead II. indicates serious functional or structural cardiac derangement. It seems justifiable to conclude that the acute anoxæmia produced during anæsthesia with pure nitrous oxide seriously depresses the ventricular myocardium. The change is of a temporary nature, and is rapidly recovered from; but even in our healthy subjects recovery was sometimes not complete after several minutes. It is possible that in patients with heart disease the immediate changes might be of a more serious nature, and it is conceivable, too, that they might be of a more lasting character. It suggests that pains should be taken in such patients to avoid any anoxæmia developing by giving adequate amounts of air or oxygen in combination with nitrous oxide.

Summary.

The changes in the human heart during pure nitrous oxide anæsthesia have been studied electrocardiographically in 16 subjects. The principal results obtained were (1) tachycardia; (2) reduction, abolition, or inversion of the T wave in lead II.; (3) reduction in the R wave; (4) variable changes in the P wave; (5) little change in the P–R interval. The tachycardia and modifications in the T wave are attributed to the accompanying anoxæmia. The practical implications of these findings are discussed.

We are indebted to Drs. Anderson, Gray, Rose, and Slaughter for help with the administration of the

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* Compare, for example, the height of the T waves in the control curves of Figs. 3 and 4, in which the pulse-rates in one subject were 90 and 57 per minute respectively.

anæsthetics, and to the students of the hospital who kindly offered themselves as subjects for this work.

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ASTHMA IN CHILDREN.

THE VALUE OF SUGAR IN ITS PREVENTION AND TREATMENT.

WITH A NOTE ON THE TREATMENT OF INFANTILE ECZEMA.

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IN a previous paper[1] attention was drawn to the importance of ensuring an adequate supply of sugar, in any form, in the diet of children, and it was shown how readily many of the minor symptoms of disordered health in children can be cured and prevented by this simple measure. It was pointed out, too, that amongst the disorders which apparently yielded quite readily to this treatment were some cases of asthma. The object of the present paper is to record four cases of typical bronchial asthma in children who have been rendered entirely free from attacks over periods of one to two and a half years by the simple addition of sugar to the diet and without any other form of treatment. During the past six years other cases have been treated in the same manner, with success varying chiefly with the care and persistency with which the treatment has been supervised by the parents, though it is not to be expected that all cases will respond so favourably as the four described below.

Rackemann[2] has shown that asthma in children is often completely controlled by careful attention to the hygienic conditions under which the child lives, but in the cases considered here an increased allowance of sugar in the diet was the only alteration made in the daily life of the child. All the patients were treated at home by the parents, and were seen regularly in the out-patients' department at fortnightly intervals. The treatment simply consisted in giving three drachms of powdered glucose in lemonade three times a day, in between meals, with extra sugar and "sweets" as recommended in the paper referred to above[1] for debilitated children. In each case this treatment resulted in a marked improvement in the general health and spirits, in addition to the complete disappearance of the asthma. No evidence has been obtained as to the mode of action of sugar in these cases, but I am inclined to attribute its beneficial effects to the improvement in the general health. Barber and Oriel,[3] however, consider that in these cases there is some hepatic dysfunction, and that sugar exerts its beneficial action on the liver.

CASE 1.—A boy, aged 8 years, had suffered from bronchial asthma since he was 3 years of age. Up till then he had been in normal health. The attacks apparently dated from whooping-cough contracted at the age of 3. The attacks generally occurred at monthly intervals throughout the year, and lasted for two or three days. He was an only child, small, pale, thin, and delicate-looking, but bright and intelligent, sometimes, but not habitually, constipated. His tonsils and adenoids had been removed at 4½ years of age. There was no family history of asthma or eczema. At the age of 6 he began to have typical attacks of cyclical vomiting with the usual pyrexia. These attacks occurred at about monthly intervals but did not coincide with the attacks of asthma or bear any apparent relation to the latter, though on two occasions the history of the symptoms suggests that the asthma was preceded by symptoms of cyclical vomiting—viz., pyrexia, headache, and vomiting.

Treatment was commenced in August, 1926, and he was given three drachms of glucose thrice daily, with extra sugar at meals, and sweets. Until December, 1928, he had no further attacks of asthma. For the previous 12 months he had ceased to attend hospital, and he admitted that he had recently not been having his usual allowance of sugar; as a result, he had a single attack of asthma. The treatment was resumed and since then, until he was last seen in August, 1929, he had had no more asthma or cyclical vomiting. This boy has therefore had only one attack of asthma during the past three years.

CASE 2.—A boy of 8, the elder of two children, was thin, small for his age (weighing 40 lb. 4 oz.), and very nervous. He looked a good colour and was not constipated. The family history as regards asthma was unreliable. He had never suffered from cyclical vomiting. At the age of four months he had had "eczema," and at two and a half years pneumonia. The attacks of asthma had begun at the age of 5, and had occurred at intervals of 14 to 21 days. They began with a cough which was succeeded by difficulty in breathing, and generally started at about 2 A.M., and lasted for 48 hours.

Treatment was commenced on August 10th, 1928, and was followed by a most remarkable improvement in appearance and physique, and he has since (up to June, 1929) had no further attacks of asthma.

CASE 3.—A boy, aged 4 years, was an only child, with a pale face and a flabby and watery body. He was first seen on March 9th, 1927, when he was 2½ years old. There was no family history of asthma or eczema. He had had bronchitis and pneumonia in the previous winter. He was always constipated. When seen he was in a typical attack of bronchial asthma; there was marked prolongation of the expiratory phase and the chest was full of sibilant râles and rhonchi. For the previous nine months he had been having similar attacks at intervals of three weeks.

Treatment was commenced as in the previous cases. A week later he was much better and was able to go out of doors. He has attended hospital since at fortnightly intervals and had had no further attacks of asthma by June 6th, 1929—that is, for a period of two years and three months.

CASE 4.—A boy, aged 4½ years, whose maternal grandmother had suffered from asthma, was an only child, well built, and healthy looking. For the past three years he had suffered from attacks of cough and shortness of breath, mostly commencing during the night, and occurring every two or three weeks, both winter and summer. In some of the attacks he had headaches and vomited, and was said to be feverish. His weight was 2 st. 12 lb. 4 oz.

Treatment with sugar was begun on Feb. 18th, 1928. No further attacks occurred until Dec. 1st, when he had a mild attack. Examination of the urine showed excess of acetone bodies, suggesting that he was for some reason not having sufficient sugar. Renewed instructions as to the importance of treatment were given, and no further attacks have been experienced.

From a consideration of these cases it seems that *an increased allowance of sugar, as such (i.e., not as starchy foods)*, in the diet alone was sufficient to prevent recurrence of asthma in these four children over a considerable period of time. The result justifies the hope that a simple and effective cure and preventive measure has been found for this distressing disorder, at least in some cases. Unfortunately, so far as my experience goes, sugar is without value in the treatment of asthma in adults.

It is not possible to lay down more precise rules for the exact amount of sugar required in a given case. In general it may be said that that amount—ascertained by trial—must be given which will ensure that the urine does not contain an excess of acetone bodies (positive Rothera reaction) under any conditions of stress—i.e., worry, excitement, or infection. In practice, this would generally seem to be met by the doses given in the cases here recorded. The administration of alkalis in these cases does not appear to enhance the action of the sugar in any way.

Sugar in the Treatment of Infantile Eczema.

In view of the supposed connexion between eczema and asthma in children, it is of interest to note that, quite contrary to the usual teaching, sugar also appears to be of some value in the treatment of infantile eczema. This is so subject to spontaneous recovery and remissions that little would be gained by a detailed account of the individual cases treated, but it may be stated that in seven cases of severe infantile eczema, one involving the whole of the head, face, and trunk, glucose added to the feeds or given in lemonade was the only form of treatment employed. No other alteration in the diet was made and in none of the cases was there any local application to the skin, which, where necessary, was covered with changes of dry sterilised lint, lightly bandaged on. Bathing was forbidden. The first result noted was a drying-up of the weeping areas, and this was followed by dropping-off of the scales. None of these cases have been under observation for a sufficient length of time to determine whether or not this therapeutic measure is of any prophylactic value for recurrences of eczema. Nor is it suggested that this procedure gives better results than recognised methods for the treatment of this condition, though it may be of value in some cases in addition to the usual local measures.

These observations form part of an investigation on subnormal children carried out with the aid of a grant from the Medical Research Council.

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EMOTION AND ACUTE GLAUCOMA.

By W. S. INMAN, M.B. LOND.,

SENIOR OPHTHALMIC SURGEON, PORTSMOUTH AND SOUTHERN COUNTIES EYE AND EAR HOSPITAL.

FOR many years ophthalmologists have accepted emotion as an exciting cause of acute glaucoma. My own experience has suggested that even though conscious emotion may not be present, at any rate in a sufficient degree to account for the attack of glaucoma, nevertheless the onset may coincide with the anniversary of events once pregnant with emotion but now apparently indifferent or even long since forgotten. The psychological investigation of such cases might lead to a further knowledge of the mechanisms involved, and so enable us sometimes to prevent the development of this very serious and painful disease by providing for the discharge of the emotion through legitimate paths.

I was recently called in to see a retired medical man, aged 77, who had developed acute glaucoma in the left eye the night before. This at first sight seemed to be a case unassociated with any emotional experience. The patient said that he had had no upset on the previous day. He had gone to bed at 10 o'clock and a quarter of an hour later the attack had begun. But I was suspicious. Experience had made me wary of accepting such evidence, and I remarked to the doctor in charge, who knew of my researches, "This is probably a case of periodicity." The patient did not understand the drift of my remark, but his son, who was unusually intuitive, said that he thought he could shed some light on the attack. "Yesterday," he said, "was my birthday, and my father, who has felt recently that he would not live much longer, spent some time last evening in discussing my future after his death." Father and son were living together alone, and the bond between them was very close. The former declared that he had not been worried by the thought of death, but it was clear that he was much concerned about his son's welfare, and had chosen the birthday as the appropriate occasion for the contemplation of the most momentous event which can happen to anyone after birth. There were other matters in the conversation which might have been expected to evoke emotion from the patient, notably that several members of the family had died suddenly, the eldest and last surviving sister having done so at the age of 77. The patient, having now attained this age, thought that he too might die suddenly and wished to assure himself of his Benjamin's happiness before departing.

The patient's nervous state was shown during the operation by great restlessness, although he felt no pain. I intentionally refrained from keeping the other eye under eserine, but no further symptoms arose until two days later, when glaucoma developed. I was anxious not to operate until the left eye was safe, so reassured him, and instilled eserine. Within a few hours the symptoms of glaucoma had disappeared, and they never recurred, though he had no further treatment. A fortnight later it was decided to see what effect dilatation of the pupil would have in order to settle whether a prophylactic trephining should be done. Accordingly, homatropine was instilled after the eye had been carefully examined for any signs of past or present glaucoma. The pupil became dilated until the iris was almost invisible, but the tension remained normal and has done so up to the present, the next anniversary producing no recurrence of the disease.

Thus, in this case at any rate, some factor other than mere mechanical dilatation of the pupil must be invoked to explain why he got glaucoma in the right eye, and it is that factor which needs the most careful investigation. That it frequently depends upon some emotional disturbance is, as I have said, commonly admitted. The circumstances of the onset in the patient's left eye suggest that an attack may replace an emotion, for the strange part of the story is that the father was perfectly calm during the talk with his son and was not conscious of any mental disturbance. The son assured me that it was the custom to talk freely about possible deaths in the family. It had been so during the mother's fatal illness some years previously, and she had then serenely made detailed arrangements with her family for her burial. If, then, the patient felt no ill-effects from the conversation, can we conclude that there was any connexion between it and the ensuing glaucoma? Like all medical questions involving proof, this is difficult to answer. One case does not establish a rule, and the application of statistical methods in psychological investigation is by no means easy.

Space does not permit me to give details of the 20 consecutive cases which have been followed out, but the most striking feature has been the absence of conscious mental stress sufficient to account for the acute attack. Only two followed soon after a death in the family, and the interval in each case was sufficiently long to have allowed the patient's grief to be tempered by time. Indeed, in a long experience, I can call to mind only one instance where acute glaucoma followed immediately upon a death in the family. This was the case of a man who developed the disease whilst returning from the funeral of his mother.

In attempting to explain these strange phenomena, which, as I hope to show in future papers, could be multiplied indefinitely for eye diseases in general, one naturally turns for enlightenment to any psychological theory which might fit in with the facts, and it is with something of a shock that one remembers the emphasis laid by Freud upon the legend of Œdipus, who blinded himself in expiation of his unwitting offences against his parents. It is possible that research will reveal more and more the profound influence of complexes in the determination of organic as well as functional illness. The first case I investigated got acute glaucoma the day before the anniversary of her mother's death 47 years before—a date which she had completely forgotten—and had a recurrence of the symptoms, without actual increase of tension, on her own birthday six months later. Another woman developed an attack on her birthday, while yet another became glaucomatous while fretting over a slight chill which might have prevented her attending her mother's birthday party on the morrow. One man, aged 58, burst into tears when asked about his mother's death, which had occurred within a day or two of the date of his attack of acute glaucoma but with an interval of 48 years.

These patients, amongst others, certainly seem to have lost their sight temporarily in connexion with intimate family relationships of many years' standing. The latter are not consciously of such a nature as ordinarily to produce serious illness, and one must presume the working of an unconscious mental mechanism, unless the associations now recorded are to be attributed to pure coincidence. If the former, then the ophthalmologist must seek the aid of a skilled psychopathologist to arrive at a further elucidation of the problem, for direct questioning may be valueless. There must be many cases of acute glaucoma in which the mechanism necessary for the attack has been set in motion by stimuli other than the recurrence of a certain date. The latter has merely been used as a convenient formula for the purpose of investigation in old people who could not be subjected to direct analysis.

Clinical and Laboratory Notes.

A CASE OF KIENBÖCK'S DISEASE.

ULTIMATE RECOVERY WITHOUT OPERATIVE TREATMENT.

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ASSISTANT SURGEON TO THE HOSPITAL OF ST. JOHN AND ST. ELIZABETH; SURGICAL REGISTRAR TO THE MIDDLESEX HOSPITAL.

SEVERAL cases of this somewhat rare condition of traumatic osteoporosis of the carpal semilunar have been described recently.[1] The present case is considered worthy of record, in view of the almost perfect functional recovery after an interval of four years without operative treatment.

The patient, a crane-driver aged 33, who used his right hand to manipulate switches and brakes, was admitted to the Middlesex Hospital on July 20th, 1925, having fallen 30 feet from his crane. The diagnosis made was "compound fracture of left tibia and fibula; 'sprain' of right wrist." The pain in the wrist quickly subsided until after his discharge three months later, when he was using crutches. It then increased gradually, and was severe by March, 1926, when there was swelling and tenderness on the dorsum of the wrist and limitation of all movements. X ray examination showed patches of rarefaction and increased density in the semilunar bone.

Massage and movements were ordered, but caused no improvement. In August, 1926, the wrist was put up in plaster in dorsiflexion for three weeks, followed by massage and radiant heat; this brought about a slight improvement. In October the pain was greatest when at rest, and a cock-up splint was ordered for wear at night. In November an X ray showed some increase of the areas of rarefaction at the expense of those of increased density. In February, 1927, there was still considerable limitation of movement and X rays showed no further changes. In March the hand was manipulated under an anæsthetic; the utmost movement obtained was flexion 45°, extension 35°, adduction 30°, and abduction 0. By September there had been little change. X rays showed the areas of rarefaction now predominating. In December movement and power were limited by 50 per cent.; he could not carry a bucket of water without pain. There was swelling and tenderness over the centre of the dorsum of the wrist and an increase in the antero-posterior diameter, but no crepitation on movement. Pain in the wrist was caused by percussing the heads of the third and fourth metacarpals.

In August, 1929, he had almost completely recovered power, and could lift heavy weights with only occasional pain. He obtained a flexion of 60°, an extension of 45°, an adduction of 45°, and an abduction of 20°, and there was no tenderness, though antero-posterior thickening remained. The X ray showed mainly an increased density of the semilunar, with no arthritic changes in the carpus.

Comments.

This condition was first described by Peste in 1843; in 1910 Kienböck collected 30 cases, and his name has since been associated with the disease.[2] A similar condition of the carpal scaphoid is known as Preiser's disease, and various combinations of carpal bones may be affected, including the os magnum and unciform, as well as the semilunar and scaphoid. Buchman has described seven such multiple cases.[3]

Of Kienböck's 30 cases, 31 were males; in 24 the right wrist was affected, and 23 were between the ages of 17 and 30 years. These proportions are borne out by other observers; Goldsmith states that males are affected seven times as often as females, and the right wrist two and one-half times as often as the left, and that the commonest age of incidence is in the third or fourth decade.[4] Most observers agree that the condition follows trauma, either a single severe pressure insult or repeated small injuries, such as are received in some occupations. Müller describes in addition an anatomical type due to abnormal pressure lines from anatomical anomalies, but this has not been universally accepted. In the present case occupational trauma was present, but the onset was determined by a single violent injury.

There is, as in this case, an initial acute stage lasting for some weeks, with swelling, pain, and tenderness over the semilunar, and limitation of movement. This is followed by an interval of comparative freedom from symptoms, lasting possibly for several months. Increasing disability then becomes manifest, with swelling and tenderness, and the patient is left with a permanent moderate degree of disability.

In addition to the swelling and tenderness over the semilunar and limitation of movement, two "pathognomonic" signs have been described by Finsterer.[5] These are loss of prominence of the third knuckle, due to compression of the semilunar in its vertical axis, and pain in the semilunar on percussing the head of the third metacarpal. This latter sign is present also in some cases of fracture of the carpal bones, and the amount of radial or ulnar deviation of the hand determines which metacarpal must be percussed to give the maximum pain. Radiographic signs are usually negative in the first stage. Subsequently, areas of rarefaction and areas of increased density appear; the bone tends to be compressed vertically and widened antero-posteriorly. The proximal part is usually involved first, and may become fragmented; it is held by some that a fine line of fracture can be seen in cases examined early.

Pathology.

Examination of an excised bone shows that it contains cysts, with loose and dense fibrous tissue invading it. Various theories have been advanced to account for the condition; they may be summarised as follows:—

(*a*) *Those assuming the presence of a fracture.*—(1) Localised osteitis fibrosa in the region of a fracture (Wollenberg). (2) Defective regenerative ability of the carpus (Baum). (3) Aseptic primary bone necrosis with a pathological fracture (Axhausen).

(*b*) *With no assumption of fracture.*—(4) Injury to blood-vessels, due to tearing of the dorsal and lateral ligaments following a momentary dislocation, and followed by rarefaction (Preiser). That this is probably incorrect was pointed out by Ogilvie when showing a case recently at the Medical Society of London; he had followed up cases of dislocated semilunar which were reduced, and none had developed Kienböck's disease. (5) Abnormal pressure due to anatomical anomalies (Müller). (6) Degeneration (Destot). (7) Infection (Fontaine). (8) Leriche assumes that there can be no rarefaction without hyperæmia, and suggests a traumatic axone reflex, the sequence being trauma, vaso-constriction, vaso-dilatation, bone absorption.

In considering the possibility of an initial fracture, it must be remembered that fracture of the semilunar bone alone is very rare; Goldsmith reports only 14 cases in 13,143 fractures of all bones, or 0·1 per cent.[4] It is also difficult to conceive of any mechanism by which the semilunar alone can sustain a "crush" fracture without injury to other carpal bones.

The condition cannot be regarded as similar to Schlatter's disease, pseudo-coxalgia, or Köhler's disease of the tarsal scaphoid, all of which occur in the growth period. Henderson suggests Kümmell's disease of the spine as the nearest analogy.[7]

Prognosis for complete cure is not good; osteo-arthritis may develop as a sequela.

by a detailed account of the individual cases treated, but it may be stated that in seven cases of severe infantile eczema, one involving the whole of the head, face, and trunk, glucose added to the feeds or given in lemonade was the only form of treatment employed. No other alteration in the diet was made and in none of the cases was there any local application to the skin, which, where necessary, was covered with changes of dry sterilised lint, lightly bandaged on. Bathing was forbidden. The first result noted was a drying-up of the weeping areas, and this was followed by dropping-off of the scales. None of these cases have been under observation for a sufficient length of time to determine whether or not this therapeutic measure is of any prophylactic value for recurrences of eczema. Nor is it suggested that this procedure gives better results than recognised methods for the treatment of this condition, though it may be of value in some cases in addition to the usual local measures.

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I was recently called in to see a retired medical man, aged 77, who had developed acute glaucoma in the left eye the night before. This at first sight seemed to be a case unassociated with any emotional experience. The patient said that he had had no upset on the previous day. He had gone to bed at 10 o'clock and a quarter of an hour later the attack had begun. But I was suspicious. Experience had made me wary of accepting such evidence, and I remarked to the doctor in charge, who knew of my researches, "This is probably a case of periodicity." The patient did not understand the drift of my remark, but his son, who was unusually intuitive, said that he thought he could shed some light on the attack. "Yesterday," he said, "was my birthday, and my father, who has felt recently that he would not live much longer, spent some time last evening in discussing my future after his death." Father and son were living together alone, and the bond between them was very close. The former declared that he had not been worried by the thought of death, but it was clear that he was much concerned about his son's welfare, and had chosen the birthday as the appropriate occasion for the contemplation of the most momentous event which can happen to anyone after birth. There were other matters in the conversation which might have been expected to evoke emotion from the patient, notably that several members of the family had died suddenly, the eldest and last surviving sister having done so at the age of 77. The patient, having now attained this age, thought that he too might die suddenly and wished to assure himself of his Benjamin's happiness before departing.

The patient's nervous state was shown during the operation by great restlessness, although he felt no pain. I intentionally refrained from keeping the other eye under eserine, but no further symptoms arose until two days later, when glaucoma developed. I was anxious not to operate until the left eye was safe, so reassured him, and instilled eserine. Within a few hours the symptoms of glaucoma had disappeared, and they never recurred, though he had no further treatment. A fortnight later it was decided to see what effect dilatation of the pupil would have in order to settle whether a prophylactic trephining should be done. Accordingly, homatropine was instilled after the eye had been carefully examined for any signs of past or present glaucoma. The pupil became dilated until the iris was almost invisible, but the tension remained normal and has done so up to the present, the next anniversary producing no recurrence of the disease.

Thus, in this case at any rate, some factor other than mere mechanical dilatation of the pupil must be invoked to explain why he got glaucoma in the right eye, and it is that factor which needs the most careful investigation. That it frequently depends upon some emotional disturbance is, as I have said, commonly admitted. The circumstances of the onset in the patient's left eye suggest that an attack may replace an emotion, for the strange part of the story is that the father was perfectly calm during the talk with his son and was not conscious of any mental disturbance. The son assured me that it was the custom to talk freely about possible deaths in the family. It had been so during the mother's fatal illness some years previously, and she had then serenely made detailed arrangements with her family for her burial. If, then, the patient felt no ill-effects from the conversation, can we conclude that there was any connexion between it and the ensuing glaucoma? Like all medical questions involving proof, this is difficult to answer. One case does not establish a rule, and the application of statistical methods in psychological investigation is by no means easy.

Space does not permit me to give details of the 20 consecutive cases which have been followed out, but the most striking feature has been the absence of conscious mental stress sufficient to account for the acute attack. Only two followed soon after a death in the family, and the interval in each case was sufficiently long to have allowed the patient's grief to be tempered by time. Indeed, in a long experience, I can call to mind only one instance where acute glaucoma followed immediately upon a death in the family. This was the case of a man who developed the disease whilst returning from the funeral of his mother.

In attempting to explain these strange phenomena, which, as I hope to show in future papers, could be multiplied indefinitely for eye diseases in general, one naturally turns for enlightenment to any psychological theory which might fit in with the facts, and it is with something of a shock that one remembers the emphasis laid by Freud upon the legend of Œdipus, who blinded himself in expiation of his unwitting offences against his parents. It is possible that research will reveal more and more the profound influence of complexes in the determination of organic as well as functional illness. The first case I investigated got acute glaucoma the day before the anniversary of her mother's death 47 years before—a date which she had completely forgotten—and had a recurrence of the symptoms, without actual increase of tension, on her own birthday six months later. Another woman developed an attack on her birthday, while yet another became glaucomatous while fretting over a slight chill which might have prevented her attending her mother's birthday party on the morrow. One man, aged 58, burst into tears when asked about his mother's death, which had occurred within a day or two of the date of his attack of acute glaucoma but with an interval of 48 years.

These patients, amongst others, certainly seem to have lost their sight temporarily in connexion with intimate family relationships of many years' standing. The latter are not consciously of such a nature as ordinarily to produce serious illness, and one must presume the working of an unconscious mental mechanism, unless the associations now recorded are to be attributed to pure coincidence. If the former, then the ophthalmologist must seek the aid of a skilled psychopathologist to arrive at a further

GENERAL MEDICAL COUNCIL.

PENAL CASES.

TUESDAY, NOV. 26TH.

ACCORDING to custom, the Council heard the cases in public, deliberated upon them in camera, and the President then announced the decision.

Reported from the Dental Board.

The Case of James Ireland, registered as of "Buena Vista," Costock, Nottinghamshire, "Dentist 1921."

In May, 1928, Mr. Ireland had been summoned by the Board to attend an inquiry in respect of convictions for (*a*) being drunk whilst in charge of a motor-car, (*b*) of driving a motor-car in a manner dangerous to the public, and (*c*) of being drunk and disorderly. The convictions were found proved, but judgment was postponed for six months. In November, 1928, the case was discharged, and Mr. Ireland gave his assurance that he would do his best to justify the leniency of the Board. He was informed that if he had to appear before the Board again, the result might be very serious. On May 29th, 1929, however, he was again convicted at the Nottingham police-court of being drunk and disorderly, and was fined 10s. He sent a letter to the Board's solicitor that he was not intoxicated or disorderly at the time, but was upset and excited owing to the loss of his money which had been picked from his pocket while waiting for a 'bus. He said he could not attend the inquiry owing to an injury to his leg in August last, when he was run down by a motor-car, and the consequent expense. He was asked to send a medical certificate of inability to attend, and thereupon submitted one dated August 21st, 1929, given him at the time of the accident, which stated that he was at that time disabled from following his employment. The police reported that when Mr. Ireland was arrested he was drunk and wanted to fight anyone near him.

The Dental Board had found the conviction proved, and advised that Mr. Ireland's name should be erased from the Register.

Mr. Ireland sent a letter pleading the hardship involved to his family if his name were erased. The Council directed the Registrar to remove his name.

The Case of Mihrane Haroutune Chirinian, registered as of 26, Coventry-street, London, W.1, "Dentist 1921."

He had at the County of London Sessions commencing on April 9th, 1929, been convicted (in the name of Mihrank Haroutin Chirinian) of stealing one suit-case and other articles, the property of Violet Gutteridge; one suit, the property of Airey and Wheeler; 34 pairs of silk stockings, the property of Etams, Limited; and one gold cigarette case, the property of Elkington and Company; and sentenced to three years' penal servitude and recommended for deportation. The Chairman of Session in passing sentence had said it was plain that Chirinian was a dangerous and dishonest man, who preyed upon everybody with whom he came in contact. Respondent had applied to the Court of Criminal Appeal for leave to appeal against the conviction, and the application had been dismissed. He had sent letters to the Board's solicitor and to the Registrar of the Board from H.M. Prison, Parkhurst, denying that he was guilty of the offences, and asking for a postponement of the inquiry until he was released from prison. He complained of not being given time enough to petition to the Home Secretary for permission to attend the inquiry, and his inability to engage a lawyer. The notice of inquiry had been sent to Mr. Chirinian on Oct. 17th, 1929, thus giving him ample time to apply to the Home Office and to engage a lawyer, provided he had the means for the latter.

The Board had found the conviction proved, and had recommended that the name of Mihrane Haroutune Chirinian be erased from the Register. Mr. Chirinian did not attend and was not represented. The Council directed the Registrar to erase his name.

Restorations to the Dental Register; Dental Education.

After further deliberation in camera the President announced that the following names had been restored to the Dental Register: Laurent Eugène Doprimoz and William Laird.

The Council then received and adopted the report of the Dental Education and Examination Committee. The University of Adelaide, Mr. Dolamore said, had now complied with the requirements of the Committee and it was therefore recommended that the degrees of B.D.S. and D.D.Sc. Adelaide be recognised as entitling to registration on the Colonial list. The Committee had observed that not all degrees in Great Britain and Northern Ireland and the Irish Free State were recognised as entitling to registration in South Australia. They also noted that persons whose names appear on the Dentists Register with a British degree or licence are required to pass a practical test in New South Wales. They desired that the attention of the authorities should be drawn to these anomalies. Conversations had taken place with a representative of the Japanese Embassy, and after careful inquiry the Committee was satisfied that the differences between the Japanese system of dental education and the British were so fundamental that it was not possible to permit Japanese dental qualifications to entitle the holder to registration in this country.

Mr. J. W. McGowan and Mr. E. L. Sheridan were appointed members of the Dental Education and Examination Committee in place of Mr. Guy and Mr. Ackland.

The Council considered in camera the *Case of James Edgar Nelson*, reported by the Dental Board, and the President announced that the case was to be remitted to the Board for further inquiry and report.

Medical Case Adjourned from November, 1928.

The Case of Bertie Edward Acland, registered as of 120, Leonard-road, Birches Head, Hanley, Stoke-on-Trent, M.B., Ch.B., 1924, U. Liverpool, who had previously appeared before the Council on the following charge:—

> "That you were convicted at the Hanley petty sessions of the following misdemeanours—viz.: (1) On July 22nd, 1926, of being drunk in charge of a motor-car, and were fined £10 and witness fee £1 1s., or two months' imprisonment in default; and (2) on Oct. 2nd, 1928, of being drunk in charge of a motor-car, and were fined £20 and witnesses' fees £2 1s., and were disqualified for holding a driving licence for two years."

Last year the Council had postponed judgment. Mr. Acland appeared, and the Council's solicitor read letters from his professional brethren testifying to his sobriety during the past year and from the police authorities saying that there had been no further conviction against him. Mr. Acland spoke of the increase of his panel practice and assured the Council of his intention to abstain from alcoholic excess in future. The Council decided not to erase his name from the Register.

An Erasure for Immoral Relations with a Patient.

The Case of Angus Dugald Buchanan, registered as c/o Messrs. Crawford Herron and Cameron, 257, West George-street, Glasgow, C. 2, M.B., Ch.B. 1911, Glasg., who had been summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner, you abused your position by committing adultery with Elizabeth McCarron or Campbell, whom and whose family you had attended professionally, subsequent to which you were co-defender in the case of Campbell *v.* Campbell and Buchanan in the Court of Session, in which proceedings a decree of divorce was pronounced on Nov. 9th, 1928. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

Mr. Harper, the Council's solicitor, said that there was no complainant in this case, but the facts had been brought before the Council by Mr. Campbell. Adultery and professional relationship had been set out in the divorce proceedings, but the professional relationship was now emphatically denied and the respondent claimed that Mr. Campbell had known of the relationship and had shared in large sums of money paid by respondent to Mrs. Campbell. Dr. Buchanan had not contested the divorce proceedings but had left for Australia; he now maintained that the proof of the Campbell's doctor. She had introduced them in her own house in a friendly way, not in the least professionally. In 1926 Mrs. Campbell had confessed that the relations were and always had been guilty, and that they had started from a meeting in the street out of surgery hours. Mrs. Campbell had then said that she intended to squeeze the doctor dry and keep him in her hand till she had, and that her separation from Mr. Campbell had been due to her relationship with the doctor. After 1926 new furniture and new clothes had appeared. The neighbours had been outraged by her conduct. Dr. Buchanan had called openly in the forenoon. Witness had never nursed Mrs. Campbell, and had never been in the house as a paid charwoman or servant. She had followed Mrs. Campbell, and had seen her meet the doctor on several occasions in different streets; she had set off at twenty to three every day and returned about six. She had followed Mrs. Campbell and seen her meet the doctor every day for about three months.

Mr. Henderson put in a sworn statement sent by Dr. Angus Buchanan from Australia. He stated that he was married and had three children under 14. He confirmed the material facts of the case and declared that he had been introduced to Mrs. Campbell by a Mrs. Johnstone. Their relationship had been purely social. Mrs. Campbell had first suggested intercourse and had threatened to expose the affair to his wife when he had tried to break it off. She had demanded money and received about £2 a week for two years. When he had told her he was going on a holiday she had declared he should not go unless he paid for a holiday for her. Her demands had become more insistent and finally he had told his wife all about it. He had at no time acted as medical adviser to Mrs. Campbell or her family.

Mr. Henderson addressed the Council, submitting that the case against his client had not been proved, that the affair was simply that of a paid mistress who was willing to do her best to ruin the man who had discarded her. The evidence for professional relationship was confined to the relatives and rested on the question of medicines. It was quite true that medicines could have been made up by the practitioners themselves, but the evidence of these relatives was that the medicines had been made up by the dispenser, and the money tendered to him on many occasions. It was incredible that the name of Mrs. Campbell should invariably have been omitted from the books by that dispenser, years ago, before any question of proceedings had arisen. Mrs. Campbell's meeting with Dr. Buchanan had nothing to do with the fact that her daughter had previously joined the panel of his partner. By the time the son joined Dr. Buchanan's panel the relationship had existed for two years.

Mr. Harper briefly addressed the Council. After deliberation in camera the President announced that the Council had found the charge proved to their satisfaction, and directed that the name of Dr. A. D. Buchanan be erased from the Register.

Advertising in India.

On Wednesday, Nov. 27th, the Council considered *the Case of Ratilal Shivlal Shah*, registered (Colonial List) as c/o Umjamshi S. Shah, High Court Pleader, Rajkot, India, M.B., B.S. 1922, U.Bombay, who had been summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner, you have advertised for the purpose of obtaining patients or promoting your own professional advantage—viz.: (1) By the issue of two leaflets in respect of two medicines concocted by you, to wit 'Shwetanjan' and 'Muktanjan.' (2) By calling your private home or dispensary 'Dr. Shah's Eye Hospital' or 'Dr. Shah's Ophthalmic Hospital.' (3) By inserting, or sanctioning the insertion, or acquiescing in the insertion, in the March, 1928, number of a Gujarati paper called *Sharda* of an advertisement of the above-mentioned remedies. (4) By inserting, or sanctioning the insertion, or acquiescing in the insertion, on another page of the issue of the said paper *Sharda*, a portrait of yourself with a laudatory notice below such portrait. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The Council's attention had been drawn to this case by the Bombay Medical Council. Mr. Shah did not attend but was represented by Mr. H. F. Parfitt, of Messrs. Minet, May and Co., solicitors. The Council's solicitor related the facts, and both solicitors addressed the Council. After deliberation in camera the President announced the decision of the Council as follows:—

> "I have to announce that the Council have decided that they will not now proceed to decide whether the facts alleged against Mr. Shah in this notice of inquiry have been proved or have not been proved, on the ground that the materials for a decision are insufficient. They will, therefore, ask you both to appear in November of next year, and to bring up further evidence, Mr. Harper from the Bombay Medical Council, and Mr. Parfitt, on behalf of Mr. Shah, if he has anything further to say then."

The Council received a report from the Executive Committee that the name of Ewen Cameron McLeod had been removed from the Register of the College of Physicians and Surgeons of Manitoba. The Committee was satisfied that Mr. McLeod had not been deprived of his qualification on the ground of his adoption of any theory of medicine and surgery. It was moved by the Chairman of Business, seconded by Sir John Moore, and agreed that the name of Mr. McLeod be removed from the Register in respect of the qualification of M.C.P. & S. Man. 1926, therein recorded.

Restorations.

The President announced that the Registrar had been directed to restore to the Medical Register the names of Bernard Wilfred Goldstone and David Davey Rosewarne.

Association of a Practitioner with a Company Trading in Secret Remedies.

The Case of John Forrest Hamilton, registered as of Mexborough House, Mexborough, Yorks, M.B., Ch.B., U.Glasg., 1919, who was summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner: (1) you have associated with a person or persons (unqualified) for the purpose of treating persons in respect of matters requiring professional discretion or skill; (2) having acquired a part interest in certain secret remedies, preparations, and medicines from unregistered persons, you are engaged in association with them in the sale for your own profit of such secret remedies, preparations, and medicines. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were the Medical Defence Union, represented by Mr. Oswald Hempson. Respondent appeared in answer to his notice.

Mr. Hempson read out the prospectus of a company called "Lunvitre, Ltd.," of which the address was that of Dr. Hamilton, and of which Dr. Hamilton was a director. The memorandum of association showed that Dr. Hamilton was associated with two other directors, one of them a miner, and that the objects of the association were to acquire and trade in secret preparations and medicines for the treatment of tuberculosis of the lungs and other disorders, and such other secret preparations as seemed fit to the company. Another document was signed by Dr. Hamilton as secretary of the company. Part of the defence was that no trade had been carried out. The Medical Defence Union had no interest in waiting until the offence had become indisputable; as soon as they heard of the intention they placed the matter before the Council for a ruling. Mr. Hempson argued that it was infamous for a professional man to have any interest in the sale of medicines, particularly for a disease like tuberculosis, where general treatment was of such importance. A Mr. Webster, chemist, had written to the company about the "Lunvitre" treatment for tuberculosis, and had received a reply signed by "J. Hamilton." The reply was typewritten on business notepaper with all the usual company notices in its letterhead and a highly coloured representation of a Red Indian's head. The letter undertook to execute a commission in a month's time, and claimed marvellous results for the medicine, referring to "hundreds of testimonials." In his defence Dr. Hamilton had quoted from correspondence with his lawyer and with the British Medical Association, but had torn his quotations from their context. The Registrar had written to Dr. Hamilton in August, 1929, warning him that association with the proposed company would be highly undesirable for a registered practitioner. Dr. Hamilton had replied at some length on Sept. 18th, 1929, admitting that he was chairman of directors of a limited company, but maintaining that no harm had been done since trading had not yet been commenced, and that his position was comparable with that of any doctor holding shares in a trading concern. He declared that he would not prescribe for his own patients any product marketed by the company. On Sept. 19th the Registrar had replied as follows:—

"J. F. Hamilton, Esq., M.B.

"DEAR SIR,—In reply to your letter of Sept. 13th, I regret if it appears that mine of the 27th ult. was not sufficiently clear. There are certain practices which, without bringing a medical man within the precise terms of the warning notices, may nevertheless be considered contrary to the best interests of the profession, and to be deprecated by his fellow practitioners of good repute and competency. Amongst these has been considered the pledge of secrecy where the composition of remedies is concerned, and the association, whether openly or otherwise, with a concern devoted to their manufacture.

"The Council have never attempted to control the field of investments open to a medical practitioner, but, without introducing any element of compulsion into their opinion, they feel that in the best interests of the profession it would be wiser for a medical practitioner to seek a return for his capital in directions other than patent medicines. If, notwithstanding, he is determined to keep up his connexion with a proprietary company, he is, at least requested to see that no use is made of his name and qualifications upon official stationery, nor that his name and qualifications are made use of for the purpose of advertising the products.

"Should your association with the direction of the proprietary medicine company become known to your professional colleagues, you will almost certainly be made aware of their disapproval, and may probably be made subject to complaints to the Council regarding your action. The legal fact that the company is technically a separate entity would not protect you against such complaints.

"Yours faithfully,

"NORMAN KING,

"Registrar."

The Medical Secretary of the British Medical Association had noticed the company's advertisement and had written to Dr. Hamilton, as a member, warning him that it was contrary to all tradition that a medical man should have any interest in the sale of patent medicines. An accountant had replied on behalf of Dr. Hamilton on Sept. 9th arguing in justification: (1) that the company was a separate legal entity; (2) that Dr. Hamilton had never proposed to take any step which would bring business to the company by virtue of his medical degrees; (3) that the company did not propose to use as advertisement the fact that one of the directors was a medical man. The Medical Secretary had replied that in view of the general opinion of the profession he was sorry that Dr. Hamilton had taken this position, although the safeguards would appear to meet any objections of the General Medical Council.

Dr. J. Neal, Secretary of the Medical Defence Union, testified to his statutory declaration confirming the facts set out by Mr. Hempson and the steps taken by the Union to investigate them.

Cross-examined by Dr. Hamilton, Dr. Neal said that it was not necessarily derogatory for a medical man to hold shares in a trading firm or, further, to have some say in its direction.

Re-examined, he explained that the nature of the company and to a lesser extent the degree of the association would influence his opinion about the association of a medical man with a company.

Mr. T. Gething, an accountant, of Mexborough, testified to his declaration describing how he had bought a bottle of "Lunvitre" from Mr. G. H. Jones, who had told him that the company had also remedies for rheumatism and gall-stones which would be on sale the following week. He had also said that Dr. Hamilton's coachhouse and stables had been converted into a factory, and that as Dr. Hamilton knew where to get the drugs the cost was reduced. An old lady and a man had been present at this interview. He declared that 105, Market-street was Dr. Hamilton's private address, and produced the entry in the Voter's Register in confirmation. There was no plate on the door of that house. Mr. Jones had said that the cure had been given to him by an old Indian in Canada, and the Indian's head would be the trade-mark of the company's products.

Cross-examined, Mr. Gething denied that he was collector for a firm of doctors who had been asked by Messrs. Hempson to collect evidence, and denied that he had a grudge against Dr. Hamilton as a result of accusations brought about him some years ago. He had never heard any doctor say it would be worth £500 to him to get Dr. Hamilton out of Mexborough. He had gone to Mr. Jones's house about a debt with which he was dealing and had spoken about that account before mentioning "Lunvitre." He reiterated the statements in his declaration, particularly that Mr. Jones had said that both he and Dr. Hamilton saw patients. Mr. Jones had not made the bottle up for him as a favour; it had been already made up.

The bottle was produced. The label contained the words, "The great remedy for all lung troubles. Manufactured solely by G. E. Jones, 40, Doncaster-road, Mexborough."

Mr. Sinclair, M.P.S., deposed that he was a chemist and had traded with Mr. G. E. Jones for two or three years. Mr. Jones had purchased pure glycerin, syrup of mulberry, oil of juniper, Friar's balsam, and sal volatile. The first two were ingredients for the "cure." Since the company had been formed, Mr. Jones had told him that the recipe was obtained from an American Indian, and that an Indian was to appear on the label. He had referred to a film which had been prepared to advertise the remedy, and said he had entered into partnership with Dr. Hamilton for the preparation of the remedy, its factory to be at 105, Market-street. Witness was familiar with Dr. Hamilton's signature on prescriptions, and thought the signature on the letter from "Lunvitre, Ltd.," closely resembled his, though the initials were not quite as usual.

Cross-examined, he asserted that Mr. Jones had repeatedly used the word "cure." He had supplied Mr. Jones with glycerin and syrup within the last seven days. He denied ever discussing the cure with respondent.

In reply to the Legal Assessor, he said there were some outbuildings attached to 105, Market-street.

The Defence.

Dr. Hamilton gave evidence on his own behalf. He declared that for eight years he had been persecuted by a medical partnership who, he believed, were the informants in this case. This firm had complained to the Medical Defence Union eight years ago that respondent was touting for patients. The Union had, however, failed to get evidence. The firm had complained to the local ethical medical society and had had him boycotted in his absence; after investigation he had been completely cleared and invited to join the society. An attempt had been made to exclude him from the local hospital by underhand means. He had been approached by Mr. Jones, a patient of his, who had asked for help. Out of sympathy, respondent had offered to give him a chance, intending to get out of it as soon as Mr. Jones the Campbell's doctor. She had introduced them in her own house in a friendly way, not in the least professionally. In 1926 Mrs. Campbell had confessed that the relations were and always had been guilty, and that they had started from a meeting in the street out of surgery hours. Mrs. Campbell had then said that she intended to squeeze the doctor dry and keep him in her hand till she had, and that her separation from Mr. Campbell had been due to her relationship with the doctor. After 1926 new furniture and new clothes had appeared. The neighbours had been outraged by her conduct. Dr. Buchanan had called openly in the forenoon. Witness had never nursed Mrs. Campbell, and had never been in the house as a paid charwoman or servant. She had followed Mrs. Campbell, and had seen her meet the doctor on several occasions in different streets; she had set off at twenty to three every day and returned about six. She had followed Mrs. Campbell and seen her meet the doctor every day for about three months.

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> "That, being a registered medical practitioner: (1) you have associated with a person or persons (unqualified) for the purpose of treating persons in respect of matters requiring professional discretion or skill; (2) having acquired a part interest in certain secret remedies, preparations, and medicines from unregistered persons, you are engaged in association with them in the sale for your own profit of such secret remedies, preparations, and medicines. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainants were the Medical Defence Union, represented by Mr. Oswald Hempson. Respondent appeared in answer to his notice.

Mr. Hempson read out the prospectus of a company called "Lunvitre, Ltd.," of which the address was that of Dr. Hamilton, and of which Dr. Hamilton was a director. The memorandum of association showed that Dr. Hamilton was associated with two other directors, one of them a minor, and that the objects of the association were to acquire and trade in secret preparations and medicines for the treatment of tuberculosis of the lungs and other disorders, and such other secret preparations as seemed fit to the company. Another document was signed by Dr. Hamilton as secretary of the company. Part of the defence was that no trade had been carried out. The Medical Defence Union had no interest in waiting until the offence had become indisputable; as soon as they heard of the intention they placed the matter before the Council for a ruling. Mr. Hempson argued that it was infamous for a professional man to have any interest in the sale of medicines, particularly for a disease like tuberculosis, where general treatment was of such importance. A Mr. Webster, chemist, had written to the company about the "Lunvitre" treatment for tuberculosis, and had received a reply degrading or dishonourable to his profession. There had been no evidence of any sale of medicines with the knowledge and consent of the company. He quoted again the letter to the accountant from the Secretary of the British Medical Association saying, "I have carefully considered the points you raise, and the safeguards which Dr. Hamilton has taken seem to me pretty adequately to cover any objection which might be taken by the General Medical Council." He humbly submitted that the Council was in honour bound by the letter of its executive officer. Respondent had definitely asked whether his association with the company would be regarded by the Council as infamous conduct in a professional respect. The Registrar had replied in a manner which respondent had unhesitatingly interpreted as a negative. This case was without precedent, and it was very difficult for a young practitioner to determine what might and might not be done. The scheme had been foolishly and carelessly undertaken; but he had acted in good faith, and had taken advice from a chartered accountant and a solicitor. If they had been right, that was his justification; if they had been wrong it showed the difficulty of finding out the Council's wishes. No matter what the decision of the Council, he would sever all connexion with the company.

Mr. Hempson addressed the Council. The respondent had, he said, been warned both by the British Medical Association and by the Registrar. Dr. Cox's letter had been addressed to the accountant, and under those circumstances might well hesitate to use the strong terms of condemnation that might be directed to the doctor himself. Jones had admitted that the letter to the chemist had been written from a draft, and it was obvious that the draft had not been composed by Jones. In Mr. Hempson's opinion the original defence was not an honest one; Dr. Hamilton had not at first realised the seriousness of his position. A more heinous case of association with unqualified practice could not be conceived. Dr. Hamilton had put up money to help a well-known quack to exploit a secret remedy for one of the most fell diseases in this country, and thus to prevent people from getting adequate treatment. While the charge as a whole had been denied, every point in it had been separately admitted.

The President announced that the Council had found the charge proved to their satisfaction and had directed the Registrar to erase Dr. Hamilton's name.

Alleged Canvassing.

The Case of Nagib Iskander, registered as of 96, Primrose-lane, Hall Green, Birmingham, M.B., Ch.B., 1920, U.Birm., who had been summoned to appear before the Council on the following charge:—

> "That, being a registered medical practitioner, you have systematically canvassed for patients by means of agents, and in particular: (1) on or about March 1st and April 29th, 1929, so canvassed Mrs. Elizabeth Howell; (2) on or about March 21st, 1929, so canvassed Mrs. Gladys Martin; (3) on or about March 21st, 1929, and about a week after, so canvassed Mrs. Emily Hall; (4) on or about April 18th, 1929, so canvassed Mrs. Dora Lilian Harrison; and (5) on or about April 20th, 1929, so canvassed Mrs. Gwendoline Ruth Morgan; and that in relation thereto you have been guilty of infamous conduct in a professional respect."

The complainants were Mr. V. A. Goldman, M.R.C.S. Eng., Mr. P. Carroll, L.R.C.P. Edin., and Mr. C. C. Blair, M.B. Glasg., represented by Mr. Goldman. Mr. Iskander attended in answer to his notice, accompanied by Mr. Davis, of Messrs. Bulcraig and Davis, solicitors. Mr. Goldman proceeded to lay the facts before the Council, and read five statutory declarations from the five ladies mentioned in the charge; none of them was present.

At this point the President, having consulted the Legal Assessor and the Council, announced that there was no evidence connecting the charges with Mr. Iskander, and the case was dismissed.

(*To be continued.*)

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

AT a meeting of this Society in London on Nov. 29th, with Dr. F. J. H. COUTTS, the President, in the chair, papers on the

Urinary Excretion of Novarsenobillon in Syphilis, and its Relation to Toxic Effects

were read by Dr. N. L. LLOYD and Mr. V. E. LLOYD. Despite the wide use of salvarsan and its derivatives during the last 15 years, said Dr. Lloyd, the fate of these compounds in the body was not yet fully understood, though it was known that a considerable proportion of them was excreted soon after injection, principally in the urine and fæces. The inter-relation of intensity of therapeutic effect, rate of elimination, and toxic manifestations was of considerable importance. There was now a good deal of evidence of deterioration of hepatic efficiency following the use of these compounds; jaundice sometimes appeared, and might continue even after treatment was stopped. The chief aim in treating syphilis was to attain the maximal therapeutic action with the minimum of toxicity. At the beginning of treatment any reliable test which would reveal patients who were specially susceptible to toxic effects must be of value in deciding dosage. One of the practical objections to the present tests was that they took so much time that employers had to know why abstention from work was necessary. Accordingly Dr. Lloyd and his brother had been led to use a colour reaction, described by Abelin in 1911, which was very simple and did not need any special apparatus. Abelin's test depended on the conversion of the arsenobenzol into a diazo compound and the subsequent linking of this body to some member of the phenol or naphthol groups with development of a colour. Patients receiving salvarsan showed its presence in the urine five to ten minutes after injection, and Abelin had demonstrated that excretion continued as long as seven hours. Elimination was found to be more prolonged in tertiary syphilis and neurosyphilis. Absence of elimination should lead to careful examination of the patient before going on with treatment. Several workers had shown, however, that the rate of excretion did not decline in regular progression. It was noted that the drug disappeared rapidly from the blood stream, but it could not be demonstrated in the cerebro-spinal fluid except after massive doses in dogs. The fæces gave negative reactions.

In outline the test was as follows:—

> Five c.cm. of the fluid to be examined was placed in a test-tube and cooled in running water or ice. To this was added 0·5 c.cm. of 5 per cent. hydrochloric acid, and after a few minutes 1 c.cm. of a 0·5 per cent. solution of sodium nitrite. The solution was kept in running cold water for ten minutes. In a second test-tube was placed 4 c.cm. of a 10 per cent. solution of resorcin in water and 1 c.cm. of 10 per cent. sodium hydroxide. Then the contents of the first test-tube were added to those of the second tube. The presence of arsenobenzol was shown by the development of a colour which varied from red to reddish-brown, and this colour appeared immediately. Experiments showed that a red colour developed in watery solutions of a strength of 1 in 20,000. By looking through a depth of fluid of 5 cm. with transmitted light, a positive result could be seen in a dilution of 1 in 100,000. With urine, however, one could not be sure of a definite result in a higher dilution than 1 in 50,000.

It was not essential that the urine should be tested immediately it was passed; urine left as long as ten days gave as good a result as immediately after it was voided. The following organic preparations, tested in vitro in a strength of 1 in 1000, had given markedly positive results: novarsenobillon (N.A.B.), metarseno-argenticum, metarsenobillon, stabilarsan, sodium silver salvarsan, kharsulphan, sulpharsenol. Results were negative with watery solutions of atoxyl, stovarsol, tryparsamide, bistovol, and neobistovol. The investigation of phenacetin had proved interesting. In vitro no colour developed, but the urine voided up to a period of three to four hours after an oral dose of grs. 15 phenacetin gave an almost identical red colour with this test. In short, Abelin's test was reliable but not absolutely specific. It did not indicate the presence of arsenic.

Mr. V. E. **Lloyd** dealt with the clinical application. To ensure that the bladder was empty and to see whether elimination of a previous dose had ceased, a specimen of urine was collected from each patient before injection of N.A.B. Supplied with three 1 oz. bottles, patients were told to bring back on the following day a small quantity of the first three consecutive voidings. 1330 tests were performed in the investigation of 397 injections, and a qualitative scale was used to express the results. Positive results were obtained within an hour, and excretion could easily be followed up for 24 hours, or longer. The reaction was usually markedly positive from two to six hours after 0·45 or 0·6 g. N.A.B. Injection of 0·3 g. yielded results slightly less intense.

After an account of a series of cases tested Mr. Lloyd said it soon became apparent that there was a close association between inefficient urinary elimination of N.A.B. and toxic effects in the patient. It had been found in rats that the toxicity of organic arsenical compounds of the trivalent and pentavalent groups was inversely proportional to the rate of excretion in urine and fæces. In man delayed jaundice following injection of organic arsenical compounds was well known as a late toxic effect, and it seemed that the power of the liver to deal with these substances grew less as treatment progressed. During these investigations five cases of salvarsan jaundice and six of exfoliative dermatitis were tested and in none of them could any elimination of N.A.B. be detected. Severe toxic jaundice occurred in five cases, and in none of them had elimination been consistently good with the Abelin test. Among 36 cases in which excretion was known to be unsatisfactory, toxic effects were noted in 19. The intimate relation between toxic jaundice and indifferent excretion raised the suspicion that at least some cases of salvarsan jaundice were due to the action of the aromatic amino radicle in the salvarsan compounds, rather than to the arsenic itself. Toxic jaundice, and even "acute yellow atrophy" of the liver, had been reported following oral administration of atophan, a compound which did not contain arsenic. Jaundice was an exceptional result of poisoning by inorganic arsenic, and chemical analysis of liver from patients who died from salvarsan jaundice did not show any undue accumulation of arsenic. Animal experiments had demonstrated that the most rapidly excreted arsenical compounds tended to be the least effective, probably because of the brevity of their action.

Discussion.

Dr. **David Watson** thought these contributions were of great importance. This test seemed to be the simplest yet suggested, and he was anxious to put it into operation.

Colonel L. W. **Harrison** suggested that the reason for the delayed excretion of the amino-benzol radicle might be that it had been seized upon by the liver-cells. For years he had protested that one should not speak of arsenical but of arsenobenzol jaundice, underlining the last syllable. This idea was strongly supported by the likeness of these cases in many respects to poisoning by trinitro-toluene and by histological examination of the liver. If this supposition were correct, we might have in the Abelin test a means of rapidly determining the value of any measures to avoid the amino-benzol group being taken up by the liver-cells. He had tried previous administration of glucose for this purpose; patients so treated might show by the Abelin test a more rapid excretion than did others.

Dr. H. C. **Semon** did not remember to have seen toxic jaundice or exfoliative dermatitis following the use of salvarsan; but there were other symptoms of arsenical absorption, such as neuritis and changes in the skin, following long-continued administration of the drug by the mouth.

Major E. T. **Burke** said it would be an excellent routine in clinics that, even in cases in which the kidneys appeared to be normal to ordinary tests, Aberlin's test should be carried out on every patient after he had received one or two injections, since the renal excretory function might be abnormal only in respect of arsenobenzol. He was much interested in the references to jaundice. He attributed the rarity of jaundice in his practice to two facts: (1) he used stabilarsan as a routine, and he thought that the glucose, being dissolved in an isotonic solution, acted as a barrier against toxicity; (2) he gave arsenobenzol and bismuth alternately, not concurrently. He would now try the Aberlin test on some recent cases of jaundice which he had seen. He had observed bismuth jaundice in a number of patients who had had no arsenobenzol at all. It would be useful to know what proportion of an intravenous dose of arsenobenzol was therapeutically utilised. Levaditi's experiments seemed to show that arsenobenzol did not exert a direct lethal effect on the organism. These contributions were a step towards establishing the ideal dosage—i.e., one which reduced elimination to a minimum whilst retaining the maximal therapeutic effect.

Dr. H. M. **Hanschell** spoke of a case six years ago in which a man was admitted to hospital diagnosed as having a granular kidney, and treated with a dose of 0·3 g. N.A.B. because of a positive Wassermann. Two days after the injection he died, apparently because of the kidney trouble. Since then, however, Dr. Hanschell had administered stabilarsan to many subjects of renal disease (as shown by albuminuria, casts, &c.) apparently without any ill-effects. He thought, therefore, that the fear of administering arsenobenzol in the presence of renal disease was largely exaggerated. His practice had been to administer stabilarsan and bismuth at the same time, and jaundice had occurred in only one case.

Dr. B. B. **Sharp** asked whether, if Colonel Harrison was right in thinking that glucose protected the liver-cells from the benzol radicle, it would not increase the renal excretion in a previously bad excretor. It would be well to carry out ordinary excretory tests on the kidney in all bad excretors, to see if the kidney was holding back other substances also.

Dr. **David Nabarro** thought that though the test was very valuable, it would be difficult to carry out in children. Children's organs were usually in much better working order than those of their elders, and toxic symptoms following the use of arsenicals were less likely owing to rapid elimination of the drug.

The **President** felt that the test would prove valuable. The chemistry of the body was still largely a closed book. It had been a matter of speculation whether any portion of the arsenobenzol compound passed through the body unchanged. In some cases, it appeared, the test was quite negative, and this suggested either a decomposition so complete that none of the benzol radicles passed into the kidneys, or alternatively a very complete absorption by some of the cells of the body.

Dr. N. L. **Lloyd**, in reply, said that no work had been done by his brother and himself on the effect of giving glucose in improving the voiding of the product by bad excretors. They had tried sodium thiosulphate without success. Three of the five severe cases of jaundice in the clinic had not had any bismuth.

Clinical Cases.

Dr. **Hanschell** showed two patients.

The first was a man who, 20 years ago, acquired a primary chancre. Sixteen years ago his hair began to fall out, and apparently he had had no treatment. He had now received 15 injections of stabilarsan and bismuth. Three weeks after this treatment ceased the man returned with an acutely inflamed tongue. A week later still he developed severe jaundice. The Wassermann reaction was still strongly positive, and the question was whether the condition of the tongue was due to syphilis or was a later arsenical manifestation. This was the first case in 3000 given stabilarsan by him which had developed jaundice after it.

The second patient was a Chinaman, who came from his ship with the diagnosis of acute syphilitic myelitis. He was unable to stand or work. He also had a Hunterian chancre on each eyelid, hard and firm. The knee-jerks were entirely absent; the pupils reacted to both light and accommodation. He had an acute attack of beri-beri. No spirochætes had been found, and antisyphilitic injections had not produced any effect.

Dr. SEMON thought that in the first case the tongue was syphilitic.

JOINT TUBERCULOSIS COUNCIL.

AT a meeting of the Council held on Nov. 16th, Sir HENRY GAUVAIN presiding, the hon. secretary, Dr. ERNEST WARD, gave an account of the present position of the scholarships in Canada and America next year offered by the Sun Life Company. A selection and management committee was appointed as follows: Sir Henry Gauvain (for the Ministry of Health), Prof. Lyle Cummins (to represent the National Association), Dr. Lissant Cox, Dr. G. Jessel, and Dr. Ward. The following memorandum was adopted :—

Improvement of the Tuberculosis Service.

The efficiency of the tuberculosis service varies widely in different districts, but backward areas are being improved by wise stimulation from headquarters. Supervision should not be used so as to hamper individual initiative or impede experimental methods. The chief factor in success is the personality and ability of tuberculosis officers and superintendents of sanatoriums, and to secure this remuneration sufficient to attract good officers is all-important. An indifferent officer fails to obtain the confidence and esteem of the general practitioners on whom so much depends.

It is better to have fewer and better-paid officers with larger areas that a large number of poorly-paid men and women of mediocre capacity. Rural areas of 250,000 population and urban areas of 350,000 can be managed by one whole-time officer, with adequate medical and clerical assistance, and would provide sufficient remuneration. The service should be graded so that those who had acted as assistants might become higher-salaried, whole-time, consultant tuberculosis officers or senior sanatorium superintendents. Superannuation schemes should be generally adopted, or so arranged that an officer does not lose by transference to another district.

The tuberculosis officer and sanatorium superintendent should have at their disposal facilities for diagnosis, such as an X ray outfit, and for special forms of treatment, such as light and artificial pneumothorax. Each tuberculosis officer should have hospital beds. Dispensary and sanatorium officers should be first and foremost clinicians, but should have a public health outlook. Facilities to attend post-graduate courses are of the highest importance. In certain circumstances, where the sanatorium belongs to the authority responsible for the district in which it is situate, it may be advantageous for the medical superintendent of a sanatorium to be responsible for the tuberculosis work in the vicinity of the institution as part of his whole-time duties. It is not intended that this should apply to sanatoriums other than those under direct control of local authorities.

The practitioners' sense of responsibility in the diagnosis, prevention, and treatment of tuberculosis must in no way be impaired, and it is the first duty of dispensary and sanatorium officers to ensure this. One of the most helpful qualifications for these officers is to have been themselves in private practice. Any improvement in the tuberculosis service is closely bound up with the preliminary training of men entering this service, and with the education of medical students and general practitioners in tuberculosis.

A memorandum on the notification of tuberculosis was also adopted. Dr. Lissant Cox undertook to prepare an investigation on the fate of delicate children in tuberculous households. The Research Committee suggested as a further inquiry, the Occurrence of Acute Tuberculosis in Infants and Children under 5 Years of Age. Dr. W. Brand reported that the course in X ray work at the Brompton Hospital was already fully booked; a second course was being arranged after Christmas.

Reviews and Notices of Books.

PRACTICAL LOCAL ANÆSTHESIA.

Its Surgical Technique. Second edition. By ROBERT EMMETT FARR, M.D., F.A.C.S. London: Henry Kimpton. 1930. With 268 engravings and 16 plates. Pp. 611. 42s.

THE first edition of this book appeared nearly seven years ago. Since that time the use of local analgesia has extended considerably and fresh drugs have been brought into play, tutocain, for example, and novocainborate. The value of the book, however, does not depend so much on its being up to date in detail, but on the excellent way in which the broad principles involved in the practice of local anæsthesia are enunciated and explained by the author. His forecast is that "unlike the past, the future will find available individuals who are equipped to offer to patients the greatest merits that local anæsthesia possesses. These surgeons will not only be able to anæsthetise thoroughly the various regions of the body with minimum discomfort to the patient—but will, in addition, realise the full significance of surrounding and protecting the patient with every available artifice essential to its successful use. This concept embodies a large variety of factors. It demands the coöperation of every individual who—in any manner, comes into contact with the patient, the office force, hospital managers, nurses, interns, equipment and, indeed, every factor entering into the patient's environment from the time of his first visit till he is discharged." This statement may appear overloaded, but there is no doubt that attempts at local anæsthesia often meet with only partial success because of the lack of importance attributed to apparently irrelevant accessories. The stage in fact must be perfectly set, and all, not only the chief, actors thoroughly trained in their parts when a conscious patient is being handled. It is from this point of view that the combination of powerful sedatives with local anæsthetics is so important and one may well believe that the success of the latter will be enhanced and their use made more popular by familiarity with such agents as avertin and paraldehyde. The author, however, rightly lays stress on the necessity for the surgeon who wishes to succeed with local anæsthetics being proficient in operating with them on perfectly conscious patients. The method is, in fact, often brought into disrepute by its occasional practice by men not versed in its niceties. As the author writes: "Surgeons of repute would, without doubt, freely admit that none but the most perfectly trained experts should be allowed to administer general anæsthesia, yet without any special training or experience in the use of local anæsthetics they appear to be quite willing to proceed to use them upon their patients." Referring to the early occurrence of pain after operations under local anæsthetics, the author recommends the giving of morphia hypodermically before the patient leaves the table. In wounds which are to heal by granulation, quinine-urea hydrochloride 1 in 600 should be liberally injected as a prophylactic against after pain. Opium is to be used freely during the first 48 hours. All details of technique are fully discussed and illustrated by the numerous diagrams. The author is, of course, an enthusiast for the method of local analgesia, but his support of it is logical, and he does not fail to point out the care and patience which it demands for success.

PRACTICAL SURGERY.

Beiträge zur Practischen Chirurgie. By Dr. ALBERT KRECKE. Two volumes. Munich: J. F. Lehmann. 1929. Pp. 1094. M.12.

THESE two volumes are composed of short essays on subjects suggested by the work the author has carried out in his private clinic during the period 1923–26. There is much sound common sense in his reflections, and it is of interest to read how a practical general surgeon solves the problems coming his way and how his conclusions have been arrived at. Failures are impartially reported with successes. The sections are short and serve to pass an odd hour with profit and entertainment.

ELEMENTS OF HYGIENE AND PUBLIC HEALTH.

Third edition. By J. P. MODI, L.R.C.P. & S., L.F.P.S., Reader of Medical Jurisprudence in the Faculty of Medicine, Lucknow University. London: Butterworth and Co. (India), Ltd. Pp. 645. 10*s*.

THIS is a manual designed for Indian students of public health. It is ambitious in scope and covers the whole field of public health activity, special attention being given to the sanitary problems peculiar to India. In the chapter on ventilation much space is accorded to relatively unimportant details (for example, enumeration of types of inlet), while there is only a brief reference to the work of Leonard Hill (page 93) and no mention of the kata-thermometer. A useful section on the construction of hospitals and schools (page 145) is included, although the size of wards suggested (viz., 40, 32, and 24 beds) does not conform to modern ideals of hospital administration. The chapter on meteorology and climatology contains no reference to ultra-violet rays. Evidence of faulty proof-reading is furnished on page 228, where hydrogen peroxide is described as destroying the water-soluble B-vitamin, thus depriving milk of its *antiscorbutic* properties. In the description of the modes of infection the important method of droplet spread is omitted, and the discredited view that foul air plays a part in the transmission of dysentery and diarrhœa is included. Damp soil is held to predispose to tuberculosis, diphtheria, measles, and other diseases. Noguchi's leptospira is still described as the causative organism in yellow fever, though its association with the disease is not now accepted. The arm-to-arm method of vaccination still appears to enjoy pride of place in India. The hypothesis that putrid meat causes ptomaine poisoning should no longer find a place in a text-book. No reference is made to bacterial agents of food poisoning. The book is marred by a certain crudeness in style and occasional misuse of words.

DISEASES OF THE SCALP.

Pelades et alopècies en aires. By Dr. R. SABOURAUD, Director of the Paris Municipal and St. Louis Hospital Laboratories. Paris: Masson et Cie. 1929. Pp. 378. Fr.80.

THE appearance of this the fifth and last of his series on diseases of the scalp almost coincides with Sabouraud's retirement from hospital routine. The five volumes have occupied his spare time for thirty years, and is not the least of many monuments to his indefatigable diligence and devotion to the scientific progress of dermatology. The subject is arranged in sections which deal consecutively with the microscopic appearances, the bacteriology, the differentiation of analogous conditions of hair loss, heredity and congenital syphilis, causes suspected by patients, associated disorders of the menopause, thyroid dyscrasia, which the author favours as a factor in some cases; and finally, a masterly consideration of the sympathetic and reflex nervous theories first propounded by the author's fellow-countryman, N. Jacquet. The last section is a general summary, and reviews the best of the many treatments that have been advocated. As in the other volumes there are many excellent reproductions of original drawings from microscopic sections and clinical photographs.

There is no cutaneous abnormality so mysterious and dramatic in its manifestations and so frequently discussed as alopecia areata. It has evolved or, rather revolved, in the course of decades through nervous, infective, toxic, reflex, and endocrine-sympathetic phases of conjecture and hypothesis. There is no general agreement to date. A certain "quid ignotum" remains to be discovered—a common factor which will explain the mechanism of production in every case. The subject teems with difficulties, for we are but floundering at the periphery of the endocrine-sympathetic physiology, and are still seeking the instruments of precision which are now available for estimating the functions of most of the other systems and organs of the human body.

The author's modest claim will, we think, be conceded by every reader. "If our conclusions remain dubious, we have at least illuminated the subject to the best of our ability, and we may thereby have facilitated the work of those that shall follow after."

PHARMACOLOGY.

Pharmaceutical Therapeutics, with Pharmacology, Posology, and Toxicology. By ELDIN V. LYNN, Ph.D., Professor of Pharmacology and Chemistry, University of Washington, College of Pharmacy, Seattle. London: McGraw-Hill Publishing Co., Ltd. 1929. Pp. 431. 20*s*.

Prof. Lynn, while not in favour of prescribing by druggists, holds the opinion that the capable pharmacist, in addition to his knowledge of the chemical and physical properties and doses of drugs, must be acquainted with their physiological action and therapeutical uses. This view may be correct, but since it would involve the pharmacist of the future in the strenuous duty of studying anatomy, physiology, pathology, and clinical medicine, he might well prefer to take a medical qualification. The following description of the physiological action of digitalis might well bewilder the reader. "The most prominent result is a powerful persistent stimulation of selected medullary areas, including the vagus, the vomiting center, the heat regulation, the respiration, and the reflexes." The author says in the preface that he has freely consulted numerous treatises on pharmacology, therapeutics, and toxicology. On the whole, he has given a good account of the action and uses of drugs, but it is difficult to see what advantage the book presents to the student of pharmacy over similar works intended primarily for physicians.

Theoretische und Klinische Pharmakologie. Third edition. By H. V. HOESSLIN, Prof. Dr. med., und FRANZ MÜLLER, a.o. Prof. Dr. nat. et med. Leipzig: Georg Thieme. 1929. Pp. 231. M.8.60.

THIS book was published originally in 1921 by Prof. Müller as a companion volume to his text-book for dental students, and while based on the well-known work of Meyer and Gottlieb, was intended to give a succinct account rather than an elaborate discussion of experimental and clinical pharmacology. That it appealed to the German student is indicated by the fact that in 1924 a second edition appeared under the joint authorship of Profs. Hoesslin and Müller, the collaboration of a clinician resulting in a broader discussion of clinical subjects. The general plan is that followed by most modern text-books of pharmacology and therapeutics, though the introductory chapter deals in somewhat greater detail than is usual with the subjects of prescribing, dosage, and the preparations of drugs. There is a short account of general pharmacology, but the bulk of the book deals with special pharmacology, the drugs being classified according to the system on which they exert their main action. By adopting the didactic manner and avoiding discussion, the authors have succeeded in packing more information regarding the action and uses of drugs into its pages than appears in most other works of a similar size. The third edition has brought the book into line with the advances in pharmacology during the past four years, and deals with many of the drugs recently introduced into medical practice. It can be recommended to the busy practitioner as a handy manual of reference, and to the student as a companion to his lectures.

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[*See also pp. 33, 34 & 35*

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LITERATURE AND SAMPLES ON REQUEST FROM

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THE LANCET.

LONDON: SATURDAY, DECEMBER 7, 1927.

AMENDMENT OF THE LUNACY ACTS.

THE new Mental Treatment Bill which was read a second time in the House of Lords last week was, as may be seen from our Parliamentary correspondent's report, well received. Lord RUSSELL in his opening remarks stated that the Bill had the approval of the chairman of the recent Royal Commission, and we believe that in so far as it provides increased facilities for the treatment of mental disorders the Bill will commend itself to the medical profession. There are certain details to which exception may be taken, but when these are amended the result of its enactment will be to bring the treatment of mental illness much more in line with the general practice of medicine than it has been in the past. Persons suffering from milder forms of mental disorder will, regardless of their social position, be able to obtain treatment without certification and without suffering from any civil disability. The Bill is a short one of 22 clauses. Clauses 1–5 make provision for the treatment of voluntary boarders. Clause 5 provides for treatment without certification of persons temporarily incapable of volition. Clauses 6–10 deal with the duties of local authorities in these matters. Clauses 11–14 provide for a reorganisation of the Board of Control. Clause 16, in amending Section 330 of the principal Act, raises the important question of the protection of medical men signing certificates.

Everyone is agreed that our public mental hospitals should be able to receive voluntary patients. The scandal will at last be ended that persons applying for treatment in these well-equipped hospitals built at public expense should be refused treatment and virtually told to go away and wait until they are bad enough to get certified as insane. Few will quarrel with the proviso that the name of every voluntary patient admitted to a recognised mental hospital or licensed home must be notified to the central authority. The position is, however, very different when voluntary patients are admitted to general hospitals, nursing homes, or under the care of medical men privately. If a person with mental disturbance voluntarily ask for treatment in a hospital or home why should he more than any other invalid have to be notified to the Board of Control? Who, it may be asked, is going to make a distinction between hysteria and mental disorder or to say that this or that person is sufficiently over the border-line to be notified? It is obvious that those in charge of such patients, let alone the patients themselves and their relatives, will object to compulsory notification, with the result that there will be considerable evasion of the law. It should be remembered that Section 315 of the principal Act is not repealed and that anyone who receives persons of unsound mind for profit will be liable to prosecution; indeed if this Bill passes the section may well be much more strictly enforced. Doubtful cases there will always be, and those in charge of them, perplexed and worried at the possibility of prosecution, will prefer to inform the Board of the presence of such patients. If, instead of requiring that all persons with mental disorder who present themselves voluntarily for treatment should be notified, the Bill left this to the discretion of those in charge, the possibility is that all doubtful cases would be reported. This should in itself be a sufficient safeguard. If there were no concealment the evil of illegal detention would be to a very large extent prevented. Whilst it must not be concluded that mere notification would necessarily be a bar to prosecution under Section 315, it is not likely that the Board would initiate proceedings when they had had opportunity of ascertaining all the facts. We trust that obligation to notify all voluntary mental patients will be withdrawn and discretion left to the medical man responsible for the treatment of the patient. We also concur with Lord DAWSON in wishing to drop the word "boarder" altogether. It is most undesirable to draw a distinction between boarder and patient; all are patients and the term "voluntary patient" is sufficiently explicit.

The clauses of the Bill providing temporary treatment for persons unable to exercise volition without certification will prove a great boon to many. The acute puerperal case, many post-febrile confusional cases, a large proportion of alcoholic and toxic insanity will be treated to recovery without formal certification. The procedure recognises recommendations by two medical practitioners, one of whom must either be the usual medical attendant of the patient or a practitioner appointed for the purpose, either by the Board or by the local authority. This creation of a specialist class, although in some respects open to exception, may prove desirable on the balance; it will make the position of practitioners generally much easier if in difficult cases they can call to their assistance someone whose knowledge and experience have official recognition. It is most satisfactory that the Minister of Health has had the courage to depart from the recommendations of the Royal Commission in dispensing with the application to a judicial authority in respect of these cases. How patent it is to everyone with clinical experience that the recommendations—reluctantly proposed by the Commission—requiring an application to a justice of the peace before securing temporary treatment, would defeat the end in view. These patients are not being detained against their will, they are confused and indifferent, and their relatives would certainly not apply to a magistrate unless compelled to do so; serious delay would result and the procedure would resemble so closely that adopted for the certification as of unsound mind that the provision would be hardly worth while. In the House of Lords debate Lord BRENTFORD seemed to suggest that a judicial inquiry was desirable, and the Lunacy Reform Association will press for it. We are of the opinion that the intervention of a magistrate is neither a protection to the patient nor to the medical man who signs recommendations or certificates; it generally means delay, and the protection afforded is illusory. Neither the Royal Commission (nor, we believe, the Departmental Committee which preceded it) was able to find a single case of any person improperly detained; it is surely clear that the public has no cause for disquietude.

The proposed reorganisation of the Board of Control does not greatly affect medical men generally, but

Clause 16 which is designed to give greater protection to medical men signing recommendations and certificates is of great importance. Practitioners are now so unwilling to sign certificates that there is often serious difficulty in securing treatment for insane persons. The actual effect of the new clause is difficult to forecast; we must confess that we do not see a great deal of difference between it and the sections of the previous Acts which it replaces. It is perhaps more emphatic, but it does not appear expressly to say that on the person who wishes to bring an action lies the onus of proving that the medical man "has acted in bad faith or without reasonable care." We have never asked for the recommendations or certificates of medical men to be entirely privileged—privilege would necessitate a judicial inquiry under conditions inimical to the treatment of mental illness; it is clear, nevertheless, that they should not be exposed to the expense and annoyance of proving their good faith and care in the discharge of an unwelcome public duty. The present law does not effectively prevent this, and the new clause must be so drafted as to carry out the manifest intention of the legislature. It is a fact, we believe, that generally in proceedings involving an allegation of negligence—for instance in a case arising out of a collision between two motorists—a much more emphatic proof of carelessness is insisted upon in charges of criminal negligence than in civil actions for damages. It might be possible to insert in the Bill a proviso that no certifying practitioner be held liable in damages except upon clear proof of such degree of negligence as would justify conviction upon a criminal charge.

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OPERATION FOR DETACHMENT OF THE RETINA.

THERE are few ophthalmic surgeons who cannot count on the fingers of one hand the cases of "cure" of detached retina within their own personal experience. Yet there are two facts that prevent us from giving up every case that we see as entirely hopeless. One is that there is not the slightest doubt that sometimes, after a shorter or longer interval and with or without treatment, a reattachment does take place, it may be with some restoration of function, and that in many cases where this does not occur extension of the detachment is arrested, and a certain amount of useful vision retained even for a considerable period. The second fact is that when a detachment occurs the detached portion does not at once necessarily lose its function and become dead like the superficial layer of skin over a blister. The detached layer is not in fact the complete retina, but only the part corresponding to the anterior part of the primary optic vesicle. After invagination has taken place there is always a potential space between the anterior and the posterior layer, the latter developing into the pigmented epithelium and always remaining attached to the choroid by which it is nourished. True, the rods and cones which go with the anterior layer are also normally nourished by the choroidal vessels, but when a detachment occurs they seem to be able to derive sufficient nourishment to maintain life for a time, either by lymph from the retinal capillaries whose branches penetrate from within as far as the external molecular layer (but not as far as the nuclei of the rods and cones) or from the choroidal vessels through the intervening layer of fluid. Exactly how this happens has never been adequately investigated, but there is no doubt that it does happen. As H. L. EASON puts it, "For some long period after a detachment the nutrition of the retina remains quite unimpaired and vision is recovered immediately contact with the pigment layer is restored." At any rate this occurs in some cases. Illustrations of these two facts will be found in the discussion which took place in the Ophthalmological Society at its congress of 1915 and the findings of the committee appointed to report on the subject.[1] The latter deals with 85 cases of "cure" in the sense that the retina had gone back into position and stayed there for six months. Now since according to all our past experience the complete reattachment or permanent cure of a detached retina must be considered as exceptional, it is important to classify the cases according to their different causes with a view of determining whether some are more hopeful than others.

Roughly and according to different estimates, from one to two-thirds of the cases are associated with myopia, but it is remarkable that cases of high myopia, higher than 10 or 12 dioptres, are not more liable to detachment than cases of moderate myopia below 10 dioptres. The first classification therefore may be made between myopic and non-myopic cases. The latter may be classified into (1) those associated with a new growth; (2) albuminuric cases which may be subdivided into those associated with pregnancy and those not so associated; (3) those associated with cyclitis or choroiditis; (4) traumatic cases; (5) those in which no definite association can be discovered. Of these the two classes in which the prognosis is not so bad as the average are first the cases of albuminuric retinitis of pregnancy and secondly simple traumatic cases due to an effusion of blood or lymph into the inter-retinal space. Cases of detachment may be classified in what is perhaps a more fundamental way into those which depend on a push from behind and those which depend on a pull from in front. Some authorities in the past have attributed all or almost all detachments to exudation from the choroidal vessels into the inter-retinal space and an osmotic action between that and the vitreous chamber (Rachlmann's diffusion theory). Others have attributed all or nearly all cases to the formation of bands in the vitreous attached to the inner surface of the retina pulling on it and in some cases causing holes in it (Leber-Nordenson theory). Since in some cases the first of these two theories has been proved to be correct and in other cases the second, the truth would appear to lie not between the two theories but to embrace them both, with the proviso that neither must be regarded as applying to *all* cases. Another classification which by some is regarded as of fundamental importance is into those cases in which there is a hole or holes in the retina and those in which there is none. If there is a hole connecting the inter-retinal space with the vitreous chamber and the vitreous is fluid (as it generally is in these cases) it is obvious that any treatment by rest or by puncture which may result in a temporary emptying of the inter-retinal space and reapplication of the retina proper to its pigmentary layer can be of no permanent benefit. Sir WILLIAM LISTER has demonstrated this point with great clearness.[2] On the other hand, it is supposed by some that nearly all cases of detachment are associated with a hole which, however, is often so far forward in the region of the equator that it may be very difficult to detect with the ophthalmoscope.

As to treatment, we must first of all exclude those cases in which the detachment is merely a symptom of an underlying tumour, cases in which no treatment but excision is indicated, as well as cases of complete funnel-shaped detachment in which any treatment is obviously futile. Setting these aside the different methods which have been adopted in the endeavour to find a cure for the condition may be divided into non-operative and operative. The former include rest in bed for some weeks with or without such measures as pilocarpine injections to secure free diaphoresis. Of the latter simple evacuation of the fluid by scleral puncture is the simplest, but the use of the cautery to secure inflammatory adhesion at the site of the puncture is also widely practised. Multiple incisions into the vitreous chamber division of the vitreous bands and in certain cases injection of sterilised calf's vitreous into the chamber are the principles of Deutschmann's operations (1895) by which he claimed a large proportion of successes—lacking endorsement, it is true, from any other operator. Iodine, which was at one time injected subconjunctively, has been revived in the form of subcutaneous injection designed to promote absorption of the effused fluid (RICHARD KERRY of Montreal[3]). The subconjunctival injection of a solution of salt or other fluids calculated to produce counter-irritation is a procedure that can do no harm and is frequently practised. At the recent International Congress at Amsterdam Dr. J. GONIN, of Lausanne, showed paintings of patients treated by a new method designed to close up the hole in the detachment by means of the thermocautery, the results being said to be remarkable. In the report of the Ophthalmological Society of 1916 already referred to, 44 of the 85 cases of cure followed some form of operation, usually scleral puncture, in 41 no operation was done, and in 24 the reposition of the retina took place spontaneously in the absence of any treatment or after treatment had been tried and proved unsuccessful. It is noteworthy that in none of the successful operation cases is there any note of the presence of retinal holes, but in three cases of spontaneous cure holes were noted. With regard to all operative procedures except, perhaps, simple puncture, we have to take into account the fact emphasised by ERNEST THOMSON[4] that in a certain proportion of cases they have actually done harm, as well as the fact that statistical evidence shows that up till 1910 the proportion of cures claimed for non-operative treatment was nearly as great as that for operative. Writing in 1910, THOMSON found that taking the average of the claims of cures by various operative methods he could not put it at higher than 10 per cent., whereas the claims of other writers who adopted solely non-operative methods averaged a proportion of cures of 7 per cent.

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[1] Trans. Oph. Soc., 1915, p. 69; 1916, p. 352.

[2] Brit. Jour. Oph., January, 1924, p. 1.

Since these percentages are derived from more or less selected cases which different writers have chosen to illustrate the results of the various lines of treatment advocated by them, it is safe to surmise that the actual percentage of cure in all cases is very much lower, and seeing that, so far as is known, the prognosis of operative treatment has not materially improved since THOMSON'S estimate was made in 1910 the particular line of treatment chosen must be left to individual judgment. At the present time the balance of benefit can hardly be said to be decidedly in favour of operative treatment. The most hopeful line of advance in the future would seem to be an increasing knowledge of the pathology of detachment and especially as to the causation and significance of holes.

SOME EFFECTS OF MUSCULAR EXERCISE.

THE physical consequences of heavy exertion have not been worked out at all fully, but modern methods of investigation are steadily supplying us with facts on this subject which are of practical importance in clinical medicine. It has long been known, for instance, that muscular exercise increases the pulse-rate and is followed by a fall in the blood pressure, and radiology now enables us to say that it decreases the size of the heart. While most observers agree about this decrease, they are by no means unanimous when saying at what point it begins. Probably, however, it is present during the muscular effort itself; this is at any rate the view of F. DEUTSCH,[5] who studied Olympic athletes in 1928, and in some 90 per cent. of them found a diminution in the diameter of the heart immediately after maximal physical exertion. The decrease of volume may last a considerable time; after prolonged effort, such as the marathon race, it may persist for 24 hours. The degree of exertion, says DEUTSCH, is reflected not so much in the extent of the decrease as in the time it lasts. Thus the sprinter and the marathon runner show similar diminution in cardiac volume, but the former gets over it relatively quickly. P. P. GOTTHARDT,[6] in a report of nearly 1000 radiographic examinations of the hearts of athletes, agrees in finding no relationship between the reduction in the size of the heart and the kind of exercise undertaken. While it is difficult to say what is a large heart or a small one for a given individual, he came to the conclusion that the relatively large hearts lessened in volume more than the relatively small ones. In his long series he found no form of athletics in which an abnormally large heart was the rule. On the contrary, the bulk of his subjects showed heart widths smaller than the average for people who had not undertaken heavy athletics. The only possible exception to this rule were the swimmers, and it was noted that boxers, runners, and oarsmen had especially small hearts. After months or even years of strenuous athletics no cardiac enlargement could be detected beyond what might be expected from natural growth. The average diminution in transverse diameter after exercise appears to be about 1 cm., and it is not very easy to account for it. Since it follows mild as well as severe exertion, it cannot be due to exhaustion; nor is it wholly dependent on changes in pulse-rate or blood pressure. Rather it must be an expression of alteration in the peripheral circulation brought about, DEUTSCH suggests, by oxidative conditions in the tissues themselves—e.g., accumulation of CO_2 or lactic acid, or altered viscosity of the blood—which affect the venous filling of the heart. If, as is likely, the decrease is present during exertion, it cannot be looked on as a state of recovery, but must be recognised as an accommodative response of the healthy cardiac muscle. Possibly a shortening of muscle follows a brief initial stretching which results from increased diastolic filling. In a diseased organ this shortening may fail to take place, and hence permanent dilatation may follow. According to this view, lasting enlargement from extreme exertion would be evidence that the muscle was previously damaged.

Another organ whose reaction to exercise has lately been investigated is the spleen. Prof. JOSEPH BARCROFT, having formerly shown that muscular effort causes remarkable variation in its dimensions, now (with H. FLOREY[7]) brings forward evidence that in the dog a contraction of the spleen persists when exertion is over. In one case, for example, after moderately severe exercise, it contracted to almost half its resting size and remained in this condition for the 20 minutes during which the animal was under observation. This reduction in the volume of the spleen may be looked on as part of a reserve mechanism whereby the active muscles receive as much blood as possible for their all-important work. Barcroft quotes M. S. Pembrey and others as having demonstrated a corresponding constriction of the renal vessels during severe exercise. The existence of such a reaction is of no little practical importance, and it must clearly be taken into account in conditions like the so-called orthostatic albuminuria. It has long been realised, of course, that traces of albumin are commonly to be found in the urine in normal subjects after strenuous muscular exercise. Recent information about this is provided by O. Hug[6] who, in a study of the Swiss marathon runners in 1928, found a greater or lesser degree of albuminuria in every one of them after the race, whereas beforehand none had shown any abnormality in the urine. The quantities of albumin varied between 0·2 and 0·8 parts per 1000, the average being just under 0·4 per 1000, and these are striking figures which may well cause surprise. Even more remarkable, however, were the results of the microscopic examination of the urine. In every case in which sufficient urine could be obtained immediately after the race large numbers of hyaline and granular casts were found, together with a few red blood cells. In almost all the subjects the benzidin test on the urine was positive —an observation which is suggestive, despite the well-known drawbacks to this test when applied to the urine. Two of the runners were still passing casts and red blood cells in the urine when re-examined 8 and 14 days after the race. Such findings point unmistakably to some definite damage to the structure of the kidney as a result of the exertion, but their like has seldom been recorded by other investigators. Hug suggests that an important factor in the 1928 race was the extreme heat of the day, whereby the competitors were overheated and their urinary secretion was excessively reduced. Possibly their renal damage may be largely attributable to the very high acidity of the urine under such circumstances in combination with the vaso-constriction described by Pembrey. Such inquiries might well be pursued further—perhaps with particular reference to functional albuminuria and related problems.

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[3] Brit. Jour. Oph., May, 1928, p. 246.

[4] Ophthalmoscope, 1910, p. 430.

[5] Med. Klin., 1929, xxv., 628.

[6] Münch. med. Woch., 1929, lxxvi., 1117.

[7] Jour. Physiol., Oct. 23rd, p. 181.

Such questions as these are closely bound up with the interesting phenomenon of the second wind. This is so definite, and happens so quickly, that it has been put down to the activation of a reserve mechanism —possibly a change of blood pressure, of sweat production, or of coronary circulation. K. F. Wenckebach has drawn a striking analogy between the "dead point" (Totenpunkt) occurring just before the onset of second wind, and an attack of angina pectoris— a comparison which his novel theory of this condition supports. It may be, as Gotthardt suggests, that an initial stretching of the heart at the onset of violent exercise is followed at the moment of second wind by the secondary contraction to which we have referred. Stretching and distension of hollow viscera is certainly a more frequent cause of pain than is contraction, and the same may perhaps be true of the blood vessels themselves. As Wenckebach has pointed out, pain is absent during the vaso-constriction brought on, for example, by cold, but comes on with extraordinary intensity—as all will remember— during the succeeding period of vaso-dilatation.

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[6] Schweiz. med. Woch., 1929, lix., 522.

Annotations.

"Ne quid nimis."

ST. BARTHOLOMEW'S HOSPITAL APPEALS.

On Wednesday last, by setting in motion a revolving beacon, the Prince of Wales, the President, inaugurated an appeal for a million sterling for the reconstruction, enlargement, and re-equipment of St. Bartholomew's Hospital. The appeal was made at a gathering in the Great Hall, and it was fittingly made not merely to London or these islands but to the Empire at large. St. Bartholomew's, founded more than 800 years ago, is the mother-hospital of the British realm, and its claim is as undeniable as its needs. The appeal comes appropriately from the heir to the throne, for St. Bartholomew's has always been the especial care of the Crown, and it holds from his ancestors a dozen charters at least.

A round million is a formidable sum of money, but a little consideration shows that the estimate is not extravagant. It is plain that a building largely 200 years old cannot meet the necessities of so elaborate a mechanism as a modern hospital, and it will no doubt surprise many people to learn that the small maternity ward at St. Bartholomew's is housed in an attic, with dormer windows. Anything more unsuitable cannot be imagined, unless it be the necessity, only now obviated, of wheeling patients to and from the operating theatres across an open quadrangle. Many of these disadvantages to patients, medical staff, and nurses are still being endured. Some of them are in course of removal, but they cannot be completely obviated until the success of the appeal enables the Governors to replace archaic conditions by modern ones making for smooth and easy working, the comfort of patients, and the convenience of those who tend them. A good beginning has already been made. The rapid progress of surgery puts heavy demands upon all hospitals, and St. Bartholomew's has found it necessary to build a new surgical block of 250 beds, with five attendant operation theatres, and to enlarge Queen Mary's Nurses Home to accommodate 50 more nurses. All this work is in progress and nearing completion. It will cost £231,000, of which £138,000 has yet to be provided. A great new out-patients' block, its central hall seating 850 people, with all the necessary appurtenances, has already been built. What has been done and is being done is, however, only an instalment—much more "remains behind." The south, west, and east quadrangle blocks have to be replanned and grouped departmentally, the eighteenth-century fronts being retained. Attic floors will be removed and replaced by new ones, and the south quadrangle block will be given a flat roof for air and sun treatment. Children in-patients, who are at present in adult wards, will be placed in a separate department, the maternity and gynæcological unit will be transferred to the present casualty block, and the new out-patients' block will be completed by the erection of orthopædic, massage, and children's out-patients departments on the site of the obsolete anatomical lecture theatre, chemistry and biology schools of the medical college. That college is to be enlarged by new buildings adjoining the Harvey laboratories, which will provide lecture theatres for medicine and surgery, and laboratories with full provision for research for anatomy, biology, and chemistry, departments at present crowded into inconvenient and obsolete quarters. When money is available it is hoped to supply one of the most urgent requirements of the hospital by building a students' residential college in St. Bartholomew's Close, a part of Rahere's original foundation.

But hospitals do not live by buildings and equipment alone ; in teaching and research they play a part which is ever growing. There is no need to insist upon the position long held by "Bart.'s" in this field, but only to say that in research its fame has been won in face of the most serious handicaps. "Endowment of research" is unknown in Smithfield. There is no endowment for any one of the six professorial chairs in the medical college, and there is urgent need for new chairs and readerships in obstetrics, biochemistry, clinical pathology, and bacteriology. It is the ultimate aim of the hospital to establish an institute for research, and to such purposes will be devoted any money which is not absorbed by things more tangible but not more immediate. Meanwhile, the ordinary expenditure of St. Bartholomew's Hospital exceeds its ordinary income by between forty and fifty pounds a day. Here, then, are abundant opportunities for help, not only in the alleviation and cure of disease but in its prevention. To the man in the street the daily work of a great hospital naturally makes the first appeal, but he is beginning to learn that this work is made possible and effective only by labour behind the scenes. The appeal now being made is indirectly for something larger and more momentous even than the modernisation of the world's most historic hospital.

PASTEURISATION AS A MAKESHIFT.

AT a discussion last week in the Comparative Section of the Royal Society of Medicine on improvement in the public milk-supply, Mr. H. W. Steele-Bodger, M.R.C.V.S., contended in a closely reasoned argument that pasteurisation was making milk dangerous instead of safe for consumption. It had been proved, he said, that coliform organisms persisted in pasteurised milk; of 189 samples of pasteurised milk delivered in 15 areas 40 per cent. had been found to exceed the bacterial content allowed by the Ministry of Health, 20 per cent. exceeded it by a large margin. Moreover, the tubercle bacillus was able to survive pasteurisation, though admittedly it was weakened. His own belief was that if the injected guinea-pig were suffered to live for three months instead of six weeks, there would be a much larger proportion of tubercle-positives. The natural bactericidal power of milk appeared to be destroyed at a temperature of 65° C. and efficient sterilisation removed from milk the antiscorbutic vitamin. Pasteurisation carried with it the temptation to submit to the process very dirty milk in the hope that it would thereby be rendered clean; it tackled the problem from the wrong end, glossing over slovenliness in production and supply, and doing nothing to mitigate the grave economic loss caused by the spread of tuberculosis among cattle. If a tithe of the money, thought, and labour spent in treating the ills caused by dirty and diseased milk were spent in preventing these ills and ensuring a quick and clean service of whole milk, the problem would soon be solved. Local authorities were now paying increased attention to the inspection and control of dairies, and Sir George Newman had recently declared that the milk supplied to-day was a different product bacteriologically from that of a few years ago. In 1922 no more than 5 per cent. of producers were supplying milk with less than 10,000 organisms per c.cm., whereas in 1928 nearly 60 per cent. had reached that standard. In the Midlands, especially in Staffordshire, lists were kept of farmers producing good milk, prizes were awarded, and it was a matter of rivalry to occupy a high place on these lists. At contract time farmers who showed lack of enterprise in the production of pure milk lost their jobs, though unfortunately they seemed able to dispose of their inferior milk readily enough in London and elsewhere. If the consumer was determined to get clean raw tubercle-free milk he would get it, but he must realise that for the better article a better price must be paid. He advocated an intensive campaign of public education, for it was not fair that producers should expend large sums on improving their milk if the public did not appreciate what was being done. Lieut.-Colonel E. C. G. Maddock, who followed him, insisted that the actual workers in milk production were keen to do all that was required of them; the type of farm labourer concerned was gradually undergoing a real change for the better. But the grading of milk was most unsatisfactory, as purchasers thought that Grade A was the best milk. If it was agreed to call Grade A the milk of tubercle-free herds which was bottled on the farm the public would then know that buying this grade ensured that the milk was free from the tubercle bacillus. Mr. P. B. Tustin, while agreeing with Mr. Steele-Bodger that no effort should be spared to get milk fresh and in the whole condition, doubted whether the bacterial count gave a clear indication of the condition of the milk. While in Canada, he said, he had a specimen of bottled milk divided into six portions, each of which was sent to a leading bacteriological laboratory with the request that it should be plated at once, notice having been sent beforehand. If his hearers had seen the differences in the reports on the same milk he thought their faith in the accuracy of the test would be shaken. He cited the instance of a cow which had been brought in with a broken leg. After it was rendered unconscious and suspended, pus ran out of the nostrils, and when the carcass was opened up it was found to be riddled with tubercle. Yet that cow bore a tag issued by a qualified veterinarian to the effect that the cow was free from tuberculosis. Experience such as that had caused him to resolve that he would have all the milk for his own use pasteurised while doing everything possible to control production. In Winnipeg, where the quality of milk at one time was very bad, he had seen to it that every supplier of milk had a concrete floor in his stable, with a separate milk house and washroom. Energy was concentrated on the individual workers, and as their standard was raised the milk-supply improved steadily. But milk had to be produced and shipped in large quantities, we were not living in a Utopia, and for the present pasteurisation could not be done without.

OBSCURE FEVERS OF THE TROPICS.

A GREAT deal of work has yet to be done in classifying the short febrile diseases of the Near and Far East. In such a task it is clear that the Royal Army Medical Corps and the Indian Medical Service have exceptional opportunities. An unrivalled clinical field, the necessity for keeping accurate records, and the laboratory facilities now available, have resulted in some definite advances in our knowledge of these tropical fevers of short duration. Such fevers, as we pointed out in a recent annotation (THE LANCET, Sept. 28th, p. 676), may be atypical or abortive attacks of known diseases or due to some agent hitherto unrecognised. In a Report on Short Fevers at Kamptee, Central Province, India,[1] which was compiled with the help of funds from the Director of Medical Services for India, Major R. N. Phease lately described the modern methods of investigating a seasonal outbreak of epidemic fever of unknown origin. As the result of careful inquiry into every possible factor, he showed that what had appeared to be a local fever with special peculiarities was really a mixture of sand-fly and dengue fever. Incidentally, he entirely failed to demonstrate the virus of either disease, and concluded that it is ultramicroscopic—a conclusion in consonance with those of Knowles and Das Gupta in Calcutta, and Young, Richmond, and Brendish at Landikotal. As was briefly reported in our columns at the time, MacArthur, Dudley, and Whittingham,[2] at the International Congress of Military Medicine, read a paper in which they show that there is a clear distinction in the blood picture between phlebotomus or sand-fly fever and dengue on the one hand, and leptospiral infections, such as Weil's disease, on the other. They claim that in an acute fever, provided that the presence of malarial parasites and the spirochæte of relapsing fever has been excluded, a leucopenia with a relative increase of large lymphocytes points to phlebotomus fever or dengue, while a leucocytosis accompanied by an absolute and relative increase of polymorphonuclears suggests the Weil's disease group. This leucopenia lasts for the first three to five days, and is followed by a transient leucocytosis. The lowest point of the leucopenia occurs six to nine hours after the onset of the pyrexia, and is a useful aid to early diagnosis. A useful suggestion for further research into these short, unclassified fevers is made by S. Smith,[3] who considers that a group with some such label as S.P.A. ("short pyrexial attack") should be created for medical record purposes, and sent up for special investigation by the A.D.M.S. At present the only "unclassified" complaint which it is permissible to have in the Army is the well-known "P.U.O.," and if a diagnosis of P.U.O. is made, it entails segregation and the whole paraphernalia of investigation as a suspected enteric. Short fevers of other origins, which cannot be classified, have therefore to be labelled after their most prominent symptoms—e.g., constipation, headache, &c.—and thus the records do not show the real nature of the illness.

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[1] Jour. of Roy. Army Med. Corps, June, 1929.

[2] Ibid., October, 1929.

SHOULD THE GUARDIANS BE TOLD?

SUPPOSE that the members of a board of guardians become aware that the admissions to a hospital under their control include large numbers of cases of "incomplete abortion." Suppose that they invite their medical superintendent to suggest some means for putting a stop to such a state of affairs. Suppose that they even press him to say what steps he is taking to bring the offenders to justice. What is the medical superintendent to do?

The answer depends, as usual, upon the point of view. The point of view of the guardians may not be fixed or certain. Some may be indifferent to the situation; others may regard it as a scandal to be hushed up; others again may demand the utmost publicity. Of these last some may even expect the medical superintendent to cross-examine the patient with all the rigours of the third degree while policewomen disguised as nurses make notes of her answers. The point of view of the patient is easier to guess. She may not be vividly conscious of criminal guilt but she will not be anxious for advertisement. She has come to the hospital for treatment, not for persecution; her mental and physical well-being will hardly be improved if she is led to look on the hospital ward as a mere corridor to the assize-court. The medical superintendent himself will probably maintain the point of view of his profession. It is his task, he knows, to save life and to restore health, and for this purpose to win confidence. He will have been trained to remember that it is no part of his duty to act as detective or magistrate, though it is equally not his business to shield a professional abortionist. His dilemma is a difficulty which meets the practitioner in private practice, though hospital experience (for instance when a number of cases are admitted from a particular district) may intensify it. It is the ancient embarrassment of reconciling his duty to the patient with his duty to the public. He will instinctively think of the former while the law will instinctively dwell upon the latter. The point of view of the law will be that the doctor, like any other good citizen, must do his utmost to aid the prevention and detection of crime. Judges have hinted that the doctor should urge the patient to make a written statement, especially if she is likely to die. The law is reluctant to lose a valuable piece of evidence in the always difficult task of bringing an abortionist to justice. In the slightly informal atmosphere of a charge to the grand jury, Mr. Justice Avory once spoke of the moral duty of the medical man to communicate with the police even where the patient was in no danger of death. All criminal trials have their own special facts and that was a case where a woman who had died after an illegal operation had confided to a doctor the name of the abortionist. There is no exact statement of the medical practitioner's duty either in the statute book or in any considered utterance of the Court of Criminal Appeal. No doctor has ever been prosecuted for aiding and abetting criminal abortion by neglecting to cross-examine his patients and to communicate the results to the police. If a doctor thinks fit, and has the opportunity, to urge a patient to make a statement for police purposes, the law will be satisfied and professional confidence will not be infringed. If he does not, the law has no obvious means of punishing him. If he makes the effort and fails, he need do no more. If the patient confides to him the name of the abortionist, it by no means follows that she authorises him to pass the statement on, though she may perhaps be the more readily persuaded to give that authority. If she makes no statement at all, the doctor is not compelled to convey mere suspicions to the police. The policeman's primary duty is to catch the criminal; the doctor's primary duty is to attend to his patient.

The position of the medical superintendent facing guardians who conceive that there is some easy short cut through these difficulties is not entirely imaginary. One such officer, hard driven by the members of his board, protested with dignity against the unfairness of expecting him to deal publicly with these matters and was finally driven to say that, unless he had some guarantee against such insistent pressure, he must decline to attend the meeting of the board. The wisdom and firmness of his attitude will be applauded.

MEDICAL PRACTICE BY FOREIGNERS IN GREAT BRITAIN AND IRELAND.

THE proposed International Convention on the Treatment of Foreigners has led the Privy Council to inquire of the General Medical Council what conditions are imposed on foreigners who wish to practise medicine or dentistry in Great Britain or Ireland. A memorandum by the Registrar states in reply that neither the General Medical Council nor the Dental Board has ever been concerned with the nationality of persons applying for registration in the Medical or Dentists Registers. If a practitioner applies who possesses a qualification entitling him to registration, the Council would register him. It may be that the applicant does not desire to come to this country but seeks registration in order that he may be able to obtain registration in British Dominions and Possessions in which registration, or eligibility for registration, in Great Britain and Ireland is an essential requirement. If the applicant desires to reside and practise in this country, it is assumed that the prescribed requirements in regard to the residence of aliens in this country have been complied with, and the Council makes no inquiries in regard to this. The fact that an applicant for registration possessed a recognised diploma would not, so far as the Council and Dental Board are concerned, be held to override any regulations which might be in force relating to the admission of aliens to this country. With regard to changes of name in the Medical and Dentists Registers, however, in the case of persons who are not British subjects applications are not acceded to unless a deed poll is supplied which has been enrolled in the Supreme Court. If this is done it is assumed that the change has official sanction and the application is usually acceded to. The memorandum goes on to point out that unregistered persons are not prohibited from practising medicine in this country though they are under certain disabilities; they cannot, for instance, hold any public medical appointment, they cannot give any valid certificate required under any Act of Parliament, and they cannot obtain dangerous drugs, or assume any title implying registration as legally qualified practitioners. Apart from this they have entire freedom of practice. Moreover, persons who are not British subjects and who have obtained from a foreign university a degree of doctor in medicine, and are entitled to practise in their own country, may act as resident physician or medical officer of any hospital established exclusively for the relief of foreigners in sickness, provided they are not engaged in medical practice except *in this way*. *This is the position in* regard to medicine. Unregistered persons, on the other hand, are entirely prohibited from practising dentistry in this country.

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[3] Jour. of Roy. Army Med. Corps, June, 1929.

CARBON MONOXIDE POISONING.

A NUMBER of readers must have been shocked when they saw the account of a recent inquest on two men who had died in the back of a saloon motor-car which was stuck in a water-splash. It was obvious to anyone familiar with carbon monoxide poisoning that the men had met their death from inhaling exhaust fumes, yet the coroner's jury brought in a verdict of death from misadventure—exposure to the elements. Two doctors attended the post-mortem examination and one of them—who was not well received by the coroner—very properly pointed out the peculiar pinkness of the blood which is so characteristic in victims of monoxide poisoning. The opinion of the other doctor, however, prevailed and the coroner and the jury were satisfied that two ordinary healthy men who had drunk no more than a pint or two of beer could meet their death seated in a closed saloon, with windows shut, through sitting for about a quarter of an hour with their feet wet. This verdict involved for the unfortunate driver of the car a committal for being drunk in charge of a motor vehicle. Owing apparently to the fact that the windows beside him were open he escaped with his life, after a period of severe poisoning which the police, not unnaturally perhaps, interpreted as alcoholic intoxication. Happily Prof. J. S. Haldane and Dr. Leonard Hill were among the readers of the report of the inquest and immediately realised that a serious miscarriage of justice was likely to arise. They offered themselves as witnesses for the defence and the case against the driver was dismissed.

It is obvious that the signs and dangers of carbon monoxide poisoning are by no means fully appreciated even by the medical profession and still less by the public. There was considerable discussion at another recent inquest (the *Times*, Nov. 28th) about the cause of the death of two people found in a bathroom in Carshalton. The strong evidence of Dr. Roche Lynch, however, was able in this case to convince the court that carbon monoxide must have been the cause. Dr. Hill wrote to the *Times* on the following day drawing attention once more to the risks of running an engine in a closed garage and in tunnels. The events in the case of the saloon trapped in the splash were very similar to those which occur when an engine *is run in a garage*. The outlet of the exhaust was under water; the driver raced his engine in the effort to drive the car out, and either a leak in the exhaust and silencer let carbon monoxide through into the body of the vehicle or the gas bubbled vertically up from the end of the pipe. The fact that the men had taken beer intensified the action of the gas in producing anoxæmia, but the fumes may well have contained 15 per cent. of monoxide, a concentration which would poison the sober and vigorous. The most recent work on carbon monoxide poisoning appears in the form of two papers by Dr. J. Argyll Campbell[1] from the National Institute for Medical Research, Hampstead. He stresses the striking resemblance between the physiological and pathological effects of carbon monoxide poisoning, of exposure to low oxygen pressure in the air, of hæmolysis, and of hæmorrhage. This supports Haldane's original view that carbon monoxide is not in itself a tissue poison, but acts simply by interfering with the oxygen supply to the tissues. The cause of death is heart failure, and the power to tolerate an atmosphere containing a good deal of the gas depends upon the ability of the vital organs to function under a low tissue oxygen tension. The classical account of the symptoms of oxygen want has been supplied by Prof. Haldane, who describes nausea, vomiting, rapid breathing, periodic respiration, headache, visual disturbance, irrational states, and finally coma and cardiac failure. It is easy to see that such symptoms in a man smelling of alcohol would very naturally be diagnosed as *drunkenness by the police. The irrational states* would add support to their view; those who have read Prof. Haldane's story will remember how he had to be dragged out of his exhaust chamber on the point of collapse, but still protesting vigorously that he was perfectly well.

Another serious question arises when the effects of chronic oxygen starvation are considered. Dr. Campbell's researches have been particularly directed towards chronic poisoning by carbon monoxide, and it is known that people who are continually starved of oxygen may suffer severe and even permanent damage to their circulatory, urinary, and nervous systems without being aware that anything is happening to them. Workers in garages and confined spaces where internal combustion engines are constantly running may be exposed to this risk. More research is needed to give us a definite statement about the chronic form of poisoning, but it cannot be too strongly emphasised or too widely known that death from acute carbon monoxide poisoning may occur *in bathrooms where the geyser has no vent pipe, in* sheds where an engine is running without free access to the air, or even in a closed car on the road if there is any leak in the exhaust pipe under the body; that one part in a thousand parts of air is a deadly mixture, that the poison is insidious and gives no warning whatever, and that the symptoms of partial poisoning strongly resemble those of alcohol. As Dr. Hill suggests in the *Times*, these facts should be taught to all first-aid classes and they should most certainly be familiar to every doctor.

DRAINAGE AFTER CHOLECYSTECTOMY.

AFTER the operation of cholecystectomy, the absence of any inflammatory reaction, a dry field, and the fact that the cystic duct has been ligatured securely, tempt the surgeon to close the abdominal wound completely. The disadvantages of drainage are a possible slight increase in the duration of convalescence, the risk, though *admittedly a slight one*, of a ventral hernia, and the production of an unsightly scar from puckering at the site of drainage. Against these rather trivial considerations have to be set off the risks of a collection of blood in the region of Morrison's pouch, most real in those cases where operation has been carried out in the presence of acute inflammation, and the grave tendency of such collections to become infected. Moreover, quite apart from hæmorrhage, a considerable quantity of bile may drain from the wound; this may be due to inadequate ligature of the cystic duct, but is in many cases, as E. R. Flint has shown, undoubtedly due to the section of accessory hepatic ducts, which are often insignificant and difficult to find or secure, even if their presence is suspected. John A. Wolfer[1] has recently published an interesting experimental study of his results, following cholecystectomy in the dog. His work shows clearly how healing of the ligatured stump of the cystic duct is encouraged by the formation round it of organising exudate. The actual site of ligature separates by aseptic necrosis without any *obliterate* process taking place within the lumen, and therefore, in the absence of organising exudate around the site of ligature, leakage is inevitable. In the dog, at any rate, drainage seems to interfere with the formation of fibrin round the stump, and leakage is more prone to occur where drainage is provided. Wolfer stresses the inadvisability of extensive stripping of the cystic duct, proximal to the site of ligature, since deprivation of its blood-supply is the result, causing further delay in healing. The separation of the ligatured stump occurs about the fifth day, and at this time the strain of coughing or vomiting is sufficient to cause leakage of bile in the absence of a protective cap of fibrin. He points out that, if a drain is used in the ordinary way for approximately 72 hours, there is little chance of fibrin collecting round the stump at the end of this period, and advises that, if a drain is inserted, it should be placed well away from the site of ligature ; in practice this is usually done as a matter of convenience. Most surgeons find the risks of oozing and of possible damage to accessory ducts so serious that drainage after cholecystectomy is likely to remain in vogue. Any leakage of bile, if it occurs, is purely transitory, and if not actually beneficial, is certainly harmless.

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[1] Brit. Jour. Exper. Path., October, 1929, p. 304; Jour. Physiol., 1929, lxviii., 81.

[1] Surg., Gyn., and Obstet., October, 1929, p. 482.

THE DRUG TRAFFIC.

A GREAT step forward in the control of the illicit drug traffic was undoubtedly taken when the Treaty of Versailles was made to include ratification of the Hague Conventions of 1912 and 1914, and the League of Nations shouldered the burden of investigating and controlling opium, cocaine, and their derivatives. Nevertheless, the problem remains a very grave one. The world's annual production of opium is about 8000 tons, and it has been estimated that not more than 20 tons are absorbed in medical, scientific, and other legitimate uses. The revolution in China introduced a new difficulty, for the weakened central government is quite unable to put down the revived poppy-growing industry which in 1913 had been completely eradicated. Moreover, a number of States still obtain a large part of their revenue from the sale of these drugs, and they cannot balance their budgets if this source of income is suddenly cut off. The smoking or eating of opium is an ancient habit in many parts of the East and is as difficult to put down as any other time-honoured national custom. Nowadays, moreover, there is a new aspect of the problem—namely, the trade in manufactured products of opium and cocaine, and the gradual invasion of the West by the drug habit. No commodity is easier to smuggle than heroin or cocaine, and the trade is said to be controlled by an international gang with tremendous capital and power.

Two discussions on the subject have taken place in London recently : a conference of the Women's International League on Nov. 14th, and a meeting of the Medico-Legal Society on the 28th. The general opinion of the conference was that nationalisation would prove the only solution of the difficulty. The drug traffic cannot be controlled so long as there is an enormous surplus over and above legitimate needs ; the supply must be cut off at the source. To do this production and manufacture must be taken out of the hands of private individuals and made a government monopoly. This was Viscount Cecil's proposal, and it has also been recommended, as Mr. F. Llewellyn Jones told the members of the Medico-Legal Society, by the League of Nations. The conference promoted by the Advisory Committee to the League, appointed in 1920, resulted in an agreement whereby the eight conferring nations—the British Empire, China, France, India, Japan, the Netherlands, Portugal, and Siam—undertook to suppress entirely the consumption of prepared opium in their territories in 15 years from the time when the poppy-growing countries prevented the exportation of raw opium. They recommended that the importation and sale of opium should be entirely a government monopoly.

Great Britain is as advanced, perhaps, as any other country in the control of these drugs. We have passed the Dangerous Drugs Act, 1920, and thereby put our own house in order. One or two voices were raised at the Medico-Legal Society to protest that this Act had introduced tiresome and vexatious restrictions on the legitimate use of morphia and its derivatives, and that the poor were suffering from inability to obtain morphia for the relief of incurable pain. According to our Paris correspondent[1] this is what is happening in France, where "some chemists actually prefer not to stock morphia at all, in order to avoid the annoyance of inspection." On the whole, however, it seems pretty generally agreed that in this country the honest doctor and the honest chemist can prescribe and dispense these drugs without fear or interference. All restrictions are annoying, but they are accepted cheerfully when they constitute a legitimate safeguard, and those who have heard the histories of drug victims or have seen for themselves the effects of cocaine and heroin on individuals or nations will be ready to welcome any reasonable system of control which will break up the trade. Only eight countries are concerned in the manufacture of these drugs, and the League has hopes of improving the situation by persuading each of them to limit its production to a definite quota of the world's legitimate requirements.

TRAUMATIC OCCLUSION.

SOME of the recent work on traumatic occlusion done by Dr. B. Gottlieb and his school in Vienna was reported to the Odontological Section of the Royal Society of Medicine on Nov. 25th by Dr. E. W. Fish. Gottlieb's experiments, he said, consist primarily in placing metal caps on one or two of the teeth of a dog to increase and modify the masticating strain on them. Sections prepared from the jaws of the animals after the caps had been worn for varying lengths of time showed the effect on the teeth and surrounding tissues. In no case was absorption of the cementum observed but the bone was absorbed on the pressure side of the tooth and deposited along the stretched fibres of the periodontal membrane on the side of traction. When the pressure was excessive the periodontal membrane was destroyed and the tooth came in contact with bone. In such cases the bone was absorbed by being undermined and was not absorbed from the surface which came in contact with the tooth. The destruction of the periodontal membrane in these cases has a bearing, said Dr. Fish, on the association of pyorrhoea with traumatic occlusion.

In the discussion which followed, Mr. F. N. Doubleday suggested that the development of sepsis round the metal caps might have some bearing on the destruction of the periodontal tissues. He thought it important to define the term "traumatic occlusion" and hoped some method would be devised for measuring the forces involved. Mr. J. G. Turner was of opinion that an intermittent pressure such as there is in traumatic occlusion would tend to produce hypertrophy and that absorption would occur only under a constant pressure.

THE DISTRIBUTION OF SICKNESS.

THE study of the causes of invalidity is indeed difficult. First we are faced with the apparent anomaly that the sickness-rates of a community increase as its health improves—because a healthy community contains a large proportion of old people. For years now the general mortality-rate has been falling, and the upward trend of sickness has been correspondingly continuous. How far the decline in the mortality-rate has to go before a decline in the sickness-rate appears no one has yet discovered. Secondly we have to remember that sickness is hard to define ; the attack of lumbago which may withhold a miner from his work at the coal face may not keep a cobbler from his last or a clerk from the office stool. Hence heavy occupations, although possibly otherwise health-giving, tend to experience sickness-rates heavy in proportion to the occupational mortality. Sir Thomas Neill, who lately reminded us of some of these matters in a presidential address to the national congress of industrial assurance approved societies, has pointed out that climate exerts a powerful influence and quoted the case of men employed in building and engineering construction with exposure to weather. According to the *Times* of Nov. 20th, he said that the average duration of a claim in an area in the north of England was considerably longer than that of a claim in the south of England, as was illustrated by the following table:—

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[1] THE LANCET, Nov. 23rd, p. 1111.

Cause of incapacity.	Excess per cent. of northern area over southern.
Rheumatism	50
Nervous and mental disorders	41
Skin diseases	14
Digestive disorders	21
Respiratory disorders	43
Microbic fevers	38
Accidents	33
All causes	36

Sir Thomas referred also to certain anomalies, as when a clerical worker of a given age in one part of the country has a longer sickness claim than a clerical worker of the same age and sex in another part; and when a woman factory worker in one area suffering from digestive disorder remains longer on the funds than a woman factory worker in another area incapacitated by a similar trouble. Since the industrial population loses every year something between 23 and 24 million weeks' work in England and Wales, study of this enormous economic and social loss is worth while. It is receiving attention from the Industrial Health Research Board, which has already carried out several intensive investigations in cotton-weaving, printing, cotton-spinning, and coal-mining.[1] It has been found that printers suffer most disablement from diseases of the nervous system, and weavers of Lancashire from diseases of the digestive system, which, like other causes of sickness, are particularly high among married weavers. The existence in the total volume of sickness of a substantial proportion of psychoneurotic complaints introduces additional complexity. This group grows when the conditions of life and of work are unfavourable. For example, it was found that coal-miners when working in deep and hot mines experienced more short-time sickness than miners doing similar work in cooler places, but invalidity of long duration was the same for both groups. Miners with similar degrees of slight incapacity not unnaturally have a greater tendency to stay at home when they work under unpleasant conditions. Now that sickness has become so much a financial responsibility and a charge upon industry and the State, efforts must ever be increased to study its causation and its prevention. At present the whole subject bristles with difficulty, and there can be little wonder that the medical sociologist turns from sickness-rates in despair to mortality records, comforting himself with the thought that stone dead knows no fellow.

THE ROCKEFELLER FOUNDATION.

The work of the Rockefeller Foundation is interesting both because it is international and because it is surprisingly polymorphic. The latest report[2] shows progress in many kinds of research. One of the aims is that no worker should be placed in the field until he has had some training in the work to be undertaken, and to this end advice and assistance [illegible] been given to medical schools and to nursing [illegible] public health training institutions all over the [illegible] At the request of governmental authorities [illegible] International Health Division will send representatives to advise on methods of prevention of disease and to assist in the organisation of public health programmes. Financial assistance is usually given only on a small scale so that its withdrawal does not cripple the scheme which it has helped to create. Limitation of activities to the fields described has been found to be necessary, but these are already so wide that a large staff is required to carry on the work involved. Originally, when the Foundation was established in 1913, much attention was devoted to hookworm disease, with incidence surveys and preventive campaigns. Subsequently a similar attack on malaria was undertaken, and in order to further these projects official departments were formed in the countries involved. These departments have since taken over more generalised public health work. More recently the efforts of the Foundation have been directed towards the prevention of yellow fever, and the report includes a description of the methods employed. In North Brazil a representative of the Foundation worked last year in coöperation with the Brazilian Rural Health Service. Antilarval measures were taken at once, and householders were encouraged to realise their responsibility in the prevention of breeding of the yellow fever mosquito, *Aëdes aegypti*. In the absence of a piped water-supply covered water-jars were used, and the number of vessels for each household was reduced to a minimum. Inspections of gutters and drains were instituted. It was believed that by control of the disease in the large coastal cities cases in the less densely populated interior would gradually disappear, a similar plan having been pursued with success in Ecuador, Mexico, and Central America. Unfortunately, however, the transport facilities between the interior towns were such that the disease was continually being carried to non-immune persons, and so persisted. The Foundation is, therefore, to coöperate with the National Department of Public Health of Brazil to extend antilarval work to some of the large interior towns of Northern Brazil. A laboratory was established at São Salvador, and experiments performed which go to show that an attack of Brazilian yellow fever protects against the African virus. It was to study the identity of American and African yellow fever that Hideyo Noguchi went to West Africa during the early months of 1928. He lost his life in the course of work at Accra, on the Gold Coast, while the West African Commission had its headquarters at Lagos. Here experiments were successfully carried out to determine the period of extrinsic incubation—that is to say, the interval between the infecting meal and the time when the aëdes mosquito can transmit the disease by its bite—a period now definitely fixed at 9 to 12 days. Further work undertaken included the determination of the species of mosquito, which are capable of transmitting the disease, and experiments on the protective value of convalescent serum. A laboratory for experimental comparison of the different strains of virus has been established at New York.

ELSEWHERE in this issue it is announced that Lieut.-Colonel W. P. MacArthur has been appointed Consulting Physician to the British Army.

THE sudden death is announced from [illegible] Western Australia, of the Hon. Athelstan [illegible] Henton Saw, Chancellor of the University of Western Australia. Dr. [illegible] who graduated in medicine at [illegible]bridge in [illegible] [illegible]1 years of age.

the re[illegible] Direct Representatives on [illegible] [illegible]eral [illegible] Dr. H. B. Brackenbury [illegible] 12,0[illegible] Bishop Harman [illegible] , and [illegible]rdon 2010 votes [illegible] [illegible]man were [illegible]

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[1] A. B. Hill: An Investigation of Sickness in Various [illegible]trial Occupations, Jour. Roy. Statist. Soc., 1929, vol. [illegible] Part II.

[2] Copies of this report may be had without charge [illegible] Rockefeller Foundation, 61, Broadway, New York.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

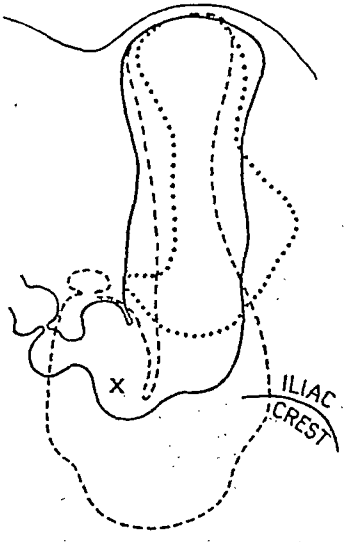
LV.

INTERPRETATION OF RADIOGRAMS OF THE ALIMENTARY TRACT.

PART II.*—THE STOMACH.

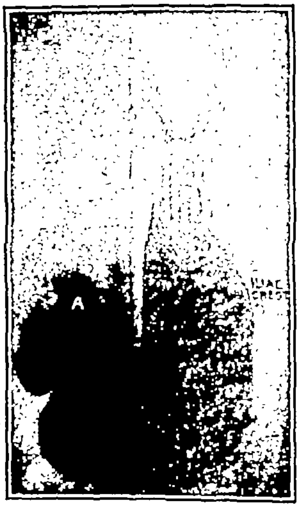
THE length of the stomach varies; moreover, it has no fixed points. It is merely suspended at either end—i.e., (1) where the œsophagus emerges through the diaphragm and (2) where the junction of the first and second parts of the duodenum is attached; this is the point where the two layers of peritoneum that completely surround the stomach and first part of the duodenum separate, forming the hepatoduodenal ligament and leaving the posterior wall bare. Between these two relatively fixed points the stomach hangs and, according to the length of stomach that lies between them, we have widely different forms that have been described as "J," "cow's horn," "fish-hoop" shaped, "gastroptotic," and so forth. Moreover, in the living subject the anatomical position of the attachment of the duodenum is far from being a fixed point. It varies within fairly wide limits in the normal subject and is, moreover, capable of moving an inch or more on palpation. On one occasion I actually manipulated this part of the duodenum across the middle line to the region of the hilus of the left kidney. Little wonder then that we have such very wide variations in the appearance of stomachs which function normally. It does not materially help us to classify them into hypertonic, sthenic, and hypotonic varieties. If we can gain a living conception of a living organ, that is what we need; no one picture can represent the normal.

FIG. 6.



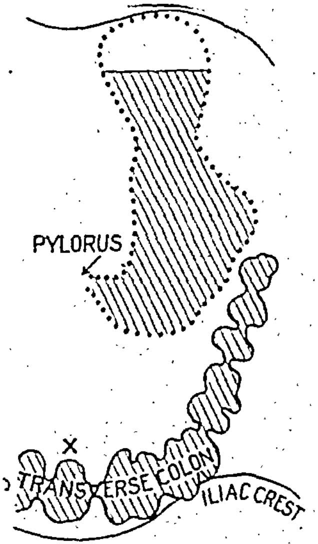
This diagram represents superimposed tracings of three stomachs that were regarded as normal. They are all common types. We are inclined to call the one represented by the continuous line normal, that by the dotted line hypertonic, and that by the broken line as the long type—it is not hypotonic (atonic), since the tone is perfect, nor does it indicate gastroptosis; it is simply a long type of normal stomach.

FIG. 7.



Normal long type of stomach, extending 4 or 5 inches below the crest of the ilium. Note the rugæ showing in the upper part of the stomach. The duodenal cap (A) is rounded, directed upwards, and its attachments have allowed it to drop and adjust itself to the low position of the stomach.

FIG. 8.



Tracing of a small hypertonic stomach. Not only is the lower border of the stomach high, but the transverse colon is drawn up to the level of the iliac crest. In this figure and the following ones X indicates umbilicus.

The recognition of the possible divergencies that occur within the normal is fundamental (Fig. 6). Inexperienced radiologists, like inexperienced clinicians, will always tend to regard every departure from their conception of the normal as a pathological condition and attribute to it symptoms for which it is in no way responsible. The stomach that extends well below the umbilicus is not necessarily pathological, nor are we justified in speaking of "gastroptosis" on this account. Tall, thin women particularly have this long type of stomach that, in the upright position, extends well below the so-called normal level, corresponding approximately to the umbilicus (4th to 5th L.V.) (Fig. 7). Such stomachs are not necessarily associated with symptoms any more than the short, hypertonic type (Fig. 8) met with in the short, dumpy muscular man that extends only to, say, two inches above the umbilicus. Such variations are not likely to give rise to symptoms except from mechanical causes. Chief among these is the possibility of drag upon the duodenal attachments, a condition that is not always easy to recognise, and is often associated with typical duodenal symptoms, and even with duodenal ulceration. The normal level of the highest part of the duodenum is about the 2nd and 3rd L.V., and if it retains this position when the stomach extends to, say, three or four inches below the umbilicus—that is, well into the pelvis—then we are likely to get drag. But in the case of patients with low stomachs who have no symptoms, we often find that the attachments have allowed the duodenum to come down to perhaps below the level of the crest of the ilium—4th to 5th L.V. Presumably this is why they are free from symptoms. Gastroptosis, of course, exists, especially as a manifestation of Glénard's disease, but the symptoms do not apparently arise from the gastric displacement *per se*. This subject is dealt with in a most complete and masterly way by H. Bedingfield in the *Quarterly Journal of Medicine* for July and October, 1929. The literature surveyed and analysed covers over 600 references.

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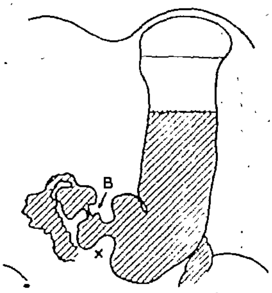
* Part I., The Œsophagus, appeared last week. The Duodenum and Intestines will be dealt with in future issues.

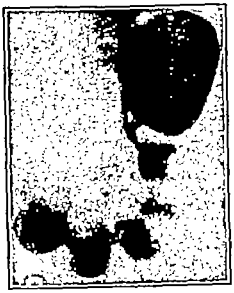
FIG. 9.



Tracing of a film to show hypersecretion. Note that the secretion poured out rises to the top of the heavy opaque food, leaving a non-opaque space between the air space and the contrast meal. On giving Na_2CO_3, the air space will increase by ½ inch or more if the secretion contains abundant free acid. The long pyloric canal (B) suggests the possibility of a pyloric ulcer, a condition in which hypersecretion is often seen. The appearance of hypersecretion is exactly simulated by an opaque meal which is not adequately suspended and rapidly settles down. Apart from hypersecretion and the long pylorus, the stomach is normal.

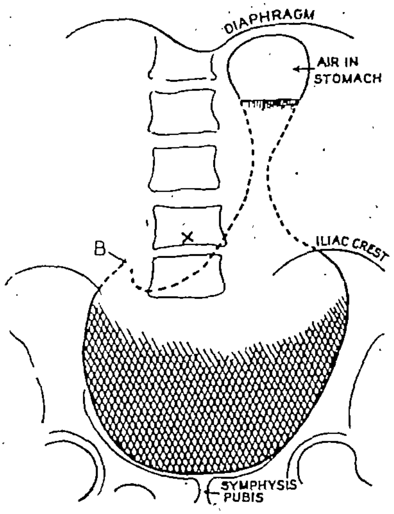
As to function, we have very few guiding points. *Hypersecretion* (Fig. 9) can be recognised by the accumulation of non-opaque fluid above the opaque meal, provided, of course, that the meal has been so made that the barium salt in it has not settled out. By giving an ounce of saturated solution of sodium bicarbonate we can roughly gauge the quantity of free acid in this secretion from the amount of CO_2 evolved. Very active hypersecretion that is apparently unduly acid is often associated with ulceration close to the pylorus. Secretion that is deficient in free acids is not necessarily associated with carcinoma, but, in my experience, is not met with in ulceration, so that this sodium bicarbonate test is of some value. *Peristalsis* is very variable and, apart from extremes, little reliance can be

FIG. 10.



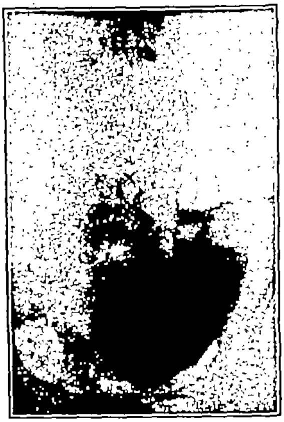
Very abnormally active peristalsis of the stomach, associated with a small ulcer near the pylorus that was eventually detected by palpation methods. Patient recumbent—the fundus is filled with opaque food.

FIG. 11.



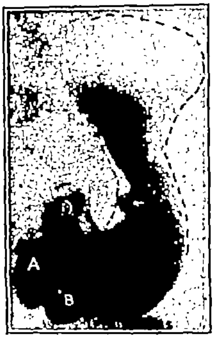
Tracing from a case of extreme old-standing pyloric obstruction. The stomach shows a line of retained fluid or secretion below the air space in the fundus. The lower border shows a crescentic outline that marches with the symphysis and rami of the pubis. No trace of peristalsis is seen. B = pylorus.

FIG. 12.



Long stomach ("gastroptosis"), showing result of air swallowing. Stomach maintains its tone, yet extends almost to the symphysis pubis. The patient is an air swallower, and the air extends down the stomach to the level of the iliac crest. Below this is a layer of fluid —secretion or retained food. The opaque food lies in the lower part and does not fill the pars pylorica. There is no information from the picture as to whether the duodenum has come down or not. Probably it has, or there would have been a large residue of retained food in so marked a case. P indicates the probable position of the pylorus.

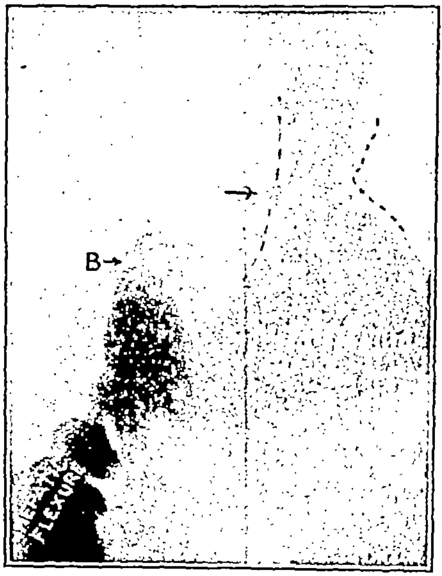
FIG. 13.



Large ulcer on lesser curve. The dotted line indicates the probable outline of the stomach wall, and suggests thickening of the mucous membrane about the ulcer. There is a wave of peristalsis close to the pylorus, and the duodenal cap is well filled. Note how the food is divided up in the duodenum as soon as it has left the "cap." The duodeno-jejunal flexure (D) is also seen. Patient standing.

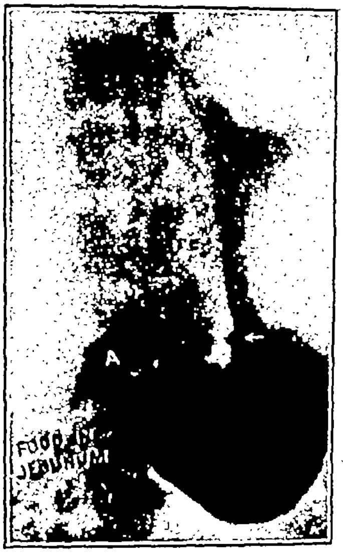
placed upon it as a diagnostic point. Normally the waves succeed each other at the rate of three a minute and are of moderate depth. Occasionally we see the stage of acute obstruction when the peristaltic waves are enormously powerful and the stomach almost writhes; such an appearance is typical of acute obstruction, but it does not tell us whether the obstruction is organic or spasmodic (Fig. 10). The other extreme in peristalsis is the entire absence. In a normal stomach this is not necessarily of pathological significance and is likely to be due to some transitory cause, perhaps a headache or even mere nervousness. Peristalsis is almost completely absent in Fig. 12 (see p. 1211). It is only just indicated by the drawing in of the greater curvature and narrowing towards the lower part.

FIG. 14.



Chronic "penetrating" ulcer near the lesser curvature on the posterior wall. Note the puckering of the mucous membrane. The dotted line indicates the probable outline of the actual wall of the stomach. There is some spasm and consequent hour-glass contraction—probably no organic narrowing. The raggedness of the greater curvature near the narrowing is due to folding of the mucous membrane. The ragged filling defect at the lowest part is due to pressure that has been employed to fill up the crater by manipulation, and the opaque food has not come back into it. Patient lying down and rotated so as to bring the ulcer crater on to the profile of the shadow. B = pylorus.

FIG. 15.



Ulcer on lesser curvature. Note the suggested thickening of the surrounding mucous membrane. The greater curve is ragged, owing partly to the irregularity of the mucosa, but chiefly because it is only partially filled—there is some atony and the food is sagging to the lowest part, leaving the upper half partially filled. The cone shape of the ulcer suggests that the ulcer is healing. The dotted outline indicates the probable outline of the stomach wall. A = duodenum.

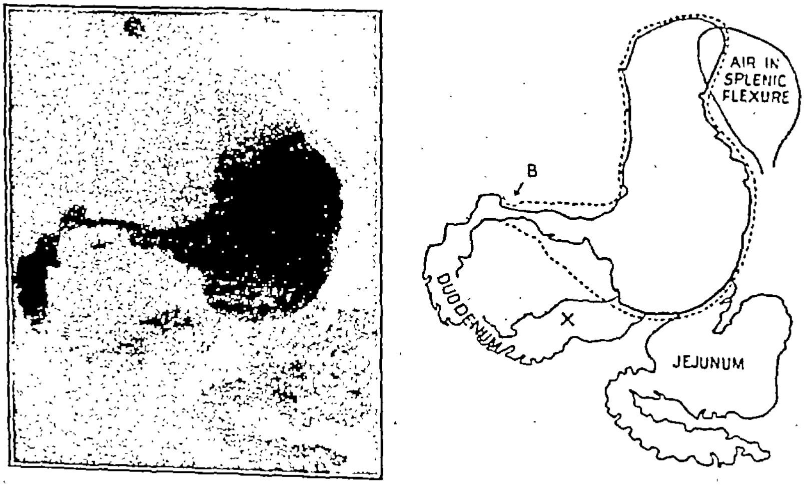
Reverse peristalsis, running from the pylorus towards the fundus, is not very rare, and when met with it always indicates a definite and probably an extensive lesion near the pylorus, usually on the lesser curve.

The *retention of a residue of food* in the stomach always tends to sag the stomach down, and this in turn makes it more difficult for the organ to empty itself. In such cases the tone becomes deficient and the food all sags to the lowest part. There is little or no attempt to maintain the normal tubular form against the action of gravity. The resulting picture is a crescentric shadow of opaque food well below the umbilicus. If on the outline of this shadow we see no evidence of peristaltic waves, or even more important, if we see a series of waves of diminishing intensity followed by a period of rest, we know that we are dealing with a case of definite *pyloric obstruction* (Fig. 11).

Air swallowing with the food is, up to a point, normal, but in certain patients, particularly nervous women, it is excessive, resulting in an accumulation of air in the stomach that is usually brought up with violent and noisy eructation. The patient is quite unconscious of what she is doing and imagines she is generating all this air in the stomach. In such a subject, if we mention that she has air in the stomach and instruct her to bring it up, we see the enlarged air space suddenly diminish, and more often than not, immediately enlarge—she has swallowed more air. Sometimes one can get the patient to distend the stomach with air until the clear area stretches to the level of the umbilicus (Fig. 12). It is an unpleasantly noisy and offensive neurosis that is easily cured by preventing swallowing; one cannot swallow unless the mouth is closed and a cork between the back teeth has brought relief to many.

Air sucking is a different and more complex story that depends on diaphragmatic action chiefly and its treatment in men, as in horses, is as yet unsolved.

FIG. 16.



Growth at the pyloric end of the stomach, probably extending to the duodenum. The dotted outline suggests the true outline of the outside of the stomach wall—the opaque food gives the inner outline only. By palpation we can usually determine the extent of such a growth, and also whether it is adherent. B = probable position of the pylorus.

Rapid emptying of the stomach is noted in association with many conditions, hunger, persistence of purgative action, irritative lesions of any part of the tract—quite often without any obvious cause. But when we note rapid emptying at the beginning of digestion and yet find that there is an appreciable residue of the five-hour meal there are several sites that are at once laid under suspicion—i.e., the gall-bladder, the pylorus, and the appendix.

Delay in emptying, retention of a residue beyond the five-hour interval does not necessarily indicate a lesion at the pylorus or duodenum, or elsewhere for that matter. There are numerous causes that are possible—e.g., headaches, nervousness, gall bladder or appendix trouble, &c., but unless some satisfactory explanation is forthcoming, the observer should confirm the observation and, if it is still present, he should insistently search the pyloric region for the slightest suggestion of the crater of an ulcer.

Gastric Ulcer.

The diagnosis of gastric ulcer is now always made on direct evidence and there should be very few mistakes. The indirect evidence, the formation of an hour-glass contraction due to spasm, although of value in directing our attention and focusing our palpation efforts to show the crater, is of itself not of very first-rate importance, owing to the possibility of such conditions being reflex. The direct evidence consists of the demonstration of the filling of the pocket of the ulcer, and it is surprising what very small ulcers can be demonstrated by a radiologist who is skilled in palpation. It is essential for this purpose that the first mouthful of opaque food to enter the *empty* stomach should be a very thick cream of almost pure barium sulphate. The radiologist should palpate and manipulate this food as it canalises the empty stomach in such a way that he outlines all the folds of the rugæ, pushing the food up and down between them, and eventually allowing it to come right down to the pylorus. It sounds easy, but in practice it is often an extremely difficult manipulation, particularly when the abdominal wall is powerful. Moreover, the radiologist must be extremely careful in the control of the illuminated area, otherwise his hand will be unduly exposed to radiations and eventually he will suffer. It is often necessary to palpate in this way both in the upright and in the supine positions, for it is only in this position that we can satisfactorily fill the cardiac end of the stomach where, fortunately, ulceration is comparatively rare.

The most difficult part of the stomach in which to demonstrate an ulcer crater is the pyloric antrum, and very frequently it requires persistence and the exercise of considerable physical power in order to obtain the necessary information. Occasionally in the presence of florid, flat ulceration near the pylorus it is impossible to demonstrate any abnormality.

When the palpation of the first mouthful has been carried out, more food—about half a pint—is given, and the profile of the shadow searched by turning the patient round. In this way the niche of an ulcer that has been demonstrated by the palpation method can be brought onto the edge of the shadow and a radiographic record of it obtained. It is often extremely difficult, if not impossible, to obtain a satisfactory film to show the pocket of a small ulcer; some of these can only be demonstrated by the palpation method.

The nature of an ulcer that is shown on an X ray film is open to question (Figs. 13, 14, 15). What looks like a large ulcer penetrating right through the wall of the stomach is not necessarily a very deep one, for the mucous membrane around the ulcer appears to be heaped up, forming a large crater. The result is that the pocket gives the appearance of being very much deeper than it actually is. The smallest ulcer that I have seen excised measured only an eighth of an inch and hardly involved the whole thickness of the mucous membrane; yet the pocket that it produced, and which I filled by palpation, must have been ½ or more an inch in diameter, and knowing where to look for it, I could obtain quite a definite projection on the outline of the shadow when the stomach was filled. The only point I know of as a guide to the actual depth of an ulcer is the information one can obtain from palpation. If we can determine that the ulcer base is fixed, we can assume that it has involved the peritoneal coat and become adherent. Sometimes the pocket of the ulcer is so deep that a bubble of air is trapped above the opaque food. Yet even in these cases it does not follow that the ulcer is a true penetrating one—some of these ulcers when excised have shown no suggestion of penetration but merely involvement down to the muscular layer, which was infiltrated and almost cartilaginous. The X ray appearance of penetration must therefore be due to the heaping up of the mucous membrane. The healing of an ulcer can be watched and the manner in which it becomes smaller noted. As it heals, the niche becomes conical—a conical crater very strongly suggests a healing ulcer.

The old-standing ulcer with cicatrisation is now comparatively seldom seen, although these cases were very common in the early days of the opaque meal. An hour-glass contraction is formed and on palpation it is usually possible to find the crater of the ulcer if it is still active. Spasm enters into these contractions to a very large extent, and it is impossible to foretell what degree of narrowing will be found in the operating theatre. It is, however, nearly always far less marked than one would expect from the X ray appearances, since spasm invariably plays a large part.

It is the ulcers near the pylorus on the lesser curvature that are most difficult to diagnose. Delay in emptying of the five-hour meal, intermittent activity of peristalsis, hypersecretion which seems to be abnormally acid, and perhaps a tender point on palpation should always tend to make the radiologist extremely careful and thorough in his detailed examination of the pyloric antrum. Minute ulcers in the pyloric canal are sometimes met with. In addition to one or more of the above signposts, a pyloric canal that appears to be longer than normal will suggest a very careful search for the crater. Unless we can demonstrate the crater, we may suspect the presence of an ulcer but we cannot make a definite diagnosis. Pain on applying pressure to the site of the ulcer is sometimes very definite; quite as often, there is no suggestion that the ulcer is sensitive to pressure, but what determines this is quite unexplained.

Diverticula of the stomach may occur at any point on the lesser curvature. They are rare and the appearances are those of a deep "penetrating" type of ulcer.

New Growths.

The diagnosis of new growths proceeds on the same lines as those employed for the detection of ulcers, but the resulting X ray picture is exactly the reverse—namely, instead of the food-filled pocket produced by an ulcer we have the displacement of the opaque food by the growth, a filling defect (Fig. 10), or a notch. In our palpation of the first mouthful as it canalises the empty stomach, we will probably note deformity of the ordered channels of the rugæ running in the length of the stomach, and displacement of the opaque food. In palpating we may detect resistance due to the growth, and by manipulation we attempt to discover whether or not there is undue fixation—infiltration of the growth into surrounding tissues. A large growth presents no difficulty in diagnosis, but the early growth is often almost, if not quite, impossible to diagnose. A curious and unexplained feature of growths is the fact that the stomach tends to empty rapidly. Note the way in which the second and third parts of the duodenum are shown in Fig. 10: this is due to rapid emptying and consequent overloading. A plaque of growth in the wall, even if it does not cause any filling defect, may cause an interruption of the peristaltic wave. This is not easily detected on the screen, and is best observed by making a series of films in such a way that the suspicious portion is on the profile. A comparison of serial films will clear up the point.

The outline of the normal greater curvature is not always regular—it is quite often "crenated," giving the appearance of the jagged inroads of an extensive growth. Palpation reveals the absence of any tumour, and it may be possible actually to palpate out the cause of the appearance, that is, the oblique direction of the rugæ which pass over the profile irregularly instead of running parallel with it, as usually happens. A growth on the anterior or posterior walls will displace the opaque food and give comparatively transradiant areas in the midst of the opaque food. Manipulation will show up these invasions of the cavity most satisfactorily.

It is always easier to make a positive than a negative diagnosis, and in any case of doubt a further examination after an interval is the safest line to take. The responsibility of the radiologist is a very grave one, and often the clinician will unwittingly press him into expressing an opinion which his observations are not sufficiently definite to justify. There are times, only too many, when it is the obvious duty of the radiologist to hedge and play for time to make more clear the signs on which he has to rely. My own experience is that the doubtful cases nearly always turn out to be negative as regards growth.

In this brief survey many possible lesions are omitted, leather-bottle stomach, papilloma, syphilis, tubercle, &c. They are all, however, so comparatively rare that, together, they do not account for more than a very small percentage of pathological cases.

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A MEDICAL MASTER OF THE HABERDASHERS' COMPANY.

Dr. Walter Carr, consulting physician to the Royal Free Hospital, is the new Master of the Haberdashers' Company, and a number of medical men attended the Livery dinner held at the Company's Hall on Nov. 28th. Sir John Rose Bradford, President of the Royal College of Physicians, replying to the toast of the "Medical Profession," proposed by Alderman Maurice Jenks, said that it was an especial pleasure to be present because he had known Dr. Carr since they were at school together. The medical profession nowadays occupied a curious position, because although the public were always ready to believe what doctors said about preventing disease, they were by no means ready to accept advice about treatment. For this they preferred unqualified advice—which was strange, because no sensible person would get a picture painted by an artist who had not been trained, or take the opinion of a lawyer who had not been trained, or get a house built by an architect who had not been trained. Fortunately the City companies had always given generously to hospitals and research, and 50 years ago, when it was difficult to get money for such an unfashionable object as scientific investigation, the City companies had given striking examples of benevolence in this cause. Mr. V. Warren Low, vice-president of the Royal College of Surgeons, said that the attitude of his college towards the companies was that of a poor relation towards a wealthy aunt. But few aunts, he thought, had shown such generosity, especially towards research. Replying to the toast of "The Guests," proposed by Mr. G. Woods Woollaston, Norroy King of Arms, Sir Humphry Rolleston, Regius Professor of Physic at Cambridge, spoke of the work of the Haberdashers' Company for education and for the care of the aged. This was an *annus mirabilis* in the City from the medical point of view, for the Haberdashers, the Drapers, and the Pewterers—not to mention the Apothecaries—had all chosen medical Masters. The choice of Dr. Carr was an exceedingly wise one, as he could testify from 30 years of friendship. In replying to the toast of "The Haberdashers' Company," proposed by Mr. R. M. Holland-Martin, Prime Warden of the Fishmongers' Company, Dr. Carr expressed his great pleasure at fulfilling a long cherished desire to entertain his medical friends in the Company's Hall. Among those present were Dr. Robert Hutchison, Dr. H. Morley Fletcher, Mr. Samuel Osborn, Sir Farquhar Buzzard, Mr. Percy Flemming, and Sir Holburt Waring.

Special Articles.

SOME OBSERVATIONS ON SCANDINAVIAN SURGERY.

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I.

THESE articles are based upon experiences gained from six months' study in the hospitals of Scandinavia and Central Europe. It was my good fortune to be the first G. H. Hunt Travelling Scholar from the University of Oxford, and I gratefully acknowledge the kindness of the trustees of the scholarship for their approval of my wish to study general surgery, with particular reference to that of the chest, and the use of radium. I also thank the Committee of the Middlesex Hospital for leave of absence during that period. I was much impressed by the internal convenience and management of the Swedish and Danish hospitals, with their small wards and many theatres en bloc, but these have recently been so fully described[1] by Mr. H. S. Souttar that further enlargement is unnecessary.

Although these observations profess to deal with certain special branches of the art, a few general impressions may be interesting to some readers. In Great Britain general anæsthesia is the rule, local the exception. On the continent the reverse obtains—general anæsthesia has a limited application and local a far wider, and is even used for such extensive operations as thoracoplasty and gastrectomy. Gastric operative surgery is almost resolved into gastro-duodenal resections after the methods of Billroth I. and II.; gastro-enterostomy is rare. Prof. Finsterer, of Vienna, is a revelation of exactness and patience in all gastric operations, particularly in those for extensive cancer, all under local anæsthesia. Gastro-enterostomy is never performed in the presence of simple ulceration. Interrupted sutures are universally used, and small needles in a holder preferred to large. The technique of treatment for fractures of long bones varies in almost every clinic, but the underlying principle is the same—viz., extension by callipers or transfixion pins. Prof. Einar Key deals with certain fractures—e.g., spiral of tibia (a frequent result of ski-ing accidents), and both bones of the forearm with inward displacement, by immediate operation. Bone-grafts are always preferred to plates.

From these incidental observations I turn to the

USE OF RADIUM AND X RAYS AT RADIUMHEMMET, STOCKHOLM.

The Radiumhemmet is the centre for the control of radium in Sweden, and at the beginning of this year had two grammes of the element at its disposal, but with the prospect of a larger stock in the near future. There are two other clinics situated a long distance from Stockholm, and these control small supplies, but beyond them no other hospital possesses radium. Patients who are recommended for treatment come under the sole care of the Radiumhemmet, and are treated on the understanding that they will attend for re-examination at regular intervals. State-aid for travelling is given if necessary. An admirable registration and follow-up system is in use, patients being indexed under three separate headings—name, disease, and time for attendance, while dictaphones are freely used for note-taking. The Radiumhemmet only possesses about 40 beds, and as a result the majority of their extensive clinic are treated as out-patients. The Institute is under the control of Prof. Gösta Forssell, with Drs. Berven and Heyman in charge of the general surgical and gynæcological departments respectively. In addition there are assistants who have had at least three to four years' training in radiology before reaching the Radiumhemmet, and there are well-equipped pathological laboratories for investigation and research. The technique and fundamentals of the treatment now in use have been arrived at after considerable experience, dating from about 1910, and have been influenced to some extent by the available quantity of radium. The whole outlook is scientific and is continually changing in an endeavour to find new forms of treatment to replace those that do not give satisfaction over a period of several years. Every patient submitted to the Radiumhemmet comes under its absolute control if suitable, no matter what organ of the body is affected, and the employment of major surgery is at the discretion of the clinic. At the present time radical surgery is frequently used in conjunction with radiology, since the figures for the combined technique are definitely superior to those in which surgery alone, or radiology alone, is employed.

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[1] THE LANCET, August 3rd, p. 242.

When major surgery is required, the patient is operated on in another hospital in the town by a chosen surgeon, while a doctor from the Radiumhemmet is generally in attendance. It is, however, possible to perform operations at the Radiumhemmet itself, but these are usually confined to electrocoagulation by means of endothermy in conjunction with radiological treatment. The visitor is bound to be impressed by the expert clinical knowledge of malignant disease during all its stages, and there is no attempt to expatiate on the virtues of any particular method. The accuracy of results and observations for publication are definite and the limitations of radium are fully realised in spite of its obvious value in many cases. Biopsy, in the absence of active treatment at the same time, is not favoured, and as a result of their experiences the Radiumhemmet has circularised the medical profession of Sweden, requesting them to forego this examination unless they are treating the condition radically at the same time.

Almost exactly the same principles apply to the Copenhagen Radiumstation in Denmark.

Methods of Use of Radium.—Radium is applied in three ways :—

Intubation.—10 mg. tubes 0·3 mm. lead equivalent screen for buried radium.

Surface Application.—Doses vary; also screen, according to range at which applied.

At a Distance.—Lysholm cannon, with extra 3 mm. screen for deeper radiation over given fields, usually at 5 cm. distance. 20–25 gramme-hours constitutes an erythema dose.

X rays and radium are used so as to avoid marked damage to the general tissues of the body and exposures to them are designed so as to submit as small a volume of the blood stream as possible to the radiation. Reaction is gauged by frequent examination of the blood count, and overdose is shown by a leucopenia, in which the lymphocytes especially are diminished.

Treatment of Special Conditions.

Benign.—Skin and vessel tumours, such as hæmangiomata and warts, are frequently treated by radium in the form of surface applications. Toxic conditions of the thyroid are freely irradiated, starting with very small doses, so as to avoid any exacerbation of symptoms, and with the definite knowledge that surgical intervention will be necessary if the condition does not respond promptly and adequately. A special applicator is used in hypertrophic conditions of the tonsil, which cannot be submitted to operation. Chronic interstitial mastitis is regarded as potentially precarcinomatous and is treated by X rays. Continued observation is deemed essential, but simple removal of the breast is rarely performed for this condition. Leucoplakia is also actively treated on account of its precancerous tendency by superficial endothermy after the area has been cocainised. The coagulated tissue separates off later as a slough, leaving a satisfactory scar. The analgesic effect of X rays on certain common conditions is made use of in many clinics, apart from the Radiumhemmet. Osteo-arthritis of superficial joints may gain considerable relief, while chilblains, whitlows, and furunculosis may improve appreciably.

Malignant Disease.

Oral and Buccal Carcinoma.—From the existing Radiumhemmet figures it is found that there is some variation in the radio-sensitivity of different situations. For example, the lymphosarcoma of the tonsil responds very promptly to radium application, and gives a satisfactory prognosis if there is no glandular involvement. On the other hand, carcinoma of the cheek is comparatively insensitive and, as secondary infection is often present, the main result of radiation is central necrosis with extension of the growth at the periphery. This form, therefore, is more frequently treated by endothermy, sometimes supplemented by radium at a distance. Cancers of the tongue are usually submitted for a start to two cross-fields of radium at a distance with the cannon (20–25 gramme-hours). The affected area is then coagulated between two small plate-electrodes with endothermy, and the periphery intubated with short 10 mg. radium needles inserted vertically for 2 to 4 hours, the tubes roughly being 1 to 1·5 cm. apart. The glandular fields are treated according to their condition. If there are no palpable glands a course of radium at a distance, to total about 20–30 gramme-hours is employed. If on observation there are found to be glands palpable, but not definitely adherent, they are submitted to block dissection by one surgeon, Dr. Hybbinnette, and radium may be buried. The opposite side is treated on the same principle. When the glands are advanced, this is when they are fixed superficially or deeply, radiation is employed, principally with the radium cannon, the dosage being watched very carefully to prevent breaking down of the mass. Carcinoma of the lip is treated on the same lines.

Carcinoma of the Breast.—Formerly the usual treatment of carcinoma of the breast consisted of the radical operation, followed by post-operative courses of X rays, but in recent years preoperative radiation has been employed in addition. Though the actual figures are not yet to hand, there has been a considerable improvement as the result of this and the preoperative radiation is held to be of more value than the post-operative. Preoperative radiation is so timed that the radical and full surgical operation is performed when the tumour is under the maximum effect of the radiation. Microscopically, the tumour cells at this time show, over large areas, degenerative changes with poorly staining nuclei and disintegration. The presence of giant cells also indicates reaction of surrounding tissues against the tumour. Macroscopically, the size of the tumour diminishes, and some cases, which have been classified previously as inoperable, come under the heading of operable cases.

Operable Cases.—The primary tumour is irradiated so as to expose as small a quantity of blood as possible to the radiations over two fields, each receiving 4 to 6 treatments, and each treatment of 1/3 to 1/4 erythema dose (½ Cu. + 1 mm. Al. filter) at a distance of 40 cm. Affected glands in the axilla are treated on similar lines. Some slight redness of the skin will result, and 3 to 4 weeks after the treatment has been concluded the radical operation is performed. The timing of the operation is a matter of considerable importance. The post-operative treatment has been carried out with relatively small doses, the general reaction of the patient being carefully watched. Massive irradiation of the thorax was tried some time ago, but was soon abandoned. Two to four weeks after operation two or three fields are irradiated with 1/4 to 1/6 E.D., with 4 to 6 treatments each (4 mm. Al. filter at 50 cm.). The series of treatments usually covers about a fortnight, and the reaction should scarcely be noticed on the skin. Three months later a second similar series may be given, and a third after yet another three months.

Inoperable Cases.—The tumour with its lymphatic field is treated with similar doses as stated in the preoperative series, and this is carried on until the tumour does not respond by further diminution in size. Then the primary growth is excised with diathermy, making no attempt to form flaps. A large raw area is left, and this is allowed to granulate over, a process which may take some time. In addition, sterilisation by large doses directed against the ovaries is performed, and thyroid is given by mouth. Palliative results over several years have been obtained on these lines, and in a few cases even an apparent cure.

Recurrences.—In cases with recurrences and metastases extensive radiation is not highly valued, since the patient, as a whole, can too easily be damaged. As a result the recurrences are treated either by surface application or by intubation with radium. Rib and bone secondaries respond quite well to this form of treatment, and where possible radium at a distance is often employed. When secondaries occur in the spine, hip, or pelvis the analgesic effect of X rays is valuable, and, in a few cases, relief for some years has resulted.

The lines of treatment, as given above, are preferred to other measures, such as burying radium round the primary tumours and glands, but when sufficient is available the use of radium at a distance has definite possibilities.

Uterine Cancer.—For carcinoma of the cervix operation at the Radiumhemmet has been abandoned, and all cases are submitted to radium treatment. Without anæsthesia, and following routine cystoscopy, an intra-uterine applicator with 3 mm. Pb. screen of about 40 mg. is inserted into the dilated cervix. The vaginal applicators to total about 77 mg. are packed round the cervix, great care being taken to protect the vaginal wall, and so prevent rectovaginal fistulæ. These are left in about 20 hours, and the treatment is repeated in 1 to 3 weeks. Treatment on the same lines is carried out in England with considerable success. This branch is under the control of Dr. Heyman, who combines the rôles of gynæcologist and radiologist.

Skin.—Skin cancers, including rodent ulcers and epitheliomata, give good results when treated by surface application and intubation. The doses are so applied as to produce a good scar. Sarcoma of bone, muscle, and melanomata are treated extensively by radium and X rays, but the results are very disappointing. Carcinoma of the œsophagus and stomach are occasionally treated by cross-fire with X rays, but with no hope of other than temporary palliation. Carcinoma of the rectum is preferably treated by the surgeon, but if X rays are used a preliminary colostomy is deemed to be essential. The burying of radium round the growth demands so wide an exposure to obtain a successful result that practically the standard radical operation has to be performed to ensure its proper application.

In conclusion, I should like to state how much I was impressed with the clinical knowledge of tumours during the course of treatment, and with the balanced judgment of each worker in regard to the prognosis.

EAST HAM ISOLATION HOSPITAL.—The Ministry of Health last week held an inquiry into the application of the East Ham town council to borrow £42,000 for the enlargement of the council's isolation hospital, which is badly overcrowded. Dr. W. Benton, the medical officer of health, stated that to comply with the standard laid down by the Ministry there should be 88 beds only, whereas there are at present 182. It further appeared that some of the nurses sleep in an old army hut, "unbearably hot in summer and very cold in winter," and that an old corrugated iron hut, formerly a store-shed, is used as a dormitory for members of the domestic staff.

THE MEDICAL USES OF RADIUM.

THE Medical Research Council publishes this week a summary of the results of research work carried out at various institutions with the stock of radium salt entrusted by the Government to the Council[1] As the preface points out, from being a doubtful empirical palliative measure for inoperable cases, radium therapy has, during the last eight years, become a curative method of primary value and in some instances is superseding surgery. The Radiology Committee of the Council have allocated the radium at their disposal to the following centres: the Middlesex Hospital; University College Hospital; St. Bartholomew's Hospital; King's College Hospital; St. Peter's Hospital; the Marie Curie Hospital; the General Hospital, Birmingham; the Royal Infirmary, Cardiff; the Royal Infirmary, Aberdeen; and the Irish Radium Committee, Dublin. The committee sound a note of caution in their introduction, for they feel that there is danger lest the general expectation of the public should outrun the real probabilities of radium therapy. "Radium should at present be looked upon," they say, "as an agent for the treatment of localised cancer, and the more limited the region affected the more chance there is of success. Once the disease is generalised the use of radium is mainly palliative."

As in previous years, the reports are conveniently gouped under the headings of regions of the body.

Cancer of the Breast.

The Middlesex Hospital has obtained the best results by using radium at a distance of several centimetres, so that no skin damage has been caused. They suggest the application of greater quantities at still greater distances. For small superficial nodules three or four applications of 10 mg. (gamma rays only) to the square centimetre, half a centimetre away, for four to six hours, usually proved sufficient. Larger nodules were treated from a distance of 2 cm. They have not found that small doses for a long time constitute a good treatment for breast cancer. The usual deep therapy has been a suberythematous dose throughout the area of disease at two or three three-weekly intervals; wide variations in quantity, concentration, distance, and time all gave satisfactory results.

Most of the patients at St. Bartholomew's Hospital were treated by radium needles screened by 0·5 mm. of platinum; a good result was obtained in 45 out of 67 patients so treated. In Dublin[2] needles containing 5–10 mc. radon in 0·4 mm. of platinum or 0·3 mm. of gold were embedded circumferentially around the primary growth and left until 2 mc. per c.cm. of neoplastic tissue had been dissipated. X rays were applied to the glandular regions in divided doses over a week. The early results were satisfactory.

Cancer of the Uterus.

The report of 1927 suggested that better results were being obtained from the Stockholm technique than from any other; this suggestion has been confirmed by the figures for 1928. Of 570 inoperable cases only 130 are alive, but it may be concluded that the radium treatment of operable cases is likely in proper hands to give lasting relief. The difficulty with inoperable cases is that some parts of the disease cannot possibly receive anything like a lethal dose. At St. Bartholomew's Hospital the Brussels technique has been modified by substituting needles for tubes. The external growth is first treated vaginally, and when it has disappeared and all ulceration healed, the abdomen is opened, the liver, pelvic organs, and aortic and iliac glands are examined, and the uterus pulled forward; the needles are inserted, so that only the eye protrudes from the peritoneum, 1–1½ cm. apart, from one sacro-iliac synchondrosis to the other. Four or more are then placed in front of the broad ligaments to attack the obturator glands. The ends of the ligatures are tied together and pushed into the pouch of Douglas. After seven days the abdomen is reopened and the needles removed. The second laparotomy is regrettable but is justified by the necessity for fixing the needles in position and the risk of doing damage by pulling them out blindly.

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[1] Special Report Series No. 144: Medical Uses of Radium. Summary of Reports from Research Centres for 1928. H.M. Stationery Office. 1929. Pp. 28 and viii. 1*s.*

[2] Report published in Sci. Proc. Roy. Dub. Soc., 1929, xix., 277.

At the Marie Curie Hospital, administered by a group of medical women, a modified Stockholm technique is used. Flat applicators are used instead of cylindrical, as they are thought to give better radiation. Two radium tubes containing 30 mg. radium element and 20 mg. respectively are placed in tandem in the uterine cavity and two or three flat applicators, each containing 25 mg., are put in the vaginal vault. These are left in for 22 hours and the treatment is repeated after a week and again after another two weeks. For cancer of the body 75 mg. are placed within the uterus, and the vaginal applicators are only used at the first two treatments. While this is the routine, every case is considered individually; older patients have smaller doses and the number and position of the vaginal applicators varies with the size of the vagina and the extent of the growth. If the growth shows no response to the three treatments, further application has been found useless and hysterectomy is advised. The only contra-indications were serious pelvic or general infection and advanced cachexia with distant metastases; only 8 out of 274 cases were refused radiotherapy. Even severe anæmia does not forbid radium, but it is well to take every means available for improving the general condition. The report of the Marie Curie Clinic has been published separately[3] and includes a full description of the technique and results, together with a review and discussion of the principal methods in use for radiotherapy of cancer of the uterus.

University College Hospital[4] reports that it is impossible to differentiate between the local sequelæ of radium treatment and the normal ravages of malignant disease. These sequelæ include persistent pyrexia, pyometra, pelvic abscess and peritonitis, fistulation, dissemination of the growth and stenosis, and shortening of the vagina. Workers at the Royal Infirmary, Cardiff, found that fistulæ occurred in 10 per cent. of cases, and do not think that the incidence and circumstances justify attributing any blame to the radiotherapy. They recommend inserting a self-retaining catheter and firm anterior and posterior vaginal packing.

Cancer of the Mouth, Pharynx, Larynx, and Œsophagus.

There is still much difference of opinion as to the best way of treating cervical glands. Block dissection, dissection and insertion of radium needles, and the radium collar all give bad results in many cases. St. Bartholomew's Hospital prefers the insertion of radium needles alone. Birmingham prefers irradiation from a collar containing 70–80 mg. of radium in 5 mg. tubes for 8–24 days, producing a well-marked erythema. Dublin tried intravenous injections of selenide of lead after radiotherapy and regards this as a sound prophylactic measure. Growths in the upper air passages show remarkably different reactions to radium; those of the skin of the nasal vestibule and of the fauces disseminate rapidly and fatally. The technique adopted at St. Bartholomew's Hospital for cancer of the larynx is to expose and fenestrate the thyroid cartilage and to lay needles, screened by 0·5 mm. of platinum, directly on its surface. As the Birmingham report observes, the region is second in difficulty only to the œsophagus; radium is indicated for growths spreading to the opposite cord or running round the larynx. Œsophageal growths are examined, measured and drawn through the œsophagoscope and a piece is taken for microscopy. Radon seeds are introduced by means of a trocar and cannula and placed as far as possible at regular intervals in directions downwards and outwards at a distance of one centimetre. The immediate results have been excellent.

Cancer of the Rectum and Bladder.

St. Bartholomew's Hospital started last year to treat carcinoma of the rectum by needling through the abdomen as a preliminary to excision or to radiation from below. Further, radon seeds have been directly implanted into the growth per rectum. Radon seeds have the advantage that they can be left in situ, but it remains to be seen whether they are as effective as needles. Birmingham irradiates round the growth per rectum and inserts needles into the peri-rectal tissue with trocar and cannula, the average dose being 5400 milligramme-hours. King's College Hospital treated 30 inoperable cases by insertion of radium into the lumen of the bowel. Varying reactions were obtained; in some cases there was radio-necrosis, while in others the effect was inappreciable although the dose was the same.

St. Peter's Hospital treats cancer of the bladder either by inserting 10 mg. platinum needles 0·5 mm. thick into the periphery of the tumour outside and inside the bladder (ulcerative growths) or buried in its base (cauliflower type), or else by burning away as much of the growth as possible by diathermy at open operation and then inserting the needles into the wall around the base of implantation.

Sarcomata and Lympho-sarcomata.

The sarcomata have usually been treated by the insertion of radium, but it is not yet possible to say whether they are best treated by large intensities for a short time or by small intensities for a long time. Reports correlating therapeutic results and histological investigations have been received from the Middlesex Hospital, University College Hospital, Birmingham, Cardiff, Aberdeen,[5] and Dublin. On the whole sarcomata appear to offer a good field for radium therapy. Lympho-sarcomata, though highly sensitive to radium, have a great tendency to become disseminated, and some authorities think the dissemination is accelerated by irradiation. The results are not satisfactory.

Although figures are given in each section of the report, it is obvious that the time for attaching importance to statistical results is not yet. The Committee sound a warning against the use of radium by any medically qualified person irrespective of special training or experience in radiotherapy. The report points out that the superficial application of radium and even its insertion into the body constitute only a very small part of radium therapy, and urges the importance of taking steps to fit more men and women for this highly specialised type of work.

MEDICINE AND THE LAW.

Osteopathic Treatment Censured at Inquest.

TREATMENT given by an osteopath was censured by a coroner's jury at a recent Southend inquest. The deceased, aged 72, had (according to his son's evidence) had a rupture four years ago; he refused the advice of four medical practitioners that a truss would be satisfactory and he followed for eight months the osteopath's prescribed treatment of manipulation, diet, and exercise. As there had not been attendance by a registered medical practitioner his death could not be the subject of a medical certificate. A post-mortem examination was conducted by Sir Bernard Spilsbury in the presence of the coroner and the osteopath. Sir Bernard at the inquest described the body as emaciated, the flesh sunken, and the ribs prominent; internally there was an almost complete absence of fat; acute pleurisy and pneumonia were

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[3] H. K. Lewis and Co., Ltd. 1929. Pp. 37. 2s. 6d.

[4] Full report published separately.

[5] The Sixth Annual Report of the Harker-Smith Registrar University Press, Aberdeen.

IRRADIATED MILK *v.* COD-LIVER OIL FOR RICKETS.

To the Editor of THE LANCET.

SIR,—The interesting communication by Miss K. H. Coward, D.Sc., on the Value of Irradiated Milk compared with Cod-liver Oil as a Source of Vitamin D (THE LANCET, Nov. 23rd, p. 1090), prompts me to comment. While Dr. Coward refrains from drawing any conclusion of direct clinical application from her results, it is clear that two conclusions might reasonably be drawn from her statement by clinicians or others. One conclusion—favourable to irradiated milk—is the possible advantage of adequately irradiated milk over cod-liver oil in the case of very young infants, where, in not a few instances, difficulty is experienced in the administration of even 10 drops of a " good average oil " regarded by her as equivalent in clinical value to a pint of " the weakest sample of irradiated milk." The other conclusion—less favourable to irradiated milk—is that in so far as " weight for weight a good sample of oil contains from 50 to 1000 times as much antirachitic vitamin as current samples of irradiated milk," the practical value of irradiated milk for older children or adults is slight. Dr. Coward herself may not accept this conclusion; in any event it is advisable to point out reasons for its rejection.

For the past nine months I have been investigating the clinical effects of irradiated milk in the treatment of rickets, in order to confirm or refute the remarkable results claimed from its use by German investigators. The results of a first series of investigations (published in your issue of Oct. 5th) confirmed the claims of the German authorities for the therapeutic value of irradiated milk in the treatment of rickets. I had an open mind as to whether any benefit that might accrue from the irradiation could be correctly ascribed to vitamin D, and the facts recorded by Dr. Coward justify my hesitancy. If the foundation of the test is not entirely accurate—in other words, if the present conception of vitamin D is not the whole truth—great caution is necessary in appraising its results. Dr. Coward found that the sample of irradiated milk I sent to her laboratory showed the presence of " antirachitic vitamins " to the extent of 0·1 unit per gramme—the lowest content recorded, but this very feeble vitamin D milk yielded the remarkable clinical results recorded in our paper and is still continuing to do so. In view of the great potency of this milk in rickets, it is a matter of interesting speculation as to what would have resulted from the use of the richest vitamin D milk 20 times stronger.

In our paper these anomalous findings were kept in view and were referred to in the statement " with fuller knowledge time may show that these tests may require modification "—the tests referred to being the line test employed by the Pharmaceutical Society, and the ostelin units per gramme test as described by Jephcott and Bacharach. Dr. Coward's clinical record confirms the view put forward tentatively in our paper.

I am, Sir, yours faithfully,
CHALMERS WATSON, M.D.
Edinburgh, Nov. 29th, 1929.

To the Editor of THE LANCET.

SIR,—I have been somewhat astonished that Dr. Coward's sweeping generalisation on the absence of vitamin D from cow's milk should be accepted without demur. On the findings of an unknown number of tests by a method which is not described, on a series of milk samples of undescribed source, Dr. Coward comes to a conclusion of far-reaching importance. These results are quite opposed to the summary of recent work on vitamin D and milk which lately appeared in the editorial columns of the *Journal of the American Medical Association* (vol. xciii., p. 1380). There Sherman and Striebling's researches are quoted demonstrating that, in a diet otherwise free from vitamin D, from 5–10 per cent. of the calories coming from a whole-milk powder carried sufficient vitamin D for normal growth and calcification. I should be grateful if Dr. Coward can be persuaded to amplify the data of those investigations on which her important conclusion is based.

I am, Sir, yours faithfully,
Bristol, Dec. 2nd, 1929. FRANK BODMAN.

THE CRAFT OF SURGERY.

To the Editor of THE LANCET.

SIR,—Prof. Tonks has called attention to a serious deficiency in the training of our surgeons. In the days of Jonathan Hutchinson and Frederick Treves, when I qualified, we did not lack material or the teaching of diagnosis; text-book " cram " then, as now, was a necessity, marks had to be obtained on the written part of the examinations, and the best memory got the most marks, the craft of surgery in its endless detail was not taught then any more than it is now. Since 1887 I have been, until two years ago, on the surgical staff of county hospitals. I have seen the work of a multitude of house surgeons, and I look back with something like terror at my own early want of knowledge of surgical craft, and the like ignorance of my residents.

Fellows, masters, or bachelors of surgery in their early days are no better craftsmen than the pass man. If we are carpenter, musician, or art student we show manipulative dexterity, not because of our medical training, but in spite of it. How many surgeons within six months of qualifying could give the many directions to cut a special splint in wood or metal? How many men, as Mr. Rocyn Jones inquires, can use a chisel or saw? The use of a needle or thread in the hands of the average young man is a travesty in stitching; the application of pressure forceps guarantees in many cases the necrosis of an area round a blood-vessel.

Young men and women are full of technical knowledge and theory, but a practical knowledge of surgical craft is almost negligible. Prof. Tonks, a demonstrator of anatomy and a well-known artist, tells us that as a F.R.C.S. he was not taught the craft of surgery; he may never have done an operation, although holding the highest qualification. I was in the ranks of surgery, and I had to learn my craft after examiners had finished with me. In all humility I submit that Fellows are in the like position. Most of us owe our position on the staff of county hospitals to the goodwill of a lay committee, not because we are craftsmen. We may learn it by practice but we have no technical training.—I am, Sir, yours faithfully,

Tunbridge Wells, Nov. 28th, 1929. W. B. COSENS.

AVERTIN ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—I should much have liked to have been present at the discussion on avertin anæsthesia which was recently held at the Royal Society of Medicine (THE LANCET, Nov. 9th, p. 978), and to have given my experience of the drug which now runs into hundreds of cases. I have used it in every type of surgical case from operations on the skull and its contents down to amputations, and I shall continue to use it owing to properties which are a genuine delight to both patient and surgeon.

The contra-indications of avertin anæsthesia are few and limited to kidney disease and low blood pressures. The only drawback is that certain patients are noisy, perhaps a little restless, when the effect of the drug is wearing off. Only in exceptional cases can avertin by itself be said to give complete anæsthesia. Its great use is in combination with other drugs, which in themselves are insufficient. Thus an absolutely non-toxic pleasant and totally efficient combination can be obtained, which is the ideal.

In children, avertin is used in combination either with infiltration anæsthesia (½ per cent. novocain in 1/200,000 solution of adrenalin hydrochloride) or with a very minute dose of ether, on an open mask. No preliminary morphia should be given to children under 14 years. In older people, morphia gr. 1/6 is given hypodermically half an hour beforehand. Avertin in adults can be combined with spinal anæsthesia, and this has been the ideal combination for the more difficult abdominal operations such as partial gastrectomy, cholecystectomy, resection of growth of the colon, and so forth. Here the avertin must be given three to five minutes before giving the spinal injection, otherwise the latter relaxes the sphincter ani, and part of the former drug is voided, spoiling the effect of the combination. For other operations in adults its use with infiltration anæsthesia as for children forms an ideal combination for operations on the breast, thyroid, hernia, and so forth.

Avertin (except in cases of kidney trouble or low blood pressure) has the following great advantages:—

(1) It is, in my experience, non-toxic and absolutely harmless.

(2) It is quick in its action; the patients are asleep in from three to five minutes after administration.

(3) In the greater majority of the cases it provides refreshing sleep for several hours after operation.

(4) It has a beneficial psychological action, for it has banished the dread of the anæsthetic mask and the surroundings of the operating theatre. This is a great factor in children.

(5) It can be administered by a nurse, although an anæsthetist should be present.

In conclusion, I emphasise three precautions. The tendency of the jaw to slip backward and produce a degree of cyanosis should be avoided by keeping the head low and on its side. The drug should always be tested with congo red before use. A dose of 0·1 g. per kilo of body-weight should be given.

I am, Sir, yours faithfully,

Bradford, Nov. 29th, 1929. BASIL HUGHES.

THE PURCHASE OF DANGEROUS DRUGS.

To the Editor of THE LANCET.

SIR,—In my innocence I thought that since the Dangerous Drugs Acts came into force the opium-taker could not purchase his dope unless he did so in a surreptitious way. Yesterday a case came under my care which showed me that an opium-fiend can buy just as much as he wants from any chemist who will sell it, provided that it is diluted sufficiently to come outside the Act, and also that the chemist has no need to enter such sale in his poison book. The woman was taken acutely ill with a septic condition, and it was found she had many 6 and 8 oz. bottles labelled "Laudanum, dil. 1 in 8." Her husband, a labourer on less than £3 a week, says she spent 15*s.* to 20*s.* a week on the stuff. But the most terrible part of the business came out later at night. A six-year-old grandchild she was bringing up began screaming for "her drops from grannie,"—did so all night. I inquired of the police if any action could be taken. They thought not. In fact they had in their possession a confession by the woman of her having given opium to an elder child now in a reformatory.

Cannot this evasion, which nullifies all the intentions of the Act, be brought to the notice of the proper authorities?—I am, Sir, yours faithfully,

Scunthorpe, Lincs., Nov. 20th, 1929. W. S. HALL.

CONTRACTILITY OF CAPILLARIES.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 9th (p. 1010) Dr. J. F. Fulton makes a valuable addition to our knowledge by revealing James Black's Description of Contractility of Capillaries (1825). Dr. Fulton mentions that neither Krogh, in the second edition of his monograph, nor Lewis, cites the interesting study by James Black. So far as Krogh's book on capillaries is concerned (2nd edition, p. 2), he distinctly states his work is not a monograph, and that he does not aim at a complete presentation of the literature of the subject. As a worker in the same field, I should certainly agree that the literature of the subject is not completely or even adequately presented by Krogh.

For example, the first published description of direct microscopic observation of the circulation going on in the glomerular arteries and capillaries, and the first published description of direct microscopic observation of the circulation going on in the capillaries, &c., of the liver, are both omitted from the text, and from the bibliography of Krogh's book. This is unfortunate, but as long as p. 2 of Krogh's volume is retained, there is no *one* responsible. On the other hand, if Krogh's volume is looked upon as an exhaustive monograph, then my colleague Leonard Hill, who is the author of the first of these discoveries, and myself, who am the author of the second, had better resign ourselves to the fate of James Black, although one never knows what might turn up in kindly obituary notices.

I am, Sir, yours faithfully,

JAMES M. MCQUEEN.

Halesowen, Worcester, Nov. 27th, 1929.

DIAGNOSIS OF GASTRIC DISEASE.

To the Editor of THE LANCET.

SIR,—Dr. Rowden's letter misrepresents my statement and my views. He bases his remarks on a very condensed version of what I said at the conclusion of a discussion; if he will refer to the fuller, but necessarily abridged, account of my opening remarks at the same discussion (THE LANCET, Nov. 16th, p. 1041) he will see that he might well have saved himself the trouble of writing. During the course of the discussion one speaker described a case of anæmia, anorexia, and fever, which was finally diagnosed at a clinic as one of gastric carcinoma. In my reply I merely pointed out that anæmia, anorexia, and fever were three well-recognised clinical symptoms of gastric carcinoma; it must be obvious to anyone that they are symptoms of the disease in an advanced stage. I agree with Dr. Rowden about the importance of careful study of dyspepsias at or after middle life, but it should also be appreciated that a considerable proportion of all cases of gastric carcinoma are already advanced before symptoms appear or the patients think it necessary to seek medical advice. Finally, there are plenty of functional dyspepsias after the age of 35 which may be recognised and classified clinically, and in which it is quite unnecessary to subject the patient to the trouble and expense of an X ray examination.

I am, Sir, yours faithfully,

London, Nov. 21st, 1929. J. A. RYLE.

G.M.C. ELECTION.

To the Editor of THE LANCET.

SIR,—As an independent candidate, I desire to thank all those practitioners who kindly voted for me in the recent election of Direct Representatives on the General Medical Council. Though not elected, I consider the result (2010) to have been very encouraging.

I am, Sir, yours faithfully,

Dec. 2nd, 1929. ARTHUR HAYDON, M.D., F.R.G.S.

ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of THE LANCET.

SIR,—The sum of £13 has been received up to the end of November for Christmas gifts in response to Sir Thomas Barlow's appeal published on Nov. 22nd. The subscriptions have been received from the following: Anonymous (Edinburgh), Dr. H. E.

Bloxsome, Dr. G. M. Bluett, Mr. W. C. Bull, Dr. W. J. Dixon, Mr. H. A. T. Fairbank, Dr. J. Fawcett. Dr. J. C. M. Given, Sir Charles Gordon-Watson, Dr. N. G. Horner, Dr. J. Hudson, Dr. R. G. MacGowan, Dr. J. C. Maddison, Dr. D. D. Malpas, Mr. W. M. Mollison, Mr. W. S. Thacker Neville, Mr. H. T. Nixon, Dr. J. Orr, Sir R. W. Philip, Dr. C. F. J. Smith, Surg.-Lieut. L. D. Spero, Dr. W. B. Tomson, and Dr. J. Walker.

The amount of money required for Christmas gifts is £500, so that further donations are very urgently required, and should be sent to: The Honorary Treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, W. 1.

I am, Sir, yours faithfully,

E. C. PENNEFATHER,
Secretary.

Dec. 3rd, 1929.

ELECTRICAL TREATMENTS IN ACUTE CONDITIONS.

To the Editor of THE LANCET.

SIR,—I did not see Dr. Bauwen's letter in your issue of Nov. 16th, with its stimulating criticism, until some days after publication, or I would have written sooner to say how entirely I am in agreement with him on the need for "electro-therapeutists expressing their thoughts in recognised technical terms." I have read through the paragraphs in my original article to which he takes exception, and in so far as I have transgressed in not "expressing my thoughts in recognised technical terms," I must cry *peccavi.* As an offender in the matter of rules that I consider should be observed, the only extenuating circumstances that I can plead are that the lecture was addressed to students, and looseness in technical expression tends to creep in when one so well knows that many electrical terms convey little or nothing to them.—I am, Sir, yours faithfully,

C. B. HEALD.

Park-crescent, Portland-place, W., Dec. 3rd, 1929.

A WHITE BLACK-BOARD FOR THE OPERATING THEATRE.

To the Editor of THE LANCET.

SIR,—Every surgeon in a teaching hospital, either just before an operation or even during its performance, must on occasion have wished to draw a diagram—a wish denied his gloved hand by the rule of asepsis. In my own theatre I have met this recurring need for surgical illustration in a simple way, and I can now go at any time to a board hung as a fixture on the wall and draw or write upon it without breaking the aseptic routine of operation. Chalk dust is undesirable, and I use the soft crayons, made on a grease basis, which are sold for children in every stationer's shop. These crayons require a white surface, which was got by painting an ordinary black-board with white enamel paint. The board is convenient to the operating table and in easy view of the students' gallery. The crayons stand, point downwards, in a metal rack like that employed for tubes in the Wassermann test. The required crayon is grasped with long, sterile sponge forceps, which are fenestrated. Six will hold the traditional colours of anatomical diagram. The crayons are best used short—a stub does not break off. Crayon marks can at once be effaced by an attendant with a swab moistened with ether. This, in time, removes a thin film of paint, but so thin that after two years my board remains clean, white, and attractive.

I am, Sir, yours faithfully,

ARNOLD K. HENRY.

Faculty of Medicine, Cairo, Nov. 13th, 1929.

ABERGAVENNY COTTAGE HOSPITAL.—Lady Mary Herbert last week laid the foundation-stone of a new wing which will include a maternity ward. This will be the third enlargement since the hospital was built in 1901; as a dispensary it has existed since 1828.

Obituary.

SIR ARTHUR SLOGGETT, K.C.M.G., K.C.V.O., F.R.C.S. ENG.,

LATE DIRECTOR-GENERAL OF MEDICAL SERVICES.

THE death of Lieut.-General Sir Arthur Sloggett, Director-General of Medical Services in France during the late war, and Chief Commissioner of the Red Cross (briefly announced in our last issue), occurred suddenly on Nov. 27th, just after he had reached his seventy-second birthday.

Arthur Sloggett, the son of the late Inspector-General W. H. Sloggett, of Paignton, by his wife Elizabeth, daughter of Thomas Crossing, J.P., of Stoke Damerel, was born at Stoke Damerel, Devon, and received his education at King's College, later joining the medical school of King's College Hospital. He obtained the qualifications of M.R.C.S.Eng., L.R.C.P. Edin. in 1886, immediately after which he entered the medical branch of the army. From that time forward he was constantly on active service, and as long ago as 1896 became a marked man when, being senior medical officer on the expedition to Dongola, he was mentioned in despatches, promoted to Surgeon Lieut.-Colonel, and received two Egyptian decorations. Two years later he was the senior medical officer of the first brigade of the British division in the Nile Expedition, and at the Battle of Khartoum was shot through the chest, an injury from which he made a remarkable recovery—he is said to have accounted for the fortunate issue by explaining that "his heart was in his boots." Further mentions in despatches, promotions, and decorations followed. In the South African War he was placed in charge of the Imperial Yeomanry Hospital, being later P.M.O. at one of the general hospitals. He played a prominent part in all the operations of that prolonged struggle, was again mentioned in despatches, decorated, and received the C.M.G. In 1903 he was the P.M.O. to the Home and London districts, an appointment which he held for five years, when he became P.M.O. to the Bombay Presidency. In 1911 he was promoted to be Director of Medical Services in India, and received the C.B.

SIR ARTHUR SLOGGETT.

[*Photograph by Elliott and Fry.*

Sloggett had been called home to succeed as Director-General Army Medical Services three months before the war broke out, and in September, 1914, he was appointed Director-General of the British Armies in the Field, as well as Chief Commissioner of the British Red Cross and the Order of St. John. As all know, he discharged his onerous duties with vigour and conscientiousness. In the late Sir William Macpherson's "General History of the Medical Services in the War," which is based on official documents, it is stated that the scheme, whose duality was criticised, worked admirably throughout the war, its success being essentially due to the fact that the regular organisation of the Army Medical Services was no longer subject to the conflicting interests and rivalries of voluntary aid organisations. What really emerged was the fitness of a man of Sloggett's attributes—of his tact, good temper, and energy—

for a difficult post, carrying responsibilities that might easily have become mutually antagonistic.

In June, 1918, Sloggett's term of office ended, and there was considerable difference of opinion as to whether it should be extended in recognition of the way in which he had met his duties. Representations to this effect were made in several quarters but were unavailing, and Sir Arthur Sloggett was succeeded in the ordinary course by Lieut.-General Sir John Goodwin, the present Governor of Queensland. Sloggett made for himself a great name by the way in which he discharged for more than three and a half years his far-reaching commitments, his success being made possible alike by his 30 years of official experience and his innate qualities of sympathy and geniality.

Sir Arthur Sloggett's honours were many. He received the C.M.G. nearly forty years ago, was made C.B. in 1910, was knighted in 1914, and in 1917 was promoted K.C.M.G., and created K.C.V.O. He was also a Grand Officer of the Legion of Honour, a Commander of the Order of Leopold (First Class), and held the Croix de Guerre both of France and Belgium. He was surgeon to His Majesty the King. He married in 1881 Helen, daughter of Mr. J. R. Boyson, formerly Solicitor-General of Madras, and had one son, Lieut.-Colonel A. J. H. Sloggett, D.S.O., late of the Rifle Brigade, and two daughters, who married respectively Lieut.-Colonel Llewelyn Evans, C.M.G., D.S.O., and Major J. T. Duffin, M.C. Sir Arthur Sloggett died suddenly while walking in Regent's Park, London, with his son.

SIR JOHN ALEXANDER COCKBURN, K.C.M.G., M.D. LOND. & ADEL., M.R.C.S. ENG.

Sir John Cockburn, who died on Nov. 26th in King's College Hospital, was a prominent figure in the politics of South Australia for forty years.

John Alexander Cockburn was a Scot who came to Cholmeley School, Highgate, and King's College, London, for his education, taking the medical course at King's College Hospital. He qualified in 1871 as M.R.C.S., graduated M.B. in the University of London two years later, and in the following year proceeded to the M.D., being awarded the Gold Medal. In 1876 he migrated to South Australia and two years later became mayor of the town in which he elected to settle, thus inaugurating a public career whose utility only ceased with his death. At the age of 38 he became Premier of South Australia and until his retirement from active politics in 1898 he was found discharging many duties in many political combinations. At no time did his medical education and training seem to play much part in his political activities, though he held the portfolio of Education on more than one occasion, and made useful contributions to debates on public health and economics; he will be remembered in Commonwealth administration by his work in respect of the taxation of land and the extension of suffrage.

In 1898 he became Agent-General, and from that time forward was a familiar figure alike in social and business circles. He represented the Commonwealth at numerous important, international congresses, dealing with public health, infant welfare, national insurance, and other economic problems; he became president of the Men's International Alliance for Woman Suffrage, of the Entente Cordiale Society, the International Philological Society, and the Society for Masonic Study; he was for 17 years chairman of the Swanley Horticultural College, on the council and vice-president of the London School of Economics, was President of the Child Study Society, and he did prominent work for the London County Council in respect of elementary education. He was created K.C.M.G. in 1900.

This brief record of a busy life shows that the medical profession had reason to be proud of their colleague as a citizen valuable to his generation.

ARTHUR TEMPLER DAVIES, M.D. CAMB., F.R.C.P. LOND.

THE death of Dr. Arthur Davies at the age of 71 leaves us poorer of a sound practical physician with a charming personality. Arthur Templer Davies was the son of Dr. Herbert Davies, and grandson of Dr. Thomas Davies, both of whom lived in the City of London, and were on the staff of the London and City Road Hospitals; his father was also physician to the Bank of England, and the son followed very closely the family tradition. Born in Finsbury Square, he was educated at Charterhouse and Trinity College, Cambridge, where he took his tripos in 1880. He went on to St. Bartholomew's Hospital, qualifying in 1884, and holding office as house and casualty physician. Having taken the necessary medical qualifications, he joined the staff of the Metropolitan and City Road hospitals with which he remained associated for the greater part of his life. One of his main interests was tuberculosis, for which he found additional scope at the Royal Ventnor Hospital, but he never specialised in any narrow sense, and a breadth of knowledge fitted him for his work as physician to the Bank of England and to a number of life assurance offices. His publications also covered a wide field. He brought out an edition of his father's "Mechanism of the Circulation of the Blood," wrote on myxœdema and other dyscrasias, and delivered an oration to the Hunterian Society on Organotherapeutics, Ancient and Modern, which revealed wide study and clinical insight.

DR. A. T. DAVIES.

Dr. Davies was an original member of the Assurance Medical Society or, as it was at first called, the Life Assurance Medical Officers' Association. He took a keen interest in its work, and was successively a member of the council, secretary for four years, vice-president and president in 1916-17. His presidential address considered the heart and nervous system, in relation to the stresses of war, and, like all his contributions, was practical and to the point. "He was always," writes one of his colleagues, "modest in presenting his views, but they were invariably the result of careful thought and showed his wide practical knowledge and experience. His reports contained all essentials, and his decisions were clean-cut." During the war he acted as hon. physician to the Fishmonger's Hall Hospital for Officers.

Dr. A. G. Phear writes: "As one who was actively associated with Dr. Davies in the work of three hospitals, I should like to add a small tribute to his memory. Dr. Davies resided in the country, and after his retirement from active hospital work he was seldom seen by his friends in the metropolis, except at occasional committee meetings; he had, however, a great capacity for friendship, and an intense loyalty to his friends was a leading feature of his character. His friendships were of an enduring nature, and to meet him again, even after a long period of absence, was to return at once to the old atmosphere of intimacy. His devotion to the hospitals he served so well was remarkable; he gave of his best to each of them; but his sympathies were, perhaps, specially identified by reason of family associations, with the Royal Chest Hospital in the City Road. In committee work his sound judgment and sane outlook were invaluable assets, and, as he was always ready to see the other side of the question, his considered opinion carried great weight with his colleagues. He was a great lover of plants; much of his leisure was spent in personal attention to his garden. Throughout the latter part of his life his outlook remained fresh, and he retained to the end a certain youthfulness of mind."

Dr. Davies married in 1889 Alicia, daughter of the Rev. Robert Irwin of Trinity College, Dublin, by whom he had a son and a daughter.

ARTHUR MERCER DAVIES, M.R.C.S., L.S.A., D P.H. CAMB.,

LIEUT.-COLONEL, R.A.M.C. (RETIRED).

WE regret to record the death of Lieut.-Colonel Arthur Mercer Davies which occurred on Oct. 25th at his house at Eltham in the 77th year of his age. Davies, who was the son of a clergyman, was born at Westminster and educated at Westminster School and Queen's College, Cork, whence he entered the medical school of Westminster Hospital. He was both a hard worker and a fine athlete. He took the double qualifications of M.R.C.S., L.S.A. in 1880 and immediately entered the Army. The country was involved in the Egyptian War shortly after Davies joined the R.A.M.C., and he saw much fighting in the Eastern Sudan and in the Nile Campaign. Then came a period of service in India where his interest in public health problems became prominent. In 1889 he took the diploma of D.P.H. Camb., obtained his majority in 1893, became Lieut.-Colonel in 1901, and retired seven years afterwards. From 1904 to 1908 he was professor of military hygiene at the Army Medical School, Netley, and was well qualified for this appointment since, during his period of service in India, he had done special official work both as bacteriologist and general sanitary officer. The appointment at Netley was confirmed at Millbank, and when he finally retired from the Army he obtained a post under the London County Council as an officer in the Public Health Department.

Colonel Davies was an accurate and fluent writer, the author of a popular handbook on hygiene, a treatise on the Food of the Soldier, and many official reports and contributions to the medical press on subjects connected with public health, military hygiene, and bacteriology. He was also for many years a valued member of the staff of THE LANCET. He leaves a widow, who is the daughter of Captain David Aird, R.N.

GEOFFREY LUCAS, B.A. CAMB., M.D. DURH., L.S.A.

Dr. Lucas, who died at Las Palmas on Nov. 26th after prolonged illness, was the youngest son of Arthur Lucas (of Hitchin) and was born at Darlington in 1875. He was educated at Durham and Tonbridge, entering Caius College, Cambridge, with an exhibition, taking the Natural Science Tripos in 1899 and demonstrating physiology in the University. Four years later he qualified from St. George's Hospital with the L.S.A. diploma and held house appointments at Westminster Hospital. He then spent two years at sea with the Orient Steam Navigation Company 1904-06 before settling down to practice at Ringwood, where he became medical officer of health to the Ringwood district. It was there that he became interested in the treatment of tuberculosis, which led him to take a resident post at the Banchory Sanatorium where he remained until 1921, with the exception of the period of the great war when he was at first physician to the 1st Scottish General Hospital and later held a commission at No. XI. Stationary Hospital B.E.F. On leaving Banchory he joined Dr. Vere Pearson at Mundesley Sanatorium until he retired last year after having made several more long voyages in search of health.

Dr. Pearson writes: "Dr. Lucas was a successful sanatorium doctor because he was genuinely fond of his work and because he was a sound general physician. A succession of patients were devoted to him because he was a man of parts, with wide interests, fond of fishing and shooting, and a good bridge player, but above all because they felt he always took an essentially sympathetic and wise interest in their welfare. He lived with his patients ordering the details of their living, understanding their foibles, and comprehending their difficulties. He was a quick worker, had an able brain, and was well versed in other branches of medicine besides tuberculosis. When during the war he practised as a general physician in the wards of the 1st Scottish General Hospital, Aberdeen, he did a certain amount of teaching as an assistant to Prof. Ashley Mackintosh. He would quickly grasp the gist of modern advances in medicine, and generally kept well abreast of these whether they were directly, or only indirectly, connected with the subject of pulmonary tuberculosis, which was, of course, the disease from which most of his patients suffered during the greater part of 20 years of his working life. By many of these he will be missed."

Dr. Lucas leaves a widow who with her two children has recently taken up residence in Australia.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 23RD, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 279 (last week 172); scarlet fever, 3673; diphtheria, 1902; enteric fever, 49; pneumonia, 1263; puerperal fever, 51; puerperal pyrexia, 116; cerebro-spinal fever, 10; acute poliomyelitis, 9; acute polio-encephalitis, 2; encephalitis lethargica, 19; dysentery, 10; ophthalmia neonatorum, 116. No case of cholera, plague, or typhus fever was notified during the week.

Of the small-pox cases 84 were reported from the County of London, as against 64 last week. These were distributed as follows: City of London, 1; Bermondsey, 2; Bethnal Green, 13; Camberwell, 16; Hackney, 6; Islington, Kensington, Lambeth, Lewisham, each 1; Poplar, 3; St. Pancras, 5; Shoreditch, 6; Southwark, 19; Stepney, 10.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Nov. 26th–27th was as follows: Small-pox, 310 under treatment, 8 under observation (last week 240 and 17 respectively); scarlet fever, 2828; diphtheria, 2663; enteric fever, 89; measles, 307; whooping-cough, 109; puerperal fever, 32 (plus 14 babies); encephalitis lethargica, 125; poliomyelitis, 7; "other diseases," 16. At St. Margaret's Hospital there were 8 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 5 (4) from enteric fever, 23 (4) from measles, 9 (2) from scarlet fever, 22 (1) from whooping-cough, 43 (8) from diphtheria, 76 (17) from diarrhœa and enteritis under two years, and 75 (10) from influenza. The figures in parentheses are those for London itself.

The single death from enteric fever outside London was reported from Acton. Diarrhœa accounted for 8 deaths at Liverpool and 6 each at Manchester and Salford. In Liverpool there were 5 deaths from diarrhœa and 4 from scarlet fever. Manchester and Wigan each reported 4 deaths from measles and West Ham 3.

There was no death from small-pox in the returns received from areas outside greater London, the county boroughs, and great towns for the month of October last.

The number of stillbirths notified during the week was 265 (corresponding to a rate of 42 per 1000 births), including 68 in London.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

CHILDREN AND YOUNG PERSONS (EMPLOYMENT AND PROTECTION) BILL.

In the House of Commons on Nov. 29th Mr. SORENSEN moved the second reading of this Bill. He said that there were hundreds of thousands of young persons working hours which he could only describe as perfectly abominable. This had an adverse effect on the health of the community, and of the young people in particular. There were still a number of young people and children who were adversely affected in industries which employed lead paint, and one of the clauses of this Bill prohibited entirely the employment of young persons in those concerns, except under very drastic conditions regarding apprentices. There was another clause in the Bill which dealt with the effect on young life of the lifting of weights that were altogether disproportionate to the size and strength of the young lads. The measure also protected young people employed in connexion with theatrical entertainment. The chief point of the Bill was that there should be no children under the *age of 13 employed, except those who were lawfully employed* when the measure came into operation. Between the ages of 13 and 16 the Bill provided that the total number of hours worked should be 88, or 8 hours per day. No child should work before the close of school each day. Between the ages of 16 and 18 the total number of hours worked should be 48, or 9 hours per day. Under the age of 18 there should be no Sunday work, and one half day per week should be guaranteed to the children and young people of the country. It was also provided that under the age of 16 no young person and no children should be employed in the coal-mines, and between 16 and 18 only those should be employed who had obtained a certificate of medical fitness.

Dr. MARION PHILLIPS seconded the motion for the second reading.

After some debate,

Mr. CLYNES (Home Secretary), said that the attitude of the Government towards the Bill was one of the completest goodwill and sympathy, but most of the ground covered by it had already been covered by Bills introduced by the Government, or Bills which they intended to introduce. He suggested that the purpose of the promoters might have been served by the debate that day, and that they should trust to the Government measures to which he now referred, and that this Bill might be withdrawn.

Dr. VERNON DAVIES said that the sympathy of all parties in the House was definitely with children and young persons, but those who had had experience of child workers or young workers in textile factories recognised that Mr. Sorensen in bringing in this Bill had taken on a colossal task and one which was really beyond the competence of any private Member. That task could only be adequately discharged by means of the large experience and sympathetic help of the Government. He welcomed the advice of the Home Secretary that the promoters should be satisfied with having raised the subject.

In reply to Mr. SORENSEN, Mr. CLYNES said that he could give an assurance that when the Government had disposed of their Factories Bill, which covered only those employed in factories, they were quite eager and ready to try to cover the remaining groups by a separate Bill which would be introduced as early as possible.

Mr. SORENSEN asked leave to withdraw the Bill, but leave was refused.

Lieut.-Colonel FREMANTLE said that it might be necessary to withdraw the Bill at a later stage, but personally he hoped that Mr. Sorensen would go through with it. The medical side of the Bill was extremely important, and he hoped that it would not be forgotten even if the Bill was withdrawn. There was a clause in the Bill which dealt with trades which had been neglected in the health services so far—the mercantile marine and mines.

After further debate,

Mr. STRAUSS moved that the debate on the Bill be adjourned.

On a division *the motion for adjournment of the debate* was carried by 152 votes to 45.

EXPENDITURE ON PAUPER LUNATICS.

Mr. GREENWOOD, Minister of Health, informed Major GLYN that the expenditure of Poor-law authorities in England and Wales during the year ended March 31st, 1928, in connexion with the certification and cost of conveyance of lunatics, was £92,007.

HOUSE OF LORDS.

THURSDAY, NOV. 28TH.

MENTAL TREATMENT BILL.

Earl RUSSELL, Parliamentary Secretary to the Ministry of Transport, in moving the second reading of the Mental Treatment Bill, said that he was not the normal representative of the Minister of Health in that House, but he had been selected for the duty on account of the experience which he acquired a good many years ago on the London County Council, when for several years he used to visit at least two asylums every week and acted for some years as Chairman of Hanwell Asylum. His interest in, and knowledge of, the subject was revived and increased when the Royal Commission was appointed in 1924 and of that Commission he was a member. It sat for two years and reported in 1926. He had been responsible when on the other side of the House for asking why that Report had not been acted upon and why nothing had been done. It therefore gave him special pleasure to present to their lordships a Bill which dealt at any rate with the important parts of the recommendations of that Commission. The Bill did not profess to create an entirely new code. That was recommended by the Royal Commission and would be very desirable, but the system under which legislation was conducted made any Government reluctant to undertake too large and too comprehensive a Bill on account of the difficulties of Parliamentary time. Therefore this Bill which was now before the House was a comparatively small Bill, although the amendments which it made were, from the point of view of the treatment of patients, very important. The Government would welcome any improvements that their lordships could suggest in the passage of the Bill through the House. It had been considered for several years by successive Ministers of Health with great care and they believed that they had arrived at the best solution, but it might well be that some useful amendments might be suggested. The Bill was not in its main features entirely new to their lordships. Lord Onslow had introduced a Mental Treatment Bill in 1923, to which their lordships gave a second reading, and which, *he thought, was based on the same principle, so far as the* major issues were concerned, as this Bill. He had no fear but that their lordships would welcome the present Bill as heartily as they welcomed that one.

Some Extracts from the Report of the Royal Commission.

The Royal Commission was presided over by Mr. Macmillan, and no opportunity should be lost of expressing the sense of public gratitude that they all ought to feel for his conduct in presiding over that Commission. The subject was extraordinarily difficult and complex. The Commission consisted of twelve persons drawn from all political parties and from all shades of thought, and, after going exhaustively into all these matters, the chairman succeeded in *presenting a Report which was unanimous*, except in one particular. That was an achievement and was also an encouragement and a support to anyone who attempted to legislate on the recommendations of that Commission. He would quote two or three short sentences from that part of the Report, which would strike the note on which he wanted to invite their lordships to deal with the Bill. The Report said:—

> "The keynote of the past has been detention; the keynote of the future should be prevention and treatment."

And, further:—

> "Contrary to the accepted canons of preventive medicine, the mental patient is not admissible to most of the institutions provided for his treatment until his disease has progressed so *far that he has become a certifiable lunatic.* Then and then only is he eligible for treatment. . . . Certification should be the last resort in treatment, not the prerequisite of treatment."

If they were to adopt the analogy that the Royal Commission thought they ought to have between mental disease and any other forms of disease, it surely would be rather absurd not to treat a disease until some symptom had reached a very aggravated stage. What would be thought of modern medicine if they did not treat a case of scarlet fever unless and until the patient had come out in spots and was distributing infection to the community? What would be thought if they did not treat people with an ordinary fever until they had shown that they had it by running out into the cold with a temperature of 102°, and running the risk *of pneumonia? This idea was not as new as might* be supposed. As far back as 1860 the Commissioners in Lunacy stated:—

> "The chances of recovery are much greater when the patients are placed under treatment in an early stage of the attack than when the disorder has been allowed to remain unchecked for some time."

Again, in their Report for the year 1891 they stated:—

> "For 40 years and more we have directed our endeavours towards securing the early treatment of mental disorder upon

which, according to all experience, recovery so materially depends."

Sir Frederick Willis's Statistics.

The present Bill was an effort to give statutory form to these aspirations, and he thought it was justified by a sentence which he would quote from some articles in the *Times* that were written by Sir Frederick Willis, a former Chairman of the Board of Control, dealing with the present position. He called their lordships' attention for the moment to this sentence:—

> "The evolution of asylums from mere places of detention to real hospitals has taken place."

That was to say, an asylum was no longer a prison. It was no longer a place where they merely confined a man in order that he could not do harm to himself or others. It was not primarily a place where they confined him for that purpose, but it was a place where they sent him for curative treatment in the hope that it would enable him to rejoin his fellow men. In that same article there were some very interesting statistics of the incidence of insanity which are as follows:—

Incidence of Insanity.

A = First admissions per 10,000 population.

Year.	A.	Year.	A.	Year.	A.
1869	4·07	1909	5·04	1923	4·93
1879	4·46	1919	5·25	1924	4·41
1889	4·58	1921	4·91	1925	4·40
1899	4·94	1922	4·91	1926	4·48

Recovery-rate.

Number of Recoveries to 100 Admissions.

Year.	A.	Year.	A.
Average—			
1869 to 1878	38·84	1920	32·21
1879 „ 1888	39·91	1921	32·52
1889 „ 1898	38·81	1922	32·29
1899 „ 1908	37·22	1923	31·61
1909 „ 1918	32·69	1924	34·86
1910 „ 1919	32·27	1925	31·84
		1926	31·85
		1927	31·43

The first statistics dealt with the incidence of insanity, and ran from the year 1869 to the year 1926, and this was the comment that Sir Frederick Willis made upon them:—

> "These figures support the statement that the incidence of the disease has not been materially reduced."

The change per 10,000 of population was from 4·07 in the first year to 4·48 in the last year. They also did not support the contrary statement that was sometimes made that insanity was very largely increasing, and to that extent they were satisfactory. They were very hopeful that, if the system proposed by this Bill was adopted, the recovery-rate, or rather the number of recoveries, might be improved. Perhaps he should make it clear that the technical recovery-rate, if it meant the rate per hundred of certified persons to recover, might very well become worse, because they were hoping that all the people who were successfully treated under this Bill would never become certified lunatics, and would therefore be taken out of the recoverable class to which that percentage applied. But they hoped that the total recoveries would be larger and that they would be more quickly effected.

Three Important Points.

Describing the Bill itself, the noble lord said that it really only contained three main matters of importance. The first, Clauses 1 to 4, related to the voluntary boarder, a person who was sufficiently intelligent to ask for treatment, and to wish for treatment. Clause 5 dealt with the temporary boarder, a person who was not in that position but who had to be treated against his will, but only for a time. Those were two important points dealing with patients. Clauses 11 to 15 gave a reconstitution of the Board of Control, to which a great deal of importance was attached. It was enough to say that the Board of Control were now constituted under an Act of 1845, to suggest that possibly the time had come when some amendment might be useful. The other clauses in the Bill were less important. Clause 1 covered a person suffering from mental disorder who was desirous of voluntarily submitting himself to treatment, and who made a written application. He might, without a reception order and without formality beyond the written application, be received as a voluntary boarder, and, in the case of an unmarried person under the age of 18, the will, the voluntas, was transferred to the parent or guardian. That was possible now in the case of most licensed houses. It was sometimes possible in the case of single care, but it was not possible for the poorer class of the community. The present rate-aided mental hospital, or, as it used to be called, the pauper lunatic asylum, had no provision for receiving the voluntary boarder, and at the Royal Commission evidence was given of most distressing cases of people who felt they they were becoming more and more unstable, more and more upset, but that a little rest, a little treatment, would probably set them right again. But they were unable to obtain that treatment from a recognised county asylum, because there was no power to admit them, and they had to go on until they had become so bad that they were certifiable before they could be treated. That proposition has only to be stated to show its absurdity.

Single Care of the Voluntary Boarder.

There was another point, of course, about the voluntary boarder, and that was the danger which any doctor suffered who took such a person into single care, and who was always liable to prosecution for harbouring an uncertified lunatic. He was not allowed to take charge of a person who was certifiable unless he was certified. These people were not intended to be certifiable people; it was hoped that they would never reach that stage, and there would be some protection here in the fact that the early treatment was recognised as a possibility. He called special attention to Subsection (3) of Clause 1, by which a person who was received as a voluntary boarder, although he had entered voluntarily, was not allowed to leave at a moment's notice. He must give 72 hours' notice. In a sense it might be said that they were imposing on the voluntary person imprisonment; in a purely legal and technical sense that was, of course, absolutely correct; but it was quite plain that it would not be safe, and it would not be in the interest of the patient, to allow him to leave at a moment's notice, since the very occasion when he would be insisting on leaving, and requiring to leave, would probably be just that occasion when he had become so mentally unbalanced as not to be able to look after himself or give himself proper care. This period of delay of 72 hours, therefore, which was by no means necessarily interposed in every case, but only where the medical officer thought it necessary, gave the opportunity either for the patient, as very often happened, to come back to a better mind before the 72 hours were up, and to say, "I will withdraw my notice and stop," or, if it had unfortunately become necessary, to proceed to the extreme measure of certification. Without that provision, it might well happen that the treatment would fail of effect and that the patient would destroy the whole value of it by his impetuous action in some special moment of excitement, or owing to some irritation caused by something that had happened. What were the protections of those patients? In Clause 2 their lordships would notice that notice of a patient's reception was to be given within two days to the Board of Control. That notice was equally to be given to the Board of Control if he died in or departed from the institution where he was being treated; and, finally, should the patient become incapable of volition, should he no longer be able to exercise a choice, or a will, he was not to be kept as a voluntary boarder for more than a month; but before the end of that period he had to be discharged unless either he had again become capable of volition—a thing which often happened—or steps had been taken to certify him. In all these cases the Board of Control was the body that the public might rely upon to see that the patient was not unfairly treated.

The Earl of ONSLOW: Will the voluntary boarder come under the provisions of Clause 5, temporary treatment, if he becomes incapable of volition?

Earl RUSSELL: Yes, and I think that that period of one month would probably be used in order to apply Clause 5 to him. Continuing, the noble lord said he hoped that might be possible in every case where it was not necessary to proceed to full certification. The effect upon the minds of the Royal Commission of all the evidence they heard, including the evidence from the Board of Control, was that the real safeguard for every person, either insane or alleged to be insane, or partially insane, who was detained or under treatment anywhere, was the existence of the Board of Control itself—and by this Bill the powers of the Board of Control were to some extent increased. If notice was given to the Board of Control there could be no secrecy, if a visit was paid by the Board of Control there could be no concealment, and there could be no deception of the experienced officials that they would send to visit. That was really far more of a safeguard to patients than any other safeguard, but he would deal with that more fully on Clause 5. Under Clause 3 a commissioner, that is, not necessarily a member of the Board of Control, but a commissioner as provided by a later clause—an official visitor of the Board of Control—might at any time visit a voluntary boarder, and he might report on the case, and then the Board of Control, if they were of opinion that his state of health was unfit for him to remain as a voluntary boarder, might order the superintendent to discharge him, or might take steps to deal with him, if necessary, as a person of unsound mind. With those protections there could be very little to be said against the voluntary boarders. The man entered of his own free will, his maximum detention was 72 hours if he gave notice to leave, his maximum detention was one month if he became incapable of free will, and at all times he had over him the controlling hand of the Board of Control, who could give orders as to what in their view was proper to be done in his case. That did not seem to the Minister of Health to leave much opportunity for abuse.

The Temporary Boarder.

Now he came to what was perhaps a little more contentious—namely, Clause 5. That clause provided for what was called the temporary boarder, a person who was suffering from mental disorder, incapable of volition and likely to benefit by temporary treatment. In his case, if an application was properly made and a proper medical certificate was given, he might be detained for six months. That period of six months was a period in which, according to the evidence and the statistics, a very large number of recoveries took place. It might not be, perhaps, as long a period as would really be useful, but the Minister of Health had been very moderate in his estimate and had only suggested detention for six months. In what way did the circumstances in which such a person was detained differ from the circumstances of full certification? So far as the *application was concerned, there was no great difference on* which he need dwell. The application must either be made by the husband or wife or a relative. If not, it must state why it was not made by them and what the interest was of the person making it. The patient must then be examined by two doctors. In the ordinary case of certification of the rate-aided patient only one doctor was required. But the great difference was that there was no interposition of the justice of the peace. In the view of the Government the two doctors provided a far greater safeguard than any number of justices of the peace, and it was provided that one of the two doctors was either to be his usual medical attendant—that was in Subsection 8—or, if not, he was to be an official person officially appointed who could have no interest of an improper character in the matter. The Royal Commission suggested a rather different form of treatment for the same purpose by what was called in their report a provisional order, and they did introduce the justice of the peace. The provisional order had been thrown over by the Ministry of Health because, although the intention was to remove the stigma of certification, it was fairly obvious that in a very short time it would have been held as exactly equivalent. One had the doctor, the justices, and all the other incidents of full certification. Therefore, this suggestion was put forward. What harm was that likely to do? He would read a short quotation from the report of the Royal Commission.

> "That in practice instances of sane persons being wrongfully certified or improperly detained must be of the rarest occurrence. We *think it proper to record that in none of the cases* which were investigated by us were we satisfied on the evidence that improper detention had been suffered."

They went on to say in connexion with another matter:—

> "Ill-usage is not deliberately or systematically practised in mental institutions."

His next sentence was again a quotation from Sir Frederick Willis:—

> "The only hope of reducing the incidence of insanity and improving *the recovery-rate is to alter the law so as to allow* and encourage the early and skilled treatment of persons mentally ill."

On the point of the justices of the peace the Royal Commission said that they reluctantly recommended retaining the justices of the peace. They recommended it merely because they were afraid of Parliament and uninformed public opinion. But they added this sentence to which their lordships would give full weight:—

> "If we were free to consider exclusively the medical treatment of the patient we should have little hesitation in accepting this suggestion."

That was the suggestion of certification without the justices.

Modern Methods in Mental Disease.

There still existed in some places the feeling which was aroused, possibly naturally and justifiably, nearly 100 years ago against confinement in asylums and asylum treatment. For that feeling there existed no justification to-day. Every person connected with these institutions devoted his whole thought and his whole attention to curing his patient if he possibly could and, if he could not entirely cure him, at least to ameliorate his condition. The fear which then existed was a fear which need exist no longer. So far as rate-aided institutions were concerned, there was no temptation to them to detain the patient one day longer than they could help. They were full; they were overfull; they had difficulty in finding accommodation. The trouble recently had rather been, perhaps, the other way—that sometimes people were discharged almost before they were fit to be at large. He submitted that they should recognise now that a doctor was not that sinister figure which in former times he was represented to be, anxious simply to confine a man to a dungeon for life, but that he was treating mental disorder in exactly the same way as he treated any other disease, with a sole view to its cure. When they used such phrases as "liberty of the subject"—and no one attached more importance to real liberty of the subject than he did—let them reflect upon what the circumstances were. If their daughter had a fever was she not restrained in bed instead of being allowed to run out in the cold air to die of double pneumonia? They did not invoke the justices to do that. They did not even invoke the ordinary certificate. They did it as a matter of course. If *one of* their lordships was delirious and in a fever he would be without volition within the meaning of this Act for the time; he would not know what he was doing. He would not appreciate that he was being treated. Nobody hesitated in those circumstances to restrain personal liberty until the time when it was necessary to restrain it was passed, and that restraint was, of course, in the obvious interest of the patient. When the patient had recovered the patient was grateful for it. Precisely the same thing happened *in the case of mental treatment.* The vast majority of these patients were grateful when they recovered for the treatment they had received and recognised the good that had been done them. Therefore they ought not to be led away by mere words on this matter.

Visits to Mental Patients.

There was still another thing to be remembered, and that was the number of visits which might be paid to these patients. *First of all, there was the Board of Control* entitled to visit at any time and as often as they liked. Then there was the superintendent of the asylum himself who, of course, visited his patients regularly, though they might regard him as an interested party. In the case of the rate-aided asylum, there was the visiting committee or, in the case of the licensed house, the visiting justices. Then there were the patient's friends who were at liberty to visit the patient and hear his own account, for what it was worth, of his treatment. Finally, in the case of patients who had property, they had the Lord Chancellor's visitor. So their lordships might take it that these people were, and would be, well protected. In Subsection 9, in addition to the Board of Control's visit, within one month the patient was to be visited by two members of the visiting committee or, if not, by two of the visitors of licensed houses, and that after that visit they were to sign a statement either to the effect that it was proper the patient should continue to be detained, or that it was not proper, *and then they should within two days again report to the* Board of Control stating their opinion.

In Subsection 12, dealing with the powers of the Board of Control, it was provided that at any time they might order that a person received as a temporary patient should be discharged, or that steps should be taken to deal with him as a person of unsound mind. He thought that the public really had no reason to fear these provisions. The whole object nowadays was to assimilate the treatment of mental disease to the treatment of other disease. For his own *safety, and sometimes for the safety of other people, it was* unfortunately essential that the patient should be placed under restraint and deprived of his liberty, which was sometimes only an incident and might be of only a few days' duration. That it should be necessary to put him upon the stigma of full certification for that purpose, or that he should have become so bad that he must be fully certified before they treated him at all, was a thing which could no longer be tolerated. The provisions in this Bill were likely to do a great deal to prevent people ever reaching the stage of certification, and to empty, in that sense, the certified wards, and to send the people back without that stigma which was a very serious stigma both in the matter of reputation and in the matter of employment.

Reconstitution of the Board of Control.

Clauses 11 to 15 were the clauses which reconstituted the Board of Control, and this reconstitution was in accordance with the views which the Royal Commission expressed. As a member of that Commission he welcomed it, and he would explain the present position. There were about twelve Commissioners, some medical and some legal. They had the duty not only of regulating policy and principles, but of visiting all these various institutions which this and the principal Act imposed upon them. The result had been that they were so busy running about the country that they were never able to have real consultative committee meetings in London, as they should have, to decide upon the principle and the policy to be applied. These clauses proposed to divide the Commissioners into two parts. There would be five in all who would constitute the Board of Control, and the idea was that those five should have primarily as their duty the coördination of the control of all the general matters relating to administration, of which there were a great many—provision of drugs, the qualification of nurses, the staffing of asylums, the construction of asylums, and the thousand and one matters of policy that were proper to be centred and fully discussed: and those five people would be able to meet regularly, and without interruption, and discuss these matters. They would be called the Senior Commissioners. There would be other Commissioners, and there would also be Assistant Commissioners, and those Commissioners and the Assistant Commissioners would primarily do the visiting that was required. Clause 13 provided that one Commissioner might carry out visits which were at present sometimes required to be made by two. In a great many cases the law required two Commissioners to visit when there was no sort of reason why more than one should do so. It had been found impossible to carry that out for some time now on account of the difficulty of the numbers; but under this clause, as the Commission would now be constituted, the visiting would primarily be done by the Junior Commissioners and the Assistant Commissioners.

Five members of the Board of Control would meet regularly and control policy, and would, of course, themselves visit these institutions from time to time in order to keep abreast of what was being done, and to learn with their own eyes what was going on. Under Clause 11 there was to be a Chairman. That was in Subsection 1. In Subsection 2 there was to be a legal Commissioner, a medical Commissioner and a woman. That accounted for four, leaving one place vacant which could be filled up by another medical Commissioner, or as might be thought most desirable. Ths existing Commissioners who were not members of the new Board of Control would continue as Junior Commissioners, although that word was not used in the Bill, and there would also be Assistant Commissioners. Subsection 7 provided that such salaries should be paid to these Commissioners as the Minister and the Treasury might determine. The Royal Commission expressed a very strong view that the position of the Chairman of the Board of Control was so important and so responsible that a substantial salary should be attached to it. Clause 12 mainly provided that the Chairman should be primarily responsible for the arrangements. The only other clause he need call attention to was Clause 15, giving a power to make rules, which was, he thought also, in the Bill of 1923. The Royal Commission attached a great deal of importance to this reconstitution of the Board of Control, because it became very evident to them that it was impossible for the work to be done as it should be done under the present Constitution, and perhaps it was, from the point of view of administration, a reform which would be as useful as any reform could be.

Clause 6 required the local authorities to provide the necessary accommodation for temporary patients. It was not likely to increase their total accommodation. In fact, they hoped on the whole that in the end it would diminish it. Clause 7 provided for the appointment of a Visiting Committee. Clause 8 provided for the circumstances which had arisen under one or two Private Acts, such as the Maudsley Hospital, where special circumstances applied.

Granting of Certificates; The Question of Immunity.

Coming to the miscellaneous clauses, he would call attention to the substituted Subsection 2 in Clause 16, which was an attempt to provide some further protection for the medical men who gave certificates. Recent actions, particularly, perhaps, the Harnett case and other actions, had not unnaturally frightened medical men, and they were very chary of giving certificates for which they might be shot at, particularly as in the Harnett case, twelve years later. It was a very grave responsibility for a professional man to take. It not only costs him money, it might ruin him professionally; and the result was that after that case there was a very great shyness on the part of doctors in giving these certificates in proper cases. No one could blame them for that. They were not paid more than an odd guinea of two and they were taking a very serious risk. The Royal Commission was pressed by the doctors to give them complete immunity. Those on that Commission who were lawyers felt that that would be contrary to the principles of the law, and that they could not go as far as that. The doctors themselves said, when asked: "No, we are not asking, and we do not ask, immunity for a rascal or a rogue or even for a thoroughly reckless person. But we do say it is a little hard that people who are exercising their profession honestly and to the best of their ability should be shot at in this way."

The Earl of ONSLOW: Does this immunity apply to certificates regarding people not capable of volition under Section 5 of this Bill?

Earl RUSSELL: I am not sure, but I think it is intended to.

Viscount BRENTFORD: Yes, if the noble Lord looks at Subsection 2, he will see it refers to anything done under this Act.

Earl RUSSELL: Yes, I think so. I would not like to answer offhand, but I think it applies to this, too. Continuing, the noble lord said that the Royal Commission considered this matter very carefully. The legal members gave attention to it, and took advice for several days and talked the matter over, and finally recommended the form of words which were now embodied in the substituted Subsection 2. The effect of these words was not to give the doctors immunity, but to shift the onus.
The Bill said:—

> ". . . such proceedings shall . . . be stayed on such terms as to costs and otherwise as the Court may think fit, unless the Court is satisfied that there is substantial ground for alleging that such act was done in bad faith or without reasonable care."

He could not help feeling that that would present some difficulty to His Majesty's judges, but there were statistics containing somewhat similar provisions on which they now and then acted. There was a statute about vexatious actions, and other statutes of that kind. What it really meant was that the plaintiff would have to satisfy the judge *in limine* that he had some sort of a case. It did not follow that it was a good case, or that he would win it, but he would have to satisfy the judge at an early stage that he had a prima facie case and that there was something which properly required investigation. It was not by any means a final protection to the doctors—very far from it—but it was some protection, and he hoped it might do something to protect them from suffering from legal actions when they had done the best they could.

Urgency Orders.

Clause 17 made urgency orders applicable to rate-aided persons. Curiously enough, urgency orders were only applicable to private patients. Why, he did not know. It was a useful form, and the rate-aided person could only be—so to speak—taken in charge if he was found wandering or in other circumstances when he was dangerous to himself or to others. This provision would give the opportunity of making an urgency order in all proper cases. Clause 18 was one to which a good deal of importance was attached. The people maintained in rate-aided mental hospitals were called pauper lunatics, the place in which they were maintained was called a pauper lunatic asylum, and the whole thing was done under the poor-law. The extraordinary result of that legislation was this. Their lordships would hardly credit it, but there was no doubt that what he was saying was correct. If a person became suddenly mad in the street, was taken by a relieving officer to the workhouse, was there certified and sent to an asylum, even if subsequently it was discovered that he was a person of means, even if he repaid to the poor-law authorities the whole of the expenses to which they had been put, he became and remained a pauper. That was clearly a ridiculous state of things. It was desired now—and the passing of the Local Government Act last session made it possible—to assimilate the treatment of this form of disease with the county medical services. This clause provided that:—

> "A person shall not be deemed to be in receipt of poor relief or be deprived of any right or privilege or be subjected to any disability by reason only . . ."

of anything done to him under this Act or under the principal Act. It was time that was done.

Clause 19 was merely a provision enabling county councils to use those workhouses which would come into their possession under the new Act. Clause 20 carried out what he had just spoken about, the change of name. The change of name implied a change of spirit, and the treatment would be different, and therefore it was appropriate that these hospitals and the people who were treated in them should receive new names and new appellations. He would say one word about the things which were not done under this Bill. It had not made a complete code for obvious Parliamentary reasons. It had not assimilated completely the method of certification in private and pauper cases which for historical reasons no doubt differed in the Lunacy Act of 1890. That would have meant rewriting the complete code and it had therefore been left over.

Licensed Houses.

The Bill had done two things which met the points that mattered; it had given the urgency order to the rate-aided persons and had removed the pauper stigma from the rate-aided cases. Neither had the Bill dealt with the vexed question of licensed houses. So vexed was the question of licensed houses that it was the only question on which the Royal Commission disagreed. There were six on one side and six on the other. But the time had come when Parliament must some day or other make up its mind what it was going to do about licensed houses. The licensed house was an institution for the treatment of insanity, which was run by a doctor or several doctors, or at any rate had to be staffed by a doctor, whoever was the owner, for private profit, and the public were perfectly right, no doubt, in looking with the very gravest suspicion upon places of that kind.

When Parliament last dealt with this question in 1890, it adopted a quite illogical and a quite indefensible half-way house attitude. The existing private licensed houses were allowed to go on; no new licensed houses were allowed to be created. No number of beds were allowed to be added to those already in existence in the licensed houses then existing. In effect, Parliament said: "We are not quite sure whether this thing is so bad that it ought to be swept away altogether, but at any rate we are not going to let it be increased," and the number of beds in 1890 was the number of beds up to this date. That was not a logical attitude. He would not say which of the two other attitudes was right, but it was obvious that one must be right. Either a licensed house was a necessary institution serving a beneficent purpose in the case of a private patient who could afford to pay for treatment, or it was an evil that ought to be swept away. Actual inconvenience was caused by this because in fact licensed houses were not so geographically distributed as to be convenient. That had nothing to do with this Bill, but as he had mentioned what was not in it he thought he ought to mention the matter on which the views of the Royal Commission were divided half and half. He had been through the Bill very carefully with the Chairman of the Royal Commission and he had authorised him to say that he welcomed it as a most useful instalment of the reforms which the Royal Commission proposed.

Liberty of the Subject.

Viscount BRENTFORD said that for a certain time while the Royal Commission was sitting he occupied the position of Minister of Health, and therefore he was in somewhat close touch with the Board of Control and the questions, so far as the administration was concerned, which were submitted to the Royal Commission. For many years the question how best to deal with insanity had troubled Parliament and the country, and he was very glad to be able to associate himself with Earl Russell in what he said in regard to the modern view of the treatment of insanity—that it should be taken at the earliest possible stage and be put as far as it could be put upon the same lines as ordinary disease. But, of course, there was distinctly a difference between the disease of insanity, whether it was mere lack of volition or complete insanity, and every other physical disease to which flesh was heir to. That was, of course, the question of the liberty of the subject. For a couple of hundred years at least there had been commissions and inquiries and Acts of Parliament of every kind, and before the Act of 1890, which was really the foundation of the Lunacy Laws, there were 40 or 50 Acts dealing with this question. Running throughout the Act of 1890 was noticeable the meticulous care of Parliament for the liberty of the subject. While he (Lord Brentford) did not intend to oppose the second reading of the Bill, there would be certain points to be raised on the Committee stage which ought to be mentioned at once because they appeared to be of considerable importance. He hoped Earl Russell, when he had heard what these points were, would consult with him as to necessary amendments in order that the Bill might go through in a satisfactory form. He wanted to clear uncontentious points out of view, and he entirely accepted the view of the Commission that there was no ill-treatment, or rather that no cases of ill-treatment were proved to them. That, however, did not quite go far enough. Earl Russell had told them quite frankly that there was both Parliamentary hesitation and uninformed criticism in regard to the question of the liberty of the subject. Under the existing law whenever a man or woman had to go into one of these homes, private homes, single-case homes, or rate-aided institutions, there had to be an inquisition of some kind or another by some kind of judicial authority. The great inquisition had now almost gone into desuetude, that was the inquisition by a master in lunacy with, or without, a jury. There was a petition for a reception order certified by two medical men, and then there was a safeguard that the petition must be presented to a special justice of the peace who had the power, if he so desired, to see the patient before the reception order was issued. That was not only a safeguard for the patient, but for the medical men themselves. Earl Russell was proposing to take away a great deal of the legal responsibility of medical men and at the same time he took away the one great safeguard both for the medical men and the patient who was supposed to be placed in a hospital.

The Young Person under Eighteen.

If one looked at the Bill it would be seen that the voluntary boarder was dealt with under Clause 1. Earl Russell referred to such a person as a man or woman who desired—rightly and sensibly desired if they liked—to place himself or herself under control for the purposes of being benefited by medical treatment in a mental hospital. He agreed that if a man or woman had sufficient sense to realise the desirability of treatment he or she might quite rightly place himself or herself there, but the noble Earl had referred to another case, and that was the case of a young person under the age of 18. Why 18 was fixed he (Lord Brentford) did not know, but he supposed that anybody over 18 was for the purpose of that clause to be treated as an adult entitled to put himself into a mental home. The case of the young person under 18 he thought should be most carefully considered by their lordships' House, which had always protected the liberty of the subject. Take the case of a boy or girl of 17 who might be a little silly, as the expression was used in some parts of the country, who might be also a great burden at home, troublesome to the parents. That young person, without any assent on his or her part, a boy or girl of 17, nearly 18, might be placed as a voluntary patient—there was not much that was voluntary about it—on the written request of the parent, the guardian, or a person who acted in the position of guardian. In his (Lord Brentford's) view the Bill needed amendment in that respect. There was not even to be a medical certificate, much less any judicial authority. It was merely left to the parent or guardian to say: "I am very worried by Tom or Jane, who is very troublesome. I will lock him (or her) up." Under the Bill he thought it was quite possible to do that. Of course he knew that there was a Board of Control over and above all cases, but Earl Russell had tried to prove too much in regard to the position of the Board of Control. If the control of the Board was so effective in regard to these people who might be placed under voluntary detention, or under Clause 5 in temporary detention, because they were incapable of volition—why trouble at all about medical certificates, why trouble at all about the reception order which still, he took it, would exist under the old law for the man who was flagrantly and patently insane? It was rather remarkable to retain, as the noble Earl said in bringing in his Bill, the greatest safeguards, including the judicial safeguard, in the case of the man who was flagrantly and patently insane, and whom everybody would put into an asylum, while for the more doubtful cases the safeguards were swept away. The noble Earl must reconsider the first clause of the Bill. As regards adults, he (Lord Brentford) would prefer the age to be 21 rather than 18, and he was not sure that the young man or woman of 18 or 21 ought to be allowed to put himself or herself into a mental hospital for treatment without any medical or judicial certificate. That was the position under the Bill, and he was not satisfied that parents or guardians or "any person who undertakes or performs . . . the duty of a parent or guardian"—it was a curious expression—ought to be allowed so put people at the age of 18 into homes for medical care.

The Meaning of "Volition."

If they turned to Clause 6 relating to the temporary treatment of persons without full certification, they found a reference to people who—he thought this was a new expression; he had not been able to find it in any Act of Parliament relating to lunacy—"were incapable of volition." It was difficult to know quite what that meant. The gradations of lunacy were so many and shaded from one to another so easily that he thought the noble Earl had tried to find a new expression to provide for these temporary cases. He wondered whether the noble Earl would consider him (Lord Brentford) incapable of volition if he said: "I am blowed if I will go into a hospital." He would use no stronger language than that. The patient might be slightly insane, but he had enough volition to say: "I will not go in"; and yet he might be a person for whom treatment would be highly desirable. He thought that this portion rather needed amending, and he was certain that there must be an amendment dealing with the question of a judicial decision. The Government had thrown over the Commission and the report which Mr. Macmillan, Earl Russell, and the present Attorney-General had signed. The noble Earl had signed that document, as did his colleagues, including the present Attorney-G and though they signed it with reluctance the at they signed it with reluctance meant th

The Earl of Cranbrook said that some noble Lords had a very poor opinion of the medical officers in charge of institutions. He could not conceive it possible that any medical officer would receive an unfortunate child into an institution who had been brought there by his parents if the child was in a completely sane condition. One point that had not been touched upon was the question of authorities being allowed to have out-patient clinics. That would be a great step in advance. He hoped the time would soon come when out-patient clinics for the treatment of incipient cases, or cases already discharged, would be established all over the country.

Reply to the Debate.

Earl Russell, replying to the debate, said he regarded out-patient clinics as a very valuable feature in treatment. As to the question of protection for the medical profession the provision in the Bill was the very best that all the legal skill brought to bear on the matter could think of. But if their lordships were prepared to extend it further he did not know that he would be prepared to oppose it. As to the views put forward by Lord Brentford perhaps the noble Lord would consult with him, or, better still, with the Minister of Health, in order to see if anything could be done to adjust Lord Brentford's view with the opinion held very strongly by everyone who knew about the matter. He (Lord Russell) felt, however, that if anything too formal was insisted upon, Clause 5 would lose its entire value. He could assure noble Lords that the utmost attention would be paid to their suggestions, and the Government would welcome any assistance in making the measure a better Bill.

The Bill was read a second time.

HOUSE OF COMMONS.

Wednesday, Nov. 27th.

Health of Public Aircraft Pilots.

Mr. Lees asked the Under Secretary of State for Air how many seaplanes were employed on the Imperial Airways' route from Genoa to Alexandria; how many pilots were available for this route; what rest period was arranged for these pilots; whether there had been any cases of sickness amongst the pilots during the last few months; and whether the Air Ministry took any steps to assure itself that pilots in public aircraft were in good health before starting on a journey.—Mr. Montague replied: I assume that my hon. friend is referring to the normal service which runs via Genoa. He is no doubt aware that that service has been temporarily suspended. For the normal route from Genoa to Alexandria three flying boats were employed and four pilots were available for the service. They were only engaged in flying duties on three days out of ten, and I understand that there was not an undue amount of sickness among the pilots during the last few months. As regards the last part, under the existing regulations, pilots of public aircraft are required to be medically examined at least every six months for the renewal of their licences, and in order to ensure the maintenance of their efficiency they are also required to be re-examined and pronounced fit before resuming air duties (*a*) whenever they have performed a total of 125 hours flying as pilot within any period of 30 consecutive days since their last medical examination, and (*b*) after illness or accident.

Thursday, Nov. 28th.

Deaths from Silicosis in Sheffield.

Mr. Hoffman asked the Home Secretary the number of deaths from silicosis in Sheffield for the years 1928 and 1929 respectively, and the number of cases in which compensation had been paid under statutory rules and orders during the same period.—Mr. Clynes replied: I have no accurate information in regard to the first part of this question, but it is estimated that the number of deaths from silicosis or silicosis accompanied by tuberculosis was 28 in 1928 and 35 in 1929. Compensation was paid under the Refractories Industries Scheme in 12 cases, including one fatal case, in 1928, and in ten cases, including three fatal cases, in 1929. Under the Metal Grinding Scheme there were 12 cases, including one fatal case, in 1928. Figures for 1929 are not available yet for the metal grinding industries nor for the sandstone and various industries schemes, which only came into force in the early part of this year.

Prison Doctors and Infliction of the Cat.

Mr. Benson asked the Home Secretary the number of cases during the past three years in which, owing to the effect upon the prisoner, the prison doctor had intervened to postpone the completion of the infliction of the cat in order that the prisoner might recover sufficiently to stand the completion of the flogging; and the number of cases in which more than one postponement had been necessary.—Mr. Clynes replied: There has been no such case in the last three years, and from inquiries made it has been ascertained that officers with over 30 years' experience of the prison service have never heard of such cases. If a medical officer stops corporal punishment his intervention is final, and there is no further corporal punishment.

Inspection of Vivisection Experiments.

Mr. Freeman asked the Home Secretary the number of inspectors of vivisection experiments; whether any or all of them were men who had had a medical training; whether he would consider the appointment in future of men known to be primarily interested in the welfare of animals; and whether he would appoint some women inspectors.—Mr. Clynes replied: There are two inspectors, both of whom have had a medical training. There are no vacancies at present and no further appointments are in contemplation. Should a vacancy arise, the candidate with the best qualifications, irrespective of sex, will be appointed.

Women Medical Officers in Prisons.

Mr. Lovat-Fraser asked the Home Secretary whether there were any women medical officers in women's prisons or sections of prisons; and, if not, whether he would consider the desirability of appointing them.—Mr. Clynes replied: There are two women medical officers at Holloway Prison, and there is a woman medical officer at Aylesbury Borstal Institution. At other prisons where the women form only a small proportion of the prisoners, the difficulty hitherto has been that the appointment of a woman medical officer would mean adding to the staff and paying two officers to do work which can be done by one.

Sexual Offences against Young Persons.

Dr. Phillips asked the Home Secretary whether he was now prepared to say what action he proposed to take to put into operation the recommendations of three departmental committees on Sexual Offences against Young Persons, on the Treatment of Young Offenders, and on Metropolitan Police Courts and Juvenile Courts respectively.—Mr. Clynes replied: Various recommendations of these committees not requiring legislation have already been brought to the notice of the courts. Some of the recommendations have already been passed into law, while others have been noted for legislation at a suitable opportunity. As soon as the state of public business permits the Government is anxious to introduce a Bill to amend the Children Act, 1908, and the recommendations of these committees are being taken into consideration in the framing of the Bill. As regards the Committee on Metropolitan Police Courts and Juvenile Courts, its recommendations do not require legislation, and steps have been taken, or are being taken, to give effect to all of them, including the recommendations in regard to the reorganisation of the juvenile courts in London.

Decrease in Overcrowding.

Mr. Simon asked the Minister of Health whether he had evidence as to whether the overcrowding, as revealed in the 1921 census, had in general increased or decreased since that date in the slum areas in different parts of the country.—Mr. Greenwood replied: I have no direct evidence on this subject, but more than a million and a quarter new houses have been completed in England and Wales since the date of the census of 1921, and this number is greatly in excess of normal requirements. It may, therefore, be assumed that overcrowding has in general decreased.

Local Authorities and the Control of Caravans.

Major Owen asked the Minister of Health whether, in view of the difficulties which were being experienced by local authorities with respect to caravans and other similar dwellings and the permanent nature of many of these dwellings, he would introduce legislation granting local authorities more extended powers to deal with such structures.—Brigadier-General Clifton Brown, Mr. Cocks, and Mr. Oswald Lewis asked similar questions.—Mr. Greenwood replied: My attention has been drawn to this matter, and I have received resolutions from a number of local authorities. I am advised that most, at any rate, of the trouble could be met if local authorities exercised more thoroughly and vigorously the powers which they now possess, and I am not satisfied that further legislation is needed. I am always pleased to give local authorities what assistance I can if they consult me on their particular difficulties.

Undulant Fever.

Lieut.-Colonel Fremantle asked the Minister of Health the number of cases of undulant fever in England and Wales during the last five years; if he had any evidence showing whether there was any connexion between that disease and contagious abortion in cattle; and whether any combined research work was being carried out into the subject by his department, the Medical Research Council, and the Ministry of Agriculture.—Mr. Greenwood replied: Undulant fever is not notifiable in this country, and no exact figures of the number of cases which have occurred are available. I understand, however, that 14 cases have been traced as having occurred in England and Wales during the period referred to. An inquiry into this disease has been made by a medical officer of my department, and his report, which has recently been published, contains evidence, mainly from foreign sources, showing that cases of undulant fever in man have been causally related to cattle affected by contagious abortion. The whole subject is receiving careful attention by my department in coöperation with the Medical Research Council and the Ministry of Agriculture and Fisheries.

Price of Graded Milk Licences.

Brigadier-General Clifton Brown asked the Minister of Health whether, in order to encourage the production of cleaner milk, he would reduce the price of licences for Certified and Grade A (T.T.) milk which the producer had now to pay.—Mr. Greenwood replied:—The amount of the licence fees does not exceed the special cost of administering the grading scheme, and higher prices are charged for these milks than for ordinary milk. I am not at present satisfied that there is sufficient justification for a reduction of the fees but I will consider the matter further in consultation with my right honourable friend, the Chancellor of the Exchequer, when opportunity occurs for the general revision of the Special Designations Order.

Artificial Sunlight Treatment.

Dr. Forgan asked the Minister of Health if it was the intention of the Government to extend the facilities for the preventive administration of artificial sunlight to mothers and children; and, if so, what steps he proposed to take to overcome any shortage of medical practitioners who were qualified for such work.—Mr. Greenwood replied: The extension of facilities for this form of treatment is a matter in the first instance for the local authorities. I am not at present aware of any shortage of doctors who have experience of this method of treatment.

Collection of Refuse in Open Dust-carts.

Mr. Day asked the Minister of Health whether his attenion had been drawn to the manner in which rubbish and refuse was still collected in some of the London boroughs in open dust-carts; and if he would consider introducing legislation to abolish open dust-carts not only in London but in all thickly populated areas.—Mr. Greenwood replied: My attention has been drawn to this matter. Legislation has not up to the present been considered to be necessary. Local authorities are increasingly making use of dust-carts with covers, and are encouraged by my Department to do so. So far as London is concerned, I think it will be best to wait until the *Departmental Committee on London Cleansing* have made their report.

Mental Defectives.

Major Glyn asked the Minister of Health how many defectives were being administered under the Mental Deficiency Act and what was the cost to the local authorities and to the Exchequer; what was the cost of the institutions directly under the administration of the Board of Control, and to what extent local authorities contributed; and how many defectives there were under treatment at these institutions.—Mr. Greenwood replied: The total number of defectives maintained in institutions or under guardianship at the joint charge of local authorities and the Exchequer on Jan. 1st, 1929, was 20,859, and there were 19,606 under supervision. The total cost for the year ended on March 31st, 1929, was £1,216,820. Of this expenditure £607,301 is borne by local authorities and £609,519 by the Exchequer. In addition a relatively small number of defectives was maintained in institutions or under guardianship at the sole charge of local authorities. Particulars of the numbers and cost are not available. The total cost to the Board of Control of State institutions directly under their administration during the year ended on March 31st, 1929, was £45,045, towards which £1838 was contributed by local authorities or relatives of patients. The number of defectives under treatment at these institutions on Jan. 1st, 1929, was 785.

MONDAY, DEC. 2ND.

Grants for Surgical Appliances.

Mr. Day asked the Minister of Pensions the number of cases during the previous 12 months in which he was able to make grants for surgical appliances out of the voluntary funds at his disposal.—Mr. F. O. Roberts replied: During the 12 months ended Oct. 31st, 1929, 81 grants were made from the voluntary fund for the purchase of surgical appliances.

Malaria in Bengal.

Commander Bellairs asked the Secretary for India whether his attention had been drawn to the increase of preventible malaria in Bengal and the recent report of Sir Malcolm Watson to the Ross Institute for an inquiry; whether he would follow the precedent of Mr. Joseph Chamberlain, who instituted an inquiry that led to the stamping out of Mediterranean fever; and whether he would immediately promote liaison work with British Guiana where a similar problem with part East Indian population had been successfully dealt with.—Mr. Wedgwood Benn replied: So far as I am aware there has been no increase in malaria in Bengal in recent years. I understand that Sir Malcolm Watson's suggestion was that an inquiry should be made as to whether the embankments of the Ganges Delta produce conditions favourable to malaria; and, if so, whether a remedy could be found. This matter is now engaging the attention of the Government of Bengal. I may add that a chair of malariology will be established in the new Rockefeller Institute in Calcutta.

Lieut.-Colonel Fremantle: Is it not a fact that no policy has yet been given out that would really reduce malaria; that it requires a great deal more inquiry; and would it not be a good thing to institute a Government inquiry with the different departments concerned with India and the Colonies generally?

Mr. Wedgwood Benn: That is a much wider question. I have stated what steps are being taken in India.

Medical Appointments in India.

Major Graham Pole asked the Secretary for India what action the Government of India intended to take in view of the rejection by the Indian legislative assembly of the proposal of the Government to appoint a European officer of the Indian Medical Service as a whole-time commissioner of medical qualifications and standards; and whether the creation of this post was proposed as an alternative to the creation of a Government commission on medical qualifications and standards or as an expedient pending the setting up of such permanent machinery.—Mr. Wedgwood Benn replied: The demand for a grant for the expenses of this appointment was not rejected by the Legislative Assembly as the House was adjourned before the termination of the debate on it. The Government of India are consulting the provincial governments as to the measures to be adopted to meet the situation and to secure the continued recognition of Indian medical degrees. The creation of the post was proposed as a temporary measure pending the establishment, by legislative enactment, of an all-India Medical Council.

WEDNESDAY, DEC. 4TH.

River Pollution on Dartmoor.

Major Hills asked the Minister of Health whether his attention had been called to the danger of pollution of the Dartmoor rivers by opening china-clay works on Dartmoor; and whether he would consider, without interfering with what might be a valuable industrial enterprise, taking measures against pollution of those rivers.—Miss Lawrence replied: The answer to the first part of the question is in the negative. As regards the second part, the prevention of pollution is a matter for the local authorities, and no doubt this particular case will engage their attention.

School Children and the Schick Test.

Mr. Freeman asked the Minister of Health by what authority local authorities imposed the Schick test against diphtheria on school children; what evidence was there that it prevented diphtheria; what instructions were issued to the parents concerning the matter; how many children were so operated on in 1928 and how many times each; and what was the cost per head of each operation.—Miss Lawrence replied: Local authorities do not "impose" this test on school children. Parents are invited to have their children tested, and, if desired, immunised. The procedure is entirely voluntary. Local authorities are empowered to act for this purpose with the *sanction of my Department* under Section 133 of the Public Health Act, 1875, or Section 77 of the Public Health (London) Act, 1891. Advice is given to parents by the local authority, but no instructions are issued. As regards the second part of the question, my right hon. friend is advised that there is abundant evidence that the practice of active immunisation, applied to persons who have been shown by the Schick test to be susceptible to diphtheria, protects such persons against the disease. My right hon. friend has no information in regard to the last two parts of the question.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdrs. O. J. M. Kerrigan to *Virid*, to *Comus*, and to *President* ; T. Gwynne-Jones to *Fisgard* ; C. J. Aveling to *Britannia* ; G. H. Courtier to *President* ; and E. Kennedy to *Resolution*.

Surg. Lt.-Comdr. D. H. Kernohan to *Comus*.

Surg. Lt.-Comdrs. (D.) : J. L. Edwards to *Pembroke*, for R.N. Barracks, Chatham ; H. J. Luck to *Fisgard* ; W. E. A. Sampson to *Flora*, for R.N. Hospital, Cape of Good Hope ; and D. Barker to *Effingham II*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lts. to be Surg. Lts. : G. O. Barber and E. C. W. Maxwell.

Proby. Surg. Lt. W. T. R. Chapman to be Surg. Lt.

ARMY MEDICAL SERVICES.

Lt.-Col. W. P. MacArthur, R.A.M.C., Professor of Tropical Medicine, Royal Army Medical College, to be Consulting Physician to the British Army in succession to Col. J. C. Kennedy, is proceeding to India on duty.

ROYAL ARMY MEDICAL CORPS.

Maj. J. Boyd relinquishes his temp. commn. and retains the rank of Maj.

Maj. A. Irvine-Fortescue is restd. to the estabt.

Lt. (on prob.) G. F. Harrison, from the secd. list, is rest. to the estabt.

Lt. (on prob.) E. G. C. Darke is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

The undermentioned Lts. (on prob.) are confirmed in their rank : E. M. Hennessy and J. M. Ryan.

REGULAR ARMY RESERVE OF OFFICERS.

The undermentioned having attained the age limit of liability to recall, cease to belong to the Res. of Off. : Col. F. F. Carroll, late R.A.M.C., and Maj. J. B. Clarke.

TERRITORIAL ARMY.

Lt. J. N. C. Ford, late R.G.A. (Spec. Res.), to be Lt.

ROYAL AIR FORCE.

J. W. H. Steil is granted a temporary commn. as a Flight Lt. (Hon. Squadron Leader).

Flying Officer J. C. Neely is promoted to the rank of Flight Lt.

Flight Lt. R. A. W. Kerr is transferred to the Reserve, Class DII.

DEATHS IN THE SERVICES.

Surg. Lt.-Comdr. Gilbert Maliso Graham, R.N. retd., whose death after a long illness was recently announced, entered the Navy as a surgeon in 1914, and was subsequently appointed to H.M. *Emperor of India*, the Flagship of Rear-Admiral A. L. Duff in the Grand Fleet. Two years later he was appointed to the Naval Hospital at Malta, where he served till after the Armistice. In 1920 he joined H.M.S. *Truro*, and during his service with the Mine-sweeping Flotilla was promoted Surg. Lt.-Comdr. He retired in 1922.

POPLAR HOSPITAL FOR ACCIDENTS.—Hitherto this institution has been almost entirely supported locally. The Port of London Authority—which provides a fast ambulance for the transport of casualties—shipping firms, factory employees and patients, all contributed to the cost of maintenance, which amounts to £22,000 a year. The hospital was founded in 1855 to deal with dock accidents, was rebuilt in 1891, and has since then been six times enlarged, but the growth of the docks and shipping business and the increase in heavy motor traffic are such that the hospital has become seriously inadequate. One fourth of the accident cases are children, and recently in one week-end eight cases of fractured skull were admitted. It is stated that the pressure upon the out-patient department is so severe that patients have sometimes to wait four or five hours for their turn ; 52,000 cases are dealt with annually. The X ray apparatus has been in use for 20 years and can deal only with ordinary fractures. It is now proposed to spend £30,000 on improvements, which will include an adequate X ray installation ; and an appeal is about to be made for the money.

Medical News.

UNIVERSITY OF OXFORD : *Radcliffe Travelling Fellowship*.—An examination for a Fellowship of the annual value of £300, tenable for two years, will begin on Feb. 11th.

Candidates must have passed all the examinations required for the B.A. and B.M., degrees and must not have exceeded four years from the time of passing the last examination required for the latter. The successful candidate must devote himself during his tenure of the Fellowship to the study of medical science, principally abroad. The examination papers will be set in physiology, pathology, and preventive medicine, and a subject will be proposed for an essay. There will also be a practical examination in pathology. Candidates may offer in addition a special branch of either medicine or surgery.

Application must be made to the Regius Professor of Medicine before Jan. 20th, 1930.

UNIVERSITY OF CAMBRIDGE.—On Nov. 30th the following degrees were conferred :—

M.D.—R. J. Lythgoe and H. W. Eddison.

M.B. & B.Chir.—M. D. Nosworthy, J. M. Graham, and E. A. Trim.

M.B.—Frank Goldby and J. O. W. Bland.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were approved :—

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

With Special Knowledge of Psychiatry.—F. T. Thorpe and Mary E. Tyars.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were approved :—

MASTER OF MIDWIFERY.

Lily A. Baker, N. R. Mucadam, W. G. Richards, and G. C. Soutter.

ROSS AWARD FUND.—In supplement to his letter on p. 1171 of our last issue Sir James Barr informs us that the Government of India have contributed the sum of £2000 to this Fund. The gift brings the total to £12,082.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The council of this Institute has appointed Prof. William H. Park, Director of the Bureau of Laboratories of the New York Health Department, to be Harben Lecturer for 1930, and Dame Louise McIlroy, Professor of Obstetrics and Gynæcology in the University of London, to be Harben Lecturer for 1931. The Smith Award for 1930 has been given to Dr. H. R. Kenwood, Emeritus Professor of Hygiene in the University of London. This award is made every third year to a medical officer of health "who is recognised as having done the most noteworthy work in the discharge of his official duties."

ORTHOPÆDIC HOSPITALS.—The annual report of the Shropshire Orthopædic Hospital and Agnes Hunt Surgical Home, Oswestry, records a slight falling-off in the number of child patients in consequence of the opening of children's orthopædic hospitals in different parts of the country ; nevertheless 500 adults and 480 children were treated. At the end of the year Dame Agnes Hunt resigned her post as honorary superintendent. Of the income of £48,000, £41,243 was contributed by, or on behalf of, patients. An adjoining property has been purchased for use as a training college. In the school for physically defective children the junior classes are given a good grounding in the buying and selling of household goods, in specially constructed shops, with cardboard coins. The massage department gave over 30,000 treatments. During 1928 the admissions to Wingfield Orthopædic Hospital, near Oxford, numbered 338, of whom 101 were children : in addition, 95 private patients were treated ; and over 18,000 out-patients were attended at the various clinics. The work increased considerably during the year, owing to increased publicity. Rebuilding is fast becoming an urgent necessity. The report of the North Staffordshire Cripples' Aid Society for the year ending March 31st last emphasises the need for a more adequate out-patient clinic and after-care centre. The special orthopædic work of the hospital is still being done, and in the coach-house and stables which were improvised for the purpose in 1918, and the work is greatly hampered by the insufficient number of beds. The orthopædic hospitals, it is pointed out, still have a nursing problem ; since there is no standard, each hospital has to make the most suitable arrangements for itself.

WALSALL GENERAL HOSPITAL.—"The sheer impossibility of dealing adequately with an incessant stream of accidents" has, the annual report records, led to the erection of a new casualty department, opened in March last. There were 17,940 attendances in the orthopædic department and 7635 treatments and exposures in the X ray department.

BRISTOL HOSPITAL FOR CHILDREN AND WOMEN.—This hospital is to be enlarged at a cost of £90,000. The present building was opened in 1886, and many extensions and improvements have since been made. The proposed scheme of reconstruction includes the addition of an extra storey to two of the blocks provided with sunlight balconies for open-air treatment.

ENLARGEMENT OF WORTHING HOSPITAL.—Two new wards, forming a further instalment of the enlargement of this institution, were opened last week by Mrs. Arthur Lloyd, who has contributed £8500 towards the cost of the work. Since the extensions began in 1926 the number of beds has been increased from 46 to 78, and various improvements have been made at a cost of £12,000. The new wards (for women) contain 20 beds in place of the former nine, and new X ray and massage departments have been added.

ST. BARTHOLOMEW'S HOSPITAL, ROCHESTER.—The average cost of the 1858 in-patients admitted last year was £8 12*s.* 7*d.*; the out-patients cost 6*s.* 6*d.* each. An extension fund of £80,000 is being collected, and various extensions and improvements are in progress. A new pathological department has been provided, and there are to be new out-patient and casualty departments. Paying patients are now received at a minimum charge of three guineas a week, exclusive of medical and surgical fees.

DENTAL HOSPITAL OF IRELAND.—The annual report shows that in the twelve months under review over 18,000 patients attended, an increase of nearly 1000. Only 16 teeth were extracted without an anæsthetic. The Dublin schools sent 1075 children for treatment. Subscriptions amounted to no more than £381, "an amount not very creditable to a large city like Dublin." The Dental Branch of the United Kingdom has made a grant of £900. There are 50 students.

MANCHESTER STUDENTS' RAG.—A proposal has been made that the entire proceeds of the Annual Rag on Shrove Tuesday next year should be given for the purpose of building a new wing to the Cancer Hospital. After a full discussion the students of the University decided to leave the allocation of the funds to the Hospital Council, but have ear-marked £1000 each for the Christie Cancer Hospital, the Dental Hospital, and the North Manchester Maternity Hospital.

UNIVERSITY OF LIVERPOOL.—At the yearly meeting of the University Court on Nov. 29th the Vice-Chancellor announced that within the last six months the University had received something like £40,000 for the endowment of research—the greater part of it to be devoted to special fields. Upwards of £20,000 was to go for research in cancer and tuberculosis, another £10,000 to be devoted to research in any field of University study, and another £10,000 by various subscribers for the endowment of research in animal pathology in the severe diseases which from time to time decimated our herds of cattle.

DONATIONS AND BEQUESTS.—Mr. Alfred Hayes, of Hawkestone, Western Park, Leicester, left £2000 to the Leicester Infirmary and £1000 to the Home for Incurables, Leamington, Warwickshire.—Mr. Anthony Brown, of Pond End, Knaresborough, Yorks, left practically the whole of his estate to charitable and philanthropic objects. Amongst the bequests are £2000 to Harrogate General Infirmary to endow two beds in his name, £1000 to Royal Bath Hospital, Harrogate, and £1000 to National Institute for the Blind. The residue of the property is left between Newcastle General Infirmary, Harrogate Infirmary, and Leeds General Infirmary.—Miss Mary Ann Shelton, of Pinchbeck-street, Spalding, in addition to other bequests, left £2000 subject to a life trust equally between the London Hospital and the Cancer Hospital, Fulham-road; £1000 each to the London Hospital, Whitechapel-road, and the Cancer Hospital; £500 to the Royal Society for the Prevention of Cruelty to Animals.—Mr. John Cross, of South-drive, Harrogate, left, besides other bequests, £1000 to the York County Hospital; £200 to the Harrogate Infirmary; £100 each to the Yorkshire Home for Incurables, Harrogate, and the Rawson Convalescent Home, Harrogate.

STOCKPORT INFIRMARY.—The work of this hospital has for some time past been impeded by lack of room. Various extensions have been made, but it is still impossible to cope with the demands, and it has therefore been decided to build an entirely new hospital. A site of 14 acres has been purchased, upon which will be erected a building to hold 400 beds. The work, which will need five years for its completion, is estimated to cost £250,000. There are at present 130 beds.

BRADFORD MUNICIPAL HOSPITAL.—The report for 1928 by Mr. B. Holroyd Slater, the medical superintendent, shows that since 1920, the first year of municipal control, the number of patients admitted has increased by 88 per cent.—7176 as compared with 3804; the number of births by 814 per cent., and the number of operations by 418 per cent. Puerperal sepsis provided the largest number of cases (63) of infectious disease. There were 11 maternal deaths, 951 live births and 60 stillbirths.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Dec. 9th.—5 P.M., WAR. Paper:—Surgeon-Commander A. E. Malone, R.N.: *Some Remarks on the Evolution of Naval Hygiene.*

TUESDAY.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Communications and discussions: Dr. J. W. Trevan, Dr. T. Izod Bennett, Dr. D. T. Davies, Dr. L. E. H. Whitby, and others: Phenylhydrazine in the Treatment of Polycythæmia. Dr. Bernard Schlesinger, Dr. F. J. Poynton, and others: Nirvanol in the Treatment of Chorea.—8.30 P.M., PSYCHIATRY. DISEASE IN CHILDREN. (Members of the Child Guidance Council will also take part in the following discussion.) Special Discussion on: The Difficult Child. Speakers: Dr. Bernard Hart, Dr. Emanuel Miller, Psychiatry. Dr. Hector Cameron, Section for the Study of Disease in Children. Dr. W. Moodie, Miss Fildes, Child Guidance Council.

WEDNESDAY.—5.30 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Pathological Meeting preceded by a Discussion on Complications of Operations for Piles, to be opened by Mr. Cecil Rowntree (President of the Subsection). Cases and Specimens:—Mr Cecil A. Joll: Combined Abdomino-perineal Excision of the Rectum and Wertheim's Hysterectomy for Carcinoma of the Recto-vaginal Septum. Mr. Cecil A Joll: Abdomino-perineal Excision of Rectum for Endometrioma. Dr. H. J. B. Fry: Multiple Papillomatosis of the Colon with Double Primary Carcinoma of the Rectum. Dr. H. J. B. Fry: Diverticulitis with Carcinoma of the Rectum. Dr. H. J. B. Fry: Sacro-coccygeal Chordoma Simulating a Colloid Carcinoma of the Rectum. Dr. H. J. B. Fry: Colloid Carcinoma of the Rectum in a Young Subject, with Metastases in the Skull. Dr. H. J. B. Fry: Papilloma of the Rectum Removed by Perineal Excision. Dr. H. J. B. Fry: Secondary Melanotic Sarcoma of the Colon. Dr. Graham Hodgson: Cases of Diverticulitis.

THURSDAY.—8.30 P.M., NEUROLOGY. Short Papers:—Dr. James Collier: Ocular Paralysis in Diabetes. Dr. Macdonald Critchley: The Syndrome of the Anterior Cerebral Artery.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Dr. C. Worster-Drought: A Case of Dystrophia Myotonica. Dr. Terence East: Case of Polycythæmia Vera. Mr. Cecil P. G. Wakeley: Case of Large Chondroma of the First Rib in a Child. Dr. Harold Cookson: Specimen, Rheumatic Carditis, Pan-valvulitis. Dr. F. Parkes Weber: Combined Degeneration of the Spinal Cord, without the Blood Picture of Pernicious Anæmia. Dr. H. V. Morlock: Case of Familial Acholuric Jaundice. Mr. Harold Edwards: Severe Deformity following Burns. Dr. Dorothy Hare: Case of Congenital Morbus Cordis with Ascites. Dr. E. Stolkind: Case of Abnormality of the Gall-bladder. Dr. Norman Hill: Case of Amyotonia Congenita. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at the Royal London Ophthalmic Hospital, City-road, E.C.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Dec. 9th.—8.30 P.M., Discussion on: The Treatment of Head Injuries. To be introduced by Mr. Wilfred Trotter.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY, Dec. 12th.—8.15 P.M., preceded by a Demonstration at 7.45 P.M. (at 11, Chandos-street, Cavendish-square), Prof. Warrington Yorke: Blackwater Fever.

BIOCHEMICAL SOCIETY.

Friday, Dec. 13th.—3 P.M. (in St. Bartholomew's Hospital E.C.). Communications:—H. E. Archer and G. A. Harrison: The Effect of Reaction on the Heat Test for Bence-Jones' Proteinuria. W. H. Hurtley: Notes on the Determination of Iodine in Blood, &c. K. V. Thimann: The Precipitation of the Basic Amino-acids of Proteins by Phosphotungstic Acid. M. J. Rowlands and B. Wilkinson: Vitamin Content of Grass Seeds in Relationship to Manures. A. G. Norman: The Biological Decomposition of Plant Materials. D. R. P. Murray and C. G. King: The Stereochemical Specificity of Esterases. H. Chick and M. H. Roscoe: Stability to Heat of Vitamin B2 (Anti-dermatitis, Anti-pellagra). F. K. Herbert and M. C. Bourne: The Non-glucose Reducing Substances of Blood with Special Reference to Glutathione. B. W. Town: Isolation of Isoleucine from Gliadin. H. G. Reeves and E. T. Renborn: Some Properties of Dihydroxyacetone. J. M. Gulland and R. A. Peters: Observations on the Reducing Substances in Avian Blood. G. Graham: The Presence of Homogentisic Acid in the Blood of Patients with Alkaptonuria.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon., 5 P.M., Lecture by Mr. John O'Malley: Inflammations of the External Ear. No fee.—National Hospital for Diseases of the Heart, Westmoreland-street, W. Wed., 6 P.M., Demonstration by Dr. T. F. Cotton. No fee.—South London Hospital for Women, 103, South Side, S.W. Wed., 2.30 P.M., Demonstration by Miss Huxley (General). Open to women graduates only. No fee.—Infants Hospital, Vincent-square, S.W., Afternoon Course, second week.—London Temperance Hospital, Hampstead-road, N.W., Practitioners' Course, second week.—Further particulars from the Fellowship of Medicine.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. Hammersmith, W.

Monday, Dec. 9th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

Tuesday.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Shaw, Medical Out-patients. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

Wednesday.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

Thursday.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

Friday.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Shaw: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department.

Saturday.—9 A.M., Mr. Vlasto: Throat, Nose and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits. Anæsthetic Courses.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, Dec. 9th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations. 4.30 P.M.: Demonstration on Practical Neurology by Dr. L. R. Yealland.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

Monday, Dec. 9th.—5 P.M., Mr. J. C. Dawes, M.I.Mech.E.: Disposal of Refuse.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Dec. 12th.—9 P.M., Dr. T. East: The Electrocardiograph and its Use: A Practical Demonstration.

SOUTH-WEST LONDON POST-GRADUATE SOCIETY, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, Dec. 11th.—4 P.M., Mr. E. T. C. Milligan: Modern Methods of Diagnosis of Rectal Diseases.

ROYAL ANTHROPOLOGICAL INSTITUTE.

Wednesday, Dec. 11th.—5.30 P.M. (in the Polytechnic Hall Extension, Great Titchfield-street, W.), Prof. F. G. Parsons: The Anthropological History of the Modern Englishman.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Friday, Dec. 13th.—4 P.M., Dr. Dan McKenzie: Early Mastoid Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Dec. 10th.—5 P.M., Dr. S. E. Dore: Erythemato-squamous Eruptions.

Thursday.—5 P.M., Dr. W. N. Goldsmith: Pigmentation of the Skin.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

Wednesday, Dec. 11th.—4.15 P.M., Clinical Meeting. Cases will be demonstrated in the wards. Tea at 4 P.M. Medical Practitioners invited.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

Wednesday, Dec. 11th.—4 P.M., Prof. Winifred Cullis: Speed as a Psycho-Physiological Factor in the Life of To-day.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.

Friday, Dec. 13th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.). Dr. R. O. Moon: The History of Medicine and the Part Played by the British Race.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, Dec. 10th.—4.15 P.M., Mr. W. H. Hey: Post-operative Embolism.

ANCOATS HOSPITAL, Mill-street, Manchester.

Thursday, Dec. 12th.—4.15 P.M., Dr. E. W. Twining: X Ray Treatment of Hyperthyroidism and Blood Diseases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, Dec. 13th.—3.30 P.M., Mr. G. Simpson: Cystoscopy.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, Dec. 11th.—4.15 P.M. (in the Victoria Infirmary), Dr. A. McLachlan: Skin Cases.

Appointments.

Galloway, R. M., M.D. Edin., D.P.H., has been appointed Medical Officer of Health, Dewsbury.

Mackenzie, J. J. R., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts at King's Cliffe, Northampton.

Massey, A., M.D. Leeds, D.P.H., Medical Officer of Health for Coventry.

Bolingbroke Hospital: Carew-Shaw, E., M.R.C.S, L.R.C.P. Lond., Clinical Assistant Ear, Nose and Throat Department; Walker, G. B. W., M.B., B.Chir. Camb., F.R.C.S., Resident Medical Officer.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital, 91, Finchley-road, N.W.—Hon. Radiologist. Hon. Surg. Reg. Also Two H.S.'s. Each at rate of £150.

Barnet, Herts, Wellhouse Hospital.—Obst. Res. and Asst. M.O. At rate of £250.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Bolingbroke Hospital, Wandsworth Common, S.W.—Hon. Anæsthetist.

Brighton County Borough Infectious Disease Hospital, &c.—Res. M.O. £350.

Brighton, New Sussex Hospital for Women and Children.—Radiologist.

Bristol General Hospital.—Surgeon, Asst. S., Asst. P., Clin. Assts., Dental S. Also Pathologist. All Honorary.

Bristol Royal Infirmary.—H.S. to Ear, Nose and Throat Dept. At rate of £60.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Cairo, Egyptian University, Faculty of Medicine.—Two Surgical Tutors. £E35 monthly.

Canterbury, Kent and Canterbury Hospital.—H.P. £125.

Cardiff, Prince of Wales' Hospital.—Res. Surg. £350.

Carlisle, Cumberland Infirmary.—Pathologist and Bacteriologist. £900.

Chelsea Hospital for Women, Arthur-street, S.W.—Pathologist. £40.

Chester, Wrenbury Hall Tuberculosis Training Colony.—Res. H.P. £250.

Dorchester, Dorset Mental Hospital, Herrison.—Jun. Asst. M.O. £300.

Dreadnought Hospital, Greenwich.—Med. Supt. £300.

Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100.

Evelina Hospital for Children Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250. Also Hon. Asst. Phys.

Greenock Royal Infirmary.—Two H.S.'s. Each £100.

Grocers' Company, Grocers' Hall, E.C.—Research Scholarships. £300.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hampshire County Council.—Asst. County M.O. £600.
Hove Hospital, Sackville-road.—Res. M.O. £150.
Huddersfield Royal Infirmary.—Res. Surg. O. £220.
Hull Royal Infirmary.—Second H.S. At rate of £160.
Italian Hospital, Queen-square, W.C.—Two Hon. Surgeons.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.
Liverpool Hahnemann Hospital.—H.S. At rate of £100. Also Hon. Path. £25.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. Med. Supt. £250.
London Lock Hospital, Dean-street and Harrow-road, W.—Second Anæsthetist. 1 guinea each attendance.
London University.—Geoffrey Duveen Travelling Studentship. £450.
Manchester Ancoats Hospital.—Asst. Pathologist. Also Med. Reg. and Surg. Reg. Each £100.
Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500.
Manchester, Salford Royal Hospital.—Res. Surg. O. £200. Also two Res. H.S.'s to special departments. Each at rate of £125.
Metropolitan Hospital, Kingsland-road, E.—Asst. S. Also Two Anæsthetists.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Nuneaton Borough.—Asst. M.O.H. £600.
Rochester, St. Bartholomew's Hospital.—Third Res. M.O. At rate of £175.
Royal London Ophthalmic Hospital, City-road, E.C.—Asst. Surgeon.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £180.
St. Leonards-on-Sea, Buchanan Hospital.—Sen. and Jun. H.S.'s. £175 and £125 respectively.
Salisbury General Infirmary.—Two H.S.'s.
Scotland Dept. of Health, Bacteriology and Medical Statistics.—M.O.'s. £600.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Sheffield Royal Infirmary.—H.P., H.S., Ophth. H.S., Asst. Ophth. H.S. Also Asst. Cas. O. Each at rate of £80.
Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. Pathologist. £250.
Wigan Infirmary.—Third H.S. £150.
Winchester, Royal Hampshire County Hospital.—Hon. Clin. Asst. for Ophth. Out-Patient Dept. Also Sen. Res. M.O. £200. H.S. £150.
Windsor, King Edward VII. Hospital.—Two H.S.'s. Each £100.
The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Windermere (Westmorland) and Wirksworth (Derby).

Births, Marriages, and Deaths.

BIRTHS.

ATKINSON.—On Nov. 28th, at Grosvenor-street, W., the wife of Dr. C. Hewitt Atkinson, of a son.

BELFRAGE.—On Nov. 30th, at 15, Somers-place, W.2, to Judith, wife of Dr. Douglas Belfrage—a son.

BROWNING.—On Nov. 25th, at Courtfield-gardens, the wife of Basil Browning, M.D., of a son.

JACOBS.—On Nov. 30th, at Maida Vale-mansions, W., to Dr. Elizabeth Jacobs, wife of Dr. L. Jacobs, of a daughter.

ROXBURGH.—On Nov. 26th, at Redington-road, Hampstead, the wife of A. C. Roxburgh, M.D., F.R.C.P., of a son.

SWAINE.—On Nov. 28th, at Beaumont-street, W., the wife of Dr. R. O. Swaine, Bedford House, Bognor, of a daughter.

MARRIAGES.

FERGUS—SMITH.—On Nov. 30th, Andrew Naismith Fergus, M.B., Ch.B., to Jean Elizabeth, elder daughter of Gilbert Smith, M.D., F.R.C.S., and Mrs. Smith, of Hindhead.

O'FLYNN—LEONARD.—On Nov. 20th, at Corpus Christi Church, London, by the Rev. Father E. O'Flynn, Surgeon-Commander J. A. O'Flynn, R.N., to Lynda Avis Lilian Leonard.

DEATHS.

BURKITT.—On Nov. 23rd, at Warneford House, Ravenstone, Leicestershire, after four days' illness, John Colley Smyth Burkitt, M.D.

BYRON.—On Nov. 25th, at "Bellgrove," Gunterstone-road, West Kensington, London, John Lean Byron, L.D.S. R.C.S. Edin.

COCKBURN.—On Nov. 26th, the Hon. Sir John Alex. Cockburn, K.C.M.G., M.D., aged 79.

DAVIES.—On Nov. 24th, Dr. Arthur Templer Davies, aged 71.

DEWAR.—On Nov. 27th, at Edinburgh, Thomas Finlayson Dewar, C.B., M.D., D.Sc., Department of Health for Scotland, aged 63.

MONTGOMERY.—On Nov. 28th, at Roebuck Park, Dundrum, Co. Dublin, Edward Hugh Montgomery, M.D., of Careysville, Fermoy, Co. Cork, aged 60.

SLOGGETT.—On Nov. 27th, suddenly, Lieut.-General Sir Arthur Sloggett, K.C.M.G., K.C.V.O.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE MECCA PILGRIMAGE, 1929.

A DOCTOR standing on the banks of the Suez Canal near Ismailia in June, 1929, saw a ship approaching from the south with a marked list to port. When she drew abreast of the watcher she proved to be a pilgrim ship; the afternoon being hot, the travellers had all crowded to the port side to catch what little wind was stirring. Their numbers were so great that they appeared to cover all the deck space, while the ship was unable to right herself from the list produced by their weight. It is hard to imagine the conditions on a ship so grossly overcrowded, especially when oriental standards of cleanliness are taken into consideration; moreover, the passengers generally prepare their own food, and latrine accommodation is none too plentiful on pilgrim ships.

The Egyptian Government has been making a determined effort this year to provide better conditions for pilgrims visiting Hedjaz. The "*Khedivial Mail Line*" received the concession for the transport of pilgrims, and the results of examination of their boats by the Egyptian authorities appears to have been satisfactory. The largest of these was authorised to take 1505 pilgrims and the smallest 742. The Egyptian authorities advise, however, that 1500 should be the highest number ever carried in future. They cite as an example of overcrowding the case of the *Plata*, a boat of another line, which carried 2000 passengers and three medical officers. Aboard this ship seven persons died between Djeddah and Tor; 11 were in hospital on arrival, four of whom were moribund; 51 were sent into hospital at Tor, of whom nine died. It is thought that the ship was short of provisions as a result of carrying a consignment *of strange pilgrims before returning to pick up those* for whom it had been chartered, and it is suggested that ships should not be authorised for such usage in future. The conditions on another ship, the *Riad*, were found to be extremely unsatisfactory; there was accommodation for only 308 pilgrims but 431 were taken; there was a lifeboat capacity only for 90 persons; washing and sanitary arrangements were hopelessly insufficient; the wireless apparatus consisted of a receiver only, and there was no operator on board. This ship was suspended from further transport of pilgrims by the Director of the Quarantine at Tor.

Attempts are now being made to vaccinate all pilgrims and to inoculate them against cholera before they reach Hedjaz. This year nearly all the pilgrims from the north received both forms of protection, as did those from the south who passed the island of Kamaran. Pilgrims from South and East Africa and from Yemen, Assyt, and Hadramout arrive in small groups, not by pilgrim ships, and probably receive neither vaccination nor inoculation. The problem of suitable protective measures is difficult to solve in view of the large numbers involved; this year it is estimated that 120,000 persons were present on the plains of Arafat on the first day of the feast. Statistics from Hedjaz are naturally difficult to obtain; the deaths from small-pox and dysentery show an increase this year over those recorded in 1928, but this may be because they have been more carefully observed. The water-supply to the pilgrims, which has sometimes been insufficient at Hedjaz, was plentiful this year as a result of a rainy winter. Condensers are available at Djeddah and Yambo.

There can be no doubt that the quarantine arrangements at Tor, which include a hospital and an efficient medical and nursing staff, do much to prevent epidemics following the return of pilgrims to their homes. This year 29,358 persons passed through the settlement; only 43 deaths are recorded and autopsies were performed in all cases; six of these died of dysentery and two of typhoid; none of typhus, small-pox, or cholera. The stools of all cases receiving medical treatment were examined for the cholera vibrion. The danger to pilgrims from infected persons joining the pilgrimage from areas in which epidemics are in progress is considered in the report of the Conseil Maritime *et Quarantenaire d'Egypte for 1929. Epidemics of small-pox* occurred in Iraq and the Sudan between October, 1928, and April, 1929; there was a small epidemic of plague in Upper Egypt and a larger one (101 cases) in Morocco. There were 953 cases of typhus in Egypt and 32 in Palestine during the same period.

The yearly pilgrimage will remain a danger to all the countries from which pilgrims are drawn as long as the conditions of transport and accommodation remain as scanty and unhygienic as at present. Efficient reorganisation of the pilgrimage in every direction is needed and should be facilitated by the governments of the large number of countries involved.

ENLARGEMENT OF A DUBLIN HOSPITAL.

Jervis-street Hospital is the oldest of the Dublin voluntary hospitals, having entered its third century some 11 years ago. It was originally founded in Cook-street by six surgeons, and its rapid success caused its removal two years later to the Inns Quay, where the Four Courts now stand. When the site was wanted for the erection of the Four Courts nearly 60 years later, the governors bought the town house of the Earl of Charlemont in Jervis-street, and occupied it from 1786 to 1803, when it was replaced by a more commodious building. This in turn was replaced in 1887 by the present hospital. Various additions have since been made, of which the most important were a new out-patient department in 1910, and a new theatre block in 1919. Last week the Archbishop of Dublin opened a new wing, which contains a chapel, and improved accommodation for the Sisters of Mercy, who control the nursing, and for the resident staff. The hospital is now very thoroughly equipped in accordance with modern ideas. It is situated in the heart of the city, surrounded by many industrial works and crowded tenement areas. It deals, therefore, both with an exceptionally large number of accidents and with much sickness among the very poor. It is gratifying that the governors and medical staff are actuated by a progressing spirit.

MEDICAL PROGRESS IN CEYLON.

IN the annual general report for 1928, the section devoted to public health begins with the gratifying assurance that "there are few countries in the world in which medical aid is more generously distributed by the State than Ceylon." In proof of this it is mentioned that there are 101 government hospitals and asylums with provision for 10,250 beds. In Colombo, the capital, are situated a general hospital with 850 beds, an ophthalmic hospital, a lying-in home, a hospital for women (Lady Havelock Hospital), a hospital for children (Lady Ridgeway's Hospital), a bacteriological institute, a Pasteur institute, a dental institute, and a home for incurables. At Angoda, six miles from Colombo, there is a hospital for infectious diseases, with 122 beds. There are special dispensaries at Kandy, Galle, Jaffa, and Batticola for the treatment of eye diseases. There is a lunatic asylum at Angoda and two leper asylums—one at Hendala in the Western Province and one at Mantivu in the Eastern Province. As regards the prevention of tuberculosis, in Colombo there is the King Edward VII Ante-Tuberculous Institute, at Kandana there is a sanatorium of 72 beds, and at Ragama there is a hospital for chronic cases. In addition to government hospitals, the owners of estates have provided 81 estate hospitals. There are also 575 central and branch dispensaries provided by government, and 684 estate dispensaries.

A Year's Work.

Dealing with the work of the year, the report states that the campaign against ankylostomiasis was continued, and in addition to the treatment afforded to the general public at hospitals and dispensaries throughout the island, 107,435 school-children and 124,336 estate coolies were treated by medical officers of the campaign staff. The activities of the anti-malaria campaign also were maintained at Chilan, Kurunegala, Anuradhapura and Trincomalee. An ordinance for the prevention of mosquito-breeding has been placed before the Legislative Council. Quinine was distributed very widely throughout the island. The number of persons treated at the Pasteur institute was 1448.

During the year there were in Colombo 40 cases of plague, 37 of which were fatal, this being the second lowest number of cases of death on record since the first appearance of plague in 1914. Out of the 40 cases, 27 were of the bubonic type and 13 of the septicæmic. All the septicæmic cases proved fatal, while the three recoveries were among those suffering from the bubonic type. Plague broke out in Kandy in the last quarter of 1927, and before the end of the year there were altogether 30 cases (26 fatal). By the beginning of 1928 the disease was got under control, and there were only eight further cases (six fatal). There were five cases of cholera in the island, of which four were fatal, compared with 11 cases and six deaths in 1927. There were 16 cases of small-pox with one death, as against 27 cases and five deaths in 1927.

Vital Statistics.

The estimated population of Ceylon on Dec. 31st, 1928, was 5,421,861. The total number of arrivals during the year amounted to 289,762, and of departures to 237,670. Of the former, 93 per cent. came from India, and of the latter, 92 per cent. were bound for India. The racial distribution of the population was, at the time of the last census (1921) as follows:—Europeans, 8118; Burghers and Eurasians, 29,439; Sinhalese, 3,016,145; Tamils, 1,120,059; Moors, 284,964; Malays, 13,402; others, 26,469. The births registered during the year numbered 213,311 (108,841 males and 104,470 females), being higher than the number registered in any previous year since registration was introduced. The birth-rate was equal to 40·0 per 1000 of the estimated population, as against 39·5 in the preceding year, and 38·8 the average for the ten years 1918-1927. The deaths of 123,337 persons were registered in 1928, as against 113,853 in 1927, and 138,853 the average for the previous ten years. The death-rate for 1928 was equal to 21·8 per 1000 of the estimated population, and 3·1 per 1000 higher than that recorded in 1927. The average for the past decade was 28·5. The number of infant deaths in 1928 was equal to a rate of 177 per 1000 births, as against 160 in 1927, and 188 the average for the past ten years. The birth-rate in Ceylon is very high compared with that prevailing in some western countries. The infant mortality-rate is greatly influenced by the birth-rate, so that it is not an unusual feature to find a high infant mortality-rate in countries that have high birth-rates and a low infant mortality-rate in countries that have low birth-rates. Though the Ceylon rate when judged by the standards of advanced western countries appears to be unsatisfactory, there is not much cause for apprehension when the climatic and other conditions in the island are taken into account.

Causes of Death.

The classification of causes of death is based on the international or Bertillon system. This was originally introduced into Ceylon in 1911, and has since undergone a revision. The revision, which is that of 1920, has been in use here for the last two years only. Owing to the absence of compulsory certification of causes of death among a very large section of the population, the statistics, particularly of diseases requiring scientific knowledge for diagnosis, are of doubtful value, but there is reason to believe that a definite though slow progress in accuracy is achieved every year. Owing to lack of certification a very large number of deaths appear under the heading "pyrexia," which is admittedly a vague cause of death. This cause, which includes all cases of fever not otherwise defined, was stated in the deaths of 18,051 persons—or 14 per cent. of the total deaths. In the previous year 13,502 deaths were registered under the cause. There is no doubt that a considerable number of the deaths so registered were actually due to malaria, but in the absence of their being so stated in the returns by village registrars, the deaths are classified under the general heading "pyrexia." Another prolific cause of death in the island is infantile convulsion, from which during the year under review there were 16,042 deaths—or 12 per cent. of the total deaths. The death-rates from some of the more important diseases registered in Ceylon in 1928 as per million of the estimated population were:—pyrexia, 3553; infantile convulsions, 3007; pneumonia, 1658; diarrhœa and enteritis, 1655; dysentery, 616; phthisis, 631; malaria and malarial cachexia, 420; premature birth and congenital defects, 419; ankylostomiasis, 405; influenza, 307; puerperal septicæmia, 204; bronchitis, 239; enteric fever, 108; cancer, 103.

REGIMENTAL COLOURS OF THE INDIAN ARMY.

To the Editor of THE LANCET.

SIR,—I am collecting information regarding the regimental colours, past and present, of the Indian army, and should be particularly grateful if any of your readers could assist me in tracing some flags once in the possession of a Surgeon-Major Newton, who lived at Cheltenham many years ago.

I am, Sir, yours faithfully,

H. BULLOCK (Capt.).

East India United Service Club, St. James's-square, S.W.,
Dec. 3rd, 1929.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, GLASGOW.

THIS hospital is to be congratulated on its first medical report. The period covered is from April 1st to Dec. 31st, 1928, during which time 2033 in-patients were treated and 1836 operations were performed. The classification of cases is done clearly on pathological lines and it should have considerable statistical value; a useful distinction is made between parous and nulliparous patients. It is hoped that the governors of the hospital will make the production of this report an annual event.

Dr. R. M. B. MacKenna desires to state that the public advertisements issued in the Seacombe district of Liverpool last week with regard to a lecture on a "lay" topic which he delivered on Nov. 24th, were issued without his knowledge or consent, and that he demanded their immediate obliteration within half an hour of learning of their publication.

An Address

ON

MODERN RADIOLOGICAL DEVELOPMENTS IN GERMANY.

Delivered at the Annual Meeting of the Institute of Radiology, Incorporated with the Rontgen Society, on Dec. 6th

BY FFRANGCON ROBERTS, M.D. CAMB.,
M.R.C.P. LOND.,

ASSISTANT PHYSICIAN, IN CHARGE OF THE X RAY DEPARTMENT, ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

I PROPOSE first to describe the remarkable strides which radiology is making in Germany at the present day; secondly, to say something of the economic aspects of the movement; and thirdly, to offer a few suggestions for the improvement of radiology in this country.

A MODEL INSTITUTE.

I shall begin by giving an account of the new radiological institute at the Städisches Krankenhaus or municipal hospital at Frankfort-on-Maine. This institute, which is under the direction of Prof. Holfelder, has only just been opened and is probably the most modern and the best equipped in Europe. The building consists of three floors and a basement. The basement is given up mainly to diathermy, ultra-violet light, and to photographic work other than the actual developing of X ray films. There are six cubicles for diathermy, while for light treatment there are four double cubicles and a large room for children.

The *ground floor* is entirely for radiographic diagnosis. On one side of the main corridor are six large rooms in all of which screening can be carried out. The first room is adapted for operative work such as pyelography and myelography; the second, third, and fourth rooms are for gastro-intestinal work, the fourth being also used for the heart and lungs; the fifth is for the skull and teeth, and the sixth for the limbs. Each room is provided with two dressing-rooms which open at one end into the corridor and at the other into the screening-room. By this means the preparation of patients is carried out with the minimum of inconvenience. Adjoining each screening-room is a small cabin containing the switchboards. This cabin is separated from the screening-room by barium-brick walls and a lead glass window, but by an ingenious device the operator, while completely protected from X rays, can easily hear the instructions called out by the person carrying out the investigation. The high tension apparatus—and this is a great feature of the institute—is housed on a *mezzanine floor* directly above the control cabins and dressing-rooms. Thus the amount of apparatus in the screening-rooms is reduced to a minimum and a greater safety both for the apparatus and for those who come in contact with it is assured. A window in the ceiling of the cabin permits the operator to read the output of the machine as registered on the clocks above. On the opposite side of the corridor are the developing-rooms, a large room for washing, drying, and viewing films, this room being also used for lectures, a kitchen for the preparation of barium meals, waiting-rooms both for ambulatory and bed patients, and administrative offices.

The *first floor* is for X ray therapy. This is carried out in two large cheerful well-ventilated rooms with big windows. In each room are three large therapy tubes enclosed in so-called "cannons," in the design of which Prof. Holfelder has to my mind displayed great ingenuity. They project horizontally into the room from a semi-octagonal glass enclosure through which they connect to the high-tension apparatus placed on the floor above. They can be raised or lowered and rotated through a horizontal axis with the greatest ease, with the result that any part of the body can be treated with very little discomfort to the patient. They are also perfectly shock-proof; any part of the outside of the cannons can, in fact, be freely handled while the tube is in operation. A further point is that no radiation can escape unless a filter is in position. Patient, operator, and attendant are thus quite free from danger. There is nothing to alarm the patient or to give him a feeling of despair as is so often the case in rooms devoted to this purpose. On the contrary, he finds himself in a atmosphere of cheerfulness and hope. The control cabins are arranged as previously described for diagnosis. On the opposite side of the corridor are waiting-rooms and rooms for surgical dressings, for examining patients, and for special investigations such as basal metabolism. On this floor, too, are the director's room, offices, and a library.

On the *second floor* is the high-tension plant for therapy. These are of the "stabilivolt" or condenser type, the current being led below through gaps in the floor into the semi-octagonal enclosures already described and thence into the cannons. A small room at the end is for standardisation and is so arranged that any apparatus at will can be connected with the measuring instruments. The remainder of this floor contains storage-rooms for films, workshops, and quarters for the resident staff.

The cost of this building, excluding the actual apparatus but including the furniture, fittings, and wiring, was about £25,000, or £2 14*s.* per cubic metre. The expense was borne partly by the hospital—that is to say, by the State, for this hospital, like most in Germany, is State-controlled—and partly by the Allgemeine Ortskrankenkasse which is the largest insurance society in Germany. This society, by way of lessening its expenditure on X ray fees, had intended building its own department, but decided that the interests of economy would be better served by combining with the hospital.

The institute has been designed to cope with 120–200 radiological examinations and 90–120 treatments per diem. It may be thought that this accommodation would satisfy the needs of Frankfort with its 500,000 inhabitants. Such, however, is very far from being the case, for there are many other X ray departments in the town, and even in the same hospital there is another, attached to the medical clinic, where at least as much X ray diagnosis is being carried out as in Prof. Holfelder's institute.

OTHER RADIOLOGICAL DEPARTMENTS.

Passing now to other towns, I found that at Mannheim under Dr. Diederich there was a radiological department which would have more than satisfied me, but this was going to be scrapped and a more modern one built. At the large Burger hospital at Cologne under Prof. Grashey I saw an entirely new department on the lines of the one at Frankfort in course of erection. In some ways the most remarkable department which I saw was not in a hospital at all but belonged to the Allgemeine Ortskrankenkasse at Cologne. This society has built and equipped on the top floor of its head office what I can only describe as a model of its kind, though it is not so large as the one at Frankfort. Here Dr. Teschendorf and his assistants carry out from 100–200 examinations each day as well as a considerable amount of therapy. I was informed that though it is primarily intended for members of the society these are perfectly at liberty to go elsewhere for radiographic examination if they wish, while on the other hand members of other societies are admitted on a recognized scale of fees. Private patients are also taken to the mutual benefit of the society and its radiologists.

WHERE GERMANY LEADS.

I have said enough to show that Germany is overwhelmingly superior to this country both in the extent to which radiology is applied and also in equipment and organisation; and this is the more remarkable when the resources of the two countries are compared. It should be stated, however, that the liberality with which radiology is being endowed is part of the general policy of the Government to spend money lavishly on all matters affecting the health of the nation, not medical services merely but also housing, public baths, recreation-grounds, and so on. A gigantic experiment in social welfare is in fact being undertaken, and many social observers are wondering whether the end is going to justify the means. But while it may be argued that Germany is erring on the side of extravagance it is, I think, indisputable that in this country the standard of equipment is far from satisfactory.

I can imagine few British radiologists returning from a visit such as mine without a feeling of envy towards their German colleagues, who appear to an outside observer to have no difficulty in obtaining all that they require. Criticism of the way in which radiology is carried out in this country has not been wanting. A year ago, for instance, Sir Thomas Horder complained that physicians' consulting-rooms were filled with worthless X ray films, while in the Annual Report of the Medical Research Council the fact is deplored that no definite school of radiotherapy has sprung up in England comparable to Vienna and other continental schools. While we must not lose sight of the fact that in the long run the man is more important than the machine and that an efficient radiologist with inferior apparatus is better than an indifferent radiologist with first-class apparatus, it may reasonably be replied to these criticisms that some allowance should be made for the technical limitations with which most radiologists in this country have to contend.

I should be sorry if any of my remarks were to be interpreted as casting a reflection upon the competence of British manufacturers. Nothing could be further from my intention. I saw nothing in Germany which so far as I could judge could not be made in England. My sympathies are very much with the British manufacturers, since in comparison with their German competitors they have a small market and must consequently experience great difficulty in expanding their business.

WHAT CAN BE DONE IN ENGLAND.

It appears to me that there are four directions in which this country should move without going to the lengths which Germany has gone.

(1) *Centralisation of apparatus.*—No other branch of medicine involves anything like so large a capital outlay, such heavy running expense, or such extensive accommodation. No other specialist starts practice at so great a financial risk. A surgeon, for example, is not expected at the beginning of his career to equip his own operating theatre and nursing home. The radiologist, unless he happens to be fortunately situated, may be compelled in order to make himself efficient to pledge his credit to an extent which the financial state of the district in which he works does not justify—and all this in order to provide himself with apparatus which is rapidly depreciating in value and is duplicated in the hospital where he works. In Germany the admission of private patients to the X ray departments of general hospitals is the rule, and all the radiologists with whom I discussed this question told me emphatically that they had no desire to burden themselves with their own apparatus. It is true, of course, that in Germany radiologists are paid for their ordinary hospital work, but then they need to be since the proportion of paying patients to the total population is lower there than in England. I am aware that there are many hospitals in this country where this practice has already been adopted with complete success. My point is that it should be carried a great deal further, especially in the poorer districts.

Is, then, private radiology as generally carried out doomed to extinction? I do not think so, since there will always be people who have an intense aversion to institutional treatment. But what I do believe is that as the work becomes more and more complex considerations of space and finance will make it increasingly difficult to practise radiology within the confines of a dwelling-house. Centralisation will mean greater efficiency as well as greater economy.

(2) *Payment to hospital for motor accident cases.*—This question is now very prominently before the public, and the claims of hospitals in this respect have been well expressed by Sir Charles Harris in the *Times* of Nov. 30th. I need only call attention here to the fact that all such accidents of any severity require X ray examination.

(3) *Payment to hospitals from National Insurance Fund.*—It is obvious to anyone that if hospitals were paid for radiological diagnosis and treatment under the Insurance Acts the whole position of radiology would be revolutionised. I am strongly of opinion that this is a matter on which the British Institute of Radiology might well ask for an investigation.

(4) *State grants to hospitals for X ray equipment.*—The proposal to demand grants from the State will naturally meet with opposition from those who pin their faith in the voluntary system. But the high cost of radiology and the increasingly important part it plays gives this branch of medicine a special claim for support from a more reliable source. The State already supports the treatment of many conditions and in particular those such as tuberculosis and venereal disease which the public has proclaimed to be a national scourge. But cancer is now recognised as a national scourge, and those who try to educate the general public on the dangers of this disease are quite rightly never tired of emphasising the importance of early diagnosis. They might well add that in many forms of cancer radiology provides the surest means of early diagnosis, while in nearly all forms it is one of the principal means of treatment. It is therefore to the public interest to see that the work is carried out efficiently. The Government responded to the appeal for radium, though it is only fair to say that in this case it was a matter of limited commodity, and it is an arresting thought that had it not been for the King's illness and recovery the country might never have acquired a quantity of radium sufficient for its needs. A further claim for State support is the logical outcome of the Local Government Act of 1929, for since under this Act the voluntary hospitals will be required among other things to provide radiological facilities for the county council hospitals, the State should be required to provide some share of the equipment in addition to reimbursing the hospitals for running expenses. So far as I am aware—and I speak open to correction—the special claims of radiology for State support have never been presented. It appears to me that the British Institute of Radiology is the body which is most competent to bring influence to bear upon the proper quarter. It should insist that the proper prosecution of the important branch which it represents is not handicapped through lack of funds.

THE SIGNIFICANCE OF THE AFFERENT IMPULSES FROM THE SKIN IN THE MECHANISM OF ABDOMINAL PAIN.

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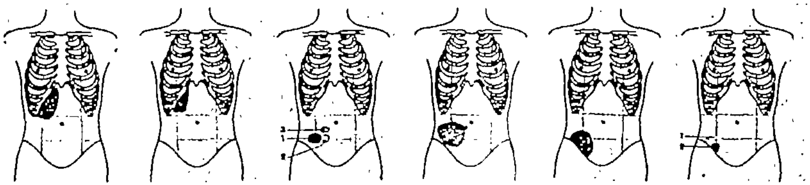
A RECENT paper by Weiss and Davis[1] recorded some important observations on a series of patients with localised thoracic or abdominal pain. These authors found that infiltration of the skin over the painful area with novocain caused abolition or diminution of the pain, and they make the remarkable claim that their findings afford experimental proof of the truth of Mackenzie's viscero-sensory reflex theory of referred pain. Their observations and the theoretical deductions that they based upon them seemed to me to be of such importance as to demand a critical investigation. The paper that follows describes a series of cases investigated in a similar manner to those of Weiss and Davis, and attempts, in the light of the results obtained, to assess the validity of their conclusions.

In this investigation, as in that of Weiss and Davis, the localised area in which the pain was felt was infiltrated with novocain as closely to the skin as possible, the deeper layers of subcutaneous tissue not being injected. But whereas they used a solution of 2 per cent. novocain I have thought it safer, in view of the wide area of skin infiltrated in some cases, to employ 1 per cent. novocain, to which a little adrenalin has been added. The object kept in view was to ascertain the effect of the infiltration in each case upon (1) the spontaneous pain, (2) the pain felt on coughing, (3) the objective cutaneous hyperalgesia as tested by light pinching of the skin, and (4) the deep tenderness and associated muscular rigidity. In this way I have attempted to obtain more precise objective findings than Weiss and Davis, who only mention such factors as deep tenderness and muscular rigidity in a few of their cases.

FIG. 1. FIG. 2. FIG. 3. FIG. 4. FIG. 5. FIG. 6.



(Case 1.) (Case 2.) (Case 3.) (Case 4.) (Case 5.) (Case 6.)

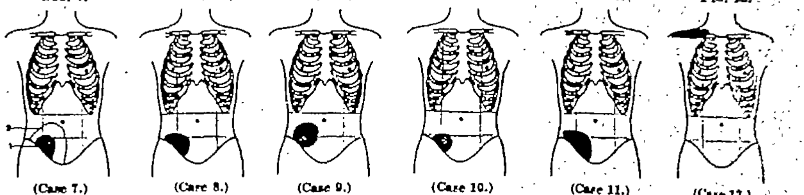
In Figs. 1, 2, 3, 4, and 6 the black represents an area of pain, deep tenderness, and rigidity; in Fig. 5 it represents an area of localised tenderness. Fig. 3 shows (1) the original area of pain, deep tenderness, and rigidity; (2) the area to which pain migrated after area (1) was infiltrated; and (3) the area to which it further migrated after infiltration of area (2). Fig. 6 shows (1) an area of cutaneous hyperalgesia; and (2) an area of pain, deep tenderness, and rigidity.

Only such patients as had distinctly localised pain and whose mental condition allowed their willing coöperation were investigated.

Observations.

CASE 1. *Acute obstructive cholecystitis*—Female, aged 64. Sudden onset of acute epigastric pain 24 hours before admission. The pain had settled down to the right hypochondrium, going through to the back. No shoulder-tip pain. History of two similar attacks recently. On admission: Temperature 101° F.; pulse-rate 100. Spontaneous pain in right hypochondrium and angle of right scapula. The pain in front was worse on coughing. Cutaneous hyperalgesia in shaded area (Fig. 1.) Deep tenderness and rigidity in shaded area. Enlarged gall-bladder vaguely palpable. The shaded area was infiltrated subcutaneously with 1 per cent. novocain until completely anæsthetic to pinprick. The spontaneous pain had now disappeared. On coughing the patient felt some pain, but less than before infiltration. Cutaneous hyperalgesia absent. On deep pressure she "couldn't feel much difference" from the tenderness before infiltration, nor could any diminution of rigidity be detected. Operation: Spinal anæsthetic with stovaine-glucose. Gall-bladder very distended, with patches of green gangrene on fundus, and a small stone impacted in cystic duct. Cholecystectomy.

FIG. 7. FIG. 8. FIG. 9. FIG. 10. FIG. 11. FIG. 12.



(Case 7.) (Case 8.) (Case 9.) (Case 10.) (Case 11.) (Case 12.)

Fig. 7 shows (1) an area of pain, deep tenderness, and rigidity; and (2) an area of cutaneous erythema. Fig. 8 shows an area of pain, deep tenderness, and rigidity, while Figs. 9–11 also show areas of pain and deep tenderness. Fig. 12 illustrates Case 13, a case of duodenal ulcer, and indicates the position of the pain in the right shoulder-tip.

CASE 2. *Acute obstructive cholecystitis.*—Male, aged 37. Onset of acute pain in right hypochondrium 12 hours before admission. On admission: Spontaneous localised pain, deep tenderness, and muscular rigidity in shaded area (Fig. 2). No cutaneous hyperalgesia. The area of pain was infiltrated with 1 per cent. novocain till anæsthetic to pinprick. States that pain has now disappeared. On palpation muscular rigidity seems perceptibly less. Patient states that deep tenderness is still present, but "nothing like so tender as it was." Operation: Acutely inflamed distended gall-bladder with solitary stone, the size of a walnut, impacted in its neck. Cholecystectomy.

CASE 3. *Acute appendicitis.*—Female, aged 20. Onset of acute pain 20 hours before admission. Pain central at first, shifting to right iliac fossa. On admission: Spontaneous pain, worse on coughing, in right iliac fossa. No cutaneous hyperalgesia. Deep tenderness and moderate rigidity in same area as pain (Fig. 3). The area of skin over deep tenderness was infiltrated with novocain till anæsthetic to pinprick. Patient was then asked to cough, and said she now felt the pain, not in the anæsthetised area, but nearer the midline. This more medial area was then infiltrated, and on coughing again some pain was felt a little higher up. Deep tenderness was now tested, and was "not so tender as before." Operation: Appendix covered with plastic lymph and curled up below cæcum. It was not perforated.

CASE 4. *Acute perforated appendix with localised abscess.*—Female, aged 32. Acute onset four days before admission. On admission: Localised pain in right iliac fossa, much worse on coughing. Cutaneous hyperalgesia well marked in shaded area (Fig. 4). Deep tenderness in same area, and some muscular rigidity. The skin was infiltrated with novocain, till anæsthetic to pinprick. Spontaneous pain had now disappeared. Pain on coughing still present, but definitely less. Deep tenderness still present, and patient could not appreciate any diminution in intensity. Operation: Spinal anæsthesia. Appendix in retrocæcal fossa, gangrenous and perforated, with abscess tracking into right lateral paracolic groove.

CASE 5. *Acute appendicitis with localised abscess.*—Male, aged 23. Onset six days before admission. On admission: Localised *tender mass in right iliac fossa* (Fig. 5). No spontaneous pain, or pain on coughing. No cutaneous hyperalgesia. The skin was infiltrated with novocain over tender area till anæsthetic to pinprick. On deep pressure patient at first stated that tenderness over mass was diminished, but when pressure was increased he doubted whether there was any real difference as compared with initial tenderness. Operation: Gangrenous appendix with localised abscess wrapped round by infiltrated omentum.

CASE 6. *Acute appendicitis with localised abscess.*—Female, aged 19. Onset of acute epigastric pain 21 hours before admission. On admission: Sharp spontaneous pain in right iliac fossa, worse on coughing. Area of deep tenderness and rigidity, with smaller area of cutaneous hyperalgesia (Fig. 6). The skin over area of deep tenderness was infiltrated till anæsthetic to pinprick. Cutaneous hyperalgesia and spontaneous pain had now disappeared, but pain on coughing still present, and deep tenderness and muscular rigidity also present. Patient stated that deep tenderness was less than before infiltration. This could not be confirmed by any change in the rigidity. Operation: Collection of pus in contact with parietal peritoneum just above middle of Poupart's ligament. Appendix hanging over brim of pelvis and perforated near tip. Uterus two months pregnant.

CASE 7. *Acute obstructive appendicitis with gangrene.*—Male, aged 18. Onset of epigastric pain 36 hours before operation. Pain shifted after a few hours to right iliac fossa. First attack. On admission: Skin erythematous from use of hot-water bottle. No spontaneous pain, but sharp pain in shaded area on coughing (Fig. 7). Cutaneous hyperalgesia present, but discounted on account of erythema. Marked deep tenderness and rigidity in shaded area. The shaded area was infiltrated with 40 c.cm. 1 per cent. novocain and adrenalin till anæsthetic to pinprick. Patient was then asked to cough, and said that he still felt pain "just the same as before." On deep pressure tenderness was still felt, but he said "I don't think it is quite so bad as before." Rigidity was unchanged. Operation: Appendix hanging over brim of pelvis. Hard concretion obstructing it one inch from tip, and part distal to this gangrenous but not yet perforated. There was a small amount of fluid round the appendix.

CASE 8. *Acute appendicitis.*—Male, aged 34. Onset of acute pain in epigastrium 20 hours before operation. After a few hours this pain disappeared, and sharp localised pain in right iliac fossa began. Two previous milder attacks. On admission: Slight spontaneous pain in right iliac fossa while lying still; much more marked on coughing. The initial epigastric pain had quite disappeared. No cutaneous hyperalgesia. Very marked rigidity and deep tenderness in shaded area (Fig. 8). The shaded area was infiltrated subcutaneously with 1 per cent. novocain until anæsthetic to pinprick. The slight spontaneous pain could not now be felt, and on coughing the sharp pain noted before the infiltration was not felt at all. On palpation there was no perceptible diminution in the muscular rigidity, nor in the associated deep tenderness. Operation: Acutely inflamed appendix with tip on outer side of cæcum. Not perforated.

CASE 9. *Acute appendicitis.*—Female, aged 12. Onset with central epigastric pain 45 hours before operation. First attack. On admission: Slight spontaneous pain in right iliac fossa, worse on coughing. Hyperalgesia of skin and deep tenderness in shaded area (Fig. 9), but not much rigidity. No tenderness or pain in back of loin. The skin was infiltrated with novocain till anæsthetic to pinprick. Spontaneous pain and pain on coughing now disappeared. Hyperalgesia was absent. Pain on deep pressure was still present, though she stated it was distinctly less than before infiltration. Operation: Appendix curled up behind lower ileum, which protected it from immediate contact with anterior parietes. Acutely inflamed, but not perforated.

CASE 10. *Acute appendicitis.*—Female, aged 35. Onset 24 hours before operation, with central pain, shifting to right iliac fossa. On admission: Spontaneous pain, not very severe, in shaded area (Fig. 10). Marked pain on coughing felt in same area. No cutaneous hyperalgesia. Deep tenderness limited to shaded area. Little muscular rigidity. The shaded area was infiltrated with novocain till anæsthetic to pinprick. Spontaneous pain was now "much less." Pain on coughing also "much less." Pain on deep pressure still marked, but "rather less tender." Operation: Kinked and swollen appendix, distended with pus, in retrocæcal fossa. No perforation.

CASE 11. *Acute salpingitis.*—Female, aged 24. Onset of pain in right iliac fossa two days before admission. No initial central pain. No urinary symptoms. On admission: Cutaneous hyperalgesia marked in shaded area (Fig. 11). No spontaneous pain, but pain on coughing. Deep tenderness over same area as hyperalgesia. Little muscular rigidity. Temp. 100° F. Pulse 108. The area was infiltrated with novocain subcutaneously till anæsthetic. Pain on coughing abolished completely. Deep tenderness much less marked. Operation: Turbid fluid in right iliac fossa and pouch of Douglas with fibrin on coils of ileum in pelvis. Left tube was congested, and muco-pus was found escaping from fimbriated end.

Discussion.

Summarising the findings from these 11 cases, we note the following results of the subcutaneous infiltration with novocain:—

Spontaneous pain.—Present in 8 cases; complete relief, 6; partial relief, 2; unchanged, 0; not present, 3.

Pain on coughing.—Present, 9; complete relief, 3; partial relief, 4; unchanged, 2; not present, 1; not noted, 1.

Deep tenderness.—Present, 11; complete relief, 0; partial relief, 8; unchanged, 3.

Rigidity.—Present, 11 (4 slight); completely abolished, 0; diminished, 1; doubtful, 3; unchanged, 7.

It will be observed that the most striking positive effect was the abolition of the spontaneous pain, which occurred in six out of eight cases. The effect on pain felt on coughing was less marked, though still definite. On deep tenderness the effect was slight, and on muscular rigidity it was hardly appreciable. Hyperalgesia, when present, was abolished inevitably by the infiltration.

These results afford, on the whole, a striking confirmation of the experimental findings of Weiss and Davis, though the type of case selected in the two investigations was somewhat different. Thus Weiss and Davis include in their 25 cases 3 of angina pectoris, 7 of pulmonary disease with pleurisy, 1 of carcinoma of the œsophagus, 1 of gastric ulcer, 4 of cholecystitis, 2 of appendicitis, 5 of renal conditions, and 2 of salpingitis, while I have confined my attention to acute abdominal lesions that could be verified immediately by operation. But while my results go to confirm their very important observations, it is necessary to make some critical remarks about their theoretical deductions. They claim that the abolition of pain by cutaneous anæsthesia proves the truth of the theory of referred pain in visceral disease, which we owe to the late Sir James Mackenzie. "According to this view, painful sensations arise as a result of irritation to a viscus. Such irritation produces a play of nervous impulses, which pass from the irritated viscera *along the splanchnic nerves*" (the italics are mine), "to certain segments in the cord. The perpetual bombardment of this cord segment with visceral impulses gives rise to an 'irritable focus' in the cord. The normal afferent impulses arising from the skin, muscles, and peripheral structures which traverse this segment now enter a cord region which is abnormally irritable. These normal impulses under such conditions give rise to painful sensations which are referred to the peripheral structures." But it cannot be admitted that these experiments prove the truth of the above viscero-sensory reflex theory of referred pain, any more than they prove the truth of my alternative theory of peritoneo-cutaneous radiation. In a paper on abdominal pain as exemplified in acute appendicitis[1] I have brought forward evidence for the view that the localised pain in the right iliac fossa in acute appendicitis (unlike the initial epigastric pain, which is a pure visceral pain), results from the stimulation of the exquisitely sensitive parietal peritoneum, and that the afferent splanchnic nerves from the appendix are not in any way concerned in its production. A reference to Figs. 13 and 14, in which these two conflicting theories of referred pain are represented diagrammatically, will show at a glance that the experiments under discussion have a precisely equal validity in the case of each theory. They no more prove one theory than they prove the other. But they may logically be held to prove that *either* the one theory *or* the other is the true explanation of referred pain.

Weiss and Davis do not appear to have taken into consideration the theory of peritoneo-cutaneous radiation at all when discussing the results of their investigations. They do make the comment, when discussing their cases of pleurisy: "It is to be remembered, also, that pain of pleural origin may be partly due to the direct sensitivity of the parietal pleura. It is recognised that the parietal pleura receives direct nerve-supply from the intercostal nerves." But the conception of a pleuro-cutaneous radiation of pain receives no attention at all. Yet I believe that their experiments afford as much proof of pleuro-cutaneous radiation of pain in pleurisy as of a viscero-sensory reflex from the afferent splanchnic nerves of the lung.

Two Conflicting Theories.

We have now arrived at a point in the argument where the experiments of Weiss and Davis, and those recorded above, leave us unable to decide between the relative claims of the two conflicting theories of referred pain—viz., the viscero-cutaneous reflex theory and the peritoneo-cutaneous (or pleuro-cutaneous) radiation theory. What these experiments prove, no more and no less, is that one or other theory is true. (It is so obviously improbable that *both* theories are true, that I do not consider that possibility in the present discussion.)

In attempting to find a method by which the merits of my theory of peritoneo-cutaneous radiation could be put to a more convincing experimental test, I naturally thought of the peculiarly striking form of referred pain in the shoulder-tip area associated with painful stimulation of the sensory fibres of the phrenic nerves in the peritoneum (or pleura) lining the diaphragm. I have already [8] drawn attention to the invariability with which the pain in the shoulder-tip area is felt when the under surface of the diaphragm is stimulated by an irritating fluid, as in perforation of an ulcer, or when, under spinal anæsthesia, a swab is brought into contact with the under surface of the diaphragm. It was, in fact, mainly from a study of this shoulder-tip pain that I elaborated my theory of peritoneo-cutaneous radiation. Pain localised to the supra-acromial region, resulting from irritation below the diaphragm, would provide exactly the test that we require, since all question of the agency of splanchnic nerves can there be set aside. It is universally admitted that the painful stimulus passes up the sensory fibres of the phrenic nerve derived from the third, fourth, and fifth cervical segments, and that the pain is felt, not in the region of the diaphragm, but in those areas of skin over the shoulder supplied by the descending cervical nerves, which originate from the same cervical segments of the cord. The "irritable focus" theory is one possible explanation of this radiation of pain. According to this theory the normally silent afferent impulses from the cutaneous nerves over the shoulder become painful, though whether the "bombardment" from the parietal peritoneum affects the posterior horn cells or the cells of the posterior root ganglia it is not possible at present to be certain. If it could be shown, then, that infiltration of the shoulder-tip area of skin with novocain abolished shoulder-tip pain, very strong evidence in favour of the theory of peritoneo-cutaneous radiation would be forthcoming.

FIG. 13.

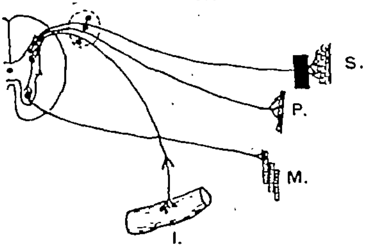


Diagram to illustrate Mackenzie's theory of viscero-sensory and viscero-motor reflex, and the effect, according to this theory, of cutaneous anæsthesia. In this figure and Fig. 14 S = skin; P = parietal peritoneum; M = muscles of abdominal wall; and I = intestine or appendix.

The following cases were investigated in order to obtain light on this question.

CASE 12. *Perforated duodenal ulcer.*—Male, aged 86. Perforated five hours before operation. On admission: Diffuse abdominal pain and rigidity with pain in the posterior part of the right shoulder-tip area, mainly over the suprascapular fossa. The shoulder-tip area was infiltrated with 1 per cent. novocain until anæsthetic to pinprick. Pain in the shoulder-tip area could no longer be felt. Operation: Spinal anæsthesia with stovaine-glucose. Perfect anæsthesia of abdominal wall extending to about the fifth dorsal segment. Right paramedian incision. While the abdomen was being opened, the patient volunteered information that he now felt pain in the tip of the left shoulder, but not in the right as before infiltration. A perforated ulcer was found in the first part of the duodenum, anterior wall, with a fair amount of extravasated fluid. The perforation was sutured. A moist swab was then passed up between the liver and the right dome of the diaphragm. At first no pain was felt. He then complained of some pain in the right shoulder-tip area. A similar swab passed up under the left dome of the diaphragm produced much more severe pain in the left shoulder immediately. This was repeated twice, and each time the difference between the two sides was most striking, judging both by the patient's statements and by the expression of his face. The left, unanæsthetised, shoulder was the seat of much more acute pain.

FIG. 14.

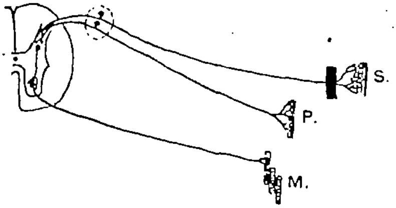


Diagram to illustrate theory of peritoneo-cutaneous radiation and peritoneo-muscular reflex, and the effect, according to this theory, of cutaneous anæsthesia.

CASE 13. *Perforated duodenal ulcer.*—Male, aged 55. Sudden onset of severe pain 5½ hours before operation, when lifting some timber. Patient had had a perforated duodenal ulcer sutured 11 months before. On admission: Great pain in abdomen and in right shoulder-tip (Fig. 12). Diffuse board-like rigidity of abdominal muscles. Although the spontaneous right shoulder-tip pain was quite unusually severe there was no hyperalgesia of the skin in that area on pinching it lightly. The right shoulder-tip area was now infiltrated with 1 per cent. novocain till anæsthetic to pinprick. Patient now stated that pain in the right shoulder was "easier." Operation: Spinal stovaine-glucose. Good anæsthesia of abdominal wall. On opening the abdomen through a right paramedian incision a perforation was found in the first part of the duodenum, with a large collection of fluid in the right subhepatic and right anterior subphrenic spaces, partly shut off from the general peritoneal cavity by adhesions from the earlier perforation. The perforation was sutured. On swabbing between the right lobe of the liver and the right dome of the diaphragm patient felt some pain in the right shoulder-tip. On swabbing in a similar manner under the left diaphragm, where no irritating fluid was found, a much more agonising pain in the left shoulder-tip area was complained of. Posterior gastro-enterostomy was performed.

It was thus found that infiltration of the shoulder-tip area abolished the spontaneous shoulder-tip pain in Case 12, and gave partial, but very marked relief, in Case 13. The unusual severity of the shoulder-tip pain in Case 13, due to the adhesions which caused a localisation of most of the extravasated fluid to the space under the right dome of the diaphragm, must be borne in mind. But the most striking phenomenon in each case was the marked difference between the intensity of the pain in the two shoulders, when a painful stimulus in the shape of a swab was applied to both domes of the diaphragm in the process of cleansing the peritoneum. The difference was so marked as to impress all the onlookers, while the patients commented on it days afterwards. It should be remembered that in each case the extravasation had been chiefly localised to the right *subphrenic space*, so that the sensory nerves on that side would presumably be in a more irritable condition. In spite of this, anæsthesia of the skin over the right shoulder-tip area produced great diminution of the referred pain as compared with the side that was not anæsthetised.

The fact that shoulder-tip pain was not abolished completely may be attributed to the fact that the descending cervical nerves from the third and fourth cervical segments supply sensory fibres to the acromio-clavicular joint as well as to the periosteum of the acromion process and clavicle. Since care was taken to make the subcutaneous injection as superficial as possible, these fibres would escape the action of the novocain, and this would account for such shoulder-tip pain as persisted.

It can be stated with the greatest confidence that none of the novocain solution was injected anywhere near the trunk of the phrenic nerve, so that a possible fallacy in the experiments—viz., anæsthesia of the phrenic nerve—need not be considered.

Peritoneo-cutaneous Radiation.

We find, then, in the above two crucial experiments that anæsthesia of the skin in the shoulder-tip area produces no less profound a modification of pain than we have found on similar infiltration over an inflamed appendix or gall-bladder. There is every reason to suppose that the mechanism of the anæsthesia, as of the production of pain, is exactly similar in the two cases. The sensitive parietal peritoneum lining the diaphragm has the same protective function as the peritoneum lining the anterior abdominal wall, with which it is continuous. Its sensory innervation is, in all respects, similar, save that an embryological accident has widely separated the subphrenic peritoneum from its corresponding skin area. It is this accident, if so it may be termed, which provides us with the opportunity of studying the protective mechanism. For, in the study of shoulder-tip pain, the problem is simplified in that no question of radiation or reflex through the afferent splanchnic nerves can be entertained. The pain is produced by a process of peritoneo-cutaneous radiation. Anæsthesia of the skin over the shoulder, by cutting off the normal afferent stimuli, profoundly modifies the sensation of pain, though the direct afferent path through the phrenic nerve to the brain remains open.

There is every reason to believe that the experiments of Weiss and Davis will find their true explanation along similar lines.

Evidence that I have already brought forward (loc. cit.) shows that the pain over an inflamed appendix is so accurately localised that it must be dependent on stimulation of the afferent nerves in the parietal peritoneum, and not of the afferent splanchnic nerves. Precisely the same reasoning holds good as regards the localised muscular rigidity and associated deep tenderness over an acutely inflamed appendix. They correspond accurately with the position in which the appendix happens to be lying, and in an early case, before perforation has widened the area of irritation, they may be used to predict the precise position in which the appendix will be found at operation to lie. A relatively slight degree of muscular rigidity and deep tenderness in a case of early acute appendicitis means that the appendix is shielded from the anterior parietal peritoneum either by occupying the retrocæcal fossa or by a covering provided by a thick omentum or the lower coils of the ileum. These precise indications of the site of an inflamed appendix are quite inconsistent with the theory of a viscero-sensory or viscero-motor reflex through the agency of the afferent splanchnic nerves from the appendix. But they are consistent with, and afford the strongest evidence for, the theory of peritoneo-cutaneous radiation and peritoneo-muscular reflex.

The condition of acute obstructive cholecystitis, due to impaction of a stone in the cystic duct or neck of the gall-bladder, which provided Cases 1 and 2 in the above series, affords evidence leading to the same conclusion. It is not uncommon in such a case for a progressive enlargement of the inflamed gall-bladder to occur, due to distension with muco-pus. If such a case is observed carefully at intervals of a few hours, the area of maximum pain, corresponding with that of muscular rigidity and deep tenderness, will be found to creep gradually lower as the gall-bladder becomes more distended, until it may be so low in the right abdomen as to give rise to difficulty in differentiating the case from one of acute appendicitis. The site of the maximum pain, tenderness, and rigidity must be determined by contact of the fundus of the inflamed gall-bladder with the parietal peritoneum. For, were the process a viscero-sensory and viscero-motor reflex, the maximum pain, tenderness, and rigidity would be constant in position, since they would be determined by the segmental splanchnic innervation of the gall-bladder.

If due weight be given to these arguments it will be found that these infiltration experiments, so far from supporting Mackenzie's viscero-sensory reflex theory, afford convincing support to the alternative theory of peritoneo-cutaneous radiation.

The question of pure visceral pain does not arise in these infiltration experiments, since all the cases dealt with showed accurately *localised* pain. While the existence of true visceral pain has been abundantly demonstrated by Hurst and others, it is a vaguely localised central pain, and is entirely unassociated with localised tenderness or rigidity. The pure visceral pain, which occurs in most cases of acute appendicitis for instance, is only present for the first few hours, and, though felt in the centre of the abdomen, is usually described by the patient as "all across." It would be quite impossible to carry out these infiltration experiments in that early stage, for one could not determine how wide an area of skin to inject, since the patient cannot localise the pain with any accuracy.

Weiss and Davis record in their paper observations on two normal subjects in whom localised pain was produced by distending the œsophagus with a balloon. Infiltration of skin with novocain in the region of the pain produced migration of the pain, with relief in the infiltrated area. It is not possible to criticise these observations satisfactorily, since such details as the dimensions of the apparatus used are not given. But it appears possible that the localised pain may have been due to pressure exerted through the walls of the œsophagus upon some branches of the intercostal nerves. Whatever the explanation may be, their results from these two cases are of much less significance than those already discussed, and cannot be held to invalidate the conclusions at which we have arrived.

Summary.

(1) In patients with *distinctly localised* abdominal pain subcutaneous infiltration of the painful area with novocain causes complete or partial relief of pain. (2) The contention that these observations afford direct experimental support for the viscero-sensory reflex theory of referred pain is criticised. (3) In patients with shoulder-tip pain from irritation of the peritoneum under the diaphragm, subcutaneous infiltration of the area in which the pain is felt causes complete or partial relief of pain. (4) These observations afford strong evidence in favour of the peritoneo-cutaneous radiation theory of referred pain as opposed to the viscero-sensory reflex theory.

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THE USES OF CHLORETONE.*

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CONSULTING PHYSICIAN TO THE MIDDLESEX HOSPITAL.

I HAVE been fond of quoting a saying by a French physician that "what impresses one's colleagues is a correct diagnosis, what impresses the relatives is a good prognosis, but what impresses the physician himself is when any definite effect results from his treatment."

I want to say something about a comparatively new drug, which I believe to be the most potent remedy for several disorders hitherto treated by palliatives with but slight success. It may seem surprising to allude to a drug as new, which I have employed for perhaps a quarter of a century, but it is not yet old enough to be admitted to the Pharmacopœia and consequently is unknown to many. The drug is chloretone—chemically trichlor tertiary butyl alcohol, and physically a white coarse powder with a rather acrid taste, volatile and sparingly soluble in water, like camphor. It first came under my notice as a preservative in Parke Davis's solution of adrenalin. I employed this in the treatment of some cases of gastric ulcer, or rather erosion, to arrest hæmorrhage and was struck with the disappearance of the pain, hunger, and restlessness which ensued. This could hardly be attributed to the adrenalin, and later when I gave the chloretone alone I found that the effect was enhanced. It acted as an anodyne as well as a preservative—not only locally but as a general sedative when the dose was increased. Following this observation I was led to employ chloretone in a number of affections in which these attributes promised to be useful.

Sea-Sickness, Chorea, and Tetanus.

Perhaps the first trouble in which the anæsthetic and sedative effect of chloretone was employed was in the prevention of sea-sickness. So many means had been recommended before without success that the general public regarded with absolute incredulity any idea of a preventive or remedy in such circumstances. I am, however, quite convinced that, given a start of half an hour, five grains of chloretone will enable a person to complete a voyage of anything up to six hours without discomfort on the score of sea-sickness. This same applies to travelling by train or air which affects some people in the same way.

I recall an instance of a French lady who taught French in England and English in France and crossed the Channel perhaps four times a year. She was evidently a poor sailor, for she never escaped sea-sickness or expected to even on a calm day. I gave her some 5-grain powders of chloretone, and she made her first crossing in perfect comfort. Unfortunately, however, the spare doses had been wrapped in ordinary paper, and on the return journey, owing to evaporation, all had disappeared, and mal-de-mer asserted itself as before. The drug was later put up in gelatin capsules, and remaining available enabled her not only to accomplish the passage without upset, but even to go by the long route.

In another instance the journey to South Africa was accomplished—a matter of 18 days—by a judicious repetition of the dose.

I only mention these two early experiences for since then proprietary articles under the name of Zotos and Mothersill in which chloretone is the effective constituent have been advertised and widely used.

The sedative effect on the brain, indicated in these instances, suggested to me the probable value of the drug in chorea, which is dependent on disturbance originating in the cerebral cortex. In our archives is included a collection of 100 such cases treated only with chloretone. They were of varying intensity, age, and duration, just as admitted, and I will only quote you the final analysis which showed that the choreic movements were suppressed in an average of five days and the stay in hospital reduced to three weeks. This not only represents a marked reduction in the duration of the illness, but in addition an immense saving in nursing and the suffering of the patient by injury and loss of sleep and food through the violent and ceaseless movements. In these cases the chloretone was given in five or ten-grain doses dissolved in paraffin or cod-liver oil emulsion, and this larger dose continued over several days disclosed further effects of the drug, two of which I will mention as leading to wider uses. Full doses led to a condition of stupor resembling that present in encephalitis lethargica, in which the patient apparently slept day and night and required to be roused to take food—not, you may think, a desirable consummation, but a very blessed contrast in severe cases to the violent contortions and need for constant restraint to keep the patient in bed or from physical injury. The administration of the drug in moderate or small doses caused insensitiveness of the bladder amounting in some to retention of urine. Now this sedative effect on the central nervous system and bladder find useful application in other directions.

On one occasion, returning from the summer vacation, I found a boy in the ward suffering from tetanus. In spite of treatment he was having seizures every hour and the outlook was as hopeless as is usual in these cases. Recalling the effect of chloretone on some of the severer cases of chorea, I administered at once in an enema 20 grains dissolved with the aid of glycerin. He had one seizure only soon after, and then made a complete recovery. As you know, tetanus is fortunately not common, and I never had another opportunity of testing the remedy; but I am glad to put this on record as I have seen accounts since of fatal cases not treated in this way. If it only controls the symptoms it may give time for other remedies to act, which at present they have little chance to do.

Vesical Irritability: Whooping-cough.

With regard to the effect on the bladder, we have been used to the employment of buchu and hyoscyamus with inconspicuous results, though frequency of micturition is a very distressing condition. Even in average health an irritable bladder causes much inconvenience, and often entirely debars people so afflicted from social engagements. I once enabled the chairman of a medical meeting to get through a long morning while suffering from diarrhœa by giving him a teaspoonful of raw arrowroot, and I am sure that the practitioner who enables a patient to weather a lunch or tea party without inconvenience by the use of a five-grain capsule of chloretone will earn eternal gratitude.

I now come to small doses, the basis being a saturated solution in water (grs. 2½ to the ounce) comparable to camphor water. This solution with two drachms of 1–1000 adrenalin solution to the ounce proved of the greatest service in hundreds of cases of conjunctivitis resulting from irritant gas during the late war, subduing the irritation and reducing the hyperæmia. At the same time the escape by way of the lacrymal duct led to some loss of sensation in the nose and pharynx. Later this side issue suggested the use of chloretone in hay fever. Inhaled as a spray from an atomiser the solution immediately allays the symptoms, the effect lasting many hours, so that occasional repetition will carry the patient through the usually distressing period of early summer. As an anti-spasmodic in acute gastric flatulence, dysmenorrhœa, persistent hiccough, or the severe pain of shingles its effect is immediate and sure.

All this will hardly be believed, but it may be observed that none of the maladies referred to has responded to specific or known remedies; so one has quite a free hand to try something fresh. Having now perhaps strained credulity to the utmost, I will conclude by making the most outrageous statement of all—namely, that this dilute solution of chloretone in doses of one grain will cure whooping-cough in a week. I was recently consulted about a little girl of 3 causing great anxiety to her parents owing to vomiting, sleeplessness, and rapid wasting resulting from the frequent violent paroxysms. One-grain doses of chloretone were given four times a day with immediate relief. After two days it was given only morning and night, and after the fifth day discontinued altogether as there was no further need, and there was no recurrence.

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* Abridged from an emeritus lecture delivered at the Middlesex Hospital on Nov. 29th.

ACUTE DISSEMINATED ENCEPHALOMYELITIS FOLLOWING VACCINATION.

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AN unusual opportunity for continuous observation during life with a complete autopsy 17 hours after death makes this fatal case of so-called post-vaccinal encephalitis worthy of record.

The patient, a female aged 5, unvaccinated, who lived in Limehouse, was admitted to Mile End Hospital on June 1st, 1929, with pneumonia of four days' standing. She had had measles and chicken-pox in infancy, and in 1927 had an attack of pneumonia which left her with a "weak chest," for which she had since attended Victoria Park Hospital.

Her temperature was 103·6° F. The lungs showed a catarrhal pneumonia chiefly affecting the right middle lobe, but the heart and abdomen showed no abnormality. Two days later both upper lobes were involved, the child was very delirious, and meningism was noted. The fever settled by lysis by June 11th and convalescence was uneventful, the physical signs in the chest clearing rapidly. She was about to be discharged from hospital when, on June 23rd, another child, admitted to the ward on the previous day, developed the rash of small-pox. As a result, the infected ward was put in quarantine, and on June 26th 15 contacts, nurses and children, were vaccinated. The same batch of Government lymph was employed for all these vaccinations, two insertions being made in the left arm and half a tube of lymph (undiluted) being used in each case.

The patient had a temperature of 100° on the fifth day after vaccination and an evening temperature above 99° on the seventh and ninth days; thereafter the temperature was normal until the evening of the thirteenth day (July 9th). During this period the child appeared well and lively.

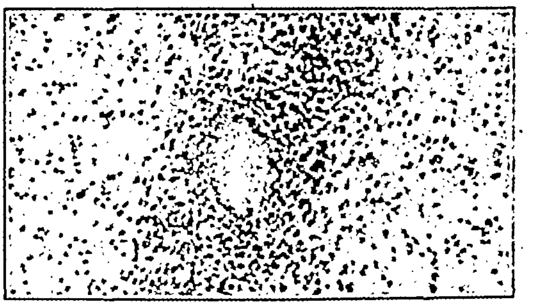
About bedtime on the evening of the thirteenth day the child was noticed to be rather excited, running about and striking other children. Her temperature was 100°, but she was not complaining. She was put to bed and given an aperient. The following morning she complained of headache and pain in the limbs. Her temperature was then 101·6°, pulse-rate 110, and respiration-rate 24. She passed urine naturally about this time. At noon the child told the nurse that she had wetted the bed; this was the only occasion on which she was incontinent. Fifteen minutes later she had become drowsy, though easily roused: her face was flushed and examination of the throat was negative. At 4.30 P.M. she accepted a drink; this was the last time she spoke or took food. It was now noticed that a stream of saliva was running from her mouth.

When examined at 5.45 P.M. she was lying on her back with the head turned to the right and saliva running freely. The face was grey, with slight cyanosis, and the cheeks were puffy, although the parotids were not palpably enlarged; she was very drowsy and difficult to rouse. There was ptosis of the right upper eyelid; the pupils were round, central and equal, and contracted briskly to light. Reaction to accommodation could not be tested. There was no squint or nystagmus. The fundi showed dilated veins in the neighbourhood of the discs but were otherwise normal. The neck muscles were stiff but there was no head retraction. The cheeks gave slight muscular response to pin-prick, more marked on the left side; there was occasional slight twitching of the left angle of the mouth, doubtful weakness of the right side of the face, and definite weakness of the right arm and leg. The abdominal reflexes were sluggish, especially the lower ones. The knee-jerks and ankle-jerks were brisk and there was bilateral ankle-clonus, not well sustained. The plantar response was extensor with all the toes on both sides, and Kernig's sign was present on the left side. Tache cérébrale was present. There were two vaccination crusts, half an inch in diameter, in the left deltoid region, with a slight surrounding fading redness. No glands were palpable in the left axilla, nor was there general enlargement of lymph glands. The heart, lungs, and abdomen showed no abnormality.

Eight ounces of urine were removed by catheter; it contained a trace of albumin but there was no organised deposit. A culture grew *B. coli communis*. Lumbar puncture was performed under light anæsthesia and 40 c.cm. of clear, colourless fluid dripped away. This contained 0·8 small lymphocytes per c.mm.; it gave normal reduction and there was no increase of protein.

The drowsiness became steadily deeper during the evening, passing into coma. When seen the following morning (July 11th, fifteenth day) the child was deeply comatose and there was still ptosis. The pupils reacted briskly to light, ptyalism had ceased, and the tongue pointed to the right. There was now no difference in the muscular power of the two sides of the body, but the tone of the limb muscles was diminished. The knee-jerk was absent on the right side and just present on the left. There was no ankle-clonus; the right plantar response was definitely flexor and the left gave a doubtful Babinski. The temperature was 101·4°, the pulse-rate 140, and the respiration-rate 68. The child was again catheterised, though the bladder was not distended.

FIG. 1.



Low power view of a vessel of the subcortical white matter showing dense extra-adventitial infiltration.

At 5 P.M. her colour was much worse. Cheyne-Stokes respiration was established and muco-pus, which collected at the back of the throat, was brought up from time to time. She was sweating profusely. Otherwise the physical signs had not altered.

At 6 P.M. the temperature was 102·4°, the pulse-rate 160, and the respiration-rate 62. The pupils were still small, round and equal, but they now responded very sluggishly to light. Lumbar puncture was again performed and 45 c.cm. of clear, colourless fluid dripped away. However, there was no improvement and she died at 7 P.M. Her bowels had acted on July 9th; from then on she was constipated.

It is noteworthy that the only other person who showed unusual signs was a girl aged 5, previously unvaccinated, who had been vaccinated with the other half of the same tube. This child was convalescent from furunculosis of the right external auditory meatus. She had previously suffered from chicken-pox and measles. On the fifth day after vaccination her evening temperature rose to 100°, and there was an evening rise above normal on the seventh, eighth, ninth, tenth, thirteenth, and fourteenth days. During this period the child appeared to be quite well. On the morning of the fifteenth day she vomited and her temperature rose to 102°; she was definitely drowsy. She was cold-sponged, and when seen at noon her temperature was 103°, although she was no longer drowsy and no abnormal physical signs could be made out. The fever subsided next day and nothing further ensued. When seen again in October, 1929, she was quite well.

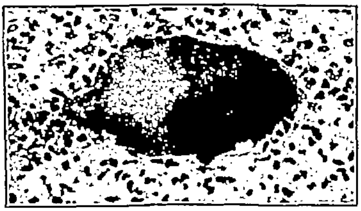
Autopsy.

The only macroscopic abnormality of the nervous system was intense congestion of the small vessels of both grey and white matter. The bulk of the brain was fixed in 10 per cent. formol-saline; after embedding in celloidin, sections were stained with hæmatoxylin and van Gieson and by Nissl's method, while frozen sections were stained for fat and by the Bielschowsky method for neurofibrils. Tissue fixed in formol bromide was utilised for Penfield's modification of Hortega's method for microglia. Zenker-fixed material was embedded in paraffin and stained by Giemsa and Panchrom. Finally, tissue was mordanted and stained by the Weigert-Pal procedure for myelin sheaths.

Character of Lesions.—In stained sections the lesions can quite easily be seen with the naked eye. In the white matter the changes occur in strict association with the blood-vessels, of which some are affected and some escape in any given area; in the grey matter this association may not at first sight appear obvious. The essential lesions are: (1) perivascular infiltration, and (2) extra-adventitial infiltration with demyelination of the area immediately surrounding the vessel. Perivascular infiltration, consisting of a collection of inflammatory cells in the Virchow-Robin spaces, varies in degree in different vessels. In some only a few scattered cells are present; in others a cuff, several cells deep, extends round the whole circumference of the artery or vein. The constituent cells are mainly large and small lymphocytes with a few plasma cells and, in some regions, occasional polymorphonuclear leucocytes. Extra-adventitial infiltration (i.e., a collection of cells in the nervous tissues immediately outside the vascular adventitia) is associated with and is presumably the reaction following destruction of the myelin sheaths over a wider or narrower zone around the vessel. Where closely adjacent vessels are affected their respective zones of infiltration and demyelination may coalesce. As is clearly seen in sections stained by Penfield's method, the majority of the cells of this infiltrate are microglial in nature; in sections stained by the Nissl method their cell-bodies, irregular in outline, appear reticulated or finely vacuolated. Appropriate methods show them to contain numerous fine fatty granules, but typical fully formed granular corpuscles are wanting. The nuclei of these cells are very polymorphic and assume a *great variety of grotesque forms; some have* to be distinguished from polymorphonuclear leucocytes, to which they bear a superficial resemblance. Glial cells, some with slightly enlarged bodies and others with large pale nuclei, are also present. Where the perivascular infiltrate is very dense there may be some overflow of lymphocytes into the immediately adjacent nervous tissue; in many areas a few polymorphonuclear leucocytes are mingled with the other infiltrating cells and may be found at some distance from the vessel wall. Occasional wander cells are present. Among all types of cells nuclear degeneration in the form of pyknosis and karyorrhexis is very common and nuclear debris is abundant in almost every region.

While in the white matter the limits of the extra-adventitial infiltrate are more or less sharply demarcated at a level where demyelination ceases, in the cortex and other areas of grey matter this infiltrate appears to be less dense but more extensive, and its peripheral limits are hard to define. Such areas cut tangentially appear to be unconnected with the vessels and suggest a localised overgrowth of microglia; many sections may have to be cut before the affected vessel comes into view. Weigert-Pal preparations show that, here as elsewhere, destruction of such myelinated fibres as may be present has occurred. In sections stained by the Weigert-Pal method the zones of perivascular demyelination are well demonstrated. In some cases the process is complete, but in others fragments of the sheaths originally present are still visible and stain more intensely than the normal myelin. At the periphery of the demyelinated area the persisting myelin sheaths are greatly distorted or ballooned and globules of free myelin are more numerous. The amount of free myelin, however, together with that of the fatty products of its degeneration seen in hæmatoxylin and Scharlach preparations, does not nearly correspond to the extent of the demyelination; there is also a striking absence of anisotropic substances in the fully demyelinated areas, and it seems that not only is the removal of waste fatty products accomplished with abnormal rapidity but that much of the myelin disappears without breaking down into the doubly refractile lipoid materials seen in the slower process of tract degeneration.

FIG. 2.



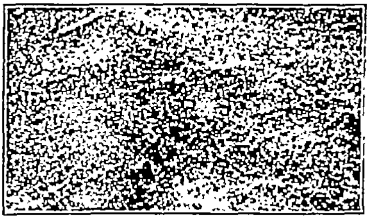
High power view of a less severely affected vessel to show the polymorphic appearance of the infiltrating microglial cells.

Even in the zones of complete demyelination a number of axis-cylinders persist, although the total is far below the number normally present. Of those which remain many are thickened and stain more intensely than normal, while fusiform swellings are present at intervals along the course of others. The nerve-cells are everywhere surprisingly well preserved; even when involved in a dense extra-adventitial infiltration their appearance is little altered. Thus in the medulla the lesions are almost unilateral and, while the cells of the twelfth nerve nucleus of one side are quite normal, on the other side they are involved in an extensive zone of infiltration and myelin destruction: even so, they show only minor changes in the form and colorability of their Nissl bodies.

Distribution of Lesions.

Cerebral Hemispheres.—Lesions are numerous throughout the white matter, in the cerebral cortex, and in the grey nuclei at the base; all of the many areas examined show some affected vessels. Both arteries and veins are involved, but in some regions particularly the latter. Perivascular infiltration may exist in the cortex in the absence of extra-adventitial changes, but elsewhere it is associated with the characteristic perivascular demyelination. Small hæmorrhages into the demyelinated areas are sometimes seen; no reaction is seen in the surrounding tissues, a fact which suggests that they occurred shortly before death or that they may possibly be attributed to rupture at autopsy of the greatly congested vessels. In a few places, particularly in the deeper parts of the sulci, the meninges contain small collections of inflammatory cells similar to those in the perivascular spaces.

FIG. 3.



Weigert-Pal preparation of spinal cord, showing zones of demyelination around the vessels radiating through the white matter.

Cerebellum.—Numerous vessels in the white matter show perivascular infiltration and zones of demyelination.

Brain-stem.—Severe in the midbrain and pons, the changes increase to a maximum in the upper part of the medulla, then decrease in intensity as the cord is approached. At all levels they are very much more marked on the right side; the central parts of the substantia reticularis and the grey matter in the floor of the ventricular system are severely involved. *Perivascular infiltration is often intense and the* extra-adventitial zones of adjacent vessels often coalesce. Arteries and veins alike are affected. The meninges are normal.

Spinal Cord.—A feature of the disease in the cord is the severe involvement of one segment and the entire freedom from lesions of a closely adjacent segment. Thus, while the first cervical segment is quite normal, the third cervical shows severe changes; the first lumbar segment is severely involved and the last lumbar segment and sacral region are free from disease. A second and unusual feature at almost all levels is the striking limitation of the lesions to the right half of the cord, the other being wholly or almost wholly spared; at the same time the grey matter in many segments is more severely affected than the white. In the middle and lower cervical, upper dorsal, and upper lumbar regions the unilateral distribution of the lesions is absolute. The vessels radiating through the white matter, particularly of the anterior and lateral columns, show considerable perivascular and extra-adventitial infiltration with a wide zone of perivascular demyelination. The large vessels of the grey matter are similarly affected and there is considerable diffuse infiltration of the anterior or posterior horns or both. There is a narrow zone of demyelination at the surface of the cord in the lateral column. The meninges are normal. In the lower dorsal region the lesions, though more marked on the right side, are not absolutely confined to it; on the left side the lesions affect only the white matter, while on the right side both white and grey matter are involved. There is considerable perivascular infiltration of the vessels of the anterior fissure, with a narrow zone of demyelination along both lips of the fissure.

Intervertebral Ganglia and Peripheral Nerves.—No changes were detected in the lower cervical ganglia or brachial plexus of either side.

Other Organs.—The lungs, which macroscopically were greatly congested, show numerous small areas of early broncho-pneumonia. The axillary lymph glands on the left side show an inflammatory reaction of moderate degree. The heart, liver, spleen, pancreas, kidneys, submaxillary and parotid glands, stomach, and intestines appear normal. One calcified lymph gland was present in the mesentery. The vaccinated area appeared normal for the period following the inoculation; there was no sign of sepsis and the blood was sterile on culture.

The clinical picture presented by this fatal case of encephalomyelitis is in accordance with the descriptions of similar cases occurring after vaccination published by Turnbull and McIntosh (1926), Bijl (1928), Rivers (1929) and others, and with those cases following acute infectious diseases—e.g., measles (Greenfield, 1929), or occurring spontaneously (Brain and Hunter, 1929). The overwhelming character of the infection was very striking. Rivers notes two instances in which, after vaccination, two children in the same family developed the symptoms of encephalomyelitis on the same day. It seems possible that the second of our cases may have had an abortive attack of encephalitis, although there is no apparent reason why this one tube of lymph should have contained anything not present in the rest of the batch.

Of the remaining 13 individuals vaccinated, two were children, aged 5 and 4 respectively and previously unvaccinated, who had recently recovered from pneumonia. In them, vaccination produced no unusual effects. In all the cases a "brisk take" was noted on inspection on July 3rd. At no time did the vaccinated arm in the fatal case differ in appearance from the arms of the others vaccinated.

Histologically the lesions in the present case conform closely to the descriptions given by Turnbull and McIntosh (1926), Lucksch (1926), Bouman and Bok (1927), Perdrau (1928) and others, of the disseminated encephalomyelitis which has during recent years occurred from time to time as an early sequel to vaccination. An unusual feature of the present case, and one to which we have been unable to find reference in the literature, is the almost complete limitation of the cord lesions to one-half of the cord. In view of the alleged direct association between vaccinia and the nervous disease, it is perhaps a not unimportant fact that it was the right half of the cord which was affected—whereas vaccination had been performed on the left arm—and that no lesions were detected in the brachial plexus or intervertebral ganglia on the vaccinated side. In their essential characters the lesions do not differ from those in the similar cases following measles (see Greenfield, 1929) and certain other infective states, or arising during the course of antirabic treatment; one of the writers (E. W. H.) is at present investigating such a case, to be published shortly, occurring after small-pox. Any investigation into the ætiology of this "post-vaccinal encephalitis" must therefore take into account the occurrence of similar complications in the other acute infective fevers and aim at discovering a common factor responsible for the production of identical histological lesions in a number of very different conditions.

We are indebted to Dr. R. L. Guthrie, coroner for East London, for permission to publish this case.

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Clinical and Laboratory Notes.

DILATATION OF THE AURICLES RESULTING FROM HEART-BLOCK

AND PRODUCING PRESSURE SYMPTOMS.

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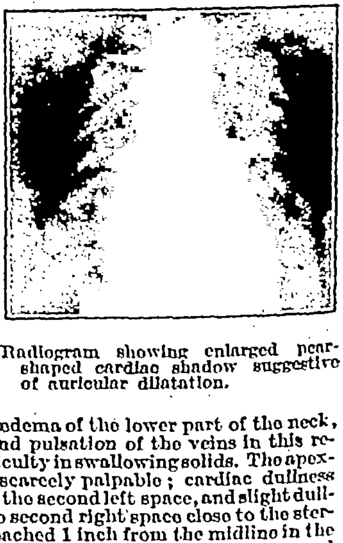
IN THE LANCET of Dec. 12th, p. 766, F. J. Bach and T. S. Keith describe a case of enlargement of the left auricle causing pressure on, and obstruction of, the left main bronchus and quote a series of cases described by various authors. Pressure on the œsophagus and paralysis of the left recurrent laryngeal nerve have also been described as rare complications of auricular dilatation. The case now described is of interest from two points of view; for in the first place it affords an example of dilatation of the auricle producing pressure symptoms of such a nature that a mediastinal tumour was suspected; and secondly, it illustrates a mechanism whereby auricular dilatation may be produced apart from valvular lesions and apart from auricular fibrillation, the two most commonly recognised causes. Inasmuch as the patient did not succumb, post-mortem confirmation of the findings and conclusions is lacking, but the clinical and instrumental findings appear sufficiently clear to warrant the conclusions drawn.

Report of the Case.

A. B., aged 48, was a healthy man until the onset of his present symptoms; he had never had acute rheumatism, chorea, or sore-throats, and had not previously suffered from cardiac symptoms. His family history was negative. About January, 1929, he began to have dyspnœa on exertion and cough, with occasionally slight œdema of the ankles at nights. In March he began to have difficulty in swallowing solid food, and stated that his voice had altered in character; he noted that the lower part of his neck was much swollen. He was sent into hospital with a tentative diagnosis of mediastinal tumour.

On admission his lips were cyanosed: there was no œdema of the legs. His speech was normal, and there was no evidence of laryngeal paralysis. There was considerable œdema of the lower part of the neck, and marked distension and pulsation of the veins in this region. He experienced difficulty in swallowing solids. The apex-beat was not visible and scarcely palpable; cardiac dullness was increased upwards to the second left space, and slight dullness was also noted in the second right space close to the sternum; the right border reached 1 inch from the midline in the fourth space, but only ¾ inch in the fifth space, the normal angle between the right border of cardiac dullness and the upper border of hepatic dullness being maintained; the left border was 4½ inches from the midline in the fifth left space. The sounds were infrequent (40 per minute), with occasional extrasystoles; a third sound could be heard periodically during the diastolic interval, sometimes occurring early, sometimes in mid-diastole. The sounds were faint at all areas, almost inaudible at the aortic; no murmurs were heard in any area; the second sound at the pulmonic area was relatively accentuated and intoned. The pulse was regular apart from occasional extrasystoles, and of moderate volume; the volume in the left radial was slightly less than

FIG. 1.

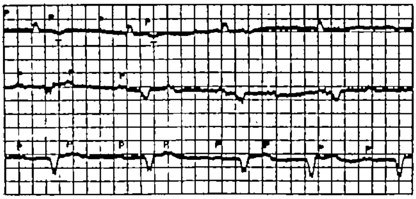


Radiogram showing enlarged pear-shaped cardiac shadow suggestive of auricular dilatation.

in the right; the arteries were not palpable and the blood pressure was not raised. Apart from occasional rhonchi at each base the lungs were normal. The liver and spleen were not palpable, and there was no albuminuria. The pupils were equal.

The Wassermann reaction was negative. A radiogram of the chest (Fig. 1) shows an enlarged, "pear-shaped" cardiac shadow suggestive of auricular dilatation; there is no evidence of a mediastinal tumour nor aneurysm. An electrocardiogram (Fig. 2) shows an auricular frequency of 86 with slight sinus irregularity; the P wave is broad and notched resembling that seen in mitral stenosis. 2–1 block is present throughout the portion of the tracing shown in the diagram, the ventricular rate being 43, but a further portion of tracing showed occasionally two successive auricular beats reaching the ventricles; another occasional feature was the occurrence of left ventricular extrasystoles in pairs. The ventricular responses show changes characteristic of a further intraventricular block, approximating to a complete block of the right branch of the auriculo-ventricular bundle. The total duration of ventricular systole is prolonged occupying 0·52 sec.; the P–R interval in those beats in which auricular contractions excite ventricular responses varies from 0·2 to 0·4 sec.; thus it comes about that the total duration of cardiac systole (from the commencement of P to the termination of T) varies from 0·72 to 0·92 sec.; and since the interval between successive auricular beats averages approximately 0·7 sec., alternate auricular beats occur before the termination of the preceding ventricular systole in the majority of cycles. The significance of this feature will be referred to presently.

FIG. 2.



The electrocardiogram.

Course of Illness.—With the lapse of time and confinement to bed the patient's symptoms gradually improved, and four weeks later he was feeling comfortable in bed; he no longer had dysphagia; the œdema of the lower part of the neck had entirely disappeared, and the distension and pulsation of the veins was very much less noticeable. In the condition of the heart itself no change was noted; an electrocardiogram showed the same features as before, with an auricular rate of 98 and ventricular rate of 49; there were still occasional extrasystoles in pairs, but now of right ventricular instead of left ventricular origin. After another three weeks he was allowed up gradually, and in another month he was able to go home; he was able for mild exertion without much dyspnœa but still had occasional slight œdema of the feet at night if he stayed up too long; the cardiac dullness remained unchanged, the sounds had improved slightly in intensity, but the block was still present; the pressure symptoms had entirely disappeared.

Comments.

Apart from the transient dysphagia which was presumably the result of pressure of a dilated auricle on the œsophagus, this case is of interest in view of the mechanism whereby the auricular dilatation appears to have been produced. Dilatation and hypertrophy of the left auricle as a result of mitral stenosis is well recognised; in Bach and Keith's case the physical signs during life were those of mitral stenosis, and although there was no narrowing of the mitral orifice post mortem—in fact, it was actually widened—the changes described as shown by the mitral cusps and chordæ tendineæ appear to be those of an early stage in the development of a certain type of stenosed mitral valve, and are at least suggestive of a considerable degree of mitral incompetence. Apart from valvular lesions, dilatation of both auricles is the rule in auricular fibrillation and in many cases of auricular flutter, where effective contraction of the auricles has ceased, and the chambers become passively distended. The present case, however, illustrates yet another possible mechanism, for it has been shown that every second auricular beat (with occasional exceptions) occurred before the termination of the preceding ventricular systole; on these occasions the auricles must fail to empty their contained blood into the ventricles, and they are consequently full of blood at the commencement of the succeeding diastole; during this diastole they must become overfilled—particularly in the case of the left auricle if the output of the right ventricle remains effective. In due course, if the condition continues, auricular hypertrophy is likely to follow, and once this has occurred the diastolic overfilling will be lessened. Thus the accentuated pulmonic second sound, the broad notched P of the electrocardiogram suggestive of auricular hypertrophy, the occurrence of pressure symptoms, and their ultimate disappearance can all be explained as the result of the heart-block; the latter in this case can only be ascribed to myocardial degenerative changes resulting from disease of the coronary arteries.

It must be pointed out that in order to explain the facts as above the essential feature is, not the presence of heart-block, but the occurrence of a relatively large proportion of the auricular beats at a time when the ventricle is actually contracting. There are other disorders of cardiac rhythm in which this condition may be fulfilled—e.g., certain cases of parasystole—and on the other hand, by no means all cases of heart-block—or even of 2–1 block fulfil the requisite conditions. In an ordinary case of 2–1 block, where the ventricular systole is not unduly prolonged and where the P–R interval of the effective auricular beats is not greater than 0·2 sec., the total duration of a cardiac cycle will not exceed 0·52 to 0·6 sec.; unless the auricular beats follow one another at intervals of less than 0·6 sec., therefore, the alternate beats will not occur before the termination of the preceding ventricular systole; that is to say, unless the auricular rate exceeds 100 per minute the conditions will not be fulfilled. To enable the conditions to be fulfilled with a lower auricular rate, there must be, in addition to the 2–1 block, either a prolongation of the P–R interval of the effective beats, or a prolongation of the duration of ventricular systole (RST period). Similar considerations may be applied to other grades of block and to other disorders of rhythm.

I am indebted to Dr. Ivy McKenzie for permission to publish the case, and to the superintendent of the Victoria Infirmary for permission to reproduce the radiogram.

A NOTE ON THE TREATMENT OF NEURASTHENIA.*

BY A. W. HENDRY, M.D., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, ABERDEEN ROYAL INFIRMARY.

THE purpose of this paper is to suggest a simple provisional plan for dealing with neurasthenic states. Life, it has been said, is the continuous adjustment of internal relations to external relations. In the mental sphere suitable adjustments depend on adaptability, and if adaptability be deficient or defective appropriate adjustments cannot occur, hence conflict and mental disharmony. Adaptability is largely a constitutional characteristic depending on the predetermined disposition of the brain. Where the predominating feature of a mentality is affective tone, there must follow a tendency to emotional states without which the neuroses could not occur. This tendency may occur in a mind otherwise normal;

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* Based on a lecture delivered to the Aberdeen University Post-Graduate Society.

it results simply from a high degree of the affective component. It may also occur in a mind below normal. Neurasthenia is as common in persons highly endowed as in persons below normal. Wherever the feelings get the better of the critical powers, wherever adaptability is deficient or defective, there must result a soil suitable for the growth of functional nervous diseases. Although it is generally accepted that a neuropathic tendency is constitutional, we should remember that, just as good soil becomes poisoned or tired, so the normal constitution under toxic conditions or fatigue may become deteriorated and susceptible to neurotic ailments. We can imagine circumstances which would render neurotic the strongest, the most stable mind. Neurasthenia, then, is a condition depending on a predominating emotionalism, a susceptibility which may be congenital or acquired.

How the Neurasthenic State is Induced.

The determining cause is any circumstance, real or imaginary, which conditions an unpleasant and unacceptable emotion. The adequate stimulus varies with the susceptibility to neurasthenic states. If the susceptibility be slight, the adequate stimulus must be considerable; if the susceptibility be great, the adequate stimulus need be but slight. Neurasthenic susceptibilities are like explosives; it takes a flame to explode one, a spark may explode another, while some explode spontaneously. Pleasant emotions are always acceptable; they cannot determine neurasthenic states. There always exists in neurasthenia some unpleasant and unacceptable emotion. One man hears of his financial ruin. He accepts, perhaps with sighs, his return to poverty and hard gruelling work; he sells his house and his cars, and discharges his servants. He says to himself, "Hard luck!" and as he clenches his hands and sets his jaw, he continues "Ah, well, its no good crying. I'll just have to make the best of things. I'll start again. I'll make good again." This man is no neurasthenic, he has accepted the misfortune and adapted himself to his altered circumstances. His mental digestion is equal to the unpalatable task. Another man hearing of his financial ruin is stunned and drops into a chair. Holding his head in his hands he rolls about and moans and groans. Sleep has deserted him; appetite is gone; his friends have forsaken him; the world has crushed him: he is misery personified. In despair he turns to his doctor, who may prescribe a stomachic and tell him that his stomach is out of order. He miserably carries on and his stomach does not improve; he begins to dread cancer, gets X rayed, has a fractional test-meal, has his stool examined, and generally ends in a worse state than ever. This man has not adapted himself to his environment; he has not accepted the unpleasant fact. This creates a mental state outside his mental entity. There is a foreign body in his mind. The uninvited, unpleasant, and persistent guest is kept at the door, where he creats a disturbance and corrupts all other visitors and thus multiplies the discomfort. The unpalatable body should have been swallowed and digested. The uninvited guest should have been asked in, and the differences settled.

The first step in a neurasthenic state is emotionalism. The unpleasant state cannot be entertained yet cannot be forgotten. The mind becomes preoccupied. This preoccupation has two results: (1) All stimuli are tainted according to the preoccupation; hence dyspepsia becomes cancer, palpitation becomes heart disease—i.e., emotional infectivity. (2) The preoccupation means the inhibition of critical faculties, hence the tendency to accept any statement without criticism; this is increased suggestibility. The sequence, therefore, is emotionalism, preoccupation, emotional infectivity, and increased suggestibility.

The Three Steps in Treatment.

The first point which I stress is, that very careful and sympathetic note should be taken of the numerous complaints. Sympathy and patience will be required, for the patient frequently goes on speaking about his symptoms for an hour or more, and it is the greatest mistake to cut him short. It is of the utmost importance also that notes be taken. There are many medical men who consider this a waste of time and cut the symptom-telling short. These men can never treat neurasthenics with any hope of success. They cannot spare an hour to carry out this absolutely necessary part of the work, but they will waste months in vaguely attempting to do the impossible. The patient should be encouraged to dilate on his troubles, for sometimes the neurasthenic is reticent, and unless you get to know your patient thoroughly—to know his fears, his pleasures, his ambitions, his home life, his habits, and his circumstances you may miss an all-important clue. It is not usually difficult to get him to unburden himself if he has confidence, and I feel very strongly that confidence can be engendered by sympathy, tact, understanding, and a genuine desire to help these patients to recovery. After you have heard his story, repeat it to him; this will keep you right and will also help the patient to appreciate the real interest you have taken in his case. All you have done in this hour is to listen to his story; in reality you have entered into his life, you have got to know him, and he has placed his confidence in you. As a matter of experience I should say you have won half the battle.

At the next meeting, probably a few days later, it is best to subject him to a complete physical examination, an examination which must be thorough and painstaking, each system being taken in turn. You then know his physical state and you increase his confidence in you, but I think it important that on both these occasions you should give nothing away. Assure him that physical examination is a routine affair, and do not attempt to give any interpretation of his symptoms. Your interpretations at this time would probably be wrong and would have to be retracted later; this rather tends to shake confidence.

Your duty is now to associate symptoms and signs; if there be no physical disease then you must analyse his symptoms. Go through them again and you will almost invariably find a common denominator, some unacceptable emotion from which all others are derived. This is usually where experience and knowledge of human nature tells, but it is not a bad rule to be guided by the earliest symptoms. In the case we have mentioned the patient may be seen years after the financial loss; his symptoms might easily be gastric or the wasting might invite thoughts of malignant disease, but the chronological order of symptoms would or should suggest the beginning of his illness. The anorexia would date from that time. The absence of physical signs of organic disease would also indicate a psychopathic disease. Put yourself in the patient's position, assume for a period his mentality and imagine the effect. In fact, I find the easiest way to understand a patient is to imagine I am the patient; it is then usually possible to interpret the symptoms. Distress inhibits appetite; sleep does not come to one who carries a constant mental agony.

The third time the patient is seen I usually find it necessary to ascertain a few matters connected with his symptoms, and by asking a few questions find out whether the general plan of my interpretation is correct. If this be so, then I proceed to unfold the story so that he himself can follow. I take him back to the initial emotional state, indicating how the symptoms occurred and how the others followed, explaining the mechanism as I go along. This does not take very long, usually about half an hour. It is then time to return to the cause under conviction, the original fault, and it will frequently be found that a different presentation of the matter results in its acceptance. Sometimes it is necessary to "predigest" the problem for him. He will then see that he should have acted differently, and nearly always says so. The case is three-parts cured, but the morale remains to be improved by encouragement and persuasion; this is where sympathy and his confidence count for a great deal, for without these he will not respond. With them his morale is enhanced, he will accept unpleasant facts, he will adapt himself thereto. The ruined man resumes means to mend his broken fortunes.

The Time Element.

The treatment takes time; it cannot be done in a day. It may be wise to isolate the patient for a time. Physical therapy is of value as means to an end, and any physical disorder should most certainly receive its proper treatment. In the main, however, the treatment is psychotherapy, a method at present rather in disgrace. Just as the healing knife of the surgeon is a murderous weapon in a villain's hand, so is psychotherapy in the hands of ignorant and unscrupulous persons. In the hands of the physician the methods I suggest can bring nothing but peace and happiness to his patients and satisfaction to himself. It is not suggested that this treatment will cure the predisposition to neurasthenic conditions, but that it will, so to speak, help the patient over a fence in the rough road of life. Curative treatment depends chiefly on prophylaxis. If we could get the child's mind in the plastic stage before predispositions were fixed, then it might be possible so to lessen the tendency to emotionalism that neuroses would not occur.

A SIMPLE METHOD OF TREATING CAVERNOUS NÆVI.

BY G. B. DOWLING, M.D., M.R.C.P. LOND.,
DERMATOLOGIST TO THE WEST LONDON HOSPITAL; ASSISTANT PHYSICIAN IN THE SKIN DEPARTMENT, GUY'S HOSPITAL.

THE treatment of cavernous angioma has always been a rather difficult problem. While the probable spontaneous disappearance of these tumours may be prophesied, for the patients are almost always infants or young children, the majority of parents prefer to have them removed as early as possible.

Application of carbon dioxide snow is ineffective though it will destroy the strawberry mark which often overlies the subcutaneous angioma, and it may even efface an overlying port wine stain. Apart from surgical excision, which is undesirable in an infant, and in some situations impossible, the methods commonly used are:—

1. Application of radium; a reliable method in the earliest cases, but likely to leave a radium scar.
2. Electrolysis with single or multiple platinum points; a painful method necessitating an anæsthetic.
3. Electro-coagulation with a needle electrode; also a painful method, and certain to damage the skin around the parts through which the needle is passed.

It occurred to me, as it has probably occurred to others, that it might be possible to destroy these lesions by thrombosing their contents by means of one of the coagulants used in the treatment of varicose veins. I have treated five cases at the West London Hospital during the past year by injecting the commonly used solution of quinine bihydrochloride and urethane; the result has been very satisfactory.

In the first case, an infant of six months, had two injections at intervals of a week into a small cavernous nævus situated on the back. The child was not brought up to see me for three months, so I was unable to observe its progress, but the eventual result was a complete flattening of the lesion, leaving a small disc of replacement fibrosis in the skin. The next two cases were treated concurrently. In one there was a cavernous nævus situated in the right labium majus; it received three treatments, carried out at intervals of a fortnight, 4 mm. of the solution being injected at a time. This nævus was somewhat shallow, and sloughing at one or two points took place; this, however, gave rise to very little trouble and the result was excellent, all that now remains being flaccidity of the skin over the part in which the nævus was situated. The other case, a cavernous nævus of 1¼ inches diameter on the back, had three treatments; it also disappeared, leaving again a flaccid overlying skin. Finally, two cases of cavernous nævus of the scalp have been treated. These required three treatments each, with the same results as in the former cases—that is, gradual disappearance of the nævus, leaving an overlying, somewhat baggy skin.

About 4–5 minims of the solution of quinine is injected at a time. The needle is passed in near the base of the nævus and about a minim is injected in three or four places. It is probable that many of the lacunar spaces are not reached by the initial treatment, but the immediate effect is an apparent solidifying of the whole nævus. In a fortnight the lesion flattens down somewhat, and the skin over it becomes slightly flaccid. It is then treated in the same way again, selecting parts which appear to have been unaffected by the first treatment. In a fortnight a further degree of shrinking of the nævus is observed, and a third treatment may then be given or it may be left for a few months, and further treatments given if necessary.

I have not treated a cavernous nævus on the lateral aspect of the nose, a common and unfortunate position, because of the possibility of extension of the thrombosis to the cavernous sinus. Although the number of cases that I have so far treated is small, I believe that thrombosis by injection may prove to be the future method of choice.

Reports and Analytical Records.

VINO SAN RAFAEL.

ESPECIALIDAD DE LA SOCIEDAD VINICOLA TARRAGONA. (SPANISH PRODUCE, BOTTLED IN GERMANY.)

THIS rich, red, fruity wine when analysed gave the following results:—

Alcohol by volume	18·24	per cent.
Equivalent to proof spirit	33·0	,,
Total acidity as tartaric acid	0·20	,,
Volatile acidity as acetic acid	0·03	,,
Total extract	23·0	,,
Consisting of—		
Sugar	22·18	,,
Mineral matter, protein, &c.	0·82	,,

The preservatives salicylic, benzoic, and sulphurous acids were tested for with negative results.

The wine, although it has the normal alcoholic content of a port, contains almost three times the amount of extractives. The acidity is low and the wine, whilst possessing a slightly astringent flavour, may be regarded as a pure product, and of value as a tonic.

CANNED FISH.

(1) PONY SMOKED HERRINGS IN TOMATO SAUCE; (2) IVANHOE BRAND SELECTED NORWEGIAN BRISLING; (3) IVANHOE BRAND BONELESS KIPPER SNACKS; (4) FINEST NORWEGIAN SILD.

(THE QUALITY CANNING CO., STAVANGER AND LONDON.)

The following four different kinds of fish were examined—viz., Pony Smoked Herrings in Tomato Sauce, Ivanhoe Brand Selected Norwegian Brisling in pure olive oil, Ivanhoe Brand Boneless Kipper Snacks, and Finest Norwegian Sild in pure olive oil.

—		Pony smoked herrings with tomato.	Brisling in olive oil.	Kipper.	Sild in olive oil.
Total weight of contents of tin		280 g.	111 g.	89·5 g.	114 g.
Weight of fish		200 g.	92 g.	89 g.	98 g.
Percentage of fish in total contents		93	82·9	100	86
Moisture	(per cent.) on drained fish	65·2	50·6	68·8	65·6
Proteins		19·3	19·5	21·6	20·6
Ash		4·0	6·3	1·40	4·7
Fat		11·6	15·7	7·14	9·1
Calorie value per lb. of drained fish		816·6	1025·3	703	767

The different fish were obviously well selected and of good quality. They were clean, palatable, and efficiently sterilised in the packing process. The calorie figures indicate the relative value of these fish as food materials.

GENERAL MEDICAL COUNCIL.

PENAL CASES.

(Continued from p. 1197.)

Alleged Adultery with a Patient.

The Case of Frederick Howard Pratt, registered as of 331, Brownhill-road, London, S.E. 6, M.R.C.S. Eng., 1925, L.R.C.P. Lond., 1925, who had been summoned to appear before the Council on the following charge:—

> "That you abused your position as a medical man by having intimate relations, at your surgery at 80, Standon-park, Lewisham, London, S.E.23, and elsewhere, between May and November, 1928, with a married woman with whom you stood in professional relationship; and that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect."

The complainant was the husband, who was represented by Mr. J. A. T. Good, of Good and Co., solicitors. Dr. Pratt appeared and was accompanied by Mr. Laurence Vine, instructed by Mr. Denton Rowe, solicitor.

Mr. Good stated that complainant had visited Dr. Pratt for ophthalmic treatment in 1927, and his wife had consulted the doctor a few days later. Violet-ray treatment had been ordered and had been administered, on some occasions by Dr. Pratt's wife. In January, 1928, complainant's wife had consulted the doctor about dyspareunia, and had been given treatment. In March Dr. Pratt had advised consultation and, as he had handed the written address of the specialist to complainant's wife, he had put his arm around her and kissed her. She had not told her husband. On the next day the doctor had again kissed her, and said he had "never felt like that before." On Oct. 14th she had had an operation at St. John's Hospital, and had then been found to be pregnant. It was not suggested that the child was not her husband's. Dr. Pratt had made advances to her on a number of occasions, but had been repelled. The first intimacy had taken place at the surgery in May, and during the doctor's holiday in July she had written to him affectionately. In September Mrs. Pratt had been away and the doctor had invited complainant's wife to his house, where intimacy had again taken place on a couch in the consulting-room. There was no doubt that she had been absolutely infatuated and had pursued the doctor, strongly resenting his attempts to withdraw from the relationship. Intimacy had continued up to three weeks before her confinement. While in the nursing home she had told the doctor that he was not treating her properly, as he was taking up with a nurse. On the last day of 1928, in a local restaurant, she had informed her husband of what had happened. In the evening the complainant and his wife had met the doctor, who had said intercourse had only happened five times, and that all had been over four months before. There had been a scene. The complainant, considering his young baby, had taken the line that the doctor must leave the neighbourhood in a month. Later he had seen the doctor at his surgery, and had left a note saying he would complain to the General Medical Council.

Complainant's wife testified that she had first seen Dr. Pratt in October, 1927, when she had accompanied her husband to the surgery, and later had seen him professionally by herself. She confirmed the account given by complainant's solicitor of subsequent events, and gave details of Dr. Pratt's advances to her. Misconduct had first taken place in the surgery in May, 1928, and had been repeated two or three times a week thereafter. She had written to the doctor at Rotterdam and Antwerp when he was on his holiday, but had never had an answer. He had never suggested discontinuance. She described the visit to the house, a visit to the bedroom, and intimacy in the consulting-room. The last intimacy had been on Nov. 2nd, and the baby had been born on Nov. 23rd. In the nursing home she had told the doctor that she had been informed that the doctor was "hot stuff" and could "not leave women alone, married or single," and that he had taken out a sister at the home. At the interview between the three parties Dr. Pratt had said his wife would probably divorce him, and that he had never cared for witness. He had, in fact, given up his surgery. Witness had seen Dr. Pratt and his wife subsequently. Before making her declaration she had telephoned Dr. Pratt and had gone to see him and talked it over. She had said she would not make the declaration if she could believe that he had ever meant anything he had said. She had suggested that he should undertake the education of the baby, and the doctor had agreed on condition that her husband withdrew the complaint. He had, however, never sent the promise in writing.

Cross-examined, she said she had married in 1926. She had not complained when Dr. Pratt had first kissed her because long before that he had won her sympathy. She denied that she had pursued and waylaid the doctor, writing and telephoning almost daily, or that she made the complaint in a spirit of vindictiveness. She had not behaved like a person deranged after her operation. Every time she had visited the doctor he had asked her to come again. She did not agree that she had been infatuated; she had been in love with the doctor. Dr. Pratt had not remonstrated with her for writing or pestering. She had told him towards the end that she felt he was getting tired and he had only to say so frankly and she would back out. She had not behaved like a distracted woman in the waiting-room. She had never been removed by the police. On one occasion in January she had waylaid Dr. Pratt after a quarrel with her husband; this was the only episode of the kind. She had not gone round to extract money for the education of the child; she had gone to see if he had ever cared at all. Her husband had known nothing about the visit. The support of the child had been the doctor's suggestion in the first place. She had not concocted the story of intimacy because she was jealous and because he would not educate her child.

Re-examined: Up to the time of the present inquiry Dr. Pratt had never denied intimacy. She had never either wanted or received money from Dr. Pratt.

By the Legal Assessor: Intimacy had usually taken place between 9 and 10 in the morning at the surgery, at first always as a result of a message from the doctor fetching her over. The surgery was at the back of the house. They had had an arrangement whereby she rang three times and the doctor opened the door to her. On some occasions the landlady had opened the door. Usually witness had gone straight into the surgery, but on the rare occasions when other patients had been waiting she had gone into the waiting-room. Intimacy had taken place in her house at various times of day in various rooms when she was alone in the house. Her husband had his own business as an iron founder and should be able to afford to educate his child by the time it grew up.

By the President: She had never expected replies to her letters. She had been rather annoyed at the doctor's refusal to take her out in his car.

The complainant identified professional receipts from Dr. Pratt dated October, 1927, April, 1928, and an unpaid account October–December, 1928, including confinement, and related other accounts which he had paid. His wife's mind had been perfectly normal after the operation and always. He described the interview on Jan. 1st, confirming Mr. Good's account of it. Dr. Pratt had said it had not been a question of love but of pure physical attraction. At his private interview with Dr. Pratt, the doctor had remarked that medical students were warned against a certain type of woman. There had been no denial of the intimacy. Subsequently witness had consulted solicitors, had threatened proceedings before the General Medical Council, and had withdrawn this threat at the request of his wife. On April 9th he had written again saying that he proposed to proceed with the complaint, as the doctor had not kept the spirit of their agreement and had been seen about the neighbourhood.

Cross-examined, he admitted that the doctor had told him when he threatened to report him to "get on with it," but did not agree that he had treated both complainant and his wife with contempt. He had never said he was satisfied with Dr. Pratt's explanation. He had noticed that his wife was very unhappy and highly strung after the operation. The doctor had said "as far as clearing out of the neighbourhood is concerned, the surgery does not pay and I have been meaning for some time to give it up." Witness knew nothing of and would not have approved of the suggestion to educate his child. His wife had never suggested withdrawal of the complaint on any such condition. He had not realised how infatuated his wife had been with Dr. Pratt.

By the President: He had heard of the General Medical Council from his cousin, a doctor. He had consulted the solicitor about divorce.

By the Legal Assessor: The doctor's words had been that "it had only occurred five times"; he had not charged the doctor with intimacy, as it had been taken for granted. As the doctor had come in he had said "I understand your wife has told you all about it." The term "intimacy" had never been used.

Mrs. Cokayne testified that she had worked in the house of complainant and had heard the quarrel on Jan. 1st, and had identified the words "Won't you kiss me good-bye?" said by Dr. Pratt.

Cross-examined, she said she had heard voices for more than half an hour but had only heard this one sentence. She was certain these words had been said by Dr. Pratt.

By the President: She supposed the parties had come out into the hall when she had heard this expression.

The Defence.

Dr. Pratt, examined by his counsel, said that he had started practice at the surgery in November, 1925, and was still carrying on practice in the neighbourhood, but had given up the surgery. Complainant's wife had consulted him for pruritus vulvæ, and as this had not responded to Lassar's paste she had been put on sunlight treatment. He described in detail the geography of the surgery to illustrate how little privacy there was there. He agreed that he had usually seen complainant's wife between 9 and 10 A.M., but she had been received absolutely as any other patient and there had been no arrangement of ringing three times. He had never kissed her at any time. During her pregnancy she had visited the surgery about once a fortnight. She had begun to get anxious about her confinement, but he had not noticed anything abnormal towards himself until September. There was no truth at all in her allegation that intimacy had taken place between May and September. The right ovary had been removed and this, together with her pregnancy, had seemed to him to account for her frequent visits and anxiety. Between September and November she had been perpetually at the surgery; it was absolutely untrue to say she had only come at his request. She had started writing letters just before his holiday in July and had written two while he was away. He had been very surprised to see them and had torn them up. He had noticed no abnormal affection for himself. She had accosted him on Christmas Eve as he left his surgery, thanking him for looking after her so well and proffering a petrol lighter as a gift. He had taken this home and shown it to his wife. On the last Sunday in the year the husband had rung him up saying she was in a terrible state of nerves. He had gone round and found her absolutely incoherent and hysterical. He had never seen her like that before and had prescribed valerian bromide. He had been in bed with influenza on Jan. 1st when she had rung up; he had refused to go, but later a new patient had rung up. He had agreed to get up to see the other patient and so had acceded to her second request for a visit. Mrs. Pratt had driven him to the house. He had found complainant's wife in the same excited state. She had said "I've told my husband everything" and that this had included intimate relations with him. He had said "you know that is absolutely untrue." She had wept and he had left. In consequence of a conversation with his wife he had telephoned complainant that evening and had visited him to explain the patient's state and deny the allegations. He had said to complainant "You know that the whole thing is absolutely untrue," and had repeated this to complainant alone. He had never said "it only occurred on five occasions." Complainant had said, "Oh, I could get you turned off the Register. I have a cousin high up in the profession who has influence and who could get you knocked off." Witness had replied "Get on with it then," and had walked out. That evening complainant had rung up to say he was not doing any more and witness had simply put the receiver down. A few days later he had found a note saying complainant was going to report the whole matter to the General Medical Council. About a month later he had met complainant's wife, who had refused to leave him. He had taken refuge in the house of some friends, but she had waited for him and tried to follow him on to a bus and a tram, and he had asked two police-sergeants to see her home. About May she had appeared in the waiting-room; he had asked two other patients to remain outside in the passage and listen to the conversation with complainant's wife. She had proposed that if he would bring up her child as he would one of his own she would withdraw the complaint. He had absolutely repudiated the suggestion and she had become hysterical. Her account of this interview was absolutely untrue. He had never carried on with nurses, nor had complainant's wife ever spoken of it to him. He had not said "Kiss me good-bye," but had probably said "Good-bye." He had never on any occasion had sexual connexion with complainant's wife and had always denied the allegation.

Cross-examined, he said he had torn up all her letters, many of them unread. They had not been professional letters but they had not been love-letters. He had not told the husband because he had put them down to her mental state and had ignored them.

By the Legal Assessor: He had told complainant's wife where he was going on holiday but not when he would be at certain places. She had known how to follow the movements of the ship he was on; it was a definite routine cruise. His surgery was overlooked by several houses; when consulting he had had the curtain drawn.

By the President: He had not asked her to write to him nor had she asked if she might write. She had just said she could find out the movements of the ship. There had been nothing in these letters or in her behaviour to arouse his suspicions of the state of her affections until towards the end of the eighth month of her pregnancy. No reference had ever been made in interviews to the letters. Complainant had not given him a month to clear out; he himself had brought the subject up, saying it was curious that he had arranged to close the surgery.

Mrs. Pratt confirmed the material facts as related by her husband. She had noticed a great alteration in complainant's wife after the birth of the child and had regarded her as deranged. Witness had had experience as a nurse.

Mrs. Hooper testified that she had assisted in the housework at Dr. Pratt's house and had seen complainant's wife there on May 21st. A patient, Mrs. Smith, had been present at that time and they had both been asked by Dr. Pratt to listen to the conversation. She related the conversation, confirming Dr. Pratt's account of it. Complainant's wife had first mentioned the education of the child and the doctor had said "Certainly not." When she came in and when she [illegible] had been very agitated, and she had [illegible] in the road half an hour later.

Cr[illegible] lainant's wife had appeared to [illegible] had not known why the doctor had asked her to listen or why he had said complainant's wife was a dangerous woman. Mrs. M. T. Smith confirmed this account of the interview in all particulars.

Mr. Vine addressed the Council, sketching the case as an example of the lengths to which a neurotic woman would go and pointing out the absence of any corroboration of her story.

Mr. Good argued that a professional man receiving affectionate letters from a woman patient and destroying them was acting suspiciously.

After deliberation in camera, The President announced the decision of the Council as follows :—

"Mr. Pratt : I have to announce that facts alleged against you in the Notice of Inquiry have not been proved to the satisfaction of the Council. The case is, therefore, dismissed."

The Case of Donald McGregor Stewart, registered as of 5, Waunwen, Nantymoel, Glam. ; L.R.C.P. and S. Edin., 1917, L.R.F.P.S. Glasg., 1917, who had been summoned to appear before the Council on the following charge :—

"That you were convicted of the following misdemeanours —viz., (*a*) At the Bridgend Petty Sessions : (1) On Oct. 16th, 1926, of being drunk whilst in charge of a motor-car, and were fined £3 and your driving licence suspended for 12 months ; also of driving a motor-car to the danger of the public, and were fined £1 ; (2) on Oct. 8th, 1927, of being drunk, and were fined 10*s.* ; also of using indecent language, and were fined 30*s.* ; (3) on Nov. 26th, 1927, of using indecent language, and were fined £3 or 14 days ; (4) on June 16th, 1928, of using indecent language, and were fined £2 or 14 days' hard labour ; (5) on August 18th, 1928, of being drunk and disorderly, and were fined £1 ; (6) on May 11th, 1929, of using indecent language, and were fined £3 or 14 days' hard labour ; and (*b*) At the Ystrad Police-court : (7) on June 25th, 1928, of using indecent language, and were fined £3."

Mr. Stewart appeared in answer to his notice.

Mr. Harper presented certified copies of the convictions and explained that Mr. Stewart had not appeared earlier in respect of the convictions in 1926 and 1927 because the first four had all been reported together to the Registrar, who had written in October, 1928, warning Mr. Stewart that any further conviction would cause him to be summoned before the Council. The actual language used by Mr. Stewart had been circulated to the members, and in the whole course of his experience Mr. Harper had never known such language used by a medical man.

Mr. Stewart addressed the Council on his own behalf, pleading as extenuating circumstances his war service, testimonials to his work and character, an organised movement to prevent him from practising in the valley, and a severe motor accident involving a compound fracture of the skull in 1926. He still suffered from extreme irritability and scotoma as a result of this injury. He related the events leading to the various fines, claiming that he had been wrongly convicted, largely owing to the animus of a certain constable. He did not think he could possibly have used that language. He expressed his great regret, promised that the offence should never be repeated, and said that he had become a total abstainer.

Mr. H. E. Lewis, clerk to the insurance committee for the County of Glamorgan, testified that Mr. Stewart had increased his panel list every year since he had started. He had appeared several times before the Medical Insurance Subcommittee on the question of these convictions. The subcommittee had talked very seriously to him but did not feel justified in suggesting removal of his name from the list. The subcommittee would be very much surprised if the Council took extreme measures with Mr. Stewart.

The President pointed out that some of the convictions antedated the accident.

In answer to questions by the President, Mr. Stewart said that he had only defended one case ; the bench of magistrates had been the same on each occasion. He read a testimonial from a professional colleague.

The President announced that judgment would be postponed until the November session, 1930. Before that date Mr. Stewart should furnish the Registrar with the names and addresses of professional colleagues willing to testify to his good conduct in the interval, and he must clearly understand that in the event of any further conviction of a like nature in the meantime the Council might direct the Registrar forthwith to remove his name from the Register.

The Case of John Caldwell Fergusson, registered as of 10, Upper Northgate-street, Chester ; M.B.E., M.C., L., L.M., 1915, R.C.P. & S. Irel., who had been summoned to appear before the Council on the following charge :—

"That you were on August 6th, 1929, convicted at the City of Hull Police-court of the following misdemeanours—namely, (1) that you on April 29th, 1929, being a person authorised to supply *preparations*, unlawfully did not keep *in accordance with the provisions of Regulation 11 of the* Dangerous Drugs (Consolidation) Regulations, 1928, a registe and enter therein true particulars with respect to every quantity of a certain preparation, to wit, one pound of tincture of opium obtained by you, contrary to the before-mentioned Regulations made under Section 7 of the Dangerous Drugs Act, 1920, and were fined £2 2*s.* or 20 days' imprisonment and £3 3*s.* costs ; and (2) that you on May 7th 1929, being a person authorised to supply preparations, unlawfully did not keep, in accordance with the provisions of Regulation 11 of the Dangerous Drugs (Consolidation) Regulations, 1928, a register and enter therein true particulars with respect to every quantity of a certain preparation, to wit six ounces of liq. morphinæ hyd., obtained by you, contrary to the before-mentioned Regulations made under Section 7 of the Dangerous Drugs Act, 1920, and were fined £2 2*s.* or 20 days' imprisonment and £3 3*s.* costs."

Mr. Fergusson sent a medical certificate stating that he was suffering from paresis of the left side and tuberculosis of the right lung, and was unable to attend.

Mr. Harper read a long letter he had received from Mr. Fergusson. His poor health and lack of money had prevented him from making a good defence, and he had wrongly supposed that the onus of proof was on the prosecution. His functional disability dated from the time when he had been blown up in Flanders and he had had frequent attacks ever since, involving constant periods of rest alternating with light work. He had had an attack on the morning of the case in court, and his solicitor had not known the Act. The conviction had arisen from the failure of the doctor whose practice he was taking to hand over the poisons register. Mr. Harper read a letter from the chief constable of Northallerton, stating that a local doctor had asserted that Dr. Fergusson was a drug-taker and unfit to practise, and relating several incidents in which Dr. Fergusson had been involved. After deliberation in camera the President announced that the Council had not seen fit to erase Dr. Fergusson's name from the Register.

An Erasure for Drunkenness.

The Case of John Joseph Macabe, registered as of 58, Brunswick-street, Chorlton-on-Medlock, Manchester, M.B., B.Ch. 1918, N.U.Irel., who had been summoned to appear before the Council on the following charge :—

"That you were on April 3rd, 1929, convicted at the Manchester City Police-court of the following misdemeanour —viz., of being drunk and incapable, and were fined 10*s.* or 7 days' imprisonment and your bail of 20*s.* forfeited."

Dr. Macabe had twice before appeared on similar charges. He did not attend and was not represented. The Council directed the Registrar to erase his name from the Register.

COMMITTEE BUSINESS.

EXECUTIVE COMMITTEE, NOV. 25TH.

Official notification was read of the reappointment as members of the Council of Sir George Newman (Crown nominee) for five years from Oct. 9th, 1929, Prof. John Beresford Leathes (representative of the University of Sheffield) for three years from Oct. 27th, and Sir John Moore (representative of the Royal College of Physicians of Ireland) for one year from Oct. 18th.

Restorations to the Register under Section 14.—The prescribed conditions having been fulfilled, the following names, removed through the omission to keep the Registrar informed of change of address, were restored to the Medical Register:—

Mrs. Gertrude E. Bartlett, Thomas L. Bonar, Neville E. Challenger, Thos. H. R. Davies, Mrs. Rose C. D'Monte, George G. Dooley, Bernard C. Ewens, Leonard M. Gabriel, William E. Giblin, John F. Haynes, Sidney Hughes, George C. Jeaffreson, Mrs. May E. Law, Vinayak L. Manker, Charles E. H. Paley, John F. Woodyatt.

Curriculum of the Welsh National School of Medicine. Approval was given to the grant of a Charter of Incorporation with the proviso—

> That the curriculum should be so framed as to afford sufficient opportunities for the study, during the last three years of the course, of physics, chemistry, biology, anatomy, and physiology, in their practical applications to medicine, surgery, and midwifery, and that the student's knowledge of these applications should be subject to test in the final examination,

a recommendation to which the Council attach great importance.

Reciprocity.—The Royal College of Surgeons of England called the attention of the General Medical Council to the difficulties in matters relating to reciprocity of medical registration between this country and British Dominions, particularly as affecting medical graduates in certain British Dominions desirous of obtaining the F.R.C.S.

The Italian Ambassador having inquired whether under the Anglo-Italian agreement of 1925 persons possessing Italian qualifications were entitled to practise in the Union of South Africa, and having asked for a complete list of territories between which and Great Britain reciprocity existed, was informed that the only parts of the Dominions with which reciprocity did not exist were the following Provinces of Canada: British Columbia, New Brunswick, Ontario, Quebec, and Saskatchewan—and that at the present time there was limited reciprocity with New Zealand.

"Army Medical Service" as an Address in the Register.—In consequence of the exception taken by a practitioner to the address "Army Medical Service," the Army Medical Department of the War Office were asked if, in their opinion, the time had come when a change should be made in the title, which had been in use for something like 80 years. They replied giving as the correct description different designations for the various ranks, and it was suggested to them that a generic title which would cover all officers in the Service regardless of rank, and preferably regardless of whether they were still serving or not, was highly desirable for the reasons that army rank was not given in the Register, and that it would be difficult for the Council to ascertain with accuracy whether or not officers were still serving. It was suggested that if it was thought desirable "Royal Army Medical Corps" might be substituted for "Army Medical Service," and the department replied that the case might be met by the substitution of the word "Army" for the present term. It was finally decided to retain the present designation as no real case seemed to have been made out for a change, and it was gathered that there was no strong desire on the part of the department that any change should be made.

Home Office Authorisation.—The Home Office had notified the Council on Oct. 14th that authorisation under the Dangerous Drugs Act, 1920, had been withdrawn from John Caldwell Fergusson, Reginald George Karn, and Frederick Stuart. The cases of Frederick George Lewtas, John Symington Stewart, and Sydney Robert Walker had been previously notified.

OTHER COMMITTEES.

Study of Biophysics and Biochemistry.—Sir Humphry Rolleston, chairman of the Education Committee, presented a report on professional instruction in physics and chemistry in their relation to medicine, particularly during the clinical years. In a special report the committee publish the replies received from the various educational authorities which show that the pre-clinical instruction given in biology, chemistry, and physiology appear satisfactory, but many of the bodies have not provided any information about the continuation of teaching in these subjects during the clinical years, while others remark that the amount of instruction incidentally given during the courses in pathology, pharmacology, and clinical medicine must obviously be determined by the demands of the subject and the personal leanings of the teacher. Sir Humphry moved that the report be referred back until all the teaching bodies had supplied adequate answers on this point. The committee recognise the force of the argument that the pre-clinical subjects should be taught by the clinical teachers in application to the clinical subjects, but it is also aware that all clinicians cannot be presumed to be sufficiently au fait with the progress of biochemistry, physiology and chemistry to foresee the application of their most recent advances to medicine. Applied anatomy is the pre-clinical subject most often taught in a special course during the clinical years, but the clinical pathology course covers a good deal of the ground that might be dealt with in a special course of applied physiology or biochemistry.

The *Examination Committee* has been paying attention to the subjects of medical jurisprudence and public health, and Sir Norman Walker, the chairman, presented an interim report on this subject. In most medical schools courses of instruction are given on each of these two branches, and very often a medical officer of health is the professor of public health or there is a link between the professor and the local health department. Generally speaking, the course of instruction in each subject lasts one term, and students are examined in their final examination, or occasionally at the end of the fourth year of study.

The *Pharmacopœia Committee* reported that 2300 copies of the British Pharmacopœia, 1914, were sold in the year ending Nov. 23rd, 1929, bringing the total to 58,183 copies. Subcommittees on pharmacy, pharmacognosy, and pharmaceutical chemistry have been formed and are preparing monographs, 93 of which have already been circulated. Other subcommittees have been formed to deal with the special subjects of ergot and its preparations; drugs of the arseno-benzine group, standards for ampoule glass, and the preparation of sterile solutions. The commission have inquired into several substances which it is proposed to include in the Pharmacopœia, such as tetra-iodo-phenolphthalein sodium, thyroid gland, and tinctures of strophanthus and squill. The commission hope to establish close coöperation with the United States Pharmacopœia Committee so that the two Pharmacopœias may be unified as far as possible. The report includes a copy of correspondence referring to the proposed international agreement on potent drugs.

The *Public Health Committee* has been visiting examinations for the diploma of public health, and has found that, on the whole, the implications of the Council's regulations have been satisfactorily carried out. Those regulations made such a change in the requirements for the diploma work that difficulties and objections might well have been expected but they are, in fact, conspicuous by their absence. The Committee reports the general impression that the standard is well within the powers of candidates who devote themselves whole-heartedly to their course of study. The examination on special subjects such as meat, structure of premises, and fevers are all strictly practical and conducted at appropriate centres. The diploma covers so wide a field that the balance of theoretical and practical is extremely difficult, and the Committee feels that time alone will show what modifications are desirable in the continuous adoption of the curriculum to the ever-increasing specialisation of public health work. The report was presented by the chairman, Sir John Moore, and Dr. Letheby Tidy was appointed a member in place of the late Sir Jenner Verrall. Dr. H. B.

Brackenbury was elected to take Sir Jenner Verrall's place on the Executive Committee.

Election Rules.—Dr. J. W. Bone, seconded by Dr. H. B. Brackenbury, carried a motion that it be referred to the Finance Committee "to consider and report to the Council whether the regulations for the conduct of elections to the Council (Section 8 of the Medical Act, 1886) and the 'Instructions to Voters' issued in connexion therewith might not be simplified and/or improved." Dr. Bone pointed out that there had been a steady increase in the number of voting papers rendered invalid and that this increase had been a subject of comment in the medical press. The regulation which covers the system of voting had been laid down by the Privy Council, but there were certain incompatibilities between the instructions in the leaflet and those on the ballot paper. It was not certain, for instance, whether the paper was to be sent off or received on the appointed day. Other regulations appeared to be trivial; for example, a paper was rendered invalid if it were folded in the wrong direction. Mr. H. L. Eason quoted the figures of the electorate and the spoiled ballot papers for several past years and showed that there was no real increase in the number of papers rendered invalid. He pointed out that the majority of faults for which papers had been rejected at the last election were faults of gross carelessness and not of trivialities. A large number of empty envelopes had been received, and many others had not been signed; only eight out of the total had been wrongly folded. Sir Robert Bolam pleaded for simplification of the procedure in order that electors should not be deterred from exercising their vote. The matter was referred to the Committee and the Committee was authorised to invite Dr. Bone to attend their meeting to discuss it.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

AT a meeting of this Section held on Dec. 3rd the chair was taken by the President, Mr. McCRAE AITKIN, and Mr. W. H. OGILVIE opened a discussion on

MINOR INJURIES ABOUT THE ELBOW-JOINT.

He classified the minor injuries as partial fractures, partial dislocations, tears of the capsule, traumatic arthritis, and injuries to muscles. He discussed the anatomy of the joint, and demonstrated its division into a posterior trochlear and an anterior condylar portion, resembling those of the lower end of the femur; and pointed out the crescentic facet on the olecranon surface of the ulna, which met the outer lip of the trochlea in full extension; and the triangular groove between the outer part of the transverse groove dividing the greater and lesser sigmoid cavities. The strength of the capsule lay, he said, in the lateral ligaments. The synovial cavity in both radio-ulnar joints was sacciform, allowing for vertical as well as rotary movement. Intracapsular synovial pads were highly developed in the elbow and intra-articular synovial fringes were abundant.

The elbow was designed for use primarily in positions between 110° and 170° of extension and between half and three-quarters pronation. Only within this range was the olecranon portion of the greater sigmoid cavity fully engaged by the trochlear surface of the humerus. In flexion beyond 110° it rode in a groove which was shallow on the outer side, so that part of its bearing surface was exposed. The real humero-ulnar articulation was between the anterior parts of the trochlea and the coronoid articular surface of the olecranon. The olecranon part of the ulna combined the function of a muscular process like the great trochanter and a steadying guiding mechanism like that of the malleoli, the latter function only being called into play in the later degrees of extension. No real disability followed excision of the head of the radius; the ulna formed a platform on which the radius, bearing the hand, was free to rotate. The carrying angle was one of 10–15° and was present in the fœtus and at all ages; it diminished as the arm was flexed and was due to the varying depth of the inner lip of the trochlea. The only acceptable explanation of the carrying angle was the constant use of the half-pronation position. In the position of use—half pronation and nearly complete extension—the purpose of the carrying angle became apparent: to allow the radius to lie in a continuation of the long axis of the humerus. The position of rest—slight flexion and rather more than half pronation—was maintained by the brachialis anticus and from this position the elbow moved for its various functions.

Two distinct sets of uses would be distinguished: those concerning the outer world and those concerning the individual. The exteroceptive range of the elbow embraced the positions from about 90° to 170° of extension and from half to full pronation and involved such movements as attack, cutting food, climbing, and handling tools, and within this range stresses were likely to fall on the elbow-joint. The articular surfaces were fully engaged and the joint was stable. The proprioceptive range included all those movements concerned with the person; from a right angle to full flexion and from half to full pronation; the joint surfaces in this range were poorly adapted and the joint depended on ligaments, but was not exposed to great stress. Full supination was rarely used in extension or full pronation in flexion. Full extension did not occur in natural use. True hyperextension was rare. The apparent hyperextension in some women was due to the demonstration by extreme supination of an exaggerated carrying angle. Upward movement of the radius was checked by the interosseous membrane and downward movement by the oblique cord. The up and down movements of the radius invited comparison with the knee.

Fractures and Dislocations.

Most injuries of the elbow were due to indirect violence. The trochlea and still more the capitellum were carried well forward and apt to be fractured forwards into the joint. Full extension, however, was rare and could not be maintained in the face of force. Falls on the outstretched hand tended to flex the elbow and not to hyperextend it. In the ordinary fall on the outstretched hand the lines of force passed out of the limb posteriorly at an angle and caused supracondylar fracture or backward dislocation. The involvement of the radius depended on the degree to which force applied to it was passed on to the ulna. In a fully pronated and radially adducted position the interosseous ligament was somewhat relaxed and the radius was forced against the capitellum; the blow would therefore tend to fracture the radial head. In partial supination and ulnar adduction a dislocation at the elbow-joint or a fracture of the humerus would be more likely to occur. If the arm was partially flexed the blow would flex it further and the main force be taken on the olecranon; then the trochlea was driven like a cold chisel into the sigmoid fossa and fractured the olecranon transversely. Direct violence usually affected the ulna, but might break any bone.

Supracondylar fracture without displacement was very common in childhood and might be missed in a poor radiogram. Bruises and sprains caused very little limitation of movement in a child and only a little swelling. Treatment involved a few days of immobilisation with active movements from the start. If there was no periosteal stripping there was no risk of bone formation in early active movements. *Isolated fractures of the internal epicondyle* were due to muscular violence and were seen in adults. The joint was not involved and the loose fragment was pulled down by the flexors. Correct position and bony union were seldom secured but the disability was slight. *Fractures of the internal condyle* were oblique, entered the joint, were common in children, and were usually due to falls on the outstretched hand. The broken fragment rode up and the displacement tended to recur when traction was released. *Fractures of the trochlea* alone were very rare. The *external epicondyle* was so small that only cracks or detachment of flakes could be included as isolated fractures. *Fractures of the external condyle* were much commoner and due to force from the ground transmitted through the radius. Cubitus valgus and ulnar palsy were common sequelæ of inadequately treated cases. *Isolated fractures of the capitellum* were rare, and as they were intra-articular there was no deformity, and the diagnosis rested on excessive limitation of function and swelling of the joint. The causative force was more probably direct. In general, direct fixation inside the capsule was undesirable. If the parts could not be fixed by posture or extra-articular screws, traction in flexion by a pin through the olecranon should be tried. *Partial fractures of the olecranon* might be detachment of flakes or fissured fractures without displacement. *Fractures of the coronoid process* were occasionally caused by muscular violence, but much more often by posterior dislocation. *Fractures of the radial head* might be due to falls on the elbow, but were more commonly due to falls on the outstretched hand. They were divided into three types: the first with loose fragments, demanding immediate operation; the second with gross deformity, usually requiring excision of the head; and the third a fissured fracture without much displacement. In the commonest type, however, the fragments retained their normal position. These fractures should be treated as sprains and active rotation started from the beginning. This often restored a full range of movement, whereas excision never gave more than 70 per cent. *Fractures of the neck of the radius* were usually due to indirect violence, and if correct alignment could not be obtained the radial head should be removed. *Fractures of the tubercle* were rare and the result of muscular efforts.

Forward dislocation of the head of the radius was usually associated with fracture of the shaft, but if isolated was usually the result of the radius striking a rounded object on the ground. *Partial subluxations* were not uncommon, but were hard to demonstrate without a stereoscopic radiogram. *Sprain of ligaments* was a clinical diagnosis and not a clearly defined injury; probably muscles were always involved as well. *Tears of muscles* were due to sudden unguarded movement, and could only be distinguished from partial fractures by the X ray appearance and the absence of crepitus. *Spurs of bone* were apt to appear in the muscles of this region in advanced years and the snapping of one of these might cause acute localised pain. *Traumatic myositis* might follow the prolonged and unaccustomed use of any muscle; the whole muscle was tender and showed soft crepitus.

Tennis Elbow.

Tennis elbow eluded classification. It occurred in patients who practised those sports and trades where the arm was suddenly jerked into full extension, while the hand grasped a large object: tennis players, fly-fishers, golfers, sabre fencers, and workers with hammers. The onset was rarely sudden; a gradual ache appeared in the outer side of the elbow, most marked in certain movements, and ceasing when the game ceased. A definite localised tender spot was found in the region of the external epicondyle and clenching the hand was painful, but passive movement was painless. The main theories of its pathology were: (1) tearing of muscles; (2) periostitis; (3) tearing of capsule, involving the external, lateral, or orbicular ligaments; (4) arthritis of radio-humeral joint; and (5) Osgood's bursitis. This bursa lay immediately distal to the external epicondyle, deep to the common origin of the extensor group. Mr. Ogilvie had been unable to find this bursa or to obtain any success by Osgood's operation. All bursæ were abnormal, for they were not present at birth, and might be developed anywhere in response to excessive movement or pressure. Mr. Ogilvie believed that the commonest cause of tennis elbow was tearing of extensor muscle-fibres at their origin from bone, with periostitis sometimes. The radial extensors came into powerful action in gripping movements in tennis. In the first stage the effusion of fluid, local hyperæmia, and round-celled infiltration caused pain and tenderness and were treated by firm pressure, massage, and rest. The second stage of early repair caused pain on certain movements only, aching, and a localised tender spot. Firm pressure by a pad smeared with iodex and strapping at 135°, and active movements, constituted the best treatment. In the third stage there might be adhesions calling for a manipulation such as Mills's. Patients usually came in the second or third stages, and the treatment suitable for one stage was quite unsuitable for the other. Focal sepsis must be sought, as few traumata ran a sterile course. Focal subinfection prolonged the second stage and made adhesions more likely.

There were other types of tennis elbow, however, and symptoms which could not be referred to tearing of the extensor carpi radialis longior. Sometimes there was a true inhibition of movement, causing the patient to drop things. This resembled the sudden giving-way of the knee, and was probably due to a similar internal derangement: a nipping of synovial fringes, especially those thickened by arthritis. Mild traumatic arthritis could be produced by overuse alone—e.g., the return to a strenuous game after a season's rest. Treatment was removal of the causative fringe.

Mr. JENNER VERRALL said that internal derangement as a cause of tennis elbow had long appealed to him, and he agreed with Mr. Ogilvie's remarks about Osgood's bursa. He regarded tennis elbow as possibly a muscular rupture in some cases but more often as a combination of circulating toxins and local trauma. In seeking Osgood's bursa one often found dense fascia between the common extensor origin and the head of the radius, and the opening-up of this explained the good effect of seeking Osgood's bursa as well as of Mills's manipulation, which undoubtedly cured about a third of the cases. Strains on the inner side of the elbow were strictly comparable with those on the outer side, and were nearly all due to tension on the flexor carpi ulnaris. Carried still further, this caused displacement of the ulnar nerve which often could only be cured by shifting the nerve. The forward-dislocated head of the radius did not limit flexion but nearly always caused chronic musculo-spiral neuritis, and it was most important, especially in children, to get the head back into place as soon as possible. After a month or two it might become quite irreplaceable. The construction of a new orbicular ligament with fascia lata was most satisfactory. Early operation was the only possible treatment for fracture of the head of the radius. Excision of the head in a movable elbow left a very weakened elbow, but early excision of small fragments was satisfactory. Fracture of the capitellum was not rare, and operation was the only possible treatment. Fractures of the internal epicondyle were not operated on often enough and were apt to limit movement.

Mr. WATSON JONES showed slides illustrating 5000 cases of elbow injury and pointed out that elbow injuries were most common and most significant in the second decade; in 94 cases of traumatic arthritis perfect cure had been achieved in 92. The problem was not how to cure but how to cure quickly. It was curious that one method or another was often continued as a routine without accurate weekly records of the range of movement. It did not matter what treatment was used so long as progress was checked by measurement. Massage did no good; aided active movements tended to arrest recovery, passive movements were harmful, and manipulation under anæsthesia was disastrous. We were apt to be too anxious about rest; results would improve by steering a course between rest and movement. The patient was the best judge of the amount of movement needed. Fractures of the head of the radius had a grave prognosis. The results might be improved by more radical treatment; the disability was less after excision of the head than after more conservative measures. The limitation of movement was limitation of extension, not of supination and pronation. In fracture of the neck with angulation the head should not be removed but slung in position with an artificial ligament. Fractures of the internal epicondyle could also be produced by direct injury. Ulnar palsies only resulted from indirect injury. The capsule, if pulled in with the epiphysis, dragged on the ulnar nerve and so caused palsy. Treatment was to free the nerve and, if necessary, transfer it to the front of the joint.

Mr. **Whitchurch Howell** said that tennis elbow was the result of bad tennis, and rarely occurred in the professional player. He reported a case of myositis ossificans in the brachialis anticus in a man who fell from his horse and was dragged by the reins, and another of a tramwayman who had had no injury save the constant jerking he sustained in climbing the tram; he had developed two loose bodies in front of the joint.

Mr. **R. C. Elmslie** recorded two cases of tennis elbow; one in his own arm. Most cases came on very gradually indeed and the toxic factor played a large part. The sufferer was the player who went on playing hard tennis at an age when many people gave it up. There were many causes other than tennis; his own might be ascribed to wrenching club-feet. Very characteristic signs were the exact situation of the tender spot over the radio-humeral joint and the pain caused by passive forced flexion of the wrist and pronation and—in more severe conditions—forced extension of the forearm. The combination of the three caused most pain. Supination of the forearm with extended wrist was also very painful. He excluded cases with arthritis from ordinary tennis elbow. His own "elbow" had been cured by removal of a molar tooth with an apical abscess. He cordially agreed that a child whose elbow had been injured would find for itself the movements that were safe and would cure itself better than any masseur could. The masseur would pretend to do a lot and really do very little.

Mr. **W. H. Trethowan** declared that nothing showed a more constant clinical picture than tennis elbow and that the pathology was equally constant. He himself had a tennis elbow due to prawning, which involved lifting weight in extension of the forearm and wrist. Osgood's bursa was nothing more than the extension of the synovial membrane of the radio-humeral joint, and one cause of pain was compression of this pouch by the extensor carpi radialis longior. Tennis elbow was always a traumatic synovitis of the radio-humeral joint. He did not believe sepsis was ever concerned. The results of treatment depended upon the stage at which each form of treatment was applied. Protracted cases were the cases which would not rest.

Mr. **Rocyn Jones** said the pathology of tennis elbow was little known. The lesion was produced by a combination of supination and extension. Mills's manipulation was very valuable in selected cases where there was a pronated arm with flexed wrist and fingers. The treatment was rest, heat, and massage, and, if these failed, operation. Fissured fracture of the head of the radius was difficult to diagnose, except by X rays; there might be some tenderness and elastic swelling; little treatment was required.

Mr. **Philip Figdor** emphasised the importance of active movements.

The **President** said that there was a very similar pain associated with the muscles arising from the internal condyle. Some cases were relieved by a pad and strap and others by manipulation.

Mr. **Ogilvie**, replying, emphasised again the importance of the exteroceptive range. Ankylosis should be in the exteroceptive position; the classical position was only useful to the man who needed two hairbrushes and wanted to get both hands to his mouth at once.

SECTION OF ANÆSTHETICS.

At a meeting of this Section on Dec. 6th, with Dr. **R. E. Apperly**, the President, in the chair, a discussion on

Anæsthesia in Rectal Surgery

was opened by Dr. **J. K. Hasler**. From the anæsthetist's point of view, he said, the surgery of the rectum was particularly satisfactory. In giving a general anæsthetic his ministrations were well out of the way of the surgeon, and if a regional or local administration was needed this part of the body was well adapted for it. Apart from operation for rectal cancer, much shock was uncommon, and the anæsthetist was seldom worried by a patient being in extremis. Of the two groups of rectal operations—the abdominal and the perineal—the former were mostly for dealing with malignant disease connected with the rectum; half of them were for colostomy, and the rest were abdominal resections or operations for insertion of radium into a high growth in the rectum and the associated glands. The surgeon required good abdominal relaxation so as to avoid unnecessary coils of intestine being constantly forced through the wound, and anæsthesia must be deep enough to allow of exploration of the abdomen if necessary in order to ascertain whether there were secondary deposits in the liver. Colostomy was often the precursor of a second operation, and the patient must be kept fit to undergo this in about a fortnight. A good general anæsthetic satisfied the requirements, but each anæsthetist would have his own preference, and should employ the one which yielded him the best results. A general anæsthetic was commonly given for the preliminary colostomy, and for the subsequent operation a spinal anæsthetic was employed in combination with some form of twilight sleep or a light general anæsthesia; but there seemed to be no reason why general anæsthesia should not be dispensed with altogether. Injection of a spinal anæsthetic between the third and fourth lumbar vertebræ caused anæsthesia well above the umbilicus, and gave good abdominal relaxation. Spinal anæsthesia did not always obviate chest complications, but the patients who developed chest trouble after it would probably have fared worse under general anæsthesia.

Perineal operations formed the second or larger group, and here the field for anæsthetics was more varied. The three most common complaints in this region were hæmorrhoids, fissure, and fistula, and these troubles had generally caused much anxiety for a number of years before operation, so that the patients had a characteristic mental state—that of long-continued suffering in silence. Many started to resist with the onset of unconsciousness, and complete relaxation was delayed, especially if the patient was alcoholic. They had to be deeply under the anæsthetic before the operation was begun, otherwise contraction of the leg muscles made it difficult to place them in the lithotomy position, especially when the sphincter was forcibly dilated. The general anæsthetic must at first be given liberally, but this rule did not apply to pure chloroform, whose use for operations involving the anus and the rectal sphincters had been widely condemned. If chloroform anæsthesia was not deep enough when the anus was dilated there was a risk of cardiac inhibition or reflex inhibition of respiration. Yeomans, of New York, considered that chloroform had no place in rectal surgery.

The forms of local anæsthetics used for perineal operations could be classified in three groups: (1) local infiltration of the operation area; (2) extradural anæsthesia brought about by caudal block and sacral block; and (3) intradural or various forms of spinal anæsthesia. In America the caudal block was often combined with trans-sacral block. At the Mayo Clinic intense anæsthesia was produced 10 to 15 minutes after the completion of the injection, and it was expected to last two hours. J. S. Lundy, of that clinic, reported 99 per cent. of successful cases in the smaller rectal operations with this method, and 75 to 85 per cent. in cases of carcinoma of the rectum. Dr. Hasler did not himself expect spinal anæsthesia to last longer than an hour; if an operation was likely to be prolonged, the spinal could be combined with a caudal block; this extra injection took but little time and certainly prolonged the anæsthesia. Recent papers by Pitkin and Kelly suggested that spinocain would be a useful anæsthetic for purely perineal anæsthesia. By tilting the body of the patient either up or down, according to whether the heavy or the light solution had been used, the anæsthetic effect could be limited to the pelvic region. But examination of the literature suggested the drawback that there was risk in altering the patient's position relative to the horizontal plane for at least two hours after the operation, though this risk could perhaps be reduced by using less spinocain. It was not always desirable to produce full relaxation of the sphincters in cases of fistula; it was usually necessary for the surgeon to be able to feel the sphincters while operating. Local anæsthetics, especially spinal ones, relaxed the sphincters too much.

Discussion.

Mr. E. T. C. MILLIGAN said that for many years it was thought that the value of an anæsthetic was enhanced if it relaxed the sphincter ani; and if it did not, the surgeon proceeded to stretch the sphincter forcibly so as to expose the piles. Now, however, the piles were withdrawn from the anus and exposed with dissecting forceps, which made such relaxation needless. But for extensive fistulæ in which the internal opening in relation to the sphincter had not been determined beforehand it was important to feel the tightly gripping sphincters, so that an anæsthetic which relaxed the sphincters was bad. This remark did not apply to simple fistulæ in which the relations of opening to track had been determined beforehand. He thought that both anæsthetist and surgeon should be familiar with all the possible anæsthetics for a given operation, so that a wise choice could be made. Operations for fissure, fistula, and piles were now perfect, and in choosing the anæsthetic the ideal was to banish apprehension before, pain and apprehension during, and pain after the operation. Though caudal block was ideal if it was reliable, he thought that in practice it was uncertain. Local anæsthesia was one of the best forms of anæsthesia for hæmorrhoid operations, but many patients were apprehensive, interpreting every movement as something that would produce pain, and for such rapid and simple operations gas-and-oxygen anæsthesia with preliminary sedative medication seemed the best means of blanking out consciousness. Low spinal or spinal anæsthesia limited to sacral nerves had advantages which made it valuable for operations on the perineum. It was controllable, and had none of the disadvantages of the higher spinal anæsthesia. Most of the bad results following spinal anæsthesia were due to improper selection of cases, and some were ascribable to faulty technique. Post-operative pain bore no relation to the method of anæsthesia.

Dr. A. L. FLEMMING asked whether it was considered that stovaine fixed more certainly and quickly than novocain. He would have thought that the administration of the anæsthetic with the patient in the sitting posture was dangerous. Dr. Hasler seemed to use only a small quantity of the drug. Pitkin apparently did not rely on the inclination or tilt of the patient; if he wanted a high anæsthesia he used a larger quantity of the solution.

Dr. W. HOWARD JONES said he did not know why stovaine was used so much in preference to novocain, which was much less toxic and irritating. The 10 per cent. solution of novocain had a specific gravity of 1·028, and the specific gravity of cerebro-spinal fluid was between 1·004 and 1·008. When the solution was injected into the cerebro-spinal fluid there was, opposite the point of the needle, an equal quantity of cerebro-spinal fluid, and so the specific gravity was reduced, the heavy solution becoming a lighter one. For a complete splanchnic block, 15 drachms of the 10 per cent. solution was injected between the second and third lumbar vertebræ, and the patient was then placed in the Trendelenburg position. The fluid would come to a halt at about the third dorsal segment. On going higher up there was a progressive decrease in the time the anæsthetic lasted, since the duration depended on the degree of concentration of the solution. With the new anæsthetic, percain, it was stated that spinal anæsthesia would last up to four hours, and even a solution of one-twentieth per cent. was effective. He believed it would be very valuable for rectal operations. The first case he had seen at hospital that day was a man of the navvy type who had been admitted as an "emergency" on account of perforated gastric ulcer, and was in intense pain. Dr. Jones had injected a one-twentieth solution of percain, flooding the subarachnoid space as far as the third dorsal vertebra. The pain disappeared immediately, and in ten minutes the abdomen was opened, the ulcer closed, and the abdomen was swabbed out without discomfort. For producing a complete splanchnic block 15 c.cm. were injected without withdrawing cerebro-spinal fluid and the solution would travel as high as the third or second dorsal vertebra. If cerebro-spinal fluid was withdrawn, the subsequent injection would travel higher.

Dr. C. F. HADFIELD expressed his surprise that stovaine could be caused to drop down by change of posture in the way Dr. Hasler had described. His own practice was to place the patient in the Trendelenburg position as soon as the injection had been made. He thought 45 minutes' operating time was all that could be reasonably expected of stovaine in the light form. Formerly he had used 1·0 c.cm. of a 10 per cent. solution, but now he used 0·6 c.cm., and he had noticed no reduction in the anæsthetic effect.

Dr. EVANS submitted that for hæmorrhoids and fistula nothing more than a fairly light anæsthesia was required—i.e., enough to keep the patient quiet and prevent him kicking. Given a good gas-and-oxygen anæsthesia the surgeon could do all that was required in comfort.

The PRESIDENT spoke of abdomino-perineal operations for carcinoma of the rectum, for which he sometimes had to give the anæsthetic—namely, spinal anæsthesia. At the end of the abdominal part of the operation, when putting the patient in the lithotomy position for the perineal part of it, the blood pressure, which previously had been satisfactory, fell considerably and was a cause of anxiety. Recently a surgical colleague at Middlesex Hospital had adopted the plan of doing the perineal part first—i.e., when the spinal anæsthesia was at its best—and concluding with the abdominal stage. The result had been extraordinarily good, and since doing this that surgeon had not lost a case.

Dr. HASLER briefly replied. He said that "light" and "heavy" solutions were relative terms; one contained glucose, the other did not. Both were heavier than cerebro-spinal fluid. With regard to depth of anæsthesia for these operations, he liked to have the patient well under, at the commencement especially, partly because of the general mental and physical state of the patient, partly because of the area of operation concerned. A patient who had had a spinal injection and had low blood pressure should be moved as little as possible for the hour or two following the incision.

SECTION OF OTOLOGY.

AT a meeting held on Dec. 6th the chair was taken by Mr. W. M. MOLLISON, the President, and a paper on

Radiological Diagnosis of Mastoid Disease

was read by Dr. ELSIE MANN. She described the technique adopted in examining the mastoid, and said she now used two lateral views as a routine; the prone position, although it had the advantage of showing the two mastoids on one plate, had not proved sufficiently useful to be made a standard practice. The exposure should be as short as possible when the patient was a child, and it was better to gain the child's confidence than to frighten him by using a clamp. A successful plate from a child under three was obtained more by luck than good management, and occasionally an older child would prove refractory to all persuasion, and would not keep still. Interpretation was not always easy. The mastoids were usually symmetrical but might be cellular on one side and acellular on the other. When they were cellular on both sides the cells were usually symmetrical, which was a useful thing to remember when trying to decide whether a space were an enlarged cell or an area of absorption. Superficial œdema, eczema of the meatus, and furunculosis might all cause blurring of bony detail, but in the absence of these conditions the radiologist could diagnose mastoiditis and give help which, though not infallible, was very useful.

Dr. GRAHAM HODGSON showed slides illustrating the

Diagnostic Value of X Rays of the Temporal Bone.

In one-third of the cases of otosclerosis, he said, X rays would reveal a loss of definition of the basal turn of the cochlea. In another third nothing abnormal could be seen, and in the remaining third there was some lack of definition which the radiologist could not distinguish with certainty from a normal variation. In some advanced cases the changes—which might be described as the difference between a raw grain of rice and the same grain boiled—could also be detected in the capsule of the posterior labyrinth. The extent of the changes did not seem to have much bearing on the symptoms, which perhaps depended more on the distribution than on the extent of the changes. Radiology could be of use in otosclerosis, however, in following the result of treatment and selecting the cases most likely to yield to it. In tumours and fractures the X ray was of definite value, as Dr. Hodgson's slides illustrated, and might detect a fistula in the external canal. Showing slides of mastoids, Dr. Hodgson suggested that a child might be kept momentarily quiet if the radiologist made more noise than it was making itself.

Mr. T. B. LAYTON spoke on the

Value of Radiography in Symptomless Mastoiditis.

He said there was no symptom of inflammation of diploetic tissue of the mastoid bone. All symptoms were evidence either of extension or of absorption of toxins or organisms. Radiology would detect the cases in which there were no symptoms. Any case of otitis media might actually be a mastoiditis, and if it did not quickly get well might be maintained by infection from the mastoid end quite as often as from the nasopharyngeal end. If it did not recover in three or four weeks the mastoid should be considered, and if there was any doubt the mastoid should be dealt with before the nasopharynx, or the case might become incurable by small operation. Caries was followed by sclerosis; radiography should in the future reveal the stage at which sclerosis began, probably two or three months after the onset of otitis media. Early operation gave perfect results without radical operation; after the onset of sclerosis there was less chance of getting the patient quite well. Clearing up the nasopharynx had given most unsatisfactory results in very many cases of running ears. Radiography would segregate the cases of symptomless mastoiditis, and show whether in otitis media the mastoid became inflamed and whether or not it would get well with the otitis.

Mr. T. H. JUST read a paper on the

Diagnosis of Acoustic Tumours.

Rare as these were, he said, every otologist must see them, because some patients complained at first of deafness, tinnitus, and giddiness. From the welter of sometimes contradictory findings he selected as outstanding symptoms: deafness, headache, falling or lurching, failing vision, giddiness, sensory disturbances—usually of the fifth nerve—vomiting, diplopia, paresis, and tinnitus. Cases of endothelioma and cholesteatoma of the meninges showed practically the same symptoms, due to pressure in the posterior fossa. The signs were connected with (1) the eye; (2) the cranial nerves; (3) the cerebellum; and (4) the eighth nerve—i.e., (1) disturbance of vision up to complete blindness; papillœdema; contraction of the visual fields, particularly to colour; spontaneous nystagmus, and diminished or absent corneal reflex; the nystagmus had been present in all of his 33 cases; (2) diminution in sensation or power in the area of the fifth nerve; (3) falling or unsteadiness, and weakness or loss of power in the limbs; (4) middle-ear deafness and loss of function in the vestibular nerve. The simplest test for the cochlear nerve was by means of a heavy and middle fork and a noise box. To be certain of a small diminution of bone conduction was not always a scientific possibility. Mr. Just had ceased to use the rotation test, as all patients showed spontaneous nystagmus and many were spontaneously giddy. The galvanic test was rather uncertain and he preferred the cold caloric test, which produced marked giddiness, errors in pass pointing, and marked and wide nystagmus if the vestibular nerve were working at all. Only the bad ear was syringed.

Dr. W. T. GARDINER read a paper on the same subject, dealing with Edinburgh cases. His findings coincided with those of Mr. Just. Deafness was usually the first symptom. Giddiness, absence of spontaneous pointing error, and spontaneous nystagmus had been the next most common, and the nystagmus was the most useful diagnostic symptom. The cold caloric test was valuable, and had been positive in all the ten cases who had permitted it. Mr. Gardiner thought, however, that the sound ear should be syringed as well as the other. The diplopia was due to the sixth nerve only. Loss of taste and sense of smell had been recorded in a few cases. The radiogram had given great help in two cases, showing enlargement of the internal meatus. Acoustic tumours should be suspected in cases of absolute deafness and loss of vestibular function associated with spontaneous nystagmus in all directions without Rombergism or spontaneous pointing error.

Cases.

Mr. C. GILL-CAREY showed a case of objective tinnitus in which a crackling sound, not exactly synchronising with the pulse, could be heard a foot away.—Mr. O. POPPER declared that this condition was due to rhythmic contraction of the tensor tympani; he himself could produce it voluntarily.—Sir JAMES DUNDAS-GRANT, Mr. L. GRAHAM BROWN, Mr. W. S. ADAMS, and Mr. GILL-CAREY commented on the case and quoted similar ones.—Dr. D. A. IMRIE showed a case of tumour of the nervus acousticus demonstrated by radiography. The difficulties encountered by the radiologist, he said, were the depth of the petrous portion and the impossibility of producing symmetrical views of two sides when the beam was passed along the internal canals. The tumour had been diagnosed by a stereoscopic transorbital view, as suggested by Conte, of Turin, the beam passing through both orbits. This method gave truly symmetrical views of both petrous bones and should lead to earlier diagnosis of acoustic tumours.—Dr. T. B. JOBSON pointed out that this patient had first been seen in the ophthalmological department, at a stage when it was really too late, and the operation had to be one of great magnitude and difficulty. Diagnosis should rest on deafness, vestibular signs, facial paresis, and radiography; to wait for further symptoms involved great risk.—Mr. G. H. STEELE remarked that the case had been an obvious auditory fibroma before operation, yet at operation the growth had been found so deeply embedded in the cerebellum that the diagnosis had been doubted. Six weeks after the first decompression the cerebellum had extruded the tumour, but operation had failed because two large blood-vessels running across the tumour had been ruptured.

Mr. E. WATSON-WILLIAMS showed skiagrams of the temporal bone. One showed extensive destruction by cholesteatomata, and the second showed infection in the mastoid cells in acute otitis media. He agreed with Mr. Layton that the mastoid was not opened early enough or often enough, but not that it should be treated before the nasopharynx. The pharynx should have been treated before three weeks had elapsed; neither end should be treated to the exclusion of the other. In his experience radiology failed to help, and was vague in just those doubtful cases of mastoiditis where help was most needed. The otologist must rely on his clinical findings.

Mr. W. A. MILL showed a case of osteomyelitis of the temporal bone. The man had had a Schwatze operation performed for acute mastoiditis. A month later he had suffered from swelling in the temporal region, headache, and pain, all of which had persisted. Operation a month later had revealed granulations in the mastoid cavity, malleus, and incus, and diseased bone in the squama with thickened dura.

Sir JAMES DUNDAS-GRANT showed skiagrams from a man who had fallen down and been picked up deaf. There was a suggestion of a fracture in the back of the orbit, possibly the labyrinth had been fractured by transmitted force.

Discussion on Papers and Cases.

Mr. A. R. TWEEDIE said that clinical findings must be regarded as more valuable than radiography in deciding what to do in otitis media. He would not open an antrum while a child had offensive tonsils and adenoids.

Mr. LAYTON, in reply, said that radiology was only one piece of evidence in mastoiditis, and that he found it valuable in cases where there was no other evidence. He did not believe that post-aural drainage was a valuable thing if there were no disease of bone. The only way of finding whether bone was involved or not was by radiography. Removal of tonsils which would not be removed save for a running ear never gave any good result; he would not operate on the nasopharynx while an acute infectious process was going on.

Sir JAMES DUNDAS-GRANT urged the value of the unilateral galvanic test for acoustic tumours, with the cathode on the back of the neck and the anode on the ear, and advocated his cold air apparatus.

Mr. TWEEDIE agreed that rotation was not of much value but still hoped to get something from it quantitatively. The galvanic and caloric tests depended very much on the technique. The first thing to note was whether the leaning or the nystagmus appeared first. In middle-ear cases it was possible to get a hyposensitive peripheral organ by the caloric test and a hypersensitive vestibular nerve by the galvanic test. *The galvanic test result was in direct* proportion to the integrity of the ganglion of the vestibular nerve. If the resistance were adjusted the patient would not suffer from the test.

Mr. S. SCOTT said his experience had differed from that of Mr. Just in that the galvanic tests had proved of great value to him; details of technique were very important.

Mr. BROUGHTON BARNES asked whether any changes had been seen in the middle ear.

Mr. JUST, in reply, said he had had no evidence of middle-ear disease in the affected ear.

SECTION OF PSYCHIATRY.

AT a meeting of this Section held on Dec. 10th, the chair was taken by the President, Sir ROBERT ARMSTRONG-JONES. Members of the Section for the Study of Diseases in Children and of the Child Guidance Society attended this meeting.

Dr. BERNARD HART opened a discussion on

THE DIFFICULT CHILD.

He defined the difficult child as one who presented obstacles to the achievement of that internal and external adaptation which constituted the aim of nurture and education. The point of view taken towards him had changed from an ethical to a physical and then to a psychological one. The difficulty had been ascribed to congenital weakness of moral fibre, diseases or defects in various organs, and lack of nervous stability, but these things never filled the whole picture, and failure of perspective must result from concentrating on them. The modern view was that the trouble was similar to that underlying functional nervous disorders, and that the difficult child was likely to become the neurotic adult. There was a failure in adaptation of the individual as a whole and not a disorder of any one system. The trouble could only be fully understood if psychological conceptions were brought to the aid of physical and chemical conceptions. The symptoms displayed by the difficult child were due to a fault in his reaction as an individual. Delinquency and behaviour anomalies were included as well as nervousness and needed treatment along the same lines.

The Child Guidance Movement was an attempt to cope with the problem along those lines. It employed a team of workers, including a psychiatrist, psychologist, and social worker, for it was essential to know much about the child, his mental and physical make-up, his home- and school-life, and the people he met in both environments. In some cases the external agencies must be modified. Team-work of this kind was always somewhat repugnant to the clinically minded physician, even when the team was welded together by the method of the conference. There was also a fear lest the social worker tail should wag the psychiatric dog, but all who had had experience of the social worker's aid would realise that this risk was well worth taking.

The Point of View of the Pædiatrist.

Dr. HECTOR CAMERON described the difficult child as a problem in management, physical culture, and metabolic instability, subject to a vicious circle of conduct and metabolic disorder. His low fat tolerance had long been recognised; great emotional excitement or physical exertion and states of infection caused exhaustion of the slender glycogen resources of the body, or glycopenia, in which condition metabolism of fat was incompletely carried out and intermediate products appeared. In this state vasomotor pallor, amyotonia, yawning, furring of the tongue, nausea, instability of temperature curve, low muscle tone, fainting, and indefinite aches and pains were the rule. Often vomiting dominated the picture; sometimes it was absent or only occasional. In between attacks the child was full of nervous energy, often squinting or stammering, pale, troublesome, incontinent of urine, a bad sleeper, and restless. The hepatic and muscular glycogen played an important part in determining the sugar content of the blood. Opposition, irritability, apprehension, terror, loss of confidence, and loss of the power to concentrate were characteristic mental states both of the nervous child and of insulin hypoglycæmia. The metabolic disorder often expressed itself in a nervous exacerbation. An excitement, a fright, a great intake of fat or an illness might each produce a deterioration in nervous control, showing itself as a failure of concentration culminating in a confusional state; increased opposition and irritability; night terrors, enuresis, or a bout of vomiting. An attack on the metabolic

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Cases.

Mr. C. GILL-CAREY showed a case of objective tinnitus in which a crackling sound, not exactly synchronising with the pulse, could be heard a foot away.—Mr. O. POPPER declared that this condition was due to rhythmic contraction of the tensor tympani; he himself could produce it voluntarily.—Sir JAMES DUNDAS-GRANT, Mr. L. GRAHAM BROWN, Mr. W. S. ADAMS, and Mr. GILL-CAREY commented on the case and quoted similar ones.—Dr. D. A. IMRIE showed a case of tumour of the nervus acousticus demonstrated by radiography. The difficulties encountered by the radiologist, he said, were the depth of the petrous portion and the impossibility of producing symmetrical views of two sides when the beam was passed along the internal canals. The tumour had been diagnosed by a stereoscopic transorbital view, as suggested by Conte, of Turin, the beam passing through both orbits. This method gave truly symmetrical views of both petrous bones and should lead to earlier diagnosis of acoustic tumours.—Dr. T. B. JOBSON pointed out that this patient had first been seen in the ophthalmological department, at a stage when it was really too late, and the operation had to lative effects, and tolerance was very slowly established, if at all. The patients relapsed when the drug was discontinued.

Behaviour disorders might occur in three types of dyspituitarism: (1) patients with increased activity of the anterior lobe, and a tendency to gigantism; (2) those with diminished activity of the posterior lobe and the dystrophia adiposo-genitalis syndrome; (3) mixed types. These disturbances were congenital, but formed a suggestive link between the mental and physical aspects of emotion.

Discussion.

Dr. D. W. WINNICOTT said that the scientific approach to the difficult child must come from a study of the child itself, whose unconscious had very great power over his life, and was not always dealt with sufficiently. All the dreadful things seen in the post-encephalitic child were present in the normal child, but controlled by the ego. Any approach which did not include the unconscious of the child was unscientific.

Miss MARY CHADWICK said there seemed to be excellent equipment for diagnosis but little for treatment. Explaining repressed tendencies would not cure anyone. Questioning a child about its emotions would not give much response. Something must be done to release its emotions and phantasies. One German clinic treated the parents when their neurosis was held to lie at the root of the child's trouble.

Dr. N. H. BURKE analysed 30 case-sheets from the Jewish clinic to illustrate methods of treatment. Home had been wrong in 23 cases; the mind in 24; the school in 7; and the bodily health in 14. Home troubles included parental disharmony or neurosis and injudicious handling; or minor difficulties, such as sleeping accommodation. In a few cases tonsils and adenoids had to come out; there were rheumatisms and debilities, a few heart cases, and a case of tuberculous joints. There had been mental dullness in a few cases; two had been defective, and one excessively intelligent. All had had various degrees of anxiety, fear and neurosis. In two cases nothing could be done with the parents, but partial adjustment had been obtained in 24 and good results in 4. Some cases needed a residential or defective school, and removal from impossible homes; others needed holidays from home—partly for diagnosis, and partly to give the mother a rest; some ought to go to better schools; others were benefited by adjustment of sleeping arrangements, admission to scout or girl guide troops, or psychotherapy. The cinema had only once appeared to have any influence.

Dr. J. D. REES said very few people in this country were doing serious analyses of children, and those who had done it in Vienna were giving it up. Doctors doing child guidance must have the analytical point of view or "environmental treatment" would be "woolly."

Dr. MARGARET LOWENFELD said that removal to a more favourable environment might improve the child, but on return he would react to the same difficulty in the same way. The child who could not deal with a difficult parent would fail later in life to deal with a difficult employer. The only method of treatment was to provide a system of play by which children could build their phantasies and slowly come to understand the reasons for their own behaviour. The child would build within itself a world which expressed its need. The emotional difficulties of childhood were associated with biochemical and physical disturbances, particularly of posture. The release given by the phantasy method was correlated with a change in the biochemical and physical picture. The problem could be approached by either path: physical or emotional.

Dr. HART, in reply, emphasised that we could not afford to neglect or be intolerant of any one of the facets of the problem.

Reviews and Notices of Books.

PSYCHOLOGY.

An Introduction to Individual Psychology. By ALICE RAVEN. Cambridge: W. Heffer and Sons, Ltd. 1929. Pp. 145. 3*s.* 6*d.*

THE title of this book, though more or less accurate in describing its thesis, is somewhat misleading in these days, when the term individual psychology has become synonymous with particular views expressed by Dr. Alfred Adler. But that is scarcely the business of the general reader, who can let the adherents themselves defend the pedestal of the idol. The book is written in a clear style, and is illustrated by a pleasant cultural breadth, but its eclecticism is a little dangerous. For example, while endorsing the very partially dynamic psychology of W. McDougall as regards the instincts and their related emotions, the author accepts fully the foundation principles of Freud's psychopathology, the power psychology of Adler, and the type psychology of Jung. Treating each system superficially, and gleaning what she feels to be most useful, she constructs a fairly coherent system of psychology. But careful analysis of her origins will bring out the glaring inconsistencies of this eclectic method. However, the very readable analyses of the plays of Æschylus, and of the character of Meleager in Swinburne's Atalanta, makes amends for he offences against established systems and the lack of logical coherence in her philosophy. Those who are familiar with the schools of thought from which it has been evolved will find this little book an interesting study.

PHYSICAL THERAPEUTIC TECHNIC.

By FRANK BUTLER GRANGER, A.B., M.D., Director of Physiotherapy, United States Army. London: W. B. Saunders Company. 1929. Pp. 417. 30*s.*

On Prescribing Physical Treatment. By MATTHEW B. RAY, D.S.O., M.D. Edin., Physician to the St. Marylebone General Dispensary. London: William Heinemann, Ltd. 1929. Pp. 179. 10*s.* 6*d.*

Dr. Granger's book is intended for the general practitioner who wishes to apply physical treatment only occasionally. It is chiefly devoted to electrical methods, and hydrotherapy and massage are passed over somewhat sketchily. The first part of the book is encumbered with elementary theoretical matter which the physician with any aptitude for the use of electricity will not need, but the last 17 chapters describe in close detail the treatment of various pathological conditions and should be helpful. Two useful features are Dr. F. A. Davis's synopsis of physiotherapeutic methods, a tabular description of the chief devices in use to-day, and the chapter on a hospital department of physical therapy, which suggests a basis for the initial foundation of a physical treatment branch, with lists of personnel and apparatus. The work is copiously illustrated, but would have been improved by a more careful selection of the pictures. It suffers from the common fault of containing a large number both of manufacturers' woodcuts, and of photographs of treatment which do not teach anything in particular.

Dr. M. B. Ray in his smaller book places balneotherapy in the foreground. He deals very little with theory, and arranges his material according to method, giving the indications for each kind of treatment as he describes it. This presentation has the defect that the practitioner who wishes to treat a certain condition must turn up several places in the book and collate the information. In many cases the descriptions have been curtailed to avoid a repetition which would have been useful, and the index is unfortunately not complete enough to support this method of arrangement. Nevertheless, this short text-book of medical hydrology and, to a lesser degree, of electrotherapy and other physical methods, is com-

comprehensive and crisp. Dr. Ray writes incisively and wastes no words, and his intelligent paragraphing, frequent side-headings, and individual page headings make the book easy to read.

SKIN DISEASES.

Grundriss der Arzneimittellehre für die Behandlung von Hautkrankheiten. By Dr. K. FÜRST, Frankfurt a/M. Leipzig: Georg Thieme. 1929. Pp. 144. M.6.

THIS small manual, which deals concisely with the external remedies in common use for the treatment of skin diseases, will be much appreciated by the thoughtful and scientific therapeutist. The author, formerly a pupil of the Herxheimer school at Frankfurt, wisely confines himself to a description of only 28 of what may be called the fundamental therapeutic elements that have withstood the test of 50 and more years of dermatological practice. They are arranged in alphabetical order, from arsenic to zinc, and each substance is considered from the aspects of its medical history, its chemical formula and attributes, its pharmacological actions, its therapeutic indications and modes of applying, and finally its toxic effects (if any) and its contra-indications. This methodical arrangement is conscientiously adhered to throughout, and the result is easily comprehended and memorised.

The work will, however, be found most useful as a book of reference. The classical *formulæ* for arsenic pills, lead plaster, and boric ointment, and the antidotes for cases of poisoning from the use of any of them, could not have been collected with more care or more concisely described. The intending purchaser will do well to note that the book contains no reference to any of the complicated modern remedies which Ehrlich and his school have introduced. There is no mention of salvarsan. There is an appendix of the literature of each medicament, and the index deals not only with these but includes also the diseases for which they are indicated. The work therefore serves both a pharmacological and therapeutic purpose.

MODERN METHODS OF TREATMENT.

Second edition. By LOGAN CLENDENING, M.D., Associate Professor of Medicine of the University of Kansas; Attending Physician, Kansas City General Hospital. London: Henry Kimpton. Pp. 815. 45*s.*

THE efforts being made to rescue the practice of therapeutics from the empirical methods of the past and to establish it on firm physiological and pathological principles are bearing fruit, but we are still much in the transition stage. Authors of text-books on therapeutics have to compromise between a pure exposition of principles on the one hand and a bald and dogmatic statement of methods on the other. Dr. Clendening attacks the problem with a decided modern bias which increases the value of his book as an impartial survey of present-day views on treatment, but is rather a disadvantage if an index of therapeutics for rapid reference is desired. A profound respect for the work of the pioneers and an extensive knowledge of more recent research lead him at times to submerge his own personality in a welter of rival opinions and conflicting theories. The passages in which he gives his own opinions are written in a vigorous and entertaining style, and indicate a wide clinical experience and a sound and conservative judgment.

The book, which deals only with medical treatment and omits all branches of surgery and diseases of the skin, is divided into two parts. The first deals with the methods used in therapeutics, and consists of chapters on drugs, sera and vaccines, gland extracts, dietetics, hydrotherapy, psychotherapy, and miscellaneous procedures. In two short chapters on radiotherapy and massage an attempt is made to describe the elements of technique in these very special subjects. In the chapter dealing with drugs the various remedies are arranged in groups according to their action—a method having certain advantages but apt to be confusing for such widely useful substances as the iodides. Twenty-two pages are devoted to digitalis, but the author holds that in practice "the only sensible way to exhibit digitalis is to return to the method of Withering."

The second part of the book takes the form of an index of treatment and the various diseases are again arranged in groups: diseases of metabolism, diseases of the kidney, and so forth. In both parts of the book a fairly extensive bibliography is provided at the end of each chapter, mainly compiled from American publications. A rather serious fault is the lack of cross references in the text between the two parts of the book. Often mention is made in the second part of methods which are recommended in the first. For instance, in the section on dietetics the Minot-Murphy diet is described in detail; but no reference to this is made in the directions for the treatment of pernicious anæmia, though the method is briefly alluded to and a number of recipes are given. In a volume arranged on this principle a complete system of cross references is very necessary, and its omission is not covered by the excellent index.

Dr. Clendening deserves praise for the admirably compact and lucid way in which he summarises modern work; the first part of his work is enriched by well-chosen quotations from original sources.

ELEMENTARY ANATOMY AND PHYSIOLOGY FOR NURSES.

By P. M. LODGE. London: J. and A. Churchill. 1929. Pp. 82. 3*s.* 6*d.*

THIS little book, based on lectures given at Birmingham to probationers, seems to us to be an exceedingly suitable work for the purpose. It is simply and clearly expressed and not burdened with a mass of wearisome (because misunderstood) detail, like so many of the manuals for nurses. It is calculated to give the probationer—and perhaps her senior colleague—a good and useful idea of the main structures and activities of the body. Its general value is not appreciably lessened by a few slips which can easily be corrected in a future issue.

THOSE TEETH OF YOURS.

By J. MENZIES CAMPBELL, L.D.S., D.D.S., F.R.S.E. London: William Heinemann (Medical Books), Ltd. 1929. Pp. 141. 3*s.* 6*d.*

THIS book is described as a popular guide to the teeth. It well fulfils this description and is an excellent example of a book suitable for the layman. Books on medical subjects intended for a lay audience fall into two categories—the brief, elementary manual couched in simple language which is intended for the personal guidance of those who read it, and the more advanced book suitable for teachers or those of more than average technical knowledge. This book is an example of the last-named type. It covers a wide range and the author supplies more than a practical guide to dental hygiene; he has included an interesting note on the historical side of dentistry. In discussing the treatment of dental disease Mr. Campbell goes into such questions as the different ways of filling teeth, anæsthesia, the various forms of dentures, and the advantages of gold and vulcanite. This is done not with the idea of usurping the province of the dentist but in order to give the reader some idea of the scope of his work. A diligent reader of this book might prove a somewhat captious patient if his professional attendant adopted a procedure not in accordance with Mr. Campbell's views, but on the whole a patient not wholly ignorant of the technical side of dentistry is more likely to coöperate intelligently in any treatment. Mr. Campbell has managed to pack much information into a little over 100 pages. Some of it will be new to those many medical men who have had no special experience in dental work, and they will find it highly profitable to familiarise themselves with the mechanical problems at issue and how they are solved.

THE LANCET.

LONDON: SATURDAY, DECEMBER 14, 1929.

SOMNAMBULISM AS A DEFENCE.

THE trial of MAGGIE ALEXANDER at the Hampshire *Assizes at the end of last month* was noteworthy for the unusual defence of somnambulism as an answer to a charge of murder. There was definite evidence that the accused sometimes walked in her sleep; there was also strong evidence that she had been in a state of acute mental distress and despondency. It is interesting to observe the attitude of the criminal law towards these two conditions. Do both of them amount to legal insanity, or were they possibly alternative defences?

Briefly the story told at the trial amounted to this: the accused had been told by her parents to break off her association with a man with whom she had become infatuated; unless she did so, they said, the home would be broken up, she would have to find a permanent situation, and her little boy would have to go into an institution. After she left home to go to her work next morning, the boy was found lying on the bed with gaping wounds in his throat; a blood-stained razor was discovered in the room. Asked by her mother why she had killed the child, the accused said she thought he would be better off. It was understood that four years ago she was jilted by a young man a few days before the date fixed for her wedding. The crux of the case was the mental state of the accused at the moment when she killed (as the defence did not dispute she did) her child; the observations of Mr. Justice CHARLES on this point will be mentioned later. Important evidence was given by Dr. WATSON, senior medical officer of Brixton Prison. He agreed, in answer to defendant's counsel, that it was possible that the killing occurred in a condition of somnambulism without the woman remembering or knowing anything about it. He had not personally met such a case nor read of one; he would not call it impossible but he would say it was improbable. He had had two long interviews with the accused in the prison and had formed the opinion that she was not insane. From her medical history *he thought she was a somnambulist; he believed her* statement that she had no recollection of committing the act, but this might be due to the suppression in the mind of a distasteful act—a very common feature in such cases. In answer to the judge, Dr. WATSON said that a woman walking in her sleep would not have her mind consciously functioning; although in a medical sense she might not be insane, she would not know the nature and quality of the act she was committing nor would she know that the act was wrong. Mr. Justice CHARLES, a judge of strong common sense and considerable experience in criminal law, left the matter to the jury in the following way. If the woman was so distraught that she did not know what she was doing, he failed to see how she could be guilty. If, on the other hand, she killed her child simply because she was miserable, in a fit of spleen or disappointment, or because she thought the boy was going to be taken away from her, then she did it knowing that she was doing it and must not do it, and in that case the jury must find her guilty. If they accepted the suggestion—and it was rather more than a suggestion—that the accused was a somnambulist, that she committed this act in a state of somnambulism and therefore did not know what she was doing, that she did not appreciate the nature and quality of the act, that she did not know she was doing it at all because of this somnambulistic state from which she unquestionably suffered, then their duty would be to find that she was guilty but insane. The judge added that, if they had any honest doubt whether the killing were done deliberately, intently and consciously, or whether it was done under the influence of somnambulism, then the prisoner was entitled to the benefit of it. *The jury, after a brief* absence from court, returned a verdict of guilty but insane.

The case gives rise to two comments. First, the state of somnambulism is not a state of insanity. A sleep-walker is not insane either in a medical or a popular sense. It is not the act *per se* which the judge and jury must consider, but the state of mind which prompts, and manifests itself in, the act. A sleep-walker is not to be punished for an act done in sleep. It is a difficulty of MAGGIE ALEXANDER's case, so far as the available reports of it go, that we do not know whether the jury thought she killed the boy *while she was awake but in a state of mental* instability, or whether she killed him while in her sleep. The second comment arises over the ridiculous formula "guilty but insane," to which the law still clings though the Atkin Committee on Insanity and Crime condemned it six years ago. "Guilty" connotes criminality; insanity negatives the existence of the criminal mind. A finding of insanity is an acquittal. The legal questions of insanity and crime are complicated enough without perpetuating a form of verdict which is illogical and a fallacy. Is there any hope that in the impending reform of the law of lunacy a brief clause can be inserted to remove this *unnecessary element of confusion?*

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INFECTION BY FOMITES.

IN the course of a serious discussion a medical officer of health of considerable standing said he had never been able to trace the origin of a single case of scarlet fever. Although this statement obviously needs qualification as regards secondary cases and return cases, and those occurring in milk-spread epidemics, it may be taken to represent the experience generally of people actively engaged in public health work. *What is true of scarlet fever is true of many* of the cases of other infectious diseases—certainly of those met with in this country. We know that missed cases and carriers are often responsible for spreading infection but informed opinion wavers over the importance of fomites—just as uninformed opinion has always wavered over the probable meaning of this peculiar word. At present it is the fashion not to lay much emphasis on the rôle of infected articles, but it must be confessed that the grounds for disregarding it are not abundant. That fomites *can* spread infectious disease has been proved over and over again; that clothing and especially underclothing and bed linen—*articles which come into the* closest possible contact with the skin—are able to maintain viruses in activity, has been demonstrated by numerous observers. In a classical report published in 1886, Dr. H. F. PARSONS quoted the experience of medical officers in various parts of the country where woollen rags and mixed woollen and cotton rags were used in the manufacture of shoddy, rag-flock, and similar substances. In 1880 Mr. Greenwood, the medical officer of health of Ossett, in Yorkshire, had attributed a case of small-pox to infection from rags which the patient was sorting. Dr. Goldie, medical officer for Leeds, had given similar instances; in Gloucestershire the source of small-pox among women at the shoddy mills at Chalford and Brinscombe in the Stroud Valley was thought to be rags. Medical literature yielded many other descriptions of outbreaks of small-pox among rag-sorters at paper mills in different parts of the country, traced to the use of calico rags, evidently derived from underclothing and bed sheets. The mills making the best writing-papers from white rags were especially affected, and it is noteworthy that rags used for this purpose are cut up by hand. Since then there have been so many instances of small-pox being spread by fomites that belief in this method of spread is now general. The recent Hendon outbreak showed that laundry workers are in danger from infected garments, and we have plenty of evidence that the virus of small-pox can survive for considerable periods.

Reading into Parsons's 1886 report the new knowledge that typhus fever is lice-borne we are fully prepared to believe in his fatal case of typhus contracted by a rag-sorter from rags. Murchison had earlier observed that laundry-women are especially liable to contract this disease without direct communication with the sick, and text-book writers had accepted the view that clothes and bedding may become vehicles for the transmission of typhus. We now know that lice infected with virus of typhus can survive only for a limited period without getting food in the form of blood, and in certain other diseases there are factors which limit the danger of infection. Thus when a serious invasion of this country by cholera was feared about 1890, the Local Government Board made regulations requiring the disinfection of imported rags; but according to present opinion any such danger would be minimised by the facts that the cholera vibrio is readily destroyed by drying and is easily crowded out by saprophytic micro-organisms, so that contamination must be recent to be effective. Typhoid fever, on the other hand, may be contracted by handling clothes of patients which were stained with fæces or urine quite a long time ago. Parsons was further able to record four cases of blood poisoning among agricultural labourers due to the handling of infected waste from rags which were spread on the land as manure, and evidence is available on the spread of scabies by rags.

For many years the Government of South Africa have required that all second-hand clothing and rags should be adequately disinfected before admission into the country, and lately the administrative arrangements have been tightened up. In South Africa there is a considerable trade in second-hand clothes; the natives coming into towns and undertaking industrial occupation resort to such European clothing as can be obtained at a price within their means. Doubtless the medical advisers of the Government have been right to ensure disinfection to avoid any spread of small-pox and other diseases in a semi-civilised community where they would be difficult to control, but recently similar regulations have been enacted in a country where the same conditions do not apply—namely, the Irish Free State. When, a week or two ago, a question was asked in the British Parliament concerning the need for disinfecting imported second-hand clothing, the official reply indicated that the precaution was held unnecessary. This answer seems to be based on the considerations that most of the small-pox present in this country is of the mild type and due to the spread of infection from case to case, that recent outbreaks of small-pox imported from abroad have been attributable to definite cases of the disease, and that of late years no instance of small-pox due to imported infected second-hand clothing has been traced nor has this source given cause for suspicion. In these circumstances it is considered inadvisable to burden importers with the trouble and expense of disinfection.

THE CENTRAL BUREAU OF HOSPITAL INFORMATION.

The origin of the Central Bureau of Hospital Information is of historic interest. It will be remembered that in 1914 a Hospital Economy Committee was set up by the War Office as a check on expenditure in the hastily improvised institutions under the control of persons inexperienced in administration. Remarkable differences in the consumption, especially of two articles, tea and soap, were observed in the various institutions visited; similar observations were made with regard to dressings, drugs, and articles of food, and soon it was possible to demolish the argument which assumes that because hospitals deal with patients whose requirements differ greatly, it is impracticable to establish standards of consumption. The Hospital Economy Committee proved up to the hilt that, without reliable relevant figures, an administrator cannot exercise effective control over his institution, but is at the mercy of his subordinates. Eventually all must bow down to returns which show with remorseless accuracy the expenditure of material or money on the performance of some unit operation, whether that be the supplying of bread to 100 persons for one day or of soap for the cleansing of 1000 articles. The close contact established between the Economy Committee and the voluntary hospitals during the war was in danger of dissolution on the declaration of peace and the gradual demobilisation of the military establishments. It was, therefore, fortunate that the Joint Council of the Order of St. John and the British Red Cross Society provided a bridge, and by the establishment of a Hospital Services Department kept available much that had been learnt during the war. This department at once took up the task of surveying the work and finances to the voluntary provincial hospitals, giving statistical information in a report published each year. The preparation of this provincial report naturally established a certain degree of contact between the individual hospital and a central body, and a good deal of information of a useful administrative character was collected. It was not, however, until a junction was effected between the Joint Council and the British Hospitals Association that the bureau of information could be considered to rest upon a firm foundation. This was provided in 1927, and the Central Bureau of Hospital Information now carries out its work on the authority of the hospitals themselves. This is, of course, a most important point, for in order to be successful it is essential that a centre should enjoy the confidence and the goodwill of the units that surround it. In addition to the publication of its annual report, the Bureau undertakes inquiries on the request of individual hospitals. It depends on the importance of the subject whether an inquiry results in a memorandum issued to all hospitals or is confined to a smaller number. The work of the Bureau is growing each month, and there will shortly be attached to it a hospital library where books and plans may be consulted. In short, the Bureau aims at becoming the intelligence department of the whole hospital system of Great Britain. To this end it is anxious to secure the goodwill and help of all foreign and international associations concerned with hospital administration. We trust that the publicity accorded to its efforts in an international contemporary will achieve this result, for the story of the Bureau is fully told in the last issue of the *World's Health* by Mr. R. H. P. Orde, hon. secretary of the British Hospitals Association.

Annotations.

"Ne quid nimis."

AN UNSOLVED PROBLEM.

AT five years of age one-quarter of the children entering school are in need of medical attention according to the Chief Medical Officer of the Board of Education, who devotes several pages of his annual report[1] to what he calls the problem of the nurture and upbringing of the pre-school child. This problem, we are told, remains unsolved in spite of the 2776 infant welfare centres and an army of health visitors. The Maternity and Child Welfare Act of 1918 has done much for the child under one year, but the arrangements are almost wholly undeveloped for those aged 2 to 5, or what is known as the pre-school group. The result of the lack of provision for this group is to burden the school medical service financially and administratively with the physical and mental defects and impairment of an earlier age, to put the clock back for all the benefit won in the infant welfare centres, and to prejudice both the health and the education of the children as a whole. At present in England and Wales there are 2,000,000 children in this group. A large number, some 165,000, are in attendance at elementary schools where special provision of a limited character may or may not be made for them. Twenty-eight nursery schools are in existence accommodating about 1000 children, and there are 98 day nurseries which admit children from one month upwards. Altogether the special provision for these 2,000,000 children is almost negligible. What is needed now, and urgently needed, is the application of some approved method, an application which can only be effective if it is general or even universal. "If," says Sir George Newman, "we give the child up to five at least as good a chance of physical health as the school child obtains, the result will be sure." And he goes on to say: "It is as certain as the law of cause and effect that whenever and wherever we safeguard early childhood—by wise mothering, by good home conditions, by appropriate child nursing, by child welfare centres, by nursery schools—then and there we get improved physical conditions in childhood."

Wise mothering we are doing our best to obtain through maternity and child welfare services which are also responsible for infant welfare centres. Home conditions are being improved slowly but surely by housing and town-planning schemes. Child nursing has been demonstrated by Dame Janet Campbell in her recent report on infantile mortality to be the *next important step in the child welfare campaign*, only the nursery school lags behind waiting for more forceful encouragement from headquarters. Undoubtedly the extension of nursery school provision will do much to solve the problem of the care of the pre-school child. The nursery school is an evolutionary advance on the day nursery, whose original function of "minding" the children of the mother who went out to work has settled into two divisions: the care of the infant from 1 month and the care of older children from 2 onwards. It is now found that although the child under 2 can be adequately cared for in a day nursery, the child of 2 or over requires more than nursing or "minding." It is out of this idea that the nursery school has evolved. Its function is concentrated on the general nurture of the child physically and mentally from the age of 2 upwards, guiding natural instincts into correct habits and associations, encouraging efforts at reasoning, discrimination, and coördination—in fact, helping the child along the path of self-education and of independence by means of careful and skilled guidance at the hands of teachers specially trained for the work.

Such a system of hygienic and educational care for the pre-school child is naturally simpler to devise for an urban than for a rural area as is indicated in the report, but now that educational provision for rural children from 11 upwards is to be centralised in special areas it ought to be possible to organise in villages and small towns what might be called health and education centres to include the infant welfare centre, the nursery, and the primary school for children up to 11 years of age. As far back as 1908 a consultative committee of the Board of Education issued a report in which they arrived at the conclusion that the best place for children whose home conditions were unsatisfactory was the nursery school. Referring to this report Sir George Newman says: "In our own day we have at least comprehended the problem." Alas, it is a far cry now to 1908, and very many, indeed millions of 5-year-old children, healthy and diseased, have passed the portals of the elementary schools since then. The problem remains unsolved. It is still, where 2,000,000 children are concerned, one of the most important and urgent of public medical problems. We understand that 15 new nursery schools have been sanctioned, which brings the number up to 43. Forty-three schools, each accommodating 100–200 children, is but a drop in the ocean.

A SURVEY OF EPIDEMIC ENCEPHALITIS.

THE Commission organised and financed by Dr. William John Matheson of New York for the study of epidemic encephalitis has issued the first instalment of its report.[1] The Commission has considered the first essential to be a complete survey of the whole subject as it is known to-day. Such a survey of a disease, which though recent in appearance has become world-wide in its spread, is in itself no light undertaking, and it is evident that the Commission has set about its task with breadth of outlook and a characteristic thoroughness. Dr. Josephine B. Neal, in addition to obtaining all the information available from contemporary literature, has made an extended tour of this country and of those parts of Europe in which the earlier outbreaks of the disease were observed, interviewing personally those who have had large experience of the disease. The general summary of ætiology presents in clear and concise language the various stages through which the pathological investigations of different schools have passed during these 10 years. Complete success, it is evident, has not yet been achieved, but it must not be forgotten that during the last few years there has been an increasing difficulty in obtaining material for investigation from acute cases.

The long chapter on epidemiology, with its vast amount of statistical information, will, we think, prove to be the most useful section of the survey. It comes as rather a surprise to find that the total number of cases known to have occurred in England and Wales exceeds those known to have occurred in any other country in the world by a very large margin of 5000. The feeling cannot be repressed that this may be the result of notification rather than of incidence. The résumé of the various methods of treatment tried in different countries at different times reveals the meagre therapeutic importance what has yet been achieved and gives point to intention of the Commission to study for itself treatment of 400 patients over a period of two with adequate controls. The bibliography contains something like 5000 references—more than one paper per day for 10 years—an output which is the measure of the interest which the disease has excited wherever it has appeared. For collecting and codifying this information in such a pleasant and convenient format the English-speaking world owes a debt to the Matheson Commission.

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[1] H.M. Stationery Office. 1s. See also THE LANCET, Nov. 30th, p. 1151.

[1] Epidemic Encephalitis: Ætiology, Epidemiology, T. Report of a Survey by the Matheson Commission. New Columbia University Press. 1929. $3.00.

OVARIAN GRAFTS.

THE study of organ transplantation has opened up a wide field of surgical research, but the results so far obtained have been disappointing from a therapeutic point of view. For some considerable time now attempts have been made to transplant the sex glands, especially the ovaries, for there are a number of clinical conditions in which this form of treatment would appear to be indicated. Opinion is more or less unanimous that heterografting, transplantation from one individual to another of a different species, is a failure. G. Schoene, who published a monograph on this question in 1912, concluded that this was to some extent due to too great divergencies in the metabolism of the two species. No real advance has been made in recent years, and it may be concluded that heterotransplantation has not justified its use in human surgery. The therapeutic future of transplantation so far as the ovary is concerned would seem to lie in the homograft—that is, transplantation from one individual to another of the same species. Up to the present, however, experiments in animals have been attended with greater success than those in human beings. I. Kross[1] in 1925 performed transplantation of immature rat ovaries into sexually mature castrated rats, observing the results for periods up to 9½ months. These grafts survived in the castrated animals far longer than in noncastrated controls, and Kross attributed his success to the use of immature ovaries in which the potentialities of growth were high. In the human subject homotransplantation has been carried out in several series of cases, notably those reported by Lesnoi, Magnani, Perezzi, Schultze, and Schreiner,[2] but with varying results. V. Pettinari, in a recent thesis (Paris 1928), reviewed the present position and in addition reported results of a number of grafts on his own cases. In his opinion, only occasional results can be expected from homografts, though he thinks that the method is worthy of a trial in certain cases of infantilism with hypoplasia of the genitalia and other cases of this kind in which ordinary therapeutic measures have failed. He lays great stress on the individuals being of the same blood grouping and in endocrine equilibrium. The operation may apparently be carried out without much surgical risk, but its results are not very encouraging. With regard to auto-transplantation—that is, removal of the ovary to some other part of the body of the same individual—there is almost general agreement as to its field of usefulness in young women of sexual maturity in whom adnexal disease has necessitated bilateral oöphorectomy. The symptoms of the artificial climacteric can thereby be prevented or delayed, and, if the uterus is retained, menstruation generally becomes re-established and continues regularly for a few years. A large number of successfully treated cases have been described by Unterberger, Cramer, Blair Bell, Sippel,[3] and, recently, by C. C. Norris and C. A. Behney.[4] The latter consider that the life of the auto-transplanted ovary is probably not more than two or three years and in this they are in agreement with the majority. In their group of cases most of the grafts, which were made into the rectus muscle, took and the operation was practically without mortality. The grafts occasionally became tender for a day or two each month, but rarely gave rise to serious trouble.

THE TREATMENT OF SYPHILIS.

MANY discussions on the treatment of syphilis have taken place in the United States recently and it is clear that the questions which still exercise the minds of practitioners are (1) what constitutes a complete cure, and (2) what methods are available for detecting latent disease in the absence of definite clinical signs. Unfortunately for the solution of these problems, as W. E. Coutts[1] has recently pointed out our evaluation of remedies is based mainly on the results obtained in experimental rabbit syphilis, on the rapidity of healing of a lesion, and on favourable changes in blood reactions and clinical symptoms, whereas the final test of efficiency of any antisyphilitic agent must be gauged by the ultimate fate of patients—years after the cessation of treatment—as well as upon records furnished by postmortem examination. It is regrettable, in view of this undoubted fact, that the death certificate of a syphilitic person seldom gives any indication of his infection. Dr. Coutts anticipates no dramatic advance in syphilotherapy until the life-cycle of the infecting agent has been elucidated, until problems such as the existence of spirochætes with particular dermotropic or neurotropic affinities have definitely been solved, or until laboratory tests have become even more sensitive and reliable. He may be too pessimistic but it must be admitted that at present no assurance of cure can be given merely on a series of negative serological tests. In fact the exact position of the Wassermann reaction and the various precipitation tests as an indication of cure is still a constant source of argument between the clinician and the laboratory worker. The reliability of the Wassermann test has been keenly criticised, but the original test and its modifications have, nevertheless, withstood attack for 25 years, and the Wassermann reaction remains to-day one of the most valuable laboratory procedures known to medicine. Those of its modifications which have been recommended in the green books published by the Medical Research Council have passed a severe specificity trial organised by the League of Nations in serological laboratories of repute. As between the Wassermann reaction and the newer precipitation tests, Kolmer,[2] who has had an extensive experience of both the clinical and the serological aspects of syphilis, holds that where possible a complement-fixation test as well as a precipitation test should be done; when one test only is feasible, he prefers a complement-fixation test. Believing, as he does, that the strength of a laboratory serological test is proportional to the degree of spirochætal activity, it follows that in his view clinical symptoms depend more on where the activity is occurring than on the amount of activity. According to this theory a few organisms may produce symptoms of syphilis with insufficient reaction for a positive serological test or, on the other hand, a number of organisms large enough to determine a pronounced positive reaction may cause no immediate symptoms. Kolmer urges the clinician not to ignore positive reactions when clinical signs are absent, but rather to suspect negative ones where such signs are present. With regard to negative reactions, Belding[3] expresses the generally accepted opinion that the syphilitic antibody shows no intensification as the result of a provocative injection of an arsenical preparation. From the aspect of treatment it is fortunate that positive serum reactions usually precede clinical signs of relapsing syphilis; hence the value of periodic

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[1] Ame Jour. Obst. and Gyn., 1925, ix., 628.

[2] Lesnoi, S. Russk. Klin., 1927, viii., 72; Magnani, L.: Riv. Ital. da Ginecol, 1927, vi., 33; Perezzi, P.: Atti d.v. Accad. d. Fis in Siena, 1927, ii., 330; Schultze, G. K. F.: Zentralbl. f. Gynäk., 1928, lii., 29; Schreiner, R.: Deutsch. med. Wchnschr., 1927, liii., 2084.

[3] Unterberg , F.: Arch. f. Gynäk., 1918, cx., 173; Cramer, H.: Deutsch med. Wchnschr., 1919, xlv., 475; Bell, W. Blair: Brit. ed. Jour., 1918, i., 619; Sippel, P.: Arch. f. Gynäk., 1923, cxviii., 445.

[4] Surg. Gyn. and Obst., November, 1929, p. 642.

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[1] Amer. Jour. of Syphilis, 1929, xiii., 489.

[2] Jour. Amer. Med. Assoc., 1929, xciii., 1429.

[3] Amer. Jour. of Syphilis, 1929, xiii., 489.

tests, for they give a warning that further treatment should be given before any symptoms or signs of tissue destruction, which may be irreparable, have appeared. Hazen[4] and others insist, moreover, that no clinical examination is complete without an observation of the heart and great vessels with the fluorescent screen. There is evidence that involvement of the nervous system occurs early in the disease—a clear indication that the cerebro-spinal fluid should be examined as a routine at the end of any course of treatment and again on the occurrence of the slightest clinical sign. The protean nature of syphilitic lesions indicates that the manifestations probably depend more on the soil on which the infection falls than on variations in virulence or species of the invading spirochæte. Of recent years there has been a tendency to standardise the treatment of syphilis to the neglect of consideration of the individual. So much has been written in medical literature of the merits of this or that particular remedy, of the superiority of arsenic to bismuth and vice versa, that doctors tend to adopt one preparation for routine use, forgetting that one agent may succeed where another fails. The effective treatment of syphilis requires both experience and resource as well as a determination to neglect no remedy which may be the most suitable for a particular patient. A selection from among modern chemotherapeutic preparations has made it possible not only to disperse with ease the obvious signs of primary and secondary syphilis, but also in most patients to give a good prognosis as regards complete cure. The same prospect cannot be held out in the tertiary affections, but even here progress has been made on unexpected lines. The control afforded by laboratory tests in syphilis has already raised the standard of effective treatment far higher than it is in certain other chronic diseases. It rests now with the clinician to keep a close watch on the future progress of cases with anomalous Wassermann reactions and to trace the early records of those whose death from cardiovascular or other forms of late syphilis testifies to defects in the scheme of treatment to which they were subjected.

THE EVACUATION OF WOUNDED BY AIR.

THE theoretical considerations involved in evacuating sick and wounded by aeroplane in war-time have recently been considered both in this country and in the United States. Practical experience has been gradually accumulating since the war, and has been summarised by General Fritz Bauer, of the Swedish Army Medical Service.[5] He says that there were no organised attempts to use aeroplanes for military medical purposes in the late war, but that by 1925 the French in Morocco and Syria had actually evacuated nearly 3000 cases by air. In October, 1921, six aeroplanes carried 18 seriously wounded men in 35 minutes a distance which by ordinary transport would have taken three days. In Iraq we followed suit, and after various trials of unsatisfactory types of aeroplanes in March, 1924, the Vernont Victoria, which carries 24 sitting or 14 lying, was adopted as a standard type, and air evacuation came to be the normal method employed. It may be said that in countries such as Morocco and Iraq this method has not proved more dangerous or costly than other modern transport, and it has an excellent effect on morale, because it saves lives and reduces suffering. The great development of flying in the United States has led Captain R. K. Simpson[6] to explore the possibilities of the organisation of air transport for the wounded on a really big scale on the outbreak of war. He states that more than a hundred firms are at present engaged on aeroplane manufacture, and points out that while civilian aeroplanes are not suitable for fighting purposes, and civilian pilots would need a considerable period of training to enable them to take the field in war, both aeroplanes and pilots would be immediately available for ambulance purposes. They would operate entirely behind the lines, and so would not run risks from enemy action, and their work would only be interfered with by dense fog. The actual types and equipment of aeroplanes most suitable for ambulance work have lately been discussed by Group-Captain H. V. Wells.[7] Machines of the small 2-seater type have the advantage of needing only a small landing and taking-off space, but they are mostly incapable of taking a stretcher case owing to the cross bracing wires of the fuselage. A hoop system, however, will dispense with cross wires, and we have such a machine in the Fairey III. F. Wells suggests that evacuation by air finds its greatest value in tropical wars.

DIET AND STERILITY.

FERTILITY, both in the animal and vegetable kingdoms, is naturally associated in our minds with an abundance of good nourishment. Among mankind fasting has been practised from time immemorial as an aid to chaste living. The relation between fertility and abundance of food is not, however, by any means a simple problem, and we think at once of the pronounced tendency of our own poorer classes to produce large families in spite of their having a decidedly limited amount of money to spend on food. There is a considerable body of evidence pointing to some relation between the state of nutrition and the degree of fertility. Dr. Donald Macomber,[8] who has made a special point of investigating possible dietetic errors as the cause of sterility in women, has recently collected some of this evidence. Animal experiments have shown clearly that the quality of food eaten may exert a profound influence on fertility, and in the rat a specific accessory factor named vitamin E has been proved essential for normal reproduction. It is possible also that the quantity of food eaten may be of importance. An experiment in undernutrition carried out in the United States during the Great War may have some bearing on the problem. A squad of 12 men belonging to a training school were submitted for a period of four months to a general dietary restriction so that they lost 12 per cent. of their weight. It was noted during the course of the experiment that without exception they ceased to manifest the usual involuntary phenomena of sexual vigour, although they felt fit and were able to carry out all their regular work and exercise. It has been reported frequently that during times of famine the menstruation of women may cease. It therefore seems possible that at the present time, when fashion decrees that women shall be perpetually undernourished, there may be cases of sterility directly attributable to the state of malnutrition. An analysis of the diets of 200 women seeking advice on account of sterility showed that their consumption of protein was 10 per cent., and of total energy value 18 per cent. below the normal standard. These figures by themselves prove nothing, but at least they suggest the desirability of including an inquiry into the dietary habits of those who are seeking a remedy for sterility. There is no definite evidence at present that deficiency of vitamin E determines the occurrence of sterility in women, although it is worthy of note that the diets of the 200 women mentioned above were in many cases found to be deficient in fat-soluble vitamins. Forty of these women became pregnant after receiving advice on how to improve their state of nutrition, and, though it cannot be assumed that the result was always due to changes in dietary habits alone, the treatment of sterility in the future may reasonably include attention to both the quantity and quality of the food eaten.

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[4] Amer. Jour. of Syphilis, 1929, xiii., 489.

[5] Jour. of Roy. Army Med. Corps, February, 1929. Translated from the Rev. Inter. de la Croix Rouge.

[6] Military Surgeon, January, 1929.

[7] Jour. of R.A.M.C., October, 1929.

[8] Jour. Amer. Med. Assoc., 1929, xciii., 1213.

THE FATE OF PREMATURE INFANTS.

THERE is still much uncertainty about the subsequent physical and mental development of the premature or underweight infant. It is agreed that mortality is high in the first few years of life, but views on the health of those who survive are so conflicting that they scarcely help in the prognosis of actual cases. Sigurd Ranke[1] has lately studied the fate of a series of infants weighing less than 2500 g. at birth, and compares his results with those of other investigators including C. Looft[2] and A. Yllpö, who adopted the same birth-weight as a standard of prematurity. Of Ranke's series of 190 children seen at a children's hospital in Malmö from 1915 to 1924, 35 could not be traced, but as many as 82 (53 per cent.) were known to have died. This percentage is almost identical with that found by Yllpö. Further analysis of these figures showed that 78 of the 82 died in the first year, and that after this age the mortality was not greater than that of full-term infants. Of the 73 children who could be traced and re-examined, Ranke found only four (5·5 per cent. of the survivors) who were classed as mentally defective. This gives a figure of 3·4 per cent. of traced cases surviving the first six months, compared with 7·4 per cent. found by Yllpö. Besides the four aments there were nine children in Ranke's series who were somewhat backward. The incidence of mental impairment is considerably lower than that found by some other authors he quotes. The majority of the premature children traced by Looft after 10 years were found to be retarded, while L. Salomonson records a mental deficiency rate of 21 per cent. On the other hand, H. Finkelstein and others found no cases of amentia. A striking difference in the series of Looft and of Ranke lies in the incidence of Little's disease, which was 18 per cent. in the former and nil in the latter. Ranke gives interesting observations on the subsequent measurements of these children; their weights tended to be at or below the average, and the heights at or above the average, corresponding with the observer's impression of "long, lean and slim" children. The principal fact which emerges from these important investigations is that prematurity, though often associated with amentia, is not an actual cause of it. The causes of prematurity itself are obscure and probably numerous, and the subsequent characteristics of the infant will be conditioned by these varying causes rather than by the state of maturity reached at birth.

A NEW KIND OF HISTORY.

"Some day a man will write a new kind of history. Its keynote will be the shaping of human destiny by disease, and, let us hope, the guidance of this destiny by virtue of the control of disease."

WITH these remarks Dr. Allen Krause opened his Hermann M. Biggs Memorial Lecture for 1927; the materials for such a task are obviously considerable, and Dr. Krause himself made no little use of them in the lecture which has now been reprinted as a booklet.[3] Using the social history of the United States as his milieu he sketches the long struggle which has gone on to obtain control of the tuberculosis problem since the early days of the public health movement. Phthisis was uncommon in America at the end of the eighteenth century, but by 1828 it was increasing "with fearful strides." Brought in by the early settlers, Dr. Krause thinks that the disease was quite likely held almost under cover as long as a sparse agricultural economy existed. Even in the developing villages and towns phthisis was probably uncommon, but growing cities began to bring it into notice, and by the time the manufacturing side of the nation had made its presence felt at the beginning of the nineteenth century, tuberculosis had become a national menace. Dr. Krause has some astonishing facts to relate of the industrial revolution in America, but although the scene is laid on the other side of the Atlantic the outlines of the picture seem to be strikingly similar to our own; James Truslow Adams and Josiah Curtis tell much the same tale as Charles Kingsley and Arnold Toynbee. Ill-ventilated factories, crowded dwellings, all the insanitary conditions which were the concomitants of the early days of industrialisation, helped to create a high tuberculosis death-rate. It was an age of enormous industrial expansion and an accelerated impulse towards urbanisation, and according to Dr. Krause, "by 1850 it was plain that mid-century industry was the handmaid of tuberculosis." He then goes on to show how public health machinery is triumphing, slowly but surely. In the early days of the industrial revolution, tuberculosis was an urban malady and an urban problem; the factory system was in process of evolution, and living conditions did not keep pace with them. Now the position is changed. The towns are out-stripping the country and if civic sanitation continues to progress at the present rate, tuberculosis is likely to become a rural rather than an urban problem.

THE INTRADERMAL TEST FOR HYDATID DISEASE.

EIGHTEEN years have elapsed since Casoni described his intradermal test for hydatid disease, and in the intervening period various modifications in its technique and interpretation have been made. The most important development has been an appreciation that the reaction manifests an immediate as well as a delayed phase. Casoni originally injected 0·5 c.cm. of hydatid fluid intradermally and noted the marked erythema of the skin, the infiltration and the puffy swelling of the subcutaneous tissues which appeared some hours later in hydatid cases. This phase is now known as the delayed reaction. Magath in 1921, using a technique similar to the Pirquet test, observed rapid wheal formation and cutaneous erythema following the application of hydatid fluid to the scratched skin in three people harbouring hydatid cysts, and in the following year Ithurrat and Calcagno reported a similar type of response occurring within a few minutes of the intradermal injection of a similar antigen. Sixty-three of their series of 65 patients suffering from hydatid gave an immediate response, and only 4 out of 127 cases subjected to the test failed to correspond with the operative findings. Later in Australia Kellaway, Dew, and Williams studied both phases of the reaction at the Walter and Eliza Hall Research Institute and came to regard the immediate reaction as of great diagnostic value. Immediate wheal formation, however, was noted in the absence of demonstrable hydatid infestation in cases showing jaundice, urticaria, and generalised skin diseases. This year two additional papers have originated from the same Institute, the first being a critical analysis by K. D. Fairley[1] of the results of the test obtained over a period of five years. Exacting criteria of diagnosis were enforced, all doubtful cases being rejected from the series. In hydatid patients tested before their first operation 82·9 per cent. showed the immediate reaction and 40·4 per cent. the delayed response. The anatomical location of the cyst was found to exert little or no effect, but its pathological condition definitely influenced the reaction, since 92·0 per cent. of cases with ruptured or suppurating cysts yielded positive results compared with 77 per cent. in which these complications were absent. On the other hand, 35 out of 87 cases (40·2 per cent.) which gave an immediate wheal failed to show any evidence of hydatids on detailed investigation, and the justifiable conclusion was reached that no surgeon should operate solely on the basis of an immediate reaction. No evidence of hydatid was found in 96·8 per cent. of hospital patients in whom wheal formation was absent and a negative reaction came to be regarded as highly important, though not infallible, evidence in excluding echinococcosis. In Fairley's opinion this constituted the chief clinical value of the test. During the post-operative period immediate reactions were recorded in 90·2 per cent. of patients. Recent rupture of the cyst with consequent temporary desensitisation was sometimes found to be responsible for negative findings. When no other cysts were present the reaction often persisted for years, but its continued absence in any patient showing a positive result before operation was regarded as evidence of cure.

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[1] Acta Pædiat., 1929, ix., 46.

[2] See THE LANCET, 1928, i., 244.

[3] Tuberculosis and Public Health. By Allen K. Krause. Baltimore. 1928. Pp. 54. Reprint from the American Review of Tuberculosis, 1928, xviii., 271–322.

[1] Fairley, K. D.: Med. Jour. of Australia, 1929, i., 472.

The second paper, written conjointly by K. D. Fairley, N. H. Fairley, and F. E. Williams[2] was the outcome of an inquiry into the causation of immediate reactions in patients showing no other evidence of echinococcosis. More exacting standards and controls for the test are recommended with the object of diminishing or abolishing the growing list of pseudo-reactions reported by numerous observers. Accurate measurements of the immediate wheal and of the area of infiltration in the delayed reaction are shown to be essential. It is pointed out that in the past the results have been classified as "positive" or "negative" largely on the impressions of what constituted a reaction or a failure to react, and as these conceptions varied with individual observers no accurate comparison of results is possible. Guisti and Hugg first reported the presence of pharmacologically active substances in samples of hydatid fluid, and it is now shown that such fluids may occasionally give rise to either direct or indirect types of reaction in normal individuals. In consequence it is urged that fluids be tested on a series of normal individuals in order to exclude pharmacologically active substances as well as standardised for antigenic potency on those harbouring hydatid cysts.

To perform the test 0·25 c.cm. of standardised hydatid fluid is injected into the dermal layer of the skin covering the outer surface of the arm, a similar injection of normal saline solution (0·9 per cent.) serving as a control a few centimetres away. Care is taken to ascertain that this area has not been previously tested. If so, another site must be selected since local sensitisation was proved to result in a normal person from the repeated injection of hydatid fluid into an area of skin ringed with silver nitrate. In recording results wheals the size of a shilling (diameter 2·4 cm.) are regarded as positive, those not exceeding sixpence (2·0 cm.) as negative, and those of intermediary dimensions as of doubtful significance. In the latter case the test is repeated. Outrunners resembling pseudopodia are taken into account in making measurements. When the control injection of saline produces a wheal exceeding 2·0 cm. in diameter, the patient is rejected as an unsuitable subject for the test, and the same applies if there is a triple response to the stroke test (Lewis). A wheal even of the dimensions mentioned, however, was not found to be pathognomonic of echinococcosis. Certain other fallacies were shown to exist, and in any case presenting a positive reaction further investigations are advised. Filtered sheep serum (0·25 c.cm.) is injected intradermally in order to exclude sensitiveness to sheep serum proteins, for the data presented clearly demonstrate that hydatid fluid from ovine sources contains sufficient host protein to produce positive reactions in patients not infested with hydatids, but sensitive to sheep serum. Finally, the group reactions attending concomitant helminthic infestation receive consideration. Both immediate and delayed reactions were observed in non-hydatid cases harbouring other tapeworms such as *Tænia saginata*, and for this reason a search for intestinal helminths may be indicated. In nematode infestations less conclusive evidence of group reaction was presented.

The new facts elicited by these important investigations clearly indicate that the intradermal test affords no short cut to diagnosis. For many years it has been appreciated that a specific antigen-antibody reaction underlies the various biological tests for echinococcosis. In the intradermal test, unfortunately, an additional vascular mechanism is involved. Increased permeability of the capillaries with fluid transudate underlies wheal formation, and according to Lewis this in turn is dependent on the liberation of "H substance" during the intracellular union of antigen and antibody. Be this as it may, the vascular factor introduces its own peculiar fallacies, the elimination of which calls for both skill and judgmention the part of the practitioner employing the test. Serological reactions, like the complement-fixation and precipitin tests, are conducted in vitro and do not suffer these limitations; of necessity they must remain the most reliable of the biological aids to diagnosis in those countries where hydatid is endemic.

CLEAN AIR.

THE National Smoke Abatement Society has produced a new journal called *Clean Air*. The first issue, dated Autumn, 1929, is sent forth with good wishes from many eminent people, and contains a number of articles on the purification of the atmosphere in our cities. Smoke was long regarded as the inevitable accompaniment of industry, and the possibility of freeing the air from it was at first the fad of a few. The idea has, however, taken firm hold and may very soon become the normal expectation of us all. It has been demonstrated over and over again in industry that the most hygienic method is the most economical, and cleansing of the atmosphere obeys this law, for smoke is simply wasted fuel. There are three principal lines along which to proceed with smoke prevention: gas, electricity, and smokeless fuels like anthracite. *Clean Air* contains an article on the use and development of gas in industry, giving examples of the innumerable directions in which gas can be economically used in various trades. The director of a research institute in America has estimated that the potential market for industrial gas is at present only 2 per cent. saturated. Another article deals with the uses and development of electricity in industry and stresses its very wide range of application, its precise and positive control, the exceptional uniformity of temperature which it yields, and the reduction to a minimum of labour requirements. It must be admitted, however, that the private consumer is the chief offender against the purity of the atmosphere; regulations have already gone far towards abolishing the cloud of smoke that used to belch forth from factory chimneys, but every small house contributes its little wisp to the fog that lies over London. The annual review of domestic heating given in the new journal suggests that those who long for the comfortable sight of an open fire burning in the grate should have their wish—more or less—by burning either anthracite or high quality gas coke in their grates. The low-temperature carbonisation fuels have saved the open grate from the condemnation with which it was threatened by the reformer, and though it must be admitted that such fuel still remains rather more expensive than coal, it reduces dirt and labour in the house as well as smoke outside it. Much experimental work requires to be done on these combustibles, and there is also scope for improving the general temperature of British houses by central heating or by insulation, so that the amount of fuel burned in the open grate is reduced. There is a very great deal to be said for the abolition of smoke, and practically nothing except prejudice or sentiment (and the price of smokeless fuels for those who want the open grate) to be said against it. We hope that the new journal will receive the support for which it asks and will be able to carry the campaign for clean air into the homes and factories of the whole country.

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[2] Fairley, K. D., Fairley, N. H., and Williams, F. E.: Ibid., 1929, ii., 320.

WE regret to announce the death of Sir Sidney Alexander on Dec. 9th, at the age of 66. From 1910 to 1920 he was Mayor of Faversham, where he practised for many years before taking up consulting work in London.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Vice-Admiral Arthur Gaskell, C.B., O.B.E., Medical Director of the Royal Navy following precedent, has accepted an extension of his appointment for one year from June, 1930, when he will have completed the ordinary term of three years, having succeeded Sir Joseph Chambers, K.C.B., C.M.G., in 1927. Surg. Vice-Admiral Gaskell, who is 58 years of age, joined the Navy in 1893. He was made C.B. for his services with the Royal Naval Division at the Dardanelles where he was A.D.M.S. Afterwards he was in charge of the hospital ship *Soudan* and later head of the R.N. Hospital at Simonstown.

Surg. Comdrs. A. R. Fisher and T. R. L. Jones are placed on the Retd. List at their own request, with the rank of Surg. Capt.

Surg. Lt.-Comdr. F. G. Hunt to be Surg. Comdr.

The following appointments are notified: Surg. Comdrs. E. Moxon-Browne to *Malaya*; G. L. Ritchie to *Greenwich*; and C. M. R. Thatcher to *London*. Surg.-Lts. J. J. Mason to *Egmont*, and J. W. L. Crosfill to *Concord*.

ROYAL ARMY MEDICAL CORPS.

Lt. H. McNeill relinquishes his tempy. commn.

ARMY DENTAL CORPS.

Maj. F. W. Shilton retires on account of ill-health receiving a gratuity.

TERRITORIAL ARMY.

Maj. A. P. Draper, R.A.M.C., vacates the appt. of Divl. Adjt., 52nd (Lowland) Div., T.A.

Lt. G. Williams to be Capt.

Supernumerary for service with O.T.C.—Lt. G. P. Crowden to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. W. T. Gardiner, from Active List, to be Maj.

Capt. W. G. Saunders, from Active List, to be Capt.

Lt. R. L. Turner, from Active List, to be Lt.

INDIAN MEDICAL SERVICE.

Lt. D. P. Lambert to be Capt.

The undermentioned officers relinquish their temp. commns.: Capt. Rama Shanker Varma, and Lts. Bonbehari Bhattacharji and Mazhar Hussain Shah.

COLONIAL MEDICAL SERVICES.

The following new appointments have been made by the Secretary of State for the Colonies:—Dr. H. G. Harvey, Medical Superintendent, King Edward VII. Memorial Hospital, Bermuda; Dr. W. B. Sutherland, Medical Officer, Malayan Medical Service, Federated Malay States; Dr. E. Holmes, Medical Officer, Iraq; Major J. W. C. Stubbs, Inspector of Medical Services, Iraq Army; Captain G. A. C. Gordon, Medical Officer of Health, Nigeria; Dr. H. G. Pritchard, Medical Officer, Nyasaland; and Dr. G. Q. Chance, Medical Officer, Malayan Medical Service, Straits Settlements. Dr. G. R. Baxter has been appointed Medical Officer of Health, and Dr. W. R. Little, Medical Officer, on the West African Medical Staff.

ROYAL SEA BATHING HOSPITAL, MARGATE.—The 138th annual report of this hospital states that the average daily number of occupied beds was 301, and the average cost per occupied bed was £127 6s. 11*d.*, as against £134 13*s.* 7*d.* in 1927. Portions of the building which are built of red brick are being so much affected by the salt-laden atmosphere that the bricks are crumbling and in some cases completely decayed. Heavy expenditure will be needed to check the degeneration.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LVI.

INTERPRETATION OF RADIOGRAMS OF THE ALIMENTARY TRACT.

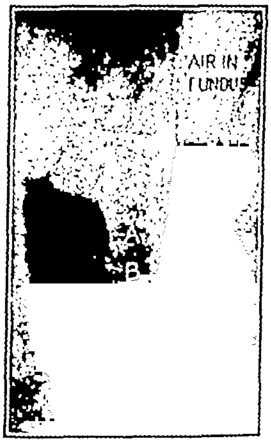
PART III.*—THE DUODENUM.

RADIOLOGISTS talk of the first part of the duodenum as "the cap." It looks and behaves quite differently from the rest of the duodenum. Functionally, apparently, it is different, for it fills up with opaque food into a triangular, cocked-hat shaped shadow, poised on top of the pylorus, usually pointing towards the gall-bladder; whereas the food passes rapidly through the second and third parts and is divided up by the muscular action of its walls, so that no definitely outlined shadow is seen (Fig. 17). In stout patients the cap is sometimes turned backwards and lies almost directly behind the stomach. This disposition greatly increases the difficulties of palpation and also of obtaining films, for it necessitates an oblique or even a transverse illumination.

Duodenal Ulcer.

The duodenal cap usually fills satisfactorily, at any rate if we are patient and wait. But if there is irritation it is sometimes extremely difficult to get the cap outlined. With patience and the assistance of manipulation it is usually possible to hold some opaque food in the cap and to manipulate it sufficiently to demonstrate that the outline is not persistently deformed. Ulceration of the duodenum is almost confined to the first part (90 per cent. or more), and whenever there is ulceration there is *persistent* deformity of the cap shadow (Figs. 18 and 19). This deformity is largely due to spasm, and the resultant picture varies widely according to the site of the ulcer and the degree of spasm. Every attempt should be made to demonstrate the actual crater of the ulcer. This is not by any means always possible; yet, apart from the demonstration of the crater, I do not think that we are justified in making an absolutely positive diagnosis. With a deformity that is persistently the same, the probabilities are very high that it is due to the presence of an ulcer, but it might be caused by adhesions, and, personally, I reserve the definite diagnosis for the cases in which the ulcer crater is detected. Every observation on the duodenum and also on the stomach, whether positive or negative,

FIG. 17.



Normal duodenal cap (A). The stomach is of the long type and the cap points vertically. Its upper limit is on the level of the crest of the ilium—i.e., the duodenal attachments have allowed it to descend to compensate for the "gastroptosis." Note the large quantity of air in the stomach. Probably a nervous type of female subject who is inclined to air-swallowing and consequent eructation. Note also the food passing through the second and third parts of the duodenum. In this and subsequent figures B = pylorus.

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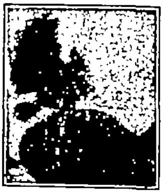
[*] Parts I. and II., on the Œsophagus and the Stomach respectively, appeared in THE LANCET of Nov. 30th and Dec. 7th. The Intestines will be dealt with in subsequent issues.

should be confirmed when the patient comes up for examination on the second day.

Beyond the duodenal cap the opaque food is quickly broken up into fine division. Sometimes there is accumulation in the loop of the duodenum—duodenal ileus. This may or may not be pathological, due to some kinking or drag at the duodeno-jejunal flexure, or other cause of obstruction, but unless it is well marked it is wise to regard it as of no pathological significance. As often as not we do not find it when we re-examine, particularly if the circumstances are more normal than at the first examination. Rapid emptying of the stomach often gives rise to such an appearance. Certainly a slight degree of duodenal ileus may be disregarded as a guide to surgical interference.

FIG. 18.



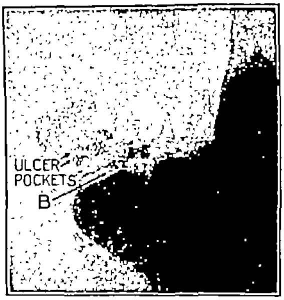
Deformity of the duodenal cap—a typical type of deformity.

New growths of the duodenum are extremely rare—an interesting fact considering the extraordinary prevalence of ulceration. There is certainly no tendency of duodenal ulcer to become malignant. Whether the very similar peptic ulcer of the stomach is as liable to malignancy as was formerly supposed seems to be open to question. X ray observations are all against such a sequence except in very rare cases.

Diverticula.

Diverticula of the duodenum are comparatively common and they are liable to give rise to symptoms that are indistinguishable from those of duodenal ulcer. The pocket of the diverticulum, which is usually about the size of the end of a finger and arising about the junction of the first and second part, is more readily identified on the screen than on the X ray film. Diverticula may occur in other parts of the duodenum (Fig. 20) and also in the small intestine, but they are not so common and are probably less often associated with symptoms. A condition of the first and second part of the duodenum which may give rise to symptoms of duodenal ulcer and to appearances that are rather similar to those of a diverticulum is caused by a dropping over and twisting of the junction of the first and second parts, an appearance that is not readily appreciated on the screen and not always recognised as a possibility on the operating table.

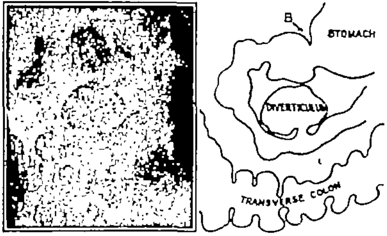
FIG. 19.



Deformity of the duodenum showing the pockets of two ulcers near the apex of the cap.

Adhesions about the gall-bladder are common, and many of them give rise to deformities of the duodenum which are almost, if not quite, indistinguishable from those caused by ulcer. Palpation of the food in the duodenum and the detection of undue fixation is the only way in which one can attempt to arrive at a reasonably accurate diagnosis.

FIG. 20.



Large diverticulum of the third part of the duodenum—an unusual site. Patient recumbent and stomach only partially filled. Normally the food passes rapidly through the duodenum. In this instance the radiologist by his manipulation has dammed the third part and forced food out of the stomach in order to obtain this radiographic effect.

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Special Articles.

SOME OBSERVATIONS ON SCANDINAVIAN SURGERY.

BY T. HOLMES SELLORS, B.M. OXF.,
G. H. HUNT TRAVELLING SCHOLAR, UNIVERSITY OF OXFORD; SURGICAL REGISTRAR, MIDDLESEX HOSPITAL.

II.

VASCULAR SURGERY.

Arterial Embolism.—The clinical and operative study of arterial embolism was greatly advanced by a paper from Prof. Einar Key, of Stockholm, in 1922. This year he has published a further report in which the results of 213 cases have been collected. This includes 17 cases of his own. The removal of emboli has become a standard surgical procedure, and the diagnosis is based on the general condition of the patient—i.e., possible existence of heart disease, *&c.*; and the site of the initial pain, lividity, and loss of pulse below this region give an accurate localisation of the embolus. The operation is usually performed almost exactly over the site, and the time factor is of great moment on account of thrombosis behind the embolus. The majority of these cases originate in heart lesions, but arterial disease may also play some part. The operation of embolectomy should be performed as soon as possible after diagnosis, so as to check the obliteration of collateral circulation by back-spread of thrombosis. Also there is the risk of malnutrition with subsequent ulceration and secondary thrombosis at the site of the embolus, which is most commonly at a bifurcation of two vessels.

The affected artery is exposed, pulsation is absent, and the rubber-like clot can be felt blocking the lumen. Soft clamps are applied beyond the limits of the clot and the intervening artery is incised. The clot is gently removed, and release of the clamps alternately will demonstrate freedom of the blood stream. Sutures of very fine vaseline silk are used to repair the incision. There has been no record of stenosis or aneurysm which can be attributed to the sutures. The prognosis ultimately is not satisfactory in cases with an underlying heart lesion, though a very large number may be said to be cured as regards their embolism. The figures from Prof. Key's paper show that, if the operation is performed under ten hours, 51 per cent. of the cases give good results. Over ten hours a good result is only obtained in about 23 per cent. of the cases. The frequency of embolism is, roughly, the femoral, common iliac, popliteal, bifurcation of aorta, brachial and axillary arteries. On the whole, embolism in the arm gives the best results, since the collaterals are freer, and even if secondary thrombosis occurs, the interval of freedom resulting from operation may be sufficient to allow the establishment of an efficient circulation.

Results from aorta are, generally speaking, bad, whereas embolism of the leg arteries gives fairly good results under ten hours. Naturally the state of the vessel itself is a big factor in the prognosis, but age is not necessarily a contra-indication to the operation, which can, in the majority of cases, be performed under local anæsthesia.

Venous Thrombosis.—Thrombosis of the femoral and iliac veins as a post-operative complication is common in Scandinavia as compared with England. The reason of this is not clear, since all commonly recognised causes have been countered as far as possible. It is said that the incidence in the north of Sweden is not as great as in the south, where the type of individual is heavier in build. There is certainly a relative tendency to the thrombotic condition in big, fat people, who have been submitted to an incision in the anterior abdominal wall, but no amount of breathing exercises, massage, or movements of the lower limbs seems to have much effect in diminishing the frequency of this condition. Prof. Nyström, of Upsala, has made some preliminary observations on the blood-platelet count, and by daily estimation is frequently able to predict, but not prevent, the onset of thrombosis.

Pulmonary Embolectomy.—From the frequency of venous thrombosis it may be gathered that pulmonary embolism, too, is not rare. To meet this dramatic emergency a modification of Trendelenburg's original operation is being practised. To date 20 failures have been reported, as against seven or eight complete successes, but it is interesting to note that there had been no complete success reported up to 1924. The time factor between the actual embolism and removal of the clot imperatively demands emergency measures. The surgeon may not be at hand, and consequently, in the majority of Scandinavian clinics, the first and second assistants have been trained to perform the operation if occasion arises. Where possible, at the onset of an embolism, the patient is hurried to the operating theatre, where sterilised instruments are kept constantly in readiness. The operation itself is not started until it is absolutely certain that the heart will stop in one or two minutes, or has already stopped. Anæsthesia is unnecessary; a vertical incision over the second to fifth costal cartilages is made, and by division of the cartilages the pericardium and pleura are exposed. The pleura is pushed aside, and the upper part of the pericardium incised. A big clamp is passed through the transverse sinus around the aorta and pulmonary artery controlling these vessels, and the base of the pulmonary artery itself is then opened and endeavours are made to extract the clot. Sometimes the clot comes free with gentle application of forceps; at other times a sucker may have to be used. Adrenalin is injected into the base of the aorta so as to reach the coronary circulation, and the control clamp is freed while the incision in the pulmonary artery is held. If the heart starts beating the hole in the pulmonary artery is sutured, the tissues are anæsthetised, and the original incision repaired. I saw Prof. Nyström's second successful case two or three weeks after the operation, and she was apparently making a satisfactory recovery. It is certainly a field of surgery which has considerable possibilities, since the proportion of successes, even allowing for unreported failures, is very encouraging, the more so when it is realised that the cases were not operated on until the heart had ceased to beat. A paper containing details of the operation as well as a full and lucid account of arterial embolism has been published this year by Prof. Einar Key in *Ergebnisse der Chirurgie*, March 22nd, 1929.

RADIOLOGICAL CONGRESS.

LONDON, DEC. 4TH–6TH, 1929.

THE annual meeting of the British Institute of Radiology incorporated with the Rontgen Society was held in the Central Hall, Westminster, from Dec. 4th to 6th. In the course of the meeting the tenth Mackenzie Davidson Memorial Lecture was delivered by Prof. GOSTA FORSSELL, in charge of Radiumhemmet, Stockholm, on the Radiotherapy of Malignant Tumours in Sweden[1]; and the twelfth Silvanus Thompson Memorial Lecture by Prof. A. S. EDDINGTON, F.R.S., on X Rays in the Stars. A number of technical papers were read, among them one by Dr. FFRANGCON ROBERTS, which appears in full on another page, and several discussions took place on debatable questions of the moment.

Dr. L. A. ROWDEN being in the chair, Dr. G. B. BATTEN opened a discussion on the

Requirements of Clinicians from Radiologists and Vice Versa.

He said that "radiologist" had come to mean a doctor who used X rays for diagnosis or treatment, while "radiographer" meant an unqualified person who used X rays. The requirements of clinicians from radiologists should be exactly the same as their requirements from all other specialists: such aid as would help them to diagnose and treat their patients in the best possible way. In many cases a team was necessary. The clinician most of all required really good films with a careful, well-considered report. The radiologist required from the clinician everything that any other specialist would require to help him to elucidate the problem for correct diagnosis. The clinician must take the radiologist into his confidence and state in what directions help was needed. There were very rare cases where a patient should be sent without any information; but the number so sent in the patient's real interests was very small. The radiologist should treat the clinician in a truly professional and consultative way, and in difficult cases should try to arrange a personal discussion. He ought to have beds of his own. His relations with his patient should be strictly ethical and as wise and reticent as possible, and he should never give away the clinician. The unsatisfactory clinicians met in actual practice could be divided into (1) those who regarded radiology as a joke—these could be allowed to die out; (2) those who regarded it as unimportant and radiologists as opponents rather than helpers—these were diminishing; (3) those who belittled radiologists and withheld knowledge about the patient; (4) those who wanted to interpret the radiograms themselves; (5) those who expected a non-medical radiographer to interpret X rays; (6) those who wanted the films interpreted as pictures only, without any opinion about the condition of the patient; (7) those who left too much to the radiologist and ignored the clinical aspect of their cases. Radiologists were of two kinds—pure radiologists and practitioners taking radiology as their specialty. It took a population of 50,000 in a town to maintain a pure radiologist. The relation of the general practitioner radiologist with his clinical colleagues was less simple than that of the pure radiologist, and he must be particularly ethical in his conduct. The radiologist must use all the knowledge he had, apart from the

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[1] See THE LANCET, Dec. 7th, p. 1214.

X ray showings. The clinician could not properly dictate treatment to the specialist unless he was himself a skilled electrotherapist. The radiologist must be right, and to be right he needed experience, good films, careful technique, and good apparatus.

Dr. D. D. MALPAS said that he parried patients' questions by explaining that he had not got a finished story until he had seen the last film.

Dr. A. J. ILES said he told patients that only a bad judge would condemn the prisoner before he had all the evidence. Radiologists were entitled to loyalty which they did not always get from clinicians.

Dr. S. MELVILLE said he had suffered in the past from the difficulties Dr. Batten had described, but had noticed a great improvement of recent years in the attitude of clinicians. The fault lay nowadays, he felt, with the radiologist, who sometimes foolishly encroached on the province of the clinician and offered indifferent work. He must offer really good work and refrain from dogmatising unless certain.

Dr. GRACE BATTEN related some of the extraordinary requests and inadequate requisitions she had received from clinicians. All these people triumphed over or blamed the radiologist for not making a correct diagnosis.

Dr. JOHN MUIR said that the only way to get peace in this world was to suffer fools gladly, and urged a conciliatory attitude towards clinicians. If the practitioner with his living to make could save his face by blaming the radiologist it was but human to do so. The radiologist should never be afraid to say he did not know.

Dr. FFRANGCON ROBERTS agreed with Dr. Muir and had no complaint to make of his hospital colleagues. The panel practitioner must be credited with doing his best under difficult circumstances. What to tell the patient constituted a most difficult problem, which depended largely on the kind of patient and the kind of doctor. It was no use beating about the bush with intelligent patients. Sometimes a patient moved into a new district from which a new doctor would write or wire for the films of an earlier examination; this was quite wrong, and the new doctor had no right to anything but a copy of the report.

Dr. MALPAS agreed that radiologists often made trouble for themselves and that a more conciliatory manner would be better.

Dr. F. I. JUPE was pleased to think that the *mariage de convenance* between clinician and radiologist was being changed to a love match, and that both parties were coming to look on the patient as their common child.

Dr. ILES spoke of the difficulty of deciding to whom the film by right belonged.

Dr. MILES asked to what extent clinicians should be allowed to see the film. He thought the radiologist's report should be enough, except when a surgeon or dentist had to operate as a result of the report.

Dr. G. HARDMAN said the radiologist ought to give the report to the new doctor on request. He thought that in the main radiologists received great courtesy from their colleagues.

Dr. A. MACGREGOR thought the clinician often insisted on a definite statement when the radiologist was unprepared to make one.

The CHAIRMAN thought it was a question of give and take; when a radiologist disregarded the clinical aspect of his cases he was rapidly degenerating into a radiographer. He must go into the history and make an examination. He (Dr. Rowden) never let films go out of his possession; if he did they never came back. The film was the property of the person who took it, but the patient had a perfect right to hear the interpretation.

Dr. BATTEN, briefly replying, said that the films belonged to the radiologist who had ordered them to be taken or to the hospital, but the doctor had a right to see them and the patient had a right to know the report.

Aspects of Radiation Therapy.

Prof. S. RUSS spoke of intensity relations, pointing out that greater intensities produced more violent reactions. Radiation of any kind released electrons from the medium and might or might not produce clinical changes. The liberation of electrons was a disturbing factor, though a perfectly normal process in the human body, which spontaneously liberated about a million ions a minute. The rate of release need not be very great in order to produce appreciable effects—something of the order of one electron per cell per second.

Mr. GEOFFREY KEYNES spoke of the radiological treatment of carcinoma of the breast. Radiology in the past had been confined to four classes of patients—those who refused operation; those treated prophylactically after operation; those treated for recurrences after operation; and the hopelessly inoperable. Comparison between radiology and surgery could only be based on operable cases. Surgery at St. Bartholomew's had not been satisfactory, and the successful eradication of local recurrences by radium had led to the treatment of primary cases. Great success had followed in a series of 145 cases, all of which had been carefully documented. Good results had been obtained in 45 out of 67 patients up to the end of 1928 and half of them were free from demonstrable signs of disease. Of 26 inoperable cases a good result was recorded in 12, and six of them were apparently cured. It was unlikely, though possible, that X rays would have been equally successful with so little damage. In the early case it was possible to promise almost with certainty that in five months after a single radium treatment the breast would be apparently normal. X rays had a part to play in supplementing radium treatment in the few cases where it had proved inadequate.

The Relative Value of X Rays and Radium.

Dr. N. S. FINZI dealt with the relative value of radium and X ray therapy in malignant disease. Both were valuable, and it was curious how seldom patients took a radiological as well as a surgical opinion. During 20 years' of experience he had seen improvement follow each increase in voltage and filtration of X rays, and the limit of this improvement had by no means been reached. For some cases radium was more valuable, for some X rays, and for others both. Radiologists should be fully acquainted with both agents. The importance of radical X ray treatment was not adequately appreciated; the results fully justified the courage required on the part of radiologist and patient. Many surgeons were just learning to apply radium; it was to be expected that they would have many failures. The radium bomb had many of the advantages of X ray treatment, but the rays were more penetrating and probably more efficient physically and biologically. The greater homogeneity obtained with X rays must be balanced against the greater effectiveness of radium gamma rays. In very radio-sensitive growths X rays were the treatment of choice every time, even in the skull. For very small growths, tending to remain localised, radium was preferable. For very radio-resistive cases radium was to be selected if surgery or diathermy was inapplicable. By increasing the time factor and decreasing the intensity better results could be obtained in many cases. The position of the growth was important. In the mouth and upper air passages the best results had been obtained with X rays alone or a combination of X rays and radium. Seeds in the local growth and a radium needle barrage for the cervical glands had given good early results, but the cases would probably show recurrences. The radium bomb through six points of entry would probably prove eventually to be the ideal application. In growths of the cervix radium for the growth and X rays for the glands were best; after X rays alone there was a tendency to recurrence. In rectal carcinoma radium seemed definitely better than X rays. If the mediastinum were involved in breast cancer X rays might still give good results, and they might do wonders for early cases. With the use of radiations for operable growths a great change had come over the prospects of the patient. Skill varied, and counted for a great deal.

Dr. **Malcolm Donaldson** said that for cancer of the cervix at St. Bartholomew's about 5 mg. of radium element, split up into 20–25 needles, was inserted all round the growth and left for 144 hours. He showed figures from various centres; the survival rate for the needle technique was not quite so good as for other methods. Needles seemed to be unsatisfactory for deeper parts of the growth. He therefore proposed in future to supplement the Stockholm technique with, first, intra-abdominal radium and, secondly, X ray treatment. He reviewed the 34 cases he had treated with intra-abdominal radium, and declared that the method was worth continuing. He now treated carcinoma of the vulva with very small intensities for two or three weeks; the primary results had been astonishing. The time factor was also important in cancer of the body. In non-malignant conditions the only problem that arose was to decide which patients could justifiably have their ovaries destroyed. Larger doses might perhaps reduce the menopausal symptoms.

Dr. J. E. **Lynham** spoke of the association of radium and X rays in the treatment of malignant disease. Radium undoubtedly gave results rapidly in some cases, but the final results of X rays were quite as satisfactory; the two agents were supplementary. Permanent success after radium only followed when the disease was localised, and was comparable with surgical success except that the cases treated by radium were inoperable. When the disease had become generalised even local cure could not be obtained, and when recurrence developed in patients previously doing well it was usually a sign of general activation of disease all over the body. There was no means of telling whether or not the disease had become generalised in any particular case. Extension by the lymphatics could be prevented by prophylactic irradiation by radium barrage, radium pack, or systematic X ray applications. Surgically treated cases should be followed up by periodic X ray or radium treatment to the site of the original tumour and to the related glands. As a matter of physics as well as of clinical experience, X rays and radium tended to approach each other as time went on, and the best results would be attained by combining or alternating them.

Use and Abuse of Radium Needles.

Prof. F. L. **Hopwood** read a paper on behalf of Miss F. E. Smallman and himself, and dealt with the economic aspect of his subject. At St. Bartholomew's it had been found that half a gramme of radium, distributed in 222 needles and eight other containers, could be used for 800 patients in a year. Needles of 1 mg. and 2 mg. radium element content were best for a general hospital, and an average yearly efficiency of use of 50 per cent. or more should be considered satisfactory. Long needles were much more valuable than short ones; there was a marked gain in mechanical strength if 0·6 mm. of platinum were used for the walls instead of 0·5 mm.; and needles used for surface application were less liable to damage than those inserted into malignant growths. Every trivial injury should be taken seriously and the needle set aside for immediate repair. The weakest spot was the eyelet, and a new and stronger type of eyelet had recently been introduced. Leakage from damaged needles was rare if they had been gold-soldered, but was such a nuisance that needles should be periodically tested. If any loss was suspected a visual and electroscopic search should at once be carried out on all refuse and laundry, but containers which had passed through an incinerator might be negative to the electroscopic test owing to melting of the solder seal. During ten years St. Bartholomew's had lost track of three needles, containing 3 mg. of radium.

Dr. **Rowden** thought that the kind of ray which would alter cell activity was the kind of ray that would be absorbed by the cell; the short-wave ray in its passage through the cell generated secondary rays which were absorbed. Superficial growths would disappear very rapidly under soft ray treatment; which ray was to be chosen?

Prof. **Hopwood** replied that the question was not simple. Experimentally the type of damage produced by the two types of radiation were almost indistinguishable. The type of ray chosen must be the *one that got to the required spot, but time and intensity* reactions also came in. The rate of absorption depended on a number of factors.

THE ANNUAL DINNER.

The annual dinner of the Institute was held on Friday, Dec. 6th, at the Trocadero, London, the President of the Society, Mr. C. Thurstan Holland, taking the chair at a large assembly. After the loyal toasts Mr. Cuthbert Andrews proposed the Prosperity of the Institute, in the course of which he detailed regrets at the changes in the management of the Institute, which had occurred since his own retirement from many offices, feelings which, he said, were shared by other recently retired officers. He pointed out that since the affairs of the Institute were no longer under their direction, an unpicturesque sense of order had got into the place, in accordance with which letters were now answered and even filed, financial records were kept in account books, and dark rooms had become dark. He lamented the good old days and left the President to explain the situation. Mr. Thurstan Holland, in reply, said that this, he thought, would be positively his last appearance as a President. The situation in which he found himself had occurred thrice before, twice in connexion with one of the bodies composing the Institute, and once at an International gathering. Now, he said, there was nothing further left for him to do officially, *unless radiological activities should be opened to those* who were translated to the stars, a terrible prospect, which had been held out before them during their conferences by Prof. Eddington. In respect of the meeting just held he was justified, he said, in regarding it as a great success, as the high-class papers that had been read revealed the extending possibilities of radiology. But he pointed out that in regard to the therapeutic relation of radium to cancer, the belief that a cure for cancer had been found was unjustified, though radium was now of such immense assistance, a view that had been expressed by their distinguished guest, Prof. Gösta Forssell, in the Mackenzie Davidson Memorial Lecture.

The toast of the Guests was proposed by Major C. E. S. Phillips, who spoke of the progress of the Institute and of the early British work in radiology, in founding the first society, and issuing the first journal devoted to the subject. Prof. Eddington, in an amusing reply, described himself as a celestial astronomer, and while testifying to the value of X rays to the star doctor, said that the celestial astronomer could not get much further than the terrestrial physician—that is, he could diagnose but must leave the rest to Nature. In illustration of the part that radiological methods might play in astronomy, he said that certain dwarf stars, which formerly were ruddy had become pale, and through radiology it had been shown that this was due to an increase of internal density; and he imagined the case of a famous astronomer who announced to his wife that he had detected a star of unique density and that, to do her honour, had called it after her. Mr. Donald Armour, President of the Medical Society of London, and Dr. G. W. C. Kaye, a late President of the Institute, also replied.

The Health of the President was proposed by Prof. Gösta Forssell, and after a brief reply from Mr. Thurstan Holland, a dramatic skit, described on the programme as a "surprise item," was rendered by the author, whose name did not appear on the programme, and three colleagues.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of four counties :—

Name of county and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Somerset .. (405,250)	14·7	11·9*	0·75	1·66	1·3	2·2	45	18	4·4
Lancashire† .. (1,811,000)	14·6	11·9	0·75	1·36	2·0	1·9	69	29	6·1
Derbyshire‡ .. (624,100)	17·8	10·2	0·72	1·19	1·3	1·6	68	—	4·3
Essex .. .. (1,083,700)	16·2	10·0	0·75	1·39	1·2	1·8	51	23	4·0

* The standardised death-rate is 9·4.
† Population adjusted from 1,809,120 for changes of boundaries during the year.
‡ Population adjusted from 692,400 for changes of boundaries during the year.

Somerset.

Dr. W. G. Savage reports that the county was invaded by small-pox on four occasions and that in three instances there were single cases and in the other three persons in one family affected. The notifications of typhoid fever were higher than usual, 41 cases with 6 deaths. Twenty of them were associated with an outbreak at Weston-super-Mare, the cause of which was not elucidated. There was a welcome decline to 18 cases in the notifications of encephalitis lethargica, but the deaths ascribed to it numbered 9. Measles was more fatal than usual and caused 36 deaths, 29 being in children under 5 years of age. There are ten clinics for venereal diseases, and the figures show an increase, both in new cases and attendances. Seventy-nine per cent. of the new cases attended at county council clinics. Dr. Savage points out that the system of multiple clinics makes it possible for every case to obtain treatment at a reasonable distance from home and facilitates following up. As a result, patients attend until cure is effected much better than formerly. A table illustrates the considerable decline in the tuberculosis mortality during the last 20 years. Thus on the 1928 population 20 years ago there would be over 400 deaths annually, whereas in each of the last three years there have been under 300. The unused buildings at Quantock Sanatorium were again used as a holiday camp for 80 debilitated girls and boys with most satisfactory results. The tuberculosis officer, Dr. L. J. Short, states that the difficulties of exact diagnosis have been increased lately by the appearance of a form of influenzal broncho-pneumonia, which for a long time closely simulates tuberculosis and may go on to a fatal termination.

Infant mortality was lower than ever before, but Dr. Savage points out that 52 per cent. of the infant deaths took place during the first month, an illustration of the importance of prenatal work. The midwives attended 57 per cent. of the births and the medical practitioners 43 per cent., the exact converse of what took place 12 years ago. A table shows that although the maternal mortality-rate has shown considerable fluctuations since 1910, there has been no decided fall. There were two cases of impairment of vision among the 34 cases of ophthalmia neonatorum notified. In one case there was delay to notify; the onset was on Jan. 19th, and on Jan. 27th the case was sent to the Bristol Eye Infirmary. The other was a severe case admitted to Taunton Hospital five days after onset, but the mother refused to stay in hospital until treatment was completed. Antenatal cards are supplied to all the midwives and examinations of urine are made for them in the county laboratory. Leaflets are also supplied to expectant mothers. The scheme for searching out rickets, especially in the rural areas, continues satisfactorily. There were 241 cases brought under treatment and the figures show 14 per cent. cured, 24·6 per cent. practically cured, 42·1 per cent improved, and 19·3 per cent. with no visible improvement or needing transfer to the orthopædic clinic. The scheme has brought out the fact that other abnormalities, which may be confused with rickets, need special attention, and this extension of the scheme has been made possible by the appointment of Dr. Hilda Halliday as assistant medical officer in April, 1928. The orthopædic scheme dealt with 440 deformities, and Dr. Savage reports that a much larger percentage of the cases seek treatment in the early stages of crippling.

As regards pollution of rivers no trouble was experienced during the year from the effluents of milk depôts. There was a decline in house building, new houses numbering 1662, as compared with 2835 in the previous year. Dr. Savage points out, however, that only 750 houses are needed for increase of population and that the 1928 figure of 1662 does something to reduce house shortage and to enable unfit houses to be closed. Under the Rural Workers Act, £1987 was paid towards the renovation of 22 dwellings during 1928. In the matter of meat control the county council have had to draw the attention of the local authorities to the requirements of Section 8 of the regulations as much laxity has arisen with respect to the giving notice of times of slaughtering. In a number of the county areas no meat was condemned at all, and it is not difficult, says Dr. Savage, for diseased animals to be killed and unsound meat to be sold for human consumption. There is some improvement in the working of the Milk and Dairies Order, 1926, but in some districts this work receives very inadequate attention. During the year 40 clean milk demonstrations were given at various farms with an average attendance of 24. There were also four competitions for milkers and another clean milk competition. During the year 273 samples of mixed milk were examined biologically for tubercle, and six, or 2·2 per cent., gave a positive result. During 1926 and 1927 the percentages were 2·2 and 2·18, and Dr. Savage points out that the Somerset percentages compare very favourably with other parts of the country. In addition to the cases mentioned, two reports of tuberculous milk produced in Somerset were received, one from Bristol and the other from London. In the follow-up of these eight tuberculous milk samples—on five farms six cows with udder tuberculosis and one cow with considerable tuberculosis and yielding tuberculous milk were detected and destroyed, while on the other three farms no cow affecting the milk-supply could be traced.

Lancashire.

Dr. J. J. Butterworth's report contains much detailed information with respect to the sanitary needs, activities, and statistics of the 19 boroughs, 81 urban districts, and 19 rural districts which make up the administrative county. Water-supply is a difficult matter in some portions of the county and Dr. Butterworth hopes that the Local Government Act of 1929 may be helpful. A table of samples taken during the year shows that 2 out of 20 samples from public supplies were unsafe or doubtful, while of 34 supplies to single houses, 6 were definitely unfit and 12 of doubtful quality. A great part of the county comes under the jurisdiction of the Mersey and Irwell and Ribble joint committees as regards pollution, and Dr. Butterworth refers to the circular issued by the Ministry in March advising each county and county borough council to consider the advisability of becoming a constituent member of a joint authority for the prevention of river pollution. The new houses erected numbered 6646, to be compared with 10,170 in the previous year. The Rural Workers Act has not been much utilised as only £736 was granted in respect of eight dwellings. Thirteen joint planning committees now function in the Manchester district and five in the remainder of the county. Every urban district with a population exceeding 20,000 was required to prepare a scheme before Jan. 1st, 1929, but the date has now been extended to Jan. 1st, 1934. All the 17 boroughs, and eight of the nine urban districts in the class mentioned, have taken some action in the preparations of schemes.

The complaints of tuberculous milk produced in the county received from outside authorities numbered 329. The county veterinary surgeons in each case visited the farm and examined the cattle but it is not stated what success they had in detecting the offending cow. There are 7841 cow-keepers in the county but only 11 entered for the fifth Clean Milk Competition, and there are only five licensed to produce "Certified" milk. The county analyst, Mr. G. D. Elsdon, returned 95 out of 2771 milk samples, or 3·4 per cent., as adulterated. He further shows that the average composition of all the samples, including those adulterated and appeals to the cow, was 3·74 per cent. of fat and 8·90 per cent. of solids—not fat, and that the experience of the last nine years proves that it is rare for the milk of a herd to fall below the standard of 3·0 per cent. of fat and 8·5 per cent. of solids—not fat. Thus, out of 25,474 samples 4·4 per cent. fell below the fat standard, while 2·9 per cent. fell below the solids—not fat standard. These percentages at first sight appear to be high, but when they are checked by appeals to the cow it is fairly obvious that the majority are sophisticated. Thus, out of 461 appeals to the cow only 112 fell below the fat standard and 35 below the standard for non-fatty solids.

The notifications of encephalitis lethargica have declined steadily since the peak year of 1924, when there were 299 cases and 103 deaths. In 1928 there were 74 notifications and 76 deaths. The death-rate from pulmonary tuberculosis was the lowest ever recorded in the county. The new cases of venereal disease attending the clinics show a considerable increase on preceding years. The new cases of syphilis are about the same as in 1923 but the new cases of gonorrhœa are nearly double. More than half the confinements were attended by midwives and the percentage of stillbirths to live births reported by midwives was 2·76. The damage done by ophthalmia neonatorum was exceptionally high—viz., two cases of total blindness and five of impaired vision. The county council is the local supervising authority for the whole of the administrative county, but for child welfare its area comprises 77 districts in which 10,765 of the 26,390 births in the county were registered. Little has apparently been done in the matter of antenatal clinics. The county council has established two, at Irlam and Litherland, and has made arrangements for the use of the antenatal clinics at Widnes and Chorley, but no particulars are given as to the attendances at these clinics. In addition to this the school nurses, who also act as health visitors, paid visits to 2068 expectant mothers. The county orthopædic scheme has made progress, and provided treatment for 2308 children. Many more authorities have joined and there are now 22 out-centres in addition to the six hospitals included in the scheme.

Derbyshire.

Dr. W. M. Ash's report contains many interesting features. During the year the orthopædic scheme was further developed. Clinics were opened at Bakewell, Chinley, and Shirebrook, making nine in all. The sparsely populated western area is provided for by a motor service and occasional clinics at existing buildings or by visits of the orthopædic staff to the homes. There are 55 beds at Bretby hospital for surgical tuberculosis and eight for non-tuberculous cripples. The new 50-bed block at Bretby will be opened during the present year and the plan of an additional 32-bed block for adult surgical tuberculosis which is in the early stages of erection, is given. The crippled patients treated during the year at Bretby numbered 107; 25 cases of non-tuberculous crippling and the remainder with one or more tuberculous lesions. Of the 43 patients discharged during the year the average duration of stay was 419 days for the tuberculous and 125 for the non-tuberculous. Bretby has been approved by the Board of Education as a special school. Dr. Ash is very emphatic as to the crime of leaving young children at home with an open case of tuberculosis. The Grancher system has not found favour in this country and the alternative is the removal of the advanced case from the home. This is difficult in Derbyshire because accommodation is only provided for this type of case at Chesterfield, and it is essential that institutional accommodation for advanced cases should be so situated that friends and relatives can visit the patient with the minimum of trouble and expense. A beginning has, however, been made by the opening of a six-bedded block for advanced cases at Darley Dale.

A complete system of antenatal clinics has now been established throughout the county under the direction of an obstetrician, Dr. Edith E. Stephens. There are 12 clinics, mostly held twice a month. The inspection of the various sewage works has been made more effective by the appointment, in March, 1928, of an additional sanitary inspector. The effluent samples collected during the year were classified as follows: good 245, satisfactory 230, unsatisfactory 100, and bad 149. Two vendors were fined for the sale of sausages containing boric acid. The notifications of small-pox during the last eight years have numbered 21, 228, 476, 1123, 339, 224, 474, and 009 (with no deaths) in 1928. The County Clean Milk Competition attracted 49 entrants, 14 for the class of previous prize winners, 28 for competitors who have not won prizes, and 7 for retailers in the borough of Chesterfield. The animals slaughtered under the Tuberculosis Order numbered 517, 448 with advanced and 68 with not advanced tuberculosis, and 1 not tuberculous. Of 490 milk samples examined for tubercle 77, or 15·7 per cent., gave a positive result.

The school report shows that three new schools of the "justly famous" Derbyshire type have been completed. Most attractive illustrations are given and a descriptive note by the architect, Mr. G. H. Widdows. The schools are heated by treating the whole of the floors as radiators and they might perhaps be described as garden schools built on open-air lines. A noteworthy departure was the opening of the first of the new clinics at Alfreton, a plan of which is given. This building will be used for the combined purpose of a school clinic and an infant welfare centre, and has been erected in the grounds of the council school. The increased efficiency of the dental service is illustrated by a graph comparing conservative work with extractions. In 1925 extractions bulked much more largely than conservative work, but now the two are on a par. Mr. H. P. Sutcliffe, the senior dentist, makes an interesting communication on the treatment of irregularities of dentition under the conditions found at a school clinic, and illustrates his remarks by striking photographs of casts before and after treatment.

Essex.

Dr. W. A. Bullough says that steady progress has been made with the county tuberculosis scheme. The new sanatorium at Black Notley is nearing completion and improvements carried out at the Harold Court sanatorium have been a great asset. The increasing work of nine tuberculosis care associations has made heavy calls on their funds, which have been supplemented by the county council. Since 1921 the population has increased by about 170,000, largely owing to the rapid growth of Dagenham and other areas near the metropolis. During the last eight years 13,049 houses have been built at Dagenham and a further 1151 houses are contemplated. This rapid growth has created a need for the extension of sewerage, sewage disposal, and water-supply schemes. The advisability of concentrating sewage purification by means of valley sewers at one large efficient plant instead of having several smaller schemes has been brought forward in the case of the Roding and Ingrebourne valleys. The South Essex Waterworks Company, which had to supply a population of 244,850 in 1922, now has to supply a population of 350,000. They are obtaining additional water from the river Stour and providing a 37-mile aqueduct from Langham to Ilford. It is hoped that authorities in the "waterless" part of Essex will take advantage of the facilities provided by this aqueduct. Under the Housing (Rural Workers) Act, 1926, grants during the year amounting to £3015 have been made in respect of 35 cottages. Up to December, 1928, 60 Essex cottages had been reconditioned under this Act.

The county analyst, Dr. Bernard J. Dyer, reports that 103 out of 1604 milk samples were unsatisfactory; 44 showed evidence of added water varying from 4 per cent. to 34 per cent.; 58 were deficient in fat, varying in extent from 5 per cent. to 45 per cent., and five samples contained annatto. Instruction in the production of clean milk has been energetically prosecuted. Essex won the Stapleton Cup in the Inter-County Clean Milk Competition, held by the British Dairy Farmers Association. Routine inspection of cows by veterinary surgeons has made no progress. Of 84 samples of milk examined for tubercle 6, or 7 per cent., gave a positive result. In the follow-up of 11 "outside" complaints of tuberculous milk, four cows at four farms were dealt with under the Order; at five farms there was no evidence of disease, and at two farms the whole of the herds had been sold by public auction.

Much is hoped from the deliberations of the departmental committee which is considering the very strong report made by Mr. J. C. Dawes, Inspector of the Ministry, as to the nuisance caused by the dumping of London's refuse in Essex. Suspicion has been thrown on Brightlingsea oysters for causing typhoid fever in one case and dysentery in another. The Fishmongers Company have stopped the sale of Brightlingsea oysters in London. Mosquito control work goes on satisfactorily at Frinton-on-Sea and Walton-on-Naze. In September the medical officer of health of Chingford reported malaria in a boy of 8 years, who had stayed with his family at Walton. Investigation revealed seven cases of indigenous malaria (three of whom had suffered from malaria some years previously) in houses close to that in which the Chingford family stayed. At the back of the last-named house is an orchard and farm where *Anopheles maculipennis* has been found in both larval and adult stages. It is suggested that one or other of the patients who had formerly suffered had a relapse and infected the mosquitoes, which caused the indigenous cases.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 30TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 108 (last week 279); scarlet fever, 3311; diphtheria, 1807; enteric fever, 55; pneumonia, 1272; puerperal fever, 52; puerperal pyrexia, 100; cerebro-spinal fever, 8; acute poliomyelitis, 11; acute polio-encephalitis, 3; encephalitis lethargica, 14; continued fever, 1; dysentery, 8; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 3rd–4th was as follows: Small-pox, 308 under treatment, 10 under observation (last week 310 and 8 respectively); scarlet fever, 2813; diphtheria, 2725; enteric fever, 83; measles, 425; whooping-cough, 110; puerperal fever, 32 (plus 18 babies); encephalitis lethargica, 125; poliomyelitis, 7; "other diseases," 12. At St. Margaret's Hospital there were 7 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 8 (1) from enteric fever, 20 (7) from measles, 8 (2) from scarlet fever, 22 (3) from whooping-cough, 47 (10) from diphtheria, 81 (15) from diarrhœa and enteritis under two years, and 56 (11) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Poplar; it was, we understand, that of a premature baby. The deaths from enteric fever outside London were reported from Manchester and Gateshead. Diarrhœa accounted for 15 deaths at Liverpool, 8 at Salford, and 5 at Birmingham. Wigan reported 6 deaths from measles, Stoke-on-Trent and Manchester each 3. Bradford reported 4 deaths from whooping-cough, Liverpool 3. Liverpool also reported 6 deaths from diphtheria and Hull 4.

The number of stillbirths notified during the week was 253 (corresponding to a rate of 48 per 1000 births), including 30 in London.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Ideal Mental Hospital.

THE General Board of Control for Scotland claims to possess the ideal mental hospital at the Edinburgh District Asylum, Bangour Village. This institution lacks only one equipment, which is represented by the solarium in course of erection at Govan District Asylum. Scotland still retains the old word "asylum" which England has discarded on account of its unfortunate associations. In its original meaning of "refuge" or "a place where you cannot be robbed" no word could better denote the haven needed and often eagerly sought by those mentally disordered, but it has undoubtedly come to suggest to the uninstructed a dreary prison for maniacs where treatment is harsh and even fair play is rare. It is no doubt a matter for argument whether the best procedure is to change the name in order to disarm mistrust or so to insist on the true nature of the institutions thus called that the name loses its associations of horror. Whatever the name, there is no doubt that the modern mental home is approximating rapidly to the ordinary hospital. As the Scottish commissioners remark, "it is now more than twenty years since it was clearly demonstrated that only a negligible number of the mentally affected, whether on admission for the first time or as the result of an exacerbation of a former mental disorder, cannot be treated under the same conditions as obtain in general hospitals." Their idea of the ideal hospital includes every kind of equipment for diagnosis and treatment. If there are 500 beds or more there should, they say, be an X ray apparatus, and smaller hospitals should have access to the radiological installation of some neighbouring institution. To control the radiological department there must be a medical officer with special training and experience, and on this official will also depend the conduct of electrical therapy, hydrotherapy, and light therapy, as well as massage—therapeutic agents which are becoming general in all large mental institutions. The Edinburgh district asylum has, of course, an operating theatre, an occupational therapy department, an energetic laboratory, and an abundant supply of literature through its library. It has recently added to its visiting staff a chiropodist—a specialist who must be almost unique at present. A well-equipped dental room and a visiting dentist are, of course, essential in a good mental hospital, and consultants in each of the special branches should also be available. A constant source of anxiety to the medical superintendent is the insane carrier of dysentery and enteric Before they are detected these patients—usually women—spread the disease far and wide. Scotland has dealt with this problem by providing a special detached hospital large enough to accommodate carriers from the mental hospitals all over the country. This excellent provision is due to the wisdom of the Govan District Board of Control. The hospital has been planned on the most modern and generous lines and provides every comfort for the patients who are so unfortunate as to require segregation for this reason. Scotland was a pioneer in offering a solution of the problem of laboratory work in the smaller institutions. Nearly 20 years ago the Scottish Western Asylums joined together in the foundation of a research institute, with a central laboratory in Glasgow, to undertake the routine examinations and carry out research on behalf of a number of mental hospitals. The nineteenth annual report, just published,[1] shows that this excellent scheme is in financial difficulties but convinced of the importance of carrying on its work. The investigation of intestinal flora and the laboratory work connected with the malarial treatment of general paralysis would be almost impossible for the individual asylums, and the Institute hopes also to be able to initiate research into the problems of mental disease. An important feature of the Edinburgh institution, considered as the "ideal," is the high proportion of voluntary inmates. Nobody interested in the mental health of the nation can rest content until patients are admitted freely on a voluntary basis to every mental hospital in these islands.

A Hospital Waiting-list.

The size of the Edinburgh Royal Infirmary waiting-list has resulted in an agitation for more beds. At a meeting of the League of Subscribers, Sir David Wallace, representing the managers, made an analysis which showed that the waiting-list of 3009 (on Nov. 1st) was somewhat inflated, but with every correction the number of surgical cases requiring admission is still serious.

During the last year the infirmary dealt with 19,800 cases: 4000 medical and 14,200 surgical. The out-departments handled 67,623 cases, an increase of 6638 over the preceding year. The ordinary income was £114,896; the extra-ordinary income, £139,382; total, £254,278. This was far beyond any previous year, largely on account of legacies and donations. The ordinary expenditure was £143,684; the extra-ordinary, £18,612; total, £162,296, leaving a balance with the general fund of £91,982.

Ten years ago, said Sir David, in-patients numbered 4056 medical and 8443 surgical. The total of medical cases was still about the same, but the surgical ones had increased by 6000. The size of the waiting-list was partly due to increasing willingness to go to hospital for operation. Practically every patient now wished to go to hospital. Out of 1668 surgical cases waiting, 738 no longer required treatment, either because they could not be traced or because they had recovered. A considerable number were in special departments, thus in the present list 518 waited admission to the ear and throat department despite its enlargement three years ago. It could be stated, however, that no urgent cases, emergency or other, were refused admission. In the majority of the cases put on the waiting-list a little delay was not deleterious to the patient. But emergency cases were so numerous that waiting cases were often delayed for a "good long time."

The new Radium Institute—the first for Scotland—was to be an integral part of the infirmary; and if the contemplated plans were carried out it would mean an increase of 36 beds. The new Cripples' Hospital at Fairmilehead would also afford some relief, and pressure on voluntary hospital beds would be reduced by coöperation with the new health authorities. He was convinced that real injury, mental or physical, to the waiting patients was much less than might be supposed. The managers were doing everything they could to get patients in at an earlier period.

The meeting thanked Sir David for his address, but felt that something more practical was required from the managers, who should not underestimate the feelings that lay behind the motion. If nothing was done, the subscribers would lose confidence in an institution which they had so generously supported. It was intimated that £21,564 had been gathered from 1410 groups of League subscribers, an increase of £129 over last year. Of this sum, greater Edinburgh was responsible for £15,942; country districts for £5622.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Road Accidents and Hospital Finance.

THE hospitals of Dublin, like those of other cities, have suffered from the increasing burden of gratuitous attendance on the victims of road accidents. This is an aspect of the results of modern road traffic which should not be overlooked in the discussion of compulsory insurance against third-party risks. Mr. A. B. Clery, assistant surgeon to the House of Industry Hospitals, Dublin, discussed the subject in an interesting address delivered last week to the Dublin Rotary Club. He pointed out that the treatment given by the hospitals diminished the liability of those responsible for the accident, and it was unjust that the hospitals should be expected to do this work for nothing. The loss incurred in this way had to be made good from moneys intended for the relief of the sick poor. Even if the injured party were awarded damages to cover hospital expenses, the money did not always reach the hospital. Mr. Clery stated that in our hospitals in Dublin 42 interne cases of road accident had been treated since Jan. 1st, involving an expense of £465, while the receipts on account of these cases was only £82. He estimated that the Dublin hospitals lost annually between £3800 and £4000 by their care of cases of road accident treated in the hospitals, without taking account of the large number treated in the externe departments. As the number of road accidents was increasing enormously the problem of safeguarding funds intended for the relief of the sick poor was becoming more urgent. Speaking on a vote of thanks to Mr. Clery, Mr. Henry Stokes, surgeon to the Meath Hospital, said that the care of the victims of a single 'bus accident which occurred last summer had already cost his hospital £300, for which they would not receive a penny.

An Electrotherapeutic Clinic in Dublin.

The Joint Committee in Ireland of the British Red Cross and the Order of St. John of Jerusalem established in Dublin an electrotherapeutic clinic for ex-Service men. There is no longer a need for it for this class, and the committee has now decided to open it for the use of patients of small means. A circular letter has been issued to the medical profession of Dublin inviting them to make use of the clinic in suitable cases. No patient will be received unless recommended by his own medical attendant, and medical men are requested only to send patients who are unable to pay the usual private fees. The clinic is in charge of a certificated nurse, experienced in such work, and it is equipped to provide massage, remedial exercises, electric treatment, radiant heat, ultra-violet light, and diathermy. It has a useful function to perform.

Mass Effect of Goitre.

At a meeting of the Ulster Medical Society on Nov. 28th Mr. Howard Stevenson, the President, introduced Dr. A. Murray Drennan, the newly appointed professor of pathology in the Queen's University of Belfast, who read a paper on Some Aspects of Goitre: the Mass Effect. Prof. Drennan based his remarks on work done by himself and his former colleagues at the University of Otago, New

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[1] Nineteenth Annual Report of the Scottish Western Asylums' Research Institute. 1928. Coatbridge: Alex. Pettigrew, Ltd.

Zealand, in which observations of the histological appearances of the thyroid gland in health and disease were correlated with the clinical history, with the gross bulk of the gland, and with estimations of its iodine content. He demonstrated by diagrams and a large number of lantern slides of microscopical sections the various histological appearances of the gland, and observed that the changes considered to be characteristic of the different types of goitre could be found in the post-mortem room in glands of normal size, where there was no history of symptoms. He then proceeded to show the effect of diminished iodine intake, which led to increase in size, but to a lower pressure of iodine, succeeded, if iodine were administered, by a colloid toxic goitre, provided the mass of gland were sufficient. If the gland was in a diffuse secretory stage with increase of its smaller vesicles, the typical appearances of exophthalmic goitre might arise; in this case administration of iodine enabled the gland to revert to a storage state. He emphasised the complexities of the thyroid problem, amongst these being the extraordinary number of secondary changes, such as hæmorrhage, fibrosis, and atrophy which complicated the clinical findings.

In the discussion which followed, Dr. Olsen said that as a co-worker of Marine in America he had followed the work of the Otago school with interest. He expressed the view that the different forms of goitre were not so sharply separated as had been thought; he was of the opinion, however, that true exophthalmic goitre should not be treated surgically, while obvious adenomata should be operated on.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Vasoligature Deemed Assault.

A WEEK or two ago there was a very remarkable trial in Graz, the second university city of Austria. A surgeon of good reputation was accused of causing bodily harm to a large number of men by performing on them an operation which, as the court believed, had the effect of sterilising them permanently. It appeared that a prisoner, when examined before starting a term of hard labour, showed on his scrotum scars from an operation which he explained he had had done with the object of becoming sterile. In his native town, he said, a large number of men had applied to a surgeon named Schmerz for the same purpose, and had obtained the desired result. In the course of the proceedings it was stated that more than 700 men had been operated upon by Dr. Schmerz in the last two years. The court regarded this wholesale sterilisation as a danger to public welfare, and although the accused said that his operation was only a temporary sterilisation and could (so to speak) be undone at any time, and that he always took care to operate only in cases where definite social or medical indications were present, he was found guilty of gross offence. In vain the witnesses and medical experts whom he called gave their evidence for him. In vain it was asserted that the method was perfectly free from any danger in the hands of this excellent surgeon, and that in view of the frequency and danger of abortion vasoligature was desirable where prevention of issue was necessary. Despite these pleas the learned judge found the doctor guilty, and as he could not deal with the offence under any other heading, he turned to an old law of 1858 which applies to injuries inflicted by assault or attack, and sentenced the accused to a fine of 15,000 Austrian shillings (about £150) or two weeks' imprisonment. Naturally this sentence will not be left without appeal. Public opinion has been seriously disturbed, and comments, both professional and lay, are not very complimentary to this way of administering law. It must be added that a certain number of medical men disapprove of Dr. Schmerz's procedure, and hold that the judge's opinion was correct. At any rate, the case will be brought once more before a jury, for otherwise every surgical interference might be regarded in the same light, and every surgeon would run the risk of heavy fines for fulfilling his professional duties.

The Gerson Diet in Tuberculosis.

The treatment of tuberculosis by means of a diet free from common salt continues to be in the foreground of medical discussion. This new treatment, as applied first by Dr. Gerson and later by Prof. Sauerbruch on a large scale,[1] has given excellent results in their hands, but has also been attacked from several quarters. Accordingly a group of eminent Viennese professors was sent to Sauerbruch's clinic at Berlin to investigate the actual conditions of treatment. The commission consisted of Dr. Durig, a physiologist; Dr. Eiselsberg, a well-known surgeon; Dr. W. Neumann and Dr. Löwenstein, specialists in tuberculosis; Dr. Volk, well known for his researches on skin diseases; and Dr. Walzel, also a special surgeon. These men had every opportunity of studying the work in Berlin, and could compare the state of patients before and after treatment by the new diet. Clinical and photographic records were examined, and the commission got a distinct impression that at least in surgical and dermatological cases the diet led to marked improvement. A sine qua non is strict and conscientious adherence to the absolutely salt-free diet—a very trying task both for the patients and the medical and nursing staff. It is not unlikely that some of the bad results obtained at several other centres have been due to neglect of this point. The investigators on their return to Vienna strongly recommended that the method should be tried here, and on this recommendation the Red Cross of Austria has volunteered to place at the disposal of the University of Vienna its tuberculosis sanatorium at Grimmensteinn, 60 miles away, where there is every opportunity for enforcing the necessary diet. Furthermore, at another place much nearer Vienna the same experimental observations will be started. The chief drawback of this useful method is the craving for salt, which soon sets in and somewhat torments the patients. A suitable change in the otherwise fairly uniform diet is therefore of the utmost importance. It may be added here that since Dr. Gerson's first publication of his diet, Dr. Max Jerusalem, a surgeon of the workmen's sickness insurance club, has treated quite a number of patients on these lines, and is satisfied that they represent a real advance in the therapy of tuberculosis of the bones and the joints.

Cutaneous Immunisation.

In view of the difficulty of getting parents to consent to injection of toxin-antitoxin for prevention of diphtheria, Prof. Löwenstein has tried combining the two substances in an ointment which is rubbed into the skin. After prolonged trials by Dr. Poindecker in a children's hospital, the ointment was found to give excellent results in 68 to 70 per cent. of cases, and accordingly it will now be used in all the municipal kindergartens. The parents will be handed a pamphlet with complete explanations, and it is expected that no difficulty will be experienced. The health authorities hope soon to eradicate by these means this dangerous disease at least amongst the youngest children. The ointment is rubbed in over the sternum in intervals of 8 to 14 days.

During the summer term of 1929 the number of medical students who proceeded to the M.D. degree was 126. Of these 63, or exactly half, were of foreign nationality, and it is clear that this high percentage of foreign students is of utmost importance to our University.

Dr. J. Rosmanit, who died recently, was a surgeon and physician of the old type, and though his work was never in the limelight it was none the less important. He was the inventor of the widely used railway first-aid apparatus, and served as the chief staff doctor of the Austrian State railways. During the war he contributed many useful suggestions concerning the methods of transport of the wounded and sick.

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[1] See THE LANCET, August 24th, p. 464, and Sept. 21st, p. 617.

Correspondence.

"Audi alteram partem."

THE MEDICAL AND DENTAL REGISTERS.

To the Editor of THE LANCET.

SIR,—In order to facilitate the work of those who find it essential to know whether a practitioner is legally qualified or not—such, for instance, as officials of insurance committees, chemists and druggists—the Council are continuing to publish an office edition of the Medical Register. This edition is bound in paper boards and contains all names and addresses as they appear in the official edition but is printed on cheaper paper and without the preliminary matter. The office edition is published at the special rate of 7*s.* 6*d.* post free, but no copies can be issued at this price unless they are ordered and paid for prior to Dec. 31st of the year preceding that of publication. Order forms will be sent on request. The Council also issue each month lists of new registrations and names deleted from the Register. These are issued on a written understanding that the lists are for the personal use of the firm to which they are supplied, that they are not communicated to any other person, and that they are not sent out from the office in order to have stencils made. Every possible care is taken to protect subscribers from the lists being made use of by others. I might add that these lists are for obvious reasons not supplied to any addressing agency; the Council has no business arrangement or agreement of any kind with any addressing agency for supplying to them any official information and it certainly has no exclusive arrangement of this kind.

Similarly the Dental Board of the United Kingdom issue an office edition of the Dentists Register which includes the names of all registered dentists together with a local list. The price of this is 4*s.* post free, provided copies are ordered and paid for prior to Dec. 31st of the year preceding that of publication. Monthly lists of new registrations and deletions are also issued by the Board. I might add that the General Medical Council and the Dental Board are always glad to answer inquiries as to whether practitioners are registered or not. Preferably these should be in writing to prevent misunderstanding but inquiries by telephone are replied to at once.

I am, Sir, yours faithfully,
NORMAN C. KING,
Registrar.

General Council of Medical Education and Registration
of the United Kingdom, 44, Hallam-street,
London, W. 1, Dec. 4th, 1929.

THE CRAFT OF SURGERY.

To the Editor of THE LANCET.

SIR,—Prof. Tonks touches upon a subject which I have repeatedly emphasised in discussions on hospital training. He very rightly points out that the dental branch of surgery is the only one in which any attempt is made to instil craftsmanship in the student, and that this teaching is of great value is well demonstrated in those hospitals where there are combined medical and dental schools. It is common knowledge in such hospitals that when dental surgeons pass into the wards to complete their medical training they usually make good dressers, and not infrequently upon completion of their training secure surgical appointments. That the value of craftsmanship is not sufficiently appreciated by the examining bodies is shown by the recent dental curriculum of the London University degree in dental surgery, where the standard of prosthetic dentistry is lower than that of the L.D.S., whereas the standard of the more academic subjects is considerably higher.

This gradual tendency to exclude the teaching of craft in favour of more theoretical subjects is certainly distressing, and in my opinion a course of craftsmanship should be made compulsory with students intending to take a higher course in surgery. As Prof. Tonks emphasises, the capable surgeon is usually made, not born, and unless an apprenticeship is served in the use of the hands and tools one cannot expect students to attain that dexterity and skill in operating which is so necessary and vital to their success. It is sometimes almost a painful sight to watch a young surgeon using a saw or chisel, being obviously unfamiliar with the tool, and there is no doubt that a little more teaching of the fundamental use of instruments would increase his confidence and skill, to the great help of both himself and his patient.

I am, Sir, yours faithfully,
W. KELSEY FRY, M.R.C.S., L.D.S.

St. Thomas's-street, S.E., Dec. 4th, 1929.

THE POSITION OF PUBLIC VACCINATORS.

To the Editor of THE LANCET.

SIR,—On behalf of the Councils of the Poor-law Medical Officers' Association, and the Public Vaccinators' Association, I am desired to appeal, through your columns, to all public vaccinators and Poor-law medical officers, who are also members of the local authority to which they will be transferred on April 1st next, to communicate with me at once, if they have not already done so, giving such particulars as may be useful in framing representations to the central authority on their behalf.

I am, Sir, yours faithfully,
ALBERT ERNEST COPE, M.D.,
President of the Public Vaccinators' Association;
Secretary of the Poor-law Medical Officers' Association.

Belgrave-road, Westminster, S.W., Dec. 7th, 1929.

CLINICS FOR RHEUMATIC CHILDREN.

To the Editor of THE LANCET.

SIR,—Dr. Burnet's plea for the establishment of special clinics for the supervision of rheumatic children needs no endorsement from me, but I may perhaps be allowed to say that his ideals are by no means as "premature" as he seems to think. There are already about a dozen such clinics at work in the London area, and many more scattered in the big cities of England and Scotland, and at least one in Ireland. I do not attempt to enumerate them lest I should leave out some unknown to me. Only last month did I hear of a new one to be opened shortly at Hull; and so the good work spreads. In many instances these clinics have adopted the plan which I think is best—namely, they are attached to a children's hospital, using its personnel and premises, and having ready access to every in- and out-patient department.

I concur with Dr. Burnet that these clinics should incorporate the word "rheumatism" in their title, and regard this as of great importance to the preventive aspect of the work. In London many of the clinics are called "rheumatism supervisory centres."

I have sometimes been betrayed into passing criticisms on the school medical service, but this rôle I see I can advantageously leave to Dr. Burnet. Perhaps, were its work boomed a little less vigorously, he would see that it does not cover the ground he expects of it. Official inspections at very long intervals are not going to do the work of careful and frequent examinations, and they are quite insufficient to pick out all early cases of rheumatism. There is, I am told, a schedule of disorders on which the school medical officer works, to the detriment of the child who has not the civic sense to ail *à la carte*, and I doubt if we are right in expecting him to come to real grips with the intricacies of clinical medicine. But I cannot in fairness close without testifying to the great value of the special schools for physically defective children, where many heart cases do phenomenally well. For myself I would say that the best régime in the long run for rheumatic children with heart disease is to live at home, attend a school for physical defectives, and be periodically examined at a centre at a children's hospital.

I am, Sir, yours faithfully,
REGINALD MILLER, M.D., F.R.C.P.
Harley-street, W., Dec. 7th, 1929.

To the Editor of THE LANCET.

SIR,—As a comment on Dr. Burnet's letter, I may perhaps be allowed to furnish a short account of our experience in Bristol. It is about six years since our colleagues in the school medical service began to refer to Dr. C. E. K. Herapath and myself selected cases of doubtful or early cardiac disease discovered in the course of their routine medical inspections. These children we saw in our out-patient rooms and then reported as to their fitness to attend school, need for treatment, and so on. Between two and three years ago this plan was stabilised and extended by agreement between the various local authorities concerned on the one hand and certain hospital physicians on the other—a step which was promoted by the Cardiac Subcommittee of the Science Committee of the British Medical Association and assisted by the Medical Research Council—and since that time it has operated smoothly over an area of three counties.

We trust that this work will afford a basis of data broad enough for conclusions as to means of prevention of rheumatic carditis, while at the same time we are convinced that good is already being done in bringing these children under medical care earlier, and over longer periods, than formerly. We think, moreover, that we have gained valuable experience in harmonious coöperation with our colleagues—those of the whole-time services on the one hand, and the family practitioners on the other. It would be foolish to pretend that no difficulties have arisen, but so far it has proved possible, by relying on the goodwill of everyone concerned, to overcome all these.

Valuable work of the same kind is also being done in London, Birmingham, Glasgow, and elsewhere. Those who are interested in tracing the progress of the whole movement will find some account of it in recent annual reports by the chief medical officer to the Board of Education.

I am, Sir, yours faithfully,
CAREY F. COOMBS.
University Centre of Cardiac Research, General Hospital,
Bristol, Dec. 9th, 1929.

THE ACUTE VULVITIS OF LITTLE GIRLS.

IS IT GONORRHŒAL?

To the Editor of THE LANCET.

SIR,—In the contribution by Dr. H. C. Cameron in your issue of Nov. 23rd (p. 1115) several questions are raised which I feel require an answer. Dr. Cameron suggests that acute vulvitis in children may not be caused by the diplococcus found in adult infections. The following analysis, in my view, strongly supports the general belief that the organism in the two conditions is identical.

Among 47 consecutive cases of gonococcal vulvo-vaginitis in children (bacteriologically confirmed) treated at the V.D. clinic of Guy's Hospital, the infection in 20 cases (42·5 per cent.) was found to be present in one or other parent, although in some of the cases the parents denied symptoms. In one case, transferred from a ward where there was an epidemic of vulvo-vaginitis, no evidence of infection could be found in the parents. In 26 cases (54·5 per cent.) the examination of parents was either impossible or bacteriological reports were inconclusive, although clinical examination revealed extremely suspicious evidence. Among these 26 cases four were associated with the epidemic already mentioned.

Whilst presenting these figures I do not for a moment deny the well-known fact that organisms other than the gonococcus—for example, *B. coli*, the streptococcus, *Micrococcus catarrhalis*, &c.—are frequently the cause of vaginal discharge in children and adults. Such cases after thorough investigation are discharged from the V.D. clinic as not venereal.

Dr. Cameron suggests that the epidemic is kept up by the anxiety of those concerned in combating it and dies down only when their activities cease from exhaustion. I maintain that it is arrested by the isolation and treatment of affected cases and the strict enforcement of rules. Since improved preventive regulations have been carried out there has been no spread of gonococcal vulvo-vaginitis in the wards of Guy's Hospital.

The assumption that only local treatment is given by medical officers in charge of V.D. clinics is not justified. The general condition of children suffering from gonococcal vulvo-vaginitis is not ignored in these clinics and measures designed to promote the general health are taken. In these cases the children generally show marked improvement in general condition and when judiciously handled do not show signs of nervous upset.

At the Children's Home, Waddon, where there are 37 beds for venereal disease, marked improvement in general health and gain in weight is the general rule, although local treatment is carried out daily in almost every case. Many cases of apparent recovery, under general and local treatment, are still found to be positive to bacteriological tests, sometimes months after all symptoms have disappeared. Also contacts with no symptoms are frequently found to be infected. These cases I consider to be carriers, comparable to those apparently well after general treatment only. It would be important to know the incidence of untraced infections due to this type of case. As to the question of ophthalmia, does Dr. Cameron consider it a common occurrence in adults? I confess to have seen a case in adult or child only very rarely, excluding, of course, ophthalmia neonatorum.

I consider that gonococcal infection in children is not the trivial condition which Dr. Cameron appears to imply, and that general treatment only is insufficient to effect a cure.

I am, Sir, yours faithfully,
MORNA RAWLINS.
Devonshire-place, W., Dec. 5th, 1929.

SUGAR IN ASTHMA.

To the Editor of THE LANCET.

SIR,—In his interesting article last week (p. 1187) on Asthma in Children Dr. A. A. Osman says that as far as his experience goes "sugar is without value in the treatment of asthma in adults." May I say that only last summer a gentleman, aged 70, whom I have known many years told me that he was recently cured of asthma by eating honey for a short time, especially from the lime tree.

I am, Sir, yours faithfully,
R. HENSLOWE WELLINGTON.
London, Dec. 9th, 1929.

SHEFFIELD HOSPITALS.—According to the 131st annual report of Sheffield Royal Infirmary 6810 in-patients were treated to a conclusion, an increase of 678; they cost £3 4*s*. 1*d*. per week. The pressure upon the out-patient department may be gauged by the fact that 27,856 persons were treated in the casualty department section. A new block is being provided which will contain casualty, massage, dermatological, and dental departments, an accident theatre, pathological, physiological, and biochemical laboratories. Last year marked the completion of 60 years' work of the Jessop Hospital for Women. The average stay of maternity patients was a small fraction in excess of 12 days; the puerperal sepsis patients, on the other hand, remained for an average of 23 days. In the absence of the money needed to provide research laboratories, especially for puerperal sepsis, it was hoped to convert some existing rooms for this purpose.

Obituary.

PHILIP HEDGELAND ROSS.

THE many friends of the late Dr. P. H. Ross who have heard with regret of his passing, will agree with the writer, who knew him nigh on 30 years, that the brief notices of his death announced in the newspapers in England, East Africa, and possibly in New Zealand cannot be deemed sufficient. The good work done by Ross, notably during the years he was in East Africa, whence the writer has but recently returned, deserves to be chronicled.

Ross was born in Christchurch, New Zealand, on July 4th, 1876. He was educated at Christchurch, Otago University, and at St. Bartholomew's Hospital, London. He became qualified in England M.R.C.S. Eng. and L.R.C.P. Lond., 1900; D.P.H. Cambridge, 1902. He held the Certificate of the London School of Tropical Medicine and won the Cragg's Research Prize, 1905. He gained the distinction of being elected Foreign Corresponding Member of the Société de Pathologie Exotique, Paris.

His research work dealt with the transmission of trypanosomiasis by various species of *Glossina* and of African relapsing fever by *Ornithodorus moubata*. Ross and Milne were the first to record human spirochætosis in Uganda. Ross was the first to discover the occurrence of piroplasmosis in monkeys (*Cercopithecus*), he described the parasites accurately, but did not figure them, he gave temperature charts, &c., of the infected monkeys which came from the Kikuyu District, Kenya. [Nuttall (Parasitology, 1908, i., 130), who studied Ross's preparations, gives the name of the species as *Piroplasma pitheci*, P. H. Ross, 1905, finding that its development in the peripheral blood (illustrated) is similar to that of *P. canis*, *P. bovis*, &c.]

His official work related less to research than to practical issues. In 1903 he was appointed to the East African Medical Service, and soon after became Government Bacteriologist to the East Africa and Uganda Protectorates, doing highly efficient work at Nairobi which led to his being made the first Director of Laboratories in East Africa. During the outbreak of plague in Nairobi in 1905 his services were so highly appreciated that he received the personal thanks of the Secretary of State. In March, 1916, he became Honorary Adviser to the Director of Medical Services in East Africa and undertook all the laboratory work for the Military Hospitals in Nairobi. Here he did great service in combating bacterial dysentery, being assisted by Dr. Kauntze; the death-rate due to this disease had been 40 per cent. After much work he prepared a carbolised polyvalent vaccine (from untreated cultures) which caused the death-rate to fall quickly to less than 5 per cent.

He wrote on June 25th, 1917, to his late mother: "We started trying it on Sept. 1st, and the first three months' results were so good that Kauntze suggested trying to inoculate the healthy carriers (of Carrier Corps) to stop them getting dysentery. It meant a fearsome amount of work, as Pillay [his Indian assistant] and I were then alone, and had seven hospitals to work (about a thousand examinations a month) and vaccine lymph to prepare and issue at the rate of 1,800,000 doses per year. But I just managed to keep the carriers supplied, though it was a very close thing. I had cabled the Crown Agents for material essential for making of culture broths, and there was delay in getting it. I borrowed from the vets., got the D.M.G. to send me material from German East Africa, and the Governor to borrow all that the Uganda Government possessed, and was down to the last bottle when a parcel-post arrived with 20 pounds worth. So now I am turning the stuff out by the bucketful and have at last persuaded the medical authorities at Dar-es-Salaam to give it a trial in their hospitals. . . . It [the vaccine] is certainly a good thing for treatment, and I hope will prove equally effective as a prophylactic. When I can get figures from the military they will prove or disprove its utility. I got the doctor of the King's African Rifles to do 7000 inoculations in a camp where they were badly troubled with dysentery, and he had only three cases afterwards, of whom one was found to have escaped inoculation."

Owing to failing health he was invalided out of the East African Service, and in April, 1919, with his wife and son returned to Christchurch, N.Z. He came again to England in June, 1926. He died unexpectedly of pancreatitis on August 6th, 1929, at Sherborne, after but a day's illness. He left a widow and one son, now a student at Corpus Christi College, Cambridge.

The following is a list of Ross's published papers:—

Ross, P. H., and Milne, A. D.: Tick Fever, Brit. Med. Jour., 1904, ii., 1453. Ross: A Note on the Natural Occurrence of Piroplasmosis in the Monkey, Jour. Hygiene, 1905, v., 18–23. Ross and Hodges, A. D. P.: Notes on a Case of Spirillum Fever in Uganda, Brit Med. Jour., 1905, i., 713–15. Ross: Tick Fever, Jour. Trop. Med., 1906, i., 65–69. Report on Experiments to Ascertain the Ability of Tsetse-flies to Convey *Trypanosoma gambiense*, &c., Roy. Soc. Rep. Sleeping Sickness Commission, 1907, viii., 80–85. Article Tick Fever in Allbutt's System of Medicine, 1907, ii., pt. 2., pp. 301–306. Some Experiments with Vaccine prepared according to the Method of Achalme and Marie Phisalix, Bull. Soc. Pathol. Exot., 1911, iv., 283–86. Spirillosis, Nairobi Laboratory Reports, 1911, pp. 6–12. Human Spirochætosis; syn. African Relapsing Fever, Human Tick Fever, Transvaal Med. Jour., 1911–12, vii., 125–29. Poisonous Insects of South Africa, New Zealand Med. Jour., 1912–13, xi., 176–91. A Further Experiment with Vaccine, prepared according to the Method of Achalme-Phisalix, Bull. Soc. Path. Exot., 1913, vi., 144. Ross and Shircore, J. O., Epidemic Cerebro-spinal Meningitis in Nairobi, British East Africa, Trans. Soc. Trop. Med. and Hyg., 1913–14, vii., 83–95. Ross, Gózony, L., and Hindle, E.: Serological Tests. I. On the Persistence of Precipitins in Sera Stored in Vitro. II. On the Reaction obtained with (*a*) Complement-fixation Tests, and (*b*) Precipitin Tests, with the Gut Contents of Blood-sucking Arthropods, Jour. Hygiene, 1914, xiv., 354–59. Ross: Dermatitis due to the Secretion of a Beetle in British East Africa, Jour. Trop. Med. and Hyg., 1916, xix., 202. Ross and Kauntze, W. H.: The Use of Polyvalent Vaccine in Dysentery, THE LANCET, 1917, i., 905. Ross: Some Observations on Malaria and Helminthiasis in Central Kavirondo Reserve adjoining Kisumu, Kenya and East Africa Med. Jour., 1929, v. 367–74.

The published work affords but slight evidence of Ross's industry and efficiency, since most of his time in Africa was occupied in the routine work of preparing vaccines for plague and dysentery on an extensive scale in connexion with epidemics and in dealing with numerous practical problems.

All who knew Philip Ross will recall his genial personality, his never-failing interest in helping others over difficulties, and the devotion he showed to the work in his domain. In East Africa he gave devoted service to mankind.

G. H. F. N.

JOHN SCOTT RIDDELL, M.V.O., O.B.E., M.B., LL.D. ABERD.

MR. Scott Riddell, who died on Dec. 5th at the age of 65, was one of the best-known surgeons of his generation in the north of Scotland. Some years ago he retired from active practice, but his time was very much occupied by public duties. He was General Council Assessor on the Aberdeen University Court, University representative on the City of Aberdeen Territorial Association, and chairman of the Joint (Disablement) Committee of the North of Scotland under the Ministry of Pensions. He also served for some years as chairman of the Managers of the Royal Infirmary. He had the temperament that made these duties a pleasure and, when a man was needed for such a position, his name always sprang to the lips. In his latter years he had to fight against a chronic disablement, but this never affected the liveliness of his interest, the readiness of his activity in public causes, or the quality of his advice in council.

In the real sense a man of action, Riddell's capacity for action was broadly based in sound scholarship both general and professional. After a long apprenticeship in classics he graduated in medicine in 1888, and soon showed a strong disposition to surgery. For seven years he acted as assistant professor of surgery when Sir Alexander Ogston was the professor. To those that began their surgery under Ogston the thoroughness of the discipline implied by those seven years needs no comment, and Riddell profited to the full by the association. He became not merely a good teacher but a skilled diagnostician and operator. He passed on to the staff of the Royal Infirmary and, in due course, became one of the consultant surgeons. His enthusiasm and lucidity in exposition made him a first-class clinical teacher and he developed a very large operative practice. He was a breezy, active, eloquent man and whatever he took up was sure to succeed. He was ready to argue and discuss with forcefulness, but always in good temper. In a word, he was a general favourite wherever he went and the professional men knew that his work was reliable. In his early days, and for many years, he conducted classes in ambulance work. His Manual of Ambulance ran into many editions and became a standard text-book in the North-East. He had the qualities of a leader and took his full share in work outside the profession. He was a member of the Council of the British Red Cross Society (Scottish Branch). He was Red Cross Commissioner for the North-Eastern District of Scotland. He became Major and Commanding Officer of the R.A.M.C. (Volunteers) and later Lieutenant-Colonel. He was Colonel and administrative medical officer of the Highland Division, Territorial Force, from 1908 to 1912. In these posts he was full of energy and stimulus and knew no fatigue. He took a full part in the appropriate surgical work incidental to the war and was made O.B.E.

A colleague writes: "Riddell was a fighter and could take a very strong stand on matters of professional administration. When the movement for the coördination of hospitals began in Aberdeen he nailed his colours to the 'voluntary' mast and showed all the good qualities of a 'die-hard.' In the end he changed his point of view and fell in cordially with the new developments. It was always a pleasure to discuss affairs with him even when he was on the opposite side. There was no sullenness of antagonism and no unreadiness to admit the justice of another standpoint. It was a pleasure to walk and talk with him and to hear his full-blooded and rapid opinions de omnibus rebus; but not least on surgery, which began with him as a passion and so remained. Like his great master, Ogston, he filled his students with enthusiasm, and each of them will with a full heart place a stone on his cairn. He was a native of Aberdeen and an out-and-out Aberdonian, but he had a bright way with him and the absolute self-confidence that marks the good surgeon and the military leader."

Mr. Riddell did a great deal to maintain the high standard of teaching both in the University and in the Royal Infirmary. His long and varied experience gave great weight to his opinions and his eloquent way both in speech and in writing secured a ready audience all over the North-East. The new Medical School and the new Royal Infirmary of Aberdeen owe, indirectly, not a little to Riddell's forceful personality.

THOMAS FINLAYSON DEWAR, C.B., M.D. ABERD., D.Sc. EDIN.

Dr. T. F. Dewar's death on Nov. 27th removes a man of exceptional attainments. A native of Arbroath, in Angus, he graduated before he was old enough to register, and then joined in his father's practice for some 12 years. The Dewar family of practitioners—father and two sons—was very well known in the East of Scotland. To his medical degrees he added the D.Sc. in public health, and when the medical officership of Angus fell vacant he was appointed to fill it. A little later he succeeded Dr. Nasmyth as county medical officer of Fife and Kinross, and it was his work in Fife that first attracted attention to his high quality. He had an instinctive capacity for organisation and administrative work. He kept the public health and the school medical service at a high level and, when in 1910 a second medical inspector was wanted for the Local Government Board of Scotland, Dewar was offered the appointment and accepted it. From that time till his death he was a member of the Civil Service. In this post as an officer of the medical staff he showed the same eager exactness in his work and the same unsleeping devotion to duty. He soon came to know the whole staff personally, and he became their natural consultant in medicine and other affairs.

From early manhood he was an active member of the Fifeshire Yeomanry, and in the South African War he became Surgeon-Captain in the Imperial Yeomanry, receiving the Queen's medal with four clasps. He published a volume "With the Scottish Yeomanry, 1901," and as a result of his South African experience he also produced a volume on "Sanitation of Armies in the Field." When the late war broke out he became an officer in the Territorials and was called up with the First Army. In 1915, he was D.A.D.M.S. of the 51st Division, and from April, 1916, to January, 1917, he was A.D.M.S. of the Northern Army, being mentioned in dispatches four times. He received the C.B. (Military Division) in 1918. For a period he had charge of the troops at Bedford, and his report on the outbreak of measles among the Highland regiments was an excellent piece of work.

When Dewar in 1918 returned to his civil work at the Local Government Board he was placed in charge of the venereal diseases section and the medical work of the poor-law; but his all-round ability led to his being entrusted with many difficult special inquiries. When the Board was superseded by the Scottish Board of Health, Dewar continued on the same general lines of work, but his time was devoted largely to nursing and developing the venereal disease clinics. A member of Lord Salvesen's Committee on maternal mortality, he made this subject also very intimately his own, but for the last few years he had specialised in venereal diseases and the medical service under the poor-law. His special chapter on venereal diseases in one of the annual reports of the Scottish Board of Health was afterwards published as a separate pamphlet and was an exceptionally useful piece of work.

A colleague writes thus of Dr. Dewar's methods: "Whenever he took up a new subject he went straight to the best authorities; he spent time in the laboratories mastering the technique involved and, when consulted, he could be relied upon to give with precision the essence of the latest work. Many years ago he deliberately elaborated a method of recording and filing both information and reports, and unlike most people he not only created the system but kept rigidly to it even at the expense of his health and strength. His system became an objective code of duty, and it is hardly too much to say that every half hour of his day was noted in his diary for three months in advance and the programme was rigidly adhered to. . . . A man of chivalrous nature, he was highly strung, keenly sensitive to every social influence, alert and full of a witty humour, and his graciousness was a proverb with those that knew him intimately. One of his juniors rightly called him 'one of the aristocrats of the profession,' and while he was conscious of his value and his power, he was the most modest of men."

Dr. Dewar was 63 years of age. He was an accomplished writer, and his long series of Medical Vignettes to the *Caledonian Medical Journal* contain some admirable descriptions of war in the field.

JAMES GILLON ROSS, M.B. EDIN.

Dr. J. G. Ross, who died at Whitby on Nov. 20th, was the son of the late Mr. Gilbert Grange Ross of Thurso and was born in Calcutta 50 years ago. He received his early education in Switzerland and Germany, and later at University College School, London, where he distinguished himself as a cricketer. At Edinburgh University he became secretary of the Athletic Club and was notably successful in various forms of sport, especially running and swimming. The Queen's Edinburgh Rifles found in him a keen member, and after graduating as M.B. in 1897 he joined the Volunteer Medical Staff Corps. On leaving Edinburgh he became house surgeon at the Nottingham General Dispensary, and served for two years in Northern Nigeria in the West African Frontier Force. In 1902 he went to Whitby as assistant to the late Dr. John Wilson, and shortly afterwards entered into partnership, which he subsequently shared with the late Dr. W. H. Wilson, Dr. John Wilson's son. When the partnership was dissolved he remained in Whitby, and carried on the practice on his own account for about twenty-three years. At the time of his death he was medical officer of health for the Whitby urban district council, and had the child welfare centre under his care. A man of wide interests, he was always eager to learn of the latest methods for combating disease, and he did excellent work as instructor in ambulance work and first aid. A prominent Freemason and this year's president of the Whitby Rotary Club he was held in high esteem by his fellow townsmen. Dr. Ross saw service in the late war first with a Yorkshire Battalion and later on the staff of the Tigue Hospital at Malta. He married in 1902 Elizabeth, daughter of the Rev. George Dodds, and she survives him with a daughter and two sons, one of whom is a medical student at Leeds. His brother is Dr. Donald Ross of Lochgilphead.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.

THE FIRST GENERAL MEETING.

THE first general meeting of the Fellows and Members of the British College of Obstetricians and Gynæcologists was held in London on Dec. 3rd and was largely attended. The President, Prof. W. Blair Bell, was in the chair, and in proposing the adoption of the report of council and the balance sheet, pointed out that the College was only incorporated as lately as Sept. 13th last. Consequently the report was brief, and the balance sheet represented for the most part the financial arrangements prior to incorporation. While registration receipts for fellowship and membership and the annual subscriptions might be sufficient to keep the College going as at present conducted, they would be quite inadequate to liquidate the expenses of a College building, or to provide the funds from which a suitable home could be purchased and furnished. The treasurer hoped, therefore, to establish three funds—an endowment fund (not less than £100,000), a house and furnishing fund (£30,000), and a fund to wipe out the liabilities in connexion with the incorporation and pre-incorporation expenses (£1600). Lord Riddell had generously given £1000 for general purposes, and other sums and benefactions had been promised. The President gave a brief sketch of the constitution of the College and of its aims. Incorporation, without the use of the appendage "Limited," was the present legal status of the College, and this gave certain financial advantages in regard to trusts and other matters. The present state was to be regarded as a stage only in progress towards the dignity of a Royal Charter, for the attainment of which the College must prove its worth to the State.

It was proposed to elect as Foundation Fellows of the College practically all of the senior obstetricians and gynæcologists in England, Scotland, Wales, Ireland, and the British Dominions; and as Foundation Members, who would subsequently become eligible for the Fellowship, the less senior obstetricians and gynæcologists. Already a majority of those approached in Great Britain and Ireland had joined; those resident in the British Dominions had not yet been invited. It was intended to elect as fellows and members only those engaged exclusively in obstetrics and gynæcology, though a certain latitude would be allowed, for example, in regard to those engaged in the public health service. The College hoped to discuss with the Royal College of Physicians of London and the Royal College of Surgeons of England the details of the granting of a diploma in obstetrics and gynæcology, for the drafting of the regulations for which a committee of the College had been sitting.

Affairs of State had already claimed their attention. The services of the College would be placed at the disposal of the Government, which intended to take action in regard to maternity problems, and had asked for assistance and advice from the College. On a matter of domestic policy, the President said that the personnel of the College, its council and officers had necessarily been elected by the original preliminary committee; but within the next few months the present officials would voluntarily resign and would offer themselves along with others duly nominated for re-election by vote of fellows and members. If the College was to make good and to justify its existence, it would need the active support, based on real interest in its endeavours, of every obstetrician and gynæcologist.

The President read to the meeting the oath of membership:—

> I solemnly affirm that I will at all times maintain the welfare and dignity of the College, faithfully obeying in the spirit as well as in the letter the Articles and Regulations, and submitting myself to the lawful authority of the Council. Furthermore, I pledge myself in the practice of the Art of Obstetrics and Gynæcology ever to have regard to the honour of the College and to the welfare of the State.

These words, he said, expressed the ideals of loyalty, progress, and service which inspired their organisation.

THE GENERAL HOSPITAL, BIRMINGHAM:

SESQUI-CENTENARY CELEBRATION.

THE General Hospital at Birmingham was founded in the year 1779 by the single-minded effort of a local physician, Dr. John Ash, F.R.S., whose memory was honoured on Dec. 10th at a notable gathering which included a midday celebration in the Cathedral, an afternoon assembly at the Hospital with orations by Prof. K. F. Wenckebach of Vienna and Lord Moynihan of Leeds, and an evening banquet at which more than 450 patrons, friends, and officers of the hospital were present. For the benefit of guests and others the story of the hospital was told in a Retrospect prepared by the senior consulting surgeon, Sir Gilbert Barling, pro-Chancellor of the University, himself unfortunately prevented by ill-health from attending. His story is a lively and worthy record of the growth of a city's care for its sick poor, side by side with the training of students and nurses and the advancement of medical science, towards their ultimate fusion in the scheme soon to be set on foot for a new hospital at Edgbaston, attached to the University, with every facility for teaching and research—the Golden Age of Medicine, as Sir Gilbert happily phrases it.

In his oration to the assembly Prof. Wenckebach discoursed on the use of the fox-glove by the bedside, with a generous recognition of the pioneer work of Dr. William Withering, a contemporary of Ash. Lord Moynihan told the story of surgery through the ages, recalling that Neolithic man suffered from spinal caries and the present-day Birmingham citizen still ran the same risk by refusing to boil his milk.

The Banquet.

At the banquet, which was a model of smooth organisation, the guests were received by the President of the hospital, Alderman A. H. James, J.P. The toast of The City was proposed by Lord Moynihan, who spoke of the medical men who had "made" the city: Lawson Tait with a leonine personality and the heart of a child; Furneaux Jordan, Jordan Lloyd ("almost a magician"), Sampson Gamgee, blessed alike to surgeon and patient for his introduction of dry dressings; Priestley Smith, dexterous and inventive; down to Gilbert Barling and Haslam. The Lord Mayor, Alderman M. L. Lancaster, J.P., in responding, expressed the hope that the voluntary hospitals would keep pace with the growth of the city and praised the work-people whose annual subscriptions now approached £150,000. Sir John Rose Bradford, in proposing The Birmingham General Hospital, spoke with great feeling of the particular place held by voluntary hospitals in the affection of the British people, and of their dependence on the gifts and devoted service of laymen for their success. Birmingham General Hospital had arisen at the *same remarkable period* which saw the foundation of the Royal Infirmary, Edinburgh, and five of the great teaching hospitals of London. The city was happy to have had men capable of appreciating the great purposes that medicine might be made to serve. Alderman James, in reply, admitted a period of suspended animation *in the life of the Hospital in preparation for the big* scheme ahead of them. The fact that more than one in four of the Birmingham population subscribed to the contributory fund was, he said, a lasting monument to the patriotism and vision of the work-people. Councillor Miss Bartleet, J.P., chairman of the board of management, also replied. Dr. Stanley *Barnes, senior physician,* who received an ovation on rising, proposed The Guests, and Prof. Wenckebach in response thanked for the good cheer and the good fellowship which he and all his fellow guests had enjoyed. A word should be added in praise of the admirable acoustic properties of the Grosvenor Room where the banquet was held.

AN OUTSIDE VIEW OF CONTRIBUTORY PENSIONS.

Dr. E. S. Moorhead, chairman of the welfare supervision board of the Winnipeg Health and Public Welfare Service, has recently been in this country studying the contributory pensions scheme, and has presented a report to his Board. He finds that the scheme is exceedingly popular in this country, and that many more people would like to be included within its scope. He draws attention to the fact that the machinery for collecting contributions was already in operation through the National Health Insurance Act. It is as easy to collect 1s. 6*d.* a week as 9*d.*, and to attach two stamps to a card involves little more labour than attaching one. This gave the scheme a great advantage from its inception, and provided a smooth and successful working. The difficulty in the way of extending it to the whole of the country is just this difficulty, Dr. Moorhead thinks, of collecting the contributions. To throw the scheme open on a voluntary basis would be economically unsound, as the healthy young men would be unlikely to seek admission while the middle-aged man suffering from tuberculosis, *heart disease, or other disability would immediately join,* especially if he had a wife and young children dependent on him. It would also be economically impossible to send round public collectors to the small shop-keeper, the small farmer, the country blacksmith, and the poorly paid clergy, all of whom were anxious to be included in some form of contributory pensions scheme. At first Dr. Moorhead was puzzled on hearing that the premium for men was double that for women, seeing that women live longer and are less likely to be killed by industrial accidents or by exposure. It was explained to him, however, that most of a man's insurance really goes to provide pensions for his widow or children. If he dies without leaving either widow or child under the age of 14, his estate is not entitled to recover any sum from the Government. Women, on the other hand, cease contributions when they marry, unless they continue to work—which is estimated to happen once in seven cases. Dr. Moorhead is *impressed with the fact that England gives the* cheapest industrial insurance in the world, and is prepared to expend for the next 35 years or more an immense sum from State funds in order to put the plan on a sound basis. He feels that Manitoba will have to face the problem of a compulsory pensions scheme and that the difficulties, though great, are not likely to prove insuperable. Any scheme which is not contributory would prove, he thinks, an excessive burden on the tax-payer in a very short time.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

BILLS ADVANCED.

IN the House of Lords on Dec. 3rd, the Poor-Law Bill, a consolidation measure, was recommitted in respect of an amendment made by the Joint Committee which considered the Bill. The amendment was agreed to and the Bill was reported with the amendment to the House. On Dec. 4th and 5th the Bill was agreed to on Report and read the third time. On Dec. 4th a Bill providing for the registration of chiropodists was read a first time. The Royal Assent was given by Commission on Dec. 6th to the Widows, Orphans and Old Age Contributory Pensions Act. On Dec. 5th in the House of Commons, Major ELLIOT'S measure The Education (Scotland) Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 4TH.

Night Baking.

Mr. MANDER asked the Home Secretary whether the Government had now decided how to deal with the subject of night baking.—Mr. CLYNES replied: This subject will be dealt with in the Factories Bill.

Sale of Tuberculous Cows.

Dr. HASTINGS asked the Minister of Agriculture whether *his department had issued any regulations to prevent the* sale of a cow, shown by test to be suffering from tuberculosis, for the purpose of producing milk for sale to the public; and, if not, whether he would consider the adoption of some method, such as branding, so that the purchaser might at least know the condition of the animal he is buying.—Mr. BUXTON replied: The Tuberculosis Order of 1925 requires the notification, and provides for the slaughter, of cows shown to be giving tuberculous milk or excreting tubercle bacilli in other ways, and for the compensation of their owners. Reaction to the tuberculin test does not, however, by itself, bring animals within the scope of the Order as that is not sufficient evidence that they are giving tuberculous milk. I do not consider that the branding of reactors is necessary; intending purchasers can protect their herds by only buying cows which have passed the tuberculin test.

THURSDAY, DEC. 5TH.

Ex-Service Men and Rheumatism.

Mr. RAMSBOTHAM asked the Minister of Pensions how many ex-Service men had been granted pensions in respect of rheumatism; how many of these pensioners had died from rheumatism and heart affection; and in how many cases wives had been granted a pension in respect of their husbands' death.—Mr. *F. O.* ROBERTS *replied:* Awards have been made since 1914 in respect of rheumatism to some 84,700 officers and men. The information asked for in the second and third parts of the question is, I regret, not available.

Vaccination and Nervous Diseases.

Mr. GROVES asked the Minister of Health how many of the cases of nervous disease following within a month of vaccination were vaccinated with Government lymph and how many with other lymph; and whether his department had any reason to suppose that complications had attended the use of foreign lymph more frequently than the use of Government lymph.—Mr. GREENWOOD replied: Of the total number of cases of the kind referred to which have been brought to the notice of my department since 1922, 148 were vaccinated with Government lymph and 37 with other lymph. I have no information as to the lymph used in the remaining 8 cases. With regard to the second part of the question, no information is available as to the extent to which lymph, other than Government lymph, is used in this country and no conclusions can, therefore, be drawn as to the comparative likelihood of complications following the use of Government lymph, and lymph supplied from private sources, respectively.

Prevention of Contagious Abortion in Cattle.

Lieut.-Colonel FREMANTLE asked the Minister of Agriculture if his department issued and recommended the use of a live vaccine as the best preventive against contagious abortion in cattle; how long this had been in use; whether it had increased or reduced the incidence of the disease in cattle; and what steps he proposed to take to ensure the adoption of every measure for the reduction of this pest.—Dr. ADDISON (Parliamentary Secretary to the Ministry of *Agriculture) replied: In herds* in which the percentage of infection of contagious abortion is not high, the Ministry recommends that the disease should be controlled by hygienic measures and the agglutination test for the detection of infected animals. In herds in which infection is heavy, the Ministry advises the immunisation of all non-pregnant animals with the live vaccine. This vaccine has been issued from the Ministry's Laboratory since 1912, and the demand for it indicates that it is serving a useful purpose. The disease does not lend itself to legislative control, and therefore my right hon. friend intends to encourage and assist research workers to concentrate on the discovery of better methods of immunising cattle against the disease.

Milk Service in Schools.

Viscount LYMINGTON asked the President of the Board of Education the number of schools having milk clubs, together with the number of school-children receiving milk under the National Milk Publicity Council's scheme for milk service in schools.—Sir CHARLES TREVELYAN replied: I regret that I am unable to give the noble lord the particulars for which he asks, but I understand that partly as a result of the activities of the National Milk Publicity Council there has, in the past few years, been a considerable extension of these arrangements for supplying milk to children in the schools. Among other places, comprehensive arrangements are in operation at Birmingham and Leeds.

District Medical Officers and Health Committees.

Mr. HACKING asked the Minister of Health whether he would take steps to prevent members of town councils who were also district medical officers under boards of guardians allowing their names to be included on the health committees of boroughs for 1930, when such health committees would be the public assistance committees of the boroughs in which these persons acted as district medical officers; and whether such persons would be prevented from taking part in the arrangements for the setting up of public assistance committees when they were actually paid servants of the Ministry of Health.—Mr. GREENWOOD replied: As the law stands, district medical officers under the poor-law who will be transferred to county councils and the councils of county boroughs under the Local Government Act, 1929, will be automatically disqualified from membership of the council or a committee of the council to whom they are transferred. District medical officers are employed and paid by the boards of guardians and not by my department.

Pauper Lunatics.

Major GLYN asked the Minister of Health the total number of pauper lunatics cared for by the poor-law authorities, and at what cost; what was the number accommodated at the expense of the asylum authorities; what was the number maintained at the expense of the boards of guardians; what was the position of the board of control in regard to the care and supervision of these lunatics; and how these figures compared with 1925, 1920, and 1910.—Mr. GREENWOOD replied: Figures are not available in regard to all the points raised by the hon. and gallant Member, but Table A shows the total number of pauper lunatics in the four years mentioned, and indicates where they were maintained, while Table B shows the expenses incurred in connexion with public mental hospitals. The cost of maintenance falls upon boards of guardians, the remaining expenditure upon local authorities under the Lunacy Acts. Board of guardians recover part of the cost of maintenance from friends and relatives of the patient. The powers and duties of the Board of Control in the case of patients on out-door relief are limited to obtaining a return from the poor-law authorities, and, in the case of lunatics in poor-law institutions, to paying periodical visits. As regards patients detained in county and borough mental hospitals, the Board of Control examine the documents upon which they are received and detained, and also consider periodical medical reports. They also visit the institutions and have general supervision over the arrangements for the proper care of the patients.

TABLE A.—*England and Wales; Total Number of Pauper Lunatics on Jan. 1st in each of the Years Specified.*

Where maintained.	1910.			1920.			1925.			1929.		
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
In county and borough mental hospitals..	43,997	50,217	94,214	34,389	47,686	82,075	39,884	55,854	95,738	44,629	61,473	106,102
In licensed houses:												
Metropolitan ..	29	83	112	12	61	73	—	—	—	15	28	43
Provincial	3	—	3	161	311	472	—	—	—	—	—	—
In criminal lunatic asylum (Broadmoor)	1	—	1	2	—	2	3	—	3	2	—	2
In poor-law institutions:												
Ordinary poor-law institutions ..	5,143	6,281	11,424	4,271	6,330	10,601	4,718	6,644	11,362	4,666	6,513	11,179
Metropolitan district asylums	3,336	3,508	6,844	2,306	3,132	5,438	2,314	2,770	5,084	2,118	2,490	4,608
On outdoor relief ..	2,181	3,458	5,639	1,424	2,482	3,906	1,282	2,216	3,498	1,323	2,277	3,600
Total	54,690	63,547	118,237	42,565	60,002	102,567	48,201	67,484	115,685	52,753	72,781	125,534

N.B.—The cost of maintenance of all these patients was borne by boards of guardians, except that of certain patients in county and borough mental hospitals who were chargeable to county or borough rates as follows: 1910, 1,609; 1920, 1,100; 1925, 1,336; 1929, 1,400. M = males; F = females.

TABLE B.

—	Financial year ending March 31st.			
	1910.	1920.	1925.	1929.
	£	£	£	£
Maintenance ..	2,619,073	5,305,008	6,510,039	6,938,235
Building and repairs ..	417,211	453,288	761,822	999,417
Land purchased	7,328	36,961	39,609	36,597
Land rented ..	4,878	5,536	6,843	7,008
Total ..	3,048,490	5,800,796	7,321,913	7,981,257

Inspection of Dairy Farms.

Lieut.-Colonel FREMANTLE asked the Minister of Health how many inspectors were employed by his department in inspection of dairy farms; and how many of the inspectors were qualified veterinary surgeons.—Mr. GREENWOOD replied: Two inspectors are employed by my department in the inspection of dairy farms, and neither of them is a qualified veterinary surgeon. I may add that the only farms inspected by officers of my department are those producing Certified and Grade A (tuberculin tested) milk, and that the examination and testing of cattle on these farms are carried out by qualified veterinary surgeons approved by the department.

MONDAY, DEC. 9TH.

Medical and Surgical Treatment of ex-Service Men.

Sir GEORGE BOWYER asked the Minister of Pensions whether he intended to take over all medical and surgical treatment of ex-Service men, providing, where necessary, full-time medical officers for the purpose.—Mr. F. O. ROBERTS replied: My department has authority under the Royal Warrants to provide such treatment only as is not otherwise provided. I could not, therefore, adopt the course suggested by the hon. and gallant Member without duplicating other statutory arrangements for the provision of treatment which are in operation under the National Health Insurance Acts and other enactments.

Maternity Benefit.

Mr. KEDWARD asked the Minister of Health whether he was proposing to make any change in the method of granting maternity benefit; and whether any reduction in the present amount of £2 was being considered.—Miss LAWRENCE

(Parliamentary Secretary to the Ministry of Health) replied: The whole question of the arrangements for maternity benefit under the scheme of National Health Insurance is under consideration, but my right hon. friend is not yet in a position to say what alterations, if any, will be made.

Drinking Water-supply in Villages.

Mr. GRANVILLE asked the Minister of Health if he was prepared to consider area schemes for providing employment in the building of rural cottages and the provision of a system for the supply of drinking water in villages.—Miss LAWRENCE replied: My right hon. friend proposes to give special consideration to the question of rural housing in connexion with forthcoming legislation. As regards rural water-supplies, my right hon. friend will be prepared to consider any schemes, and I may point out that the Government have recently announced special terms of assistance as part of their unemployment proposals.

Indian Army Veterinary Corps.

Major GRAHAM POLE asked the Secretary of State for India how many Indians had been admitted to the commissioned ranks of the Indian Veterinary Corps since that arm of the Indian Army was opened to Indian gentlemen.—Mr. BENN replied: No Indian has yet been commissioned in the Indian Army for employment in the Indian Army Veterinary Corps, but one candidate has been selected and is now under training in this country for that purpose.

TUESDAY, DEC. 10TH.

Training and Employment of Midwives.

Viscountess ASTOR asked the Minister of Health whether it was intended to introduce legislation embodying the scheme outlined in a memorandum of the British Medical Association for a national maternity service for England and Wales, the findings of the Royal Commission on National Health Insurance, and the recommendations of the report of the departmental committee on the training and employment of midwives.—Miss LAWRENCE replied: My right hon. friend is not yet in a position to make a statement on this subject.

Registration of Mental Nurses.

Mr. REMER asked the Minister of Health if his attention had been called to the fact that mental nurses in possession of the Royal Medico-Psychological Association's certificates did not receive admission to the register kept under the Nurses' Registration Act, 1919; and would he issue an order to rectify this position.—Miss LAWRENCE replied: I would refer the hon. Member to the reply given him on Nov. 28th. My right hon. friend is not empowered to issue any order in this matter.

Death after Vaccination.

Mr. FREEMAN asked the Minister of Health whether his attention had been called to the case of Clarence Morris Martin, who died on Nov. 14th, having been vaccinated on Oct. 9th, and that the coroner reported the death was caused by septicæmia following the accidental breaking off of the vaccination scab; had he instituted inquiries into this case, and had he anything further to report.—Mr. GREENWOOD replied: My attention has been called to this case which occurred at Southampton, and inquiries have been made into the matter. The death took place on Nov. 10th, the cause of death certified by the coroner, after an inquest, being as stated in the question. I am satisfied that death was due to accidental infection of the site of the vaccination from some extraneous source, and that no blame attaches to the public vaccinator or to the lymph used.

BRISTOL HOSPITALS.—The 193rd annual report of the Bristol Royal Infirmary (380 beds) shows that last year 8082 patients were admitted to the wards, and that the out-patients numbered 99,310. Of the 1,807 maternity cases 810 were admitted, the others being attended to in their own homes. Of the total births in Bristol 21 per cent. received attention at the infirmary. Very satisfactory results are stated to have attended the work of the cancer research department, and the "Bristol Royal Infirmary lead treatment" has "gone all over the world."—At the Bristol General Hospital there is a new out-patients' department and a new children's ward and operating theatre are being provided. A new ward for the treatment of male accident and other surgical cases has been necessitated by the long waiting-list of surgical cases. The local poor-law hospitals have no vacant beds available for the overflow of surgical cases. The cardiac research centre has been busily engaged. During 1928, £9763 was paid by, or on behalf of, patients, but the adverse balance on ordinary expenditure account exceeded £12,000.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On Dec. 6th the following degrees were conferred:—

M.D.—*W. L. Barnett, K. E. Harris, J. D. M. Stewart, and R. A. Hickling.

B.Chir.—W. E. Mashiter and C. G. Townsend.

* By proxy.

UNIVERSITY OF BRISTOL.—At recent examinations the following candidates were successful:—

M.D.

W. A. Gornall.

FINAL EXAMINATION FOR M.B., CH.B.

Part II.—*J. J. J. Giraldi, J. E. Newton, and N. C. Tanner. The following passed in groups which completed their examination: N. L. Price, N. D. Gerrish, and Mabel F. Porter. *In Group II. only*: R. M. Norman.

* With second-class honours.

Part I., including Forensic Medicine and Toxicology.—J. S. Adamson, T. A. Barnabas, J. E. Brown, H. L. Cleave, J. L. S. Coulter, C. J. N. Davis, F. W. A. Fosbery, L. R. Jordan, J. A. Kersley, R. H. Moore, Elizabeth S. G. Owen, C. N. Royal, and W. A. F. Taylor.

Part I.—L. P. Ashton.

FINAL EXAMINATION FOR L.D.S.

J. D. Galloway.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—On Dec. 2nd the following were admitted Fellows of Faculty: Alfred Mackenzie Clark, Joshua Ferguson, William David Henderson Stevenson, and Rosie Swamikan.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—At the Annual Meeting of the College on Dec. 5th Sir Norman Walker was elected President, Dr. Robert A. Fleming was nominated Vice-President, and the following were elected Members of Council for the ensuing year: Dr. G. Lovell Gulland, Dr. John Orr, Dr. William Fordyce, Dr. Edwin Bramwell, and Dr. Fergus Hewat. At the Extraordinary Meeting which followed, Dr. John Orr and Dr. William Fordyce were elected Representatives of the College on the Board of Management of the Royal Infirmary of Edinburgh.

WEST LONDON HOSPITAL.—The annual report states that the 3028 in-patients in 1928 stayed on an average 20·57 days instead of the 21·75 days of the previous year, a shortening which enabled a larger number of patients to be received. They cost £3 8*s.* 7*d.* per week, an increase of 1*s.* 4*d.* There were 275,730 out-patient attendances; each patient cost 8*s.* 10*d.* A new casualty department is being provided at a cost of between £4000 and £5000, and the new department for venereal diseases has cost £14,000. The work of the post-graduate college is still much hampered by lack of adequate accommodation.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN.—The annual dinner of the school was held at the Savoy Hotel, London, on Thursday, Dec. 5th; Mr. Joseph Cunning, senior surgeon to the hospital, was in the chair and presided over a great assembly of those officially connected with the hospital, including students, and a large number of guests.

Lady Emmott proposed Prosperity to the School and Hospital, having taken Lord Byng's place, who was unavoidably absent. The audience, she said, must be experiencing the sentiment aroused when, on arriving at a theatre, they found a notice to say that the principal part was going to be played by a substitute; further, she did not feel qualified to speak, being only a lay-woman, as to the scientific attainments of the students, although she was able to compliment them warmly on the excellence of the entertainments which were given each Christmas. Lady Emmott regretted the difficulties made by the metropolitan teaching hospitals with regard to the admission of women students, although this attitude made the work that was done in the School of Medicine for Women at the Royal Free Hospital more than ever valuable. She concluded by paying tribute to the men members of the medical staff for their hearty coöperation in efforts that were being made, and successfully made, to help women students, while she knew that she was right in saying that the students at the Royal Free Hospital were making a fine response.

Mr. Cunning, in reply, called attention to the zeal and efficiency of past physicians and surgeons attached to the staff, mentioning in particular the manner in which Sir James Berry had secured by his pertinacity the erection of the operating theatres. In reviewing more recent developments he said that a new pathological department was urgently needed and that funds were being raised for that purpose, while the Eastman Dental Clinic had nearly reached completion. He closed by paying a warm tribute to the practical services and generosity of Lord Riddell and Sir Albert Levy.

Dr. Chodak Gregory proposed the toast of the Guests, and said that gratitude was due to Lady Emmott for taking Lord Byng's place and proposing the chief toast of the evening. She reminded the audience that Lady Emmott was both a member of the association of the medical school and a member of the board of management of the hospital, and was therefore well posted in her facts. Enumerating the guests present she selected for special mention Sir Walter Schröder, whose kindness to the young house officers who found themselves in the coroner's court was invariable. Other guests to whom she alluded by name were Dr. Ethel Bentham, a former student of whom the school was proud, as a Member of Parliament; Dr. Catherine Chisholm, representing the Manchester Babies Hospital, who, she said combined the scientific investigation of the infant with the human treatment of the baby; Dr. Deller, the Principal of the University of London, and Mr. Rew, the secretary of the Conjoint Examination Board, whose names had a melancholy association with examinations; Miss Strachey, the Principal of Newnham, whom she congratulated on sending to the Royal Free certain of her own old students; and Lady Rhondda, whose championship of the cause of the working woman was known to all. She associated the toast with the names of Sir Patrick Hastings and Lady Rhondda.

Lady Rhondda, in reply, recalled the history of the school, and made special reference to the Marie Curie Hospital for the treatment of cancer which was staffed from the Royal Free.

The health of Mr. Cunning was proposed by Dr. Elizabeth Bolton, senior surgeon to the Elizabeth Garrett Anderson Hospital, who recalled the debt which the students at the Royal Free owed to the clinical teaching of the chairman, teaching which, she said, was embodied and condensed in a volume known to many generations of students as "little Cunning." Mr. Cunning briefly replied and invited the company to adjourn to the ball-room which promptly became crowded, and remained so until a late hour.

UNIVERSITY OF OXFORD: *G. H. Hunt Scholarship.*—This Scholarship is awarded without examination every second year to a graduate in medicine of the University (of either sex) who has not exceeded five years from the date of passing the final examination for the B.M. degree. Its value is £100, or such smaller sum as two years of the income of the Fund provides. Candidates are required to travel abroad for not less than three months for clinical study or research in medicine. Preference is given to those intending to be surgeons or general practitioners. The next election will be made in April, 1930, and candidates must apply to the Dean of the School of Medicine before Feb. 11th, 1930.

ROYAL SURGICAL AID SOCIETY.—This Society, which was founded in 1862 to supply surgical appliances to the poor, held its annual meeting at the Mansion House last week. The report stated that the total income had been £56,670, and the expenditure exactly £1000 less. During the year 29,262 patients were assisted, and 40,254 surgical appliances supplied at a cost of £16,917.

A CHILDREN'S WELFARE CLINIC.—At the quarterly court of the London Hospital last week Lord Knutsford, the chairman, reported that £3000 had been obtained towards the £4700 required to reconstruct the children's welfare clinic. The present clinic is so overcrowded as to be "a scandal." The Queen has given £250, and Sir Albert Levy has undertaken to contribute £125 a year for 16 years towards the maintenance of the clinic.

INSTRUCTION FOR D.P.H.—A three-months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N., by Dr. F. H. Thomson, the medical superintendent, on Mondays and Wednesdays, at 4.45 P.M., and alternate Saturdays at 11 A.M., from Jan. 6th, 1930. Application should be made to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4.

SCOTTISH WOMEN'S WAR HOSPITALS.—At a meeting of the Scottish Women's War Hospitals at the Royal Free Hospital last week the Duchess of York received purse containing £6285 for a scheme to commemorate heroic Scots women. The money will be used to build, equip, and endow a new ward in the maternity wing of the Royal Free Hospital and a maternity centre at Islington to be named after the Duchess. Each bed will be named after a unit of the Scottish Women's Hospitals, which worked in most of the fields of operation during the war, or after a member who gave her life in service. One of them will be dedicated to the memory of the founder of the hospitals, Dr. Elsie Inglis.

HARVEIAN SOCIETY: *Buckston Browne Prize.*—The President and Council of this Society have awarded the biennial Buckston Browne Prize of £100 and medal to Dr. C. Bruce Perry, for an essay on "Chronic Streptococcal Illnesses." Proximo Accessit: Dr. R. Cove-Smith.

BERNHARD BARON TRUST.—The annual distribution of grants from the £500,000 trust created by the late Mr. Bernhard Baron has lately been made. Contributions have been received by about 270 hospitals, orphanages, and kindred institutions, the total being £36,530.

LEEDS HOSPITAL FOR WOMEN.—From next Jan. 1st, four wards will be set apart for paying patients, at a charge of 5 guineas a week. Surgeons' fees will be on a reduced scale. There will be not more than two patients to a ward, and no separate cubicles.

DANGEROUS DRUGS ACT PROSECUTION.—Richard William Starkie, whose name was removed from the Medical Register in 1922, and who was stated by the police to have been at one time a police surgeon, and to have been in prison for administering a noxious drug, was sentenced at Maidenhead on Dec. 2nd to 12 months imprisonment for an offence under the Dangerous Drugs Act. The bench at first made the sentence one of hard labour, but subsequently altered this to imprisonment in the second division.

PITHEAD BATHS AT TWOPENCE A WEEK.—On Dec. 7th at the Grassmoor Collieries, New Chesterfield, the Minister of Mines, Mr. Ben Turner, opened pit-head baths of the most modern type. They have cost £14,000, which is provided by the Miners Central Welfare Committee, and the Grassmoor Colliery Company will supply water, electricity, and gas cost free. There is accommodation for 1200 miners and the cost will be twopence a week which will be deducted from their wages.

HOSPITALS AND MOTOR ACCIDENTS.—In the quarter ending with Sept. 30th last motor accident cases cost the Royal Free Hospital £209, of which only £35 was refunded to the charity.—Between April 1st and Oct. 30th last Sheffield Royal Infirmary and Sheffield Royal Hospital treated between them 470 motor accident cases.

BRADFORD ROYAL INFIRMARY.—The annual report for 1928 mentions that approximately 450 persons die annually in Bradford from cancer. An appeal for £20,000 to provide an adequate supply of radium had been sufficiently well responded to to justify the purchase of 1 gramme, and Dr. Chester-Williams, of the London Radium Institute, was appointed radium specialist.

ROYAL GWENT HOSPITAL.—Last year this hospital at Newport, Mon., had a surplus of income over expenditure of £5700 which was used to discharge the debt on the building extension fund. The income was £31,238, the highest in the history of the hospital. The workmen's fund produced £13,400, an increase in two years of nearly 50 per cent. During the year 2257 patients were admitted; there were 6410 cases in the casualty department, and 20,401 attendances in the venereal department.

HOSPITAL ACCOMMODATION AT HARPENDEN.—The Hertfordshire village of Harpenden is at present served by a nursing centre. Mr. Halley Stewart, a local resident, regards this as inadequate to the growing needs of the neighbourhood and, by way of celebrating his approaching ninety-second birthday, has offered 67 acres of land, his own house, and three cottages for the foundation of a cottage hospital.

EYE, EAR AND THROAT HOSPITAL FOR SHROPSHIRE AND WALES.—Last year this Shrewsbury hospital treated 6840 patients, a large increase, of whom 1351 were in-patients. Diseases of the eye and errors of refraction accounted for 4605 of them, and there were 1070 major operations, 88 of which were for cataract; there were 11 cases of ophthalmia neonatorum. The medical officer's report states that the appointment of an honorary dental surgeon has been of great value both from a diagnostic and a curative aspect.

DAVID LEWIS EPILEPTIC COLONY.—At the annual meeting of the David Lewis Manchester Epileptic Colony at Warford, Alderley Edge, on Dec. 5th, it was stated that the demand for accommodation in the colony continued to increase. Although the majority of the people who took up residence in such a colony did not cease to have fits almost all benefited very greatly. The inmates had peace of mind, the enjoyment of life, and the feeling of being useful, without which they must inevitably deteriorate in happiness, in intelligence, in good conduct, and in health. The group system for epileptics made them feel normal, and instead of depressing them it had the opposite effect.

Medical Diary.

SOCIETIES.

HUNTERIAN SOCIETY.

MONDAY, Dec. 16th.—8.30 P.M., Discussion on The Whitlow and Its Complications, opened by Mr. V. Zachary Cope and Mr. H. W. Carson, preceded at 7.30, by Dinner at Simpson's Restaurant, 2–3, Bird-in-Hand Court, 77, Poultry, Cheapside, E.C.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.

FRIDAY, Dec. 20th—5 P.M., Discussion on The Public Health Service and its Future, introduced by Prof. H. R. Kenwood and Prof. W. W. Jameson.

CHELSEA CLINICAL SOCIETY.

TUESDAY, Dec. 17th.—8.30 P.M., Discussion opened by Dr. G. Murray Levick on Present Position and Possibilities of Physical Treatment, preceded, at 7.30, by Dinner at the Hotel Rembrandt, Thurloe-place, S.W.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Dec. 16th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Dec. 17th.—5 P.M., Dr. J. A. Drake: Urticaria.

THURSDAY.—5 P.M., Dr. H. G. Burford: Pathology Demonstration.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Dec. 18th.—4 P.M., Prof. E. L. Collis: Industry in Relation to Personal and Public Health.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Dec. 20th.—4 P.M., Mr. F. W. Watkyn-Thomas: Fractured Skull and the Aural Surgeon.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Dec. 18th.—4.15 P.M. (in the Royal Infirmary), Mr. James Taylor: Surgical Cases.

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital, Gunnersbury-lane.—Res. M.O. £150.

Barnsley, Beckett Hospital and Dispensary.—H.P. £140.

Barnstaple, North Devon Infirmary.—H.S. At rate of £150.

Birmingham General Hospital.—Two Res. Anæsthetists. Each £120. Also Anæsthetist. £250.

Birmingham, Queen's Hospital.—Res. H.S. to Ophth. and Ear, Nose, and Throat Dept. Res. H.S. to Cas. Dept. Each £70. Also Hon. Phys.

Bradford City.—Asst. School Dentist. £450.

Bristol General Hospital.—Two H.P.'s, two H.S.'s, Res. Obstet. O., H.S. to Special Depts. Each at rate of £60. Also Cas. H.S. At rate of £80.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Bury St. Edmunds, West Suffolk General Hospital.—H.S. £150.

Cairo, Egypt, Giza Memorial Ophthalmic Laboratory.—Pathologist and Bacteriologist. L.E. 1200.

Cardiff, Prince of Wales' Hospital.—Res. Surg. £350.

Carlisle, Cumberland Infirmary.—Pathologist and Bacteriologist. £900.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.

Chester, Wrenbury Hall Tuberculosis Training Colony.—Res. H.P. £250.

Chesterfield and North Derbyshire Royal Hospital.—Cas. H.S. At rate of £200. Also three H.S.'s. At rate of £100–£175.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Laryngologist.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Dorchester, Dorset Mental Hospital, Herrison.—Jun. Asst. M.O. £300.

Durham County Hospital.—Jun. H.S. At rate of £120.

Edinburgh Royal Infirmary, Ophthalmic Dept.—Sen. Clin. Asst. and Clin. Tutor. £145. Also two Clin. Assts. Each £200.

Exeter, Royal Devon and Exeter Hospital.—Hon. Asst. Phys.

Grove Park Hospital, Lee, S.E.—Jun. Asst. M.O. £500.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Huddersfield Royal Infirmary.—Res. Surg. O. £200.

Hull Royal Infirmary.—Second H.S. At rate of £150. Also Sen. H.P. At rate of £200.

Kidderminster and District General Hospital.—H.S. £150.

Lancashire County Council.—Asst. County M.O., &c. £800.

Leicester Royal Infirmary.—Hon. Phys. and Hon. Surg.

London Hospital, E.—Cardiographic Dept., Paterson Research Scholar. £100.

London University.—Geoffrey Duveen Travelling Studentship. £150.

Manchester Ancoats Hospital.—Asst. Pathologist. £350. Also Med. Reg. and Surg. Reg. Each £100.

Manchester, Baguley Sanatorium.—Sen. Asst. M.O. £500. Also Asst. M.O. £350.

Manchester, County Mental Hospital, Prestwich.—Asst. M.O. £500.

Manchester Royal Infirmary, Roby-street.—Anæsthetist. £25.

Manchester, Salford Royal Hospital.—Res. Surg. O. £200. H.S. At rate of £125. Also H.S. to Aural, Skin, &c., Depts.

Miller General Hospital, Greenwich-road, S.E.—H.P. and H.S. Each at rate of £125.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

North Wales, Ruthin Castle.—Jun. Res. Phys. At rate of £200.

Perth Infirmary.—H.P. £75.

Portsmouth, St. Mary's Hospital, &c.—1st Asst. Res. M.O. £350.

Princess Louise Kensington Hospital for Children, N. Kensington. H.S. At rate of £75.

Royal Free Hospital, Gray's Inn-road, W.C.—Sen. and Jun. Clin. Assts.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £180.

St. John's Hospital, Lewisham, S.E.—Orthopædic Surgeon.

Shrewsbury, Royal Salop Infirmary.—Res. H.S. and Res. H.P. Each at rate of £160.

Singapore General Hospital.—Anæsthetist. £840.

Swansea County Borough.—Asst. M.O. £600.

University College Hospital, Gower-street, W.C.—Hon. 1st Asst. for Ear, Nose and Throat Dept.

Walsall General Hospital.—Cas. H.S. At rate of £120.

Walthamstow Borough Education Committee.—School Dentist. £500.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

Westmorland County Council.—Asst. County M.O. £800.

Wigan Infirmary.—Third H.S. £150.

Wolverhampton, Royal Hospital.—Cas. O. and Res. Anæsthetist. At rate of £125. Also H.S. for Ear, Nose and Throat Dept. At rate of £150.

Wrexham and East Denbighshire War Memorial Hospital.—Hon. Surgeon to Ear, Nose and Throat Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Redruth (Cornwall); Abingdon (Berks); and at Dover (Kent).

The Home Secretary gives notice that there will shortly be a vacancy for a Medical Referee under the Workmen's Compensation Act, 1925, for the Dundee district of the Sheriffdom of Forfar. Applications for the post from duly qualified medical practitioners should be addressed to the Private Secretary, Scottish Office, Whitehall, S.W. 1, and should reach him not later than Dec. 24th, 1929.

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Bristol, Wells and Weston-super-Mare County Courts (Circuit No. 54). Applications from surgeons should reach the Private Secretary, Home Office, Whitehall, S.W., not later than Dec. 31st.

Births, Marriages, and Deaths.

BIRTHS.

GARNHAM.—On Dec. 4th, the wife of Dr. P. C. C. Garnham, of a daughter.

SHIRES.—On Dec. 5th, at Welbeck-street, W., the wife of Dr. Bertram Shires, of a daughter.

MARRIAGES.

DANBY—ARKELL.—On Dec. 7th, at Holy Apostles Church, Cheltenham, Alfred B. Danby, F.R.C.S., of Birmingham, son of Mr. and Mrs. Danby, of Wellington, New Zealand, to Victoria, youngest daughter of the late James Arkell, of Highworth, Wilts, and of Mrs. Arkell, Oak Hill, Charlton Kings, Cheltenham.

READ—GILL.—At Linkinhorn Parish Church, Cornwall, on Saturday, Dec. 7th, by the Rev. G. Rhys, assisted by the Rev. C. C. C. Bosanquet, Charles David Read, M.B., F.R.C.S.E., 1, Park-crescent, London, W.1., to Mabyn Gill, The Old House, Rilla Mill, Callington, Cornwall.

DEATHS.

ATKINSON.—On Dec. 6th, at St. Thomas's Hospital, Walter Alexander Atkinson, M.D., B.S., of Camberwell New-road, S.E., aged 66.

CUMMING.—On Dec. 7th suddenly, George William Hamilton Cumming, M.D., of "Overton," Torquay.

HUTCHISON.—On Dec. 4th, at Cheadle, Cheshire, James Hutchison, M.D., formerly of Norbury, S.W.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE FOUNDER OF THE ROTUNDA.

THE Rotunda Hospital, Dublin, which is appealing for £20,000 to bring its buildings and equipment fully up to date, was founded early in the eighteenth century by a medical man, Dr. Bartholomew Morse, a native of Maryborough in the Queen's County. Morse was born in the year 1712, and after making a special study of obstetrics he settled in Dublin, where his compassion was aroused by the wretched condition of poor women approaching confinement who found themselves without medical aid. Having resolved to do all in his power to have a hospital established in which relief and nursing should be gratuitously supplied, he travelled France, Holland, and other parts of Europe to study hospital systems.

On his return to Dublin he took a house in St. George's-lane (now South Great George's-street), furnished it with 24 beds, and in 1745 opened there the first hospital of the kind ever established, it is said, in the British Dominions. The expenses of the undertaking were defrayed chiefly out of his own purse, supplemented by the proceeds of lotteries, plays, concerts, and oratorios. Dublin was exceedingly musical in those days, and as hospitable as it is in our own generation. Morse induced many foreign vocalists and instrumentalists to come over to Dublin, among them the Italian Castruccio, who, after delighting everyone with his performances which he gave for little or nothing, sank into poverty and died in Dublin, too proud to let anyone know he was in want. So great was the concourse of people at his funeral in St. Mary's Churchyard, Jervis-street, that it is said the parish beadle was crushed to death. When the hospital in George's-lane became too small to accommodate all who sought admission Morse secured a plot of waste ground in Great Britain-street more than four acres in extent, and in August, 1748, began to lay out at a cost of about £20,000 of his own money a garden which should be an attractive place of promenade for the nobility and gentry residing in the neighbourhood. Shrubberies were planted, ornamental walks laid out, pavilions and a coffee-room erected. Fountains, statues, and coloured lamps adorned the walks, and orchestral performances brought in many hundreds of pounds annually. When he had £500 in hand, Morse started the magnificent pile of the Rotunda as we now know it. Up to the end of 1755 he collected £11,004, but this sum, added to the whole of his personal fortune, being insufficient, he petitioned the Irish Parliament for aid and obtained two grants of £6,000 each with a further award of £2000 for himself as a recognition of his exertions in the cause of humanity. On Dec. 8th, 1757, the upper ward of 50 beds was opened by the Duke and Duchess of Bedford, the ceremony being followed by a concert of vocal and instrumental music. From these concerts in the gardens the hospital continued to benefit to the extent of £4000 a year. Morse himself only just lived to see the fruition of his efforts. He fell ill in the winter of 1758 and died in February, 1759, almost without personal estate.

THE DIFFERENTIATION OF THE PROPERTIES OF FOODSTUFFS.

THE various nutritive constituents of food and their biological values, together with chemical tests to identify each, are fully dealt with in a small book[1] recently published from the department of physiology of King's College of Household and Social Science. Methods of analysing foodstuffs in order to isolate their constituents are carefully explained, with full details of the chemical reagents required and the minimum of apparatus, the latter being of such simplicity that it could be procured at the remotest store and set up in any classroom. The chemical changes involved in digestion and the effects induced by cooking foods are illustrated by suitable experiments. Finally, food tables are given and dietary standards are discussed. Teachers of domestic science will find this book of great assistance in preparing practical class demonstrations on the properties of food.

"FISGARD."

To the Editor of THE LANCET.

SIR,—I notice in your Services column in THE LANCET last week an appointment to a ship *Fisgard*. Being curious about this name I consulted many reference books such as biographies, gazetteers, lists of battles, encyclopædias, and so forth without discovering the name mentioned. In the Navy List it appears as *Fisgard* and even in 1864 I see there was a *Fisgard* at Woolwich. I have also just seen a new catalogue of prints which describes an aquatint in colours of the capture of *Immortalité*, Oct. 20th, 1798, by H.M.S. *Fishguard*, Capt. T. B. Martin, on his way to Brest after the attempted invasion of Ireland on Oct. 12th, 1798. But the old Navy List says a medal was issued for the capture of the French frigate *L'Immortalité*, Oct. 20th, 1798, *Fisgard*, Capt. Thomas Byam Martin. I suppose by this it was not "*Fishguard*" but the question remains unsolved. What is the origin of the name? Perhaps one of your erudite readers could supply an answer.

I am, Sir, yours faithfully,

London, Dec. 7th, 1929. ETYMOLOGIST.

THE SCHOOLMASTER AND THE FIRST M.B. EXAMINATION.

AT the annual general meeting of the Incorporated Association of Headmasters, to be held at the Guildhall, London, on Jan. 3rd, Dr. Terry Thomas, headmaster of Leeds Grammar School, will propose:—

(*a*) That the Incorporated Association of Head Masters agrees with the General Medical Council that a boy should have attained the age of 17 before entering himself at a University or a Medical School recognised by one of the licensing bodies.

(*b*) That a pass at the main subject standard in a Higher School Certificate Examination in any of the subjects of the First Professional Medical Examination should be accepted, subject for subject, for the purposes of exemption from such subjects in the latter Examination.

WHITAKER'S ALMANACK.

THE sixty-seventh annual volume of Joseph Whitaker's Almanack still contains the astronomical and other cosmic data which have made it the boon companion of seamen and star-gazers for half a century, but it also contains the current everyday knowledge which makes it (in the immodest but perfectly true words of the editor-in-chief) indispensable to all who speak or read the English language. Civilisation would suffer appreciably if the files of the Almanack were lost in a cataclysm. While it contains classified information about the metropolitan hospitals and other medical information which may be of value to the public, its value to the medical man is as a vade-mecum of general information. The new features of the present issue include the names of the new Ministry and of the Members of the new House of Commons which alone make it worth its price. The Almanack has been published in the first week of December in order to make it available as a Christmas or New Year's gift to friends and kinsmen overseas. The price is 6s. for the complete edition of 928 pages, 3s. for the shorter edition of 608 pages in paper cover.

CHOCOLATES AND COCOA.

Messrs. Cadbury Bros., Ltd., have added to their large range of chocolates several preparations with new and palatable flavours, and these are included in a selection known as "Princess Elizabeth" assortment. These chocolates should prove popular, as they supplement the "King George" and other favourite assortments. Other samples sent to this office of recent invention included the new "Holiday" slab chocolate, and a conserve containing almonds and raisins; the well-known Bournville Cocoa, and a new beverage "Cadbury's Cup Chocolate," which is claimed to possess the virtues of delicacy and flavour associated with French *chocolat*, while it can be made instantly with boiling milk. Special attention has been given by the firm to the appearance and packing of their wares, while all the new productions are up to their high-class standard.

Appointments.

CATCHPOOL, DOROTHY M., M.B., B.S. Lond., has been appointed Medical Officer of Health for Friern Barnet.

MCCURRICH, H. J., M.S., M.B. Lond., Hon. Surgeon to the Hove Hospital.

New Sussex Hospital for Women and Children, Brighton: MANLEY, M. M., M.B., B.S. Lond., House Physician; ROBINSON, M. M. F., M.B., B.Ch., B.A.O. Belf., House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: D'ALTON, R., L.R.C.P. Irel., L.R.C.S. Irel (Ammanford, Carmarthen); SECCOMBE, C. W., L.R.C.P. Lond., M.R.C.S. (Southall, Middlesex); and ROBERTS, J., M.B., Ch.B. Liverp., F.R.C.S. Eng., Hon. Asst. Laryngologist, Royal Infirmary, Liverpool.

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[1] Properties of Food. By W. M. Clifford, M.Sc. Lond., Assistant Lecturer and Demonstrator in Physiology, King's College of Household and Social Science; and V. H. Mottram, M.A. Cantab., Head of the Department of Physiology in the College. London: University of London Press. Pp. 128. 2s. 6d.

Huxley Lecture

ON THE

CRYSTAL STRUCTURE OF ORGANIC SUBSTANCE IN ITS RELATION TO MEDICINE.

Delivered at Charing Cross Hospital on Nov. 28th, 1929,

BY SIR WILLIAM BRAGG, K.B.E., D.Sc., F.R.S.,
DIRECTOR OF THE ROYAL INSTITUTION OF GREAT BRITAIN AND OF THE DAVY-FARADAY RESEARCH LABORATORY.

THE choice of a subject for a lecture in honour of Huxley is no light matter. Perhaps the best test that can be applied in order to determine its suitability is to ask whether Huxley himself would have been interested in it. I cannot but think that the opening out of a new means of inquiry into the structure of living substance would have attracted his attention. It is true that we are only at the beginnings of such a movement; but already it is possible to see some features of Nature's designs which hitherto have escaped us, and the future seems to contain most attractive promises. It is my hope that I may succeed during the hour that is allowed me in making plain the prospect of gain to biological science; and in the end to medicine. That which I have to set out is not yet, of course, closely related with medical practice; but in the end it must form a link in the chain which connects the medical care of the body with the elements of which the body is built.

THE NEW X RAY ANALYSIS.

The new X ray analysis deals with matters which have hitherto been beyond our power to examine. Of atoms and molecules as independent individuals in the fluid or gas our knowledge is relatively wide, for it has been the province of chemical and physical science to extend it. With those larger structures which the microscope reveals the needs of biology have forced us to become acquainted; we gather all the knowledge that we can respecting the primary cell and its extensions. But between these two ranges of study is a great gap, where we have hitherto lost sight of the processes of construction. What is there, we may ask, between the individual molecules and those structures which must contain millions of molecules if the eye is to detect them by optical means, which fulfil complicated functions, and which have properties that depend on details of design for ever invisible?

It is here that the X rays put new means of inquiry into our hands. We do not handle them very well as yet; we have to learn to do so. But we have one highly satisfactory source of encouragement. The new science is an exact science; its indications and measurements are not vague and ill-defined in outline; they are arithmetical and precise with a sharpness of definition which we cannot yet use to the full. It is the power of interpreting what is presented to us that lacks development. The ore is rich but we have to find out how to treat it if we are to extract the full value of its contents.

ORDERED ARRANGEMENT OF MOLECULES.

The analysis of structures by X rays rests on two simple facts. The first of these is a most remarkable and widespread tendency in Nature to regularity in the arrangements of molecules. If we did not suspect this before, the X ray analysis has now forced it upon us. The tendency varies in intensity. Although molecules are always drawn together, the agitation of thermal movement may prevent them from settling into position, as, for example, in a molten substance. Or molecules may be surrounded by crowds of other molecules which keep them apart, or even act upon them so as to reduce their mutual attractiveness, as when a substance is in solution. When, however, the tendency is allowed to develop, the molecules pack themselves together according to some regular pattern. Usually the pattern is surprisingly simple; in a very large number of substances two or four or some other small number of molecules are enough to complete the pattern which, repeated through space in all directions, forms the basis of the solid body. Now the solid body is of immense importance. The fluid and gaseous forms of matter have also their importance, and the researches of physics and chemistry have explained to us many of their properties in terms of their composition. But we have known very little of the way in which the properties of the solid depend on its composition; chemistry and physics have been silent on the subject. If solid bodies are always inclined to base their structure on regularity of arrangement during their first formation, and to complete it afterwards when they have the chance, which is indeed the case, it is clear that the regularity must be a powerful factor in the determination of their characters. Such a universal feature of Nature's designs cannot be without purpose and effect. Indeed we are amply familiar with the fact in common practice. The properties of a steel depend greatly on this molecular arrangement; to use a more common phrase, they depend on the state of crystallisation. The so-called "crystal" is nothing more than a body in which this arrangement is carried to such an extent that the result is visible. The metallurgist has long made use of the microscope to study the crystalline condition of his metals and alloys and is fully aware of its fundamental importance. He is now using the X ray methods because they give him much exact information about the crystallisation which he could not obtain before. My hope and expectation is that the biologist will soon be following the same practice; indeed a beginning has already been made.

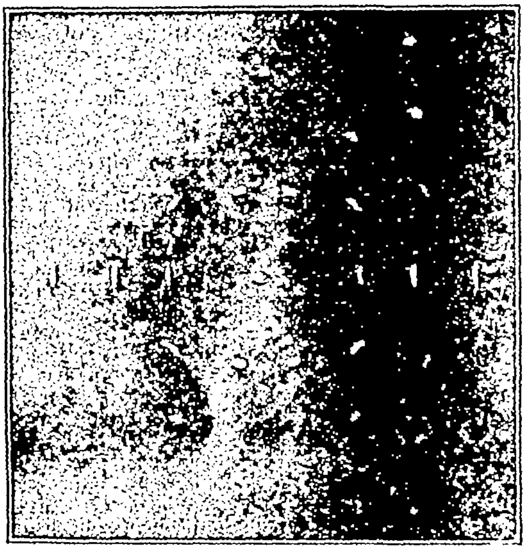
This tendency to arrangement is of universal occurrence. It is the first condition of solid growth. It is quite rare to find that the X rays when applied in the search for it are unsuccessful; and when they fail it is probable that the X ray technique is alone at fault. When molecules begin to group themselves together in many places at the same time, in the same mass of material, and when these nuclei grow into crystals which touch each other, the meeting systems will not generally be in mutual alignment. The body will consist of a multitude of minute invisible crystals irregularly oriented with respect to each other. When these minute crystals consist each of a few molecules only the X rays find it difficult to reveal them. But when a few hundred or even a few score of molecules have joined together in each crystal the task is easy, and the X rays are able, as we shall see, not merely to show the regularity of arrangement which has come about, with various details as to its nature, but also to give a good idea of the size of the aggregates; each of which, it is to be remembered, is invisible even in the microscope. A single crystal weighing as much, say, as a milligramme is at present the ideal body for investigation, but it is not often to be obtained, especially in the case of the constituents of living bodies.

This, then, is our first fact: this universal tendency to arrangement of which we have only lately been able to perceive the extent. It is not merely in the obvious crystal, diamond, or salt, or sugar, or any one of the hundreds of thousands of such examples that arrangement is the basis both of structure and quality, but there is order also in such substances as fats and muscles, hair and wool, cotton and silk, bone and shell. We can already observe even in these bodies cases in which their properties depend on the order of the structure. We infer that the design always has its importance and that it must be studied if we wish to know how the properties of any solid body are related to its composition. The modern study of biochemistry has already made great progress in the establishment of the link between the two sciences from which its name is jointly derived, but the hyphen between the "bio" and the "chemistry" is really a very long one, and this new range of inquiry is part of it.

ORDERED SCATTERING OF RAYS.

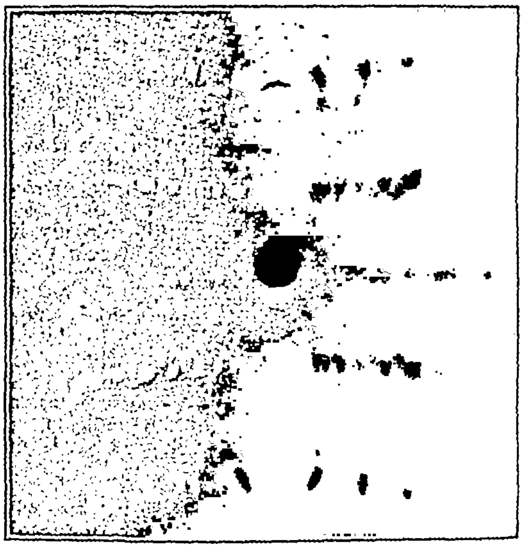
The second fact on which we have to depend is a phenomenon characteristic of radiations such as light or sound. When X rays, which may be described as a wave motion in the ether, pass through a body in which there is regularity of arrangement such as I have been describing, part of the radiation is scattered in a peculiar manner which is characteristic of the arrangement. The scattering does not take place all round; it is sharply confined to a limited number of possible directions. By examining those directions we can determine details of the design. If there is no regularity there is no choice of direction. This is a particular manifestation of the phenomenon of radiation of which I have just spoken. An example or two will serve to make the point clearer.

FIG. 1.



Mannitol.—X ray diagram obtained by Miss T. Marwick using the Laue method. A fine pencil of heterogeneous X rays passes through a small crystal, in this case mannitol, and strikes the photographic plate at the centre of the picture. The regular arrangement of spots is due to the X rays scattered by the crystal according to the principle explained in the text. The design of the crystal is to be deduced from the positions and intensities of the spots. This method of forming the photograph is due to Dr. Laue.

FIG. 2.



Asparagine.—X ray diagram, obtained by W. H. George using the "rotation" method. The X rays are monochromatic, and the crystal is rotated during the exposure. Asparagine is allied to aspartic acid (see the table of wool constituents given later). The network at the back of this diagram is placed there for convenience of interpretation.

We take first a very simple case. We strike a Burmese gong made of a single sheet of metal. It is a beautiful piece of the metal worker's art, and one of its special characteristics is that the sound rings on for a long time because, as a matter of fact, there is very little waste of energy in the material itself. But the characteristic which I would have you note is that you hear it strongly when its broadside is towards you, and only feebly when it is edgeways on. There is a choice of the directions in which the radiation spreads away. The gong is supposed to be struck at one corner, so that it turns rapidly about its cord of suspension, and the rapid alternation of intensity enforces the sound upon the ear. The cause of the choice of direction is the regularity of the timing of the two sources of sound; for there are two sources—namely, the two sides of the gong. Each side is sending out pulses into the air, and, of course, they are in time with each other; when the one is pushing the air away the other is drawing back so that the air follows it. The concentration of the emission of sound in some directions rather than in others is due to this conspiracy of the two emitting surfaces and the regularity of their joint action.

Here there are but two sources of sound and a very simple and rough delimitation of the directions in which the combined effect proceeds. Suppose now we consider a more complicated case. A number of straight lines are drawn parallel to each other, and equally spaced, upon a polished surface. A ray of light falls upon the surface. There is, of course, the ordinary reflection, but in addition feebler beams of light are scattered by the mirror and proceed in certain definite directions. If the lines were ruled anyhow this would not happen. Light would be scattered diffusely; but there would be no chosen direction. The surface of the mirror is now ruled into separate sections, each of which may be considered as a secondary source of light because it scatters part of the main beam, and, because of the regularity of the arrangement, the timing of the various sets of secondary waves is also regular. In the gong there were only two secondary sources which acted together; an optical grating of ordinary pattern contains many thousands. In both cases there is selection of direction, but whereas in the case of the gong the direction of maximum emission was ill-defined, the latter shows very sharply delimited secondary rays. The theory of the phenomenon is well known to the student of physics. There is no need to go into it now; all that has to be observed for our purpose is the fact of the existence of particular directions of radiation when there is regularity of arrangement among the sources of the secondary emission. It will readily be understood that observation of the particular choice of directions supplies information as to the ruling of the lines; in fact, when the lines are spaced widely, the special directions crowd closely in on the principal direction of reflection, and vice versa.

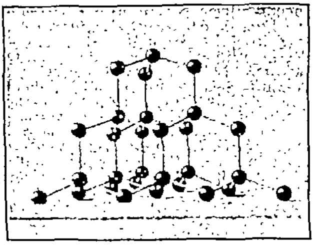
THE X RAY DIAGRAM.

It is now but one step to the X ray case. When the X rays pass through the crystal each electron scatters a minute fraction of the incident radiation; and because the electrons on the average, even after allowing for any periodic or other movements about their main position, show regularities in their arrangement consequent on the regularity of arrangement of the atoms to which they belong, therefore the X rays can be scattered in certain directions only. These directions are related to the arrangement or structure of the crystal, and photographs such as those of Figs. 1 and 2 really contain the full story of the crystal construction. This is the simple basis of the new method of analysis. Up to the present we have made such advances that the simpler patterns can generally be read, though the more difficult often baffle us. But the point to be noted is that the information is there in the photograph, and very precise information at that. The position of every spot has its meaning, and not only the position but also the intensity or magnitude of the spot. It would take far too much of my present allowance of time to show how the interpretation is accomplished; such matters must be left to the text-books of the subject of which many have already been written. I must confine myself mainly to results. One point, however, must be referred to. There is a special reason why this inquiry into the regularity of the crystal is the province of X rays, and not of visible light. The periodicities in the crystal are of the same order of magnitude as the wave-lengths of the X rays—some ten thousand times smaller than the length of light waves. If this were not so the whole business would fail.

APPLICATION TO ROCK STRUCTURE.

It was natural that the first application of the analysis when it appeared some 15 years ago should be made to the simpler and more obvious crystalline structures such as diamond, rocksalt, fluorspar, quartz, and many others. The whole series of the silicates which form the bulk of the earth's crust have lately been analysed, and their curious dependence on oxygen as the fundamental element of their structure has been laid bare. I shall, however, say very little of all these structures, as the substances with which we are now concerned are, broadly speaking, of a different class. The forces which bind the salts together are very patently *electrostatic*. When, *for example, sodium and chlorine* are in juxtaposition each sodium atom loses a negative electron and each chlorine atom gains one. Thus the sodium atoms become electrically positive and the chlorine negative. The rocksalt structure is broadly explained as due to the desire of each negative atom to surround itself with positives and vice versa. This design, which we sometimes call "ionic," is very common in inorganic substances. But in organic substances it is relatively rare.

FIG. 3.

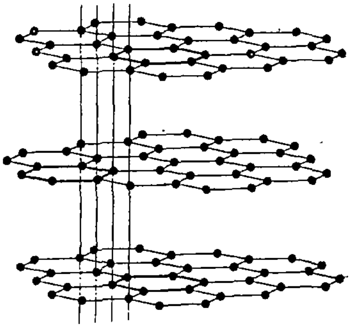


X ray analysis of the structure of diamond; every carbon atom lies at the centre of a tetrahedron at the corners of which lie other carbon atoms.

ORGANIC CRYSTALS.

I will proceed, then, to discuss certain crystals in which the design is more pertinent and typical. I must first take that of the diamond. The X ray analysis shows a very remarkable structure (Fig. 3). Every carbon atom—the diamond, of course, consists of carbon only—is surrounded by four others arranged about it in a tetrahedron, the centre of which it occupies itself. The distance from centre to centre of two neighbouring atoms is 1·54 Angstrom units; a hundred million Angstrom units are equal to one centimetre. The bonds between atom to atom are not the same as in rocksalt; there are here no positives and negatives. The bonds are of a different character altogether, and of far greater strength. When these are the forces that bind the atoms together into groups or molecules the combinations generally offer great resistance to disruption. A diamond may be looked on as one huge molecule of indefinite size and content. Its great hardness is a consequence of its structure. In a substance like naphthalene the ten carbon atoms which it contains are bound together by bonds similar to those found in diamond, and hence arises the stability of the molecule. But in solid naphthalene the molecules are held together by very much weaker bonds of a totally different character, and hence the molecules are easily separated; the substance has a low melting-point.

FIG. 4.



Structure of graphite: carbon atoms linked together in sheets.

Graphite also consists of carbon atoms, but its character is totally different; and we find the explanation when we learn its design. The atoms are now linked together in sheets, as if they lay at the points of wire netting of the ordinary hexagonal pattern (Fig 4). The distance from carbon to carbon is a very little less than in diamond. But the sheets, which are arranged like the leaves of a book, are separated from one another by no less than 3·40 Angstrom units. If we supposed that the carbon atom was a hard sphere having a diameter of one and a half Angstrom units, basing our assumption on the structure of diamond and on the arrangement of the atoms in the separate sheets of graphite, we should be at a loss to know what kept the sheets so far apart. But in fact we have no right to make suppositions of this kind. We do not know what keeps the sheets so far from one another any more than we know what sets the diamond distance at 1·54. We have to accept the fact whether we can give a reason for it or not. But we are not surprised to find that the forces binding sheet to sheet are far less than those that bind atom to atom in the same sheet. One sheet slides over another with the greatest ease; indeed, as we know, graphite is a very excellent lubricant.

In diamond the strong kind of bond holds the carbon atoms together in all three dimensions; in graphite it acts in two dimensions only, a weaker kind keeping the sheets together. We can imagine a third form of structure in which the strong bonds act only in one direction, thus forming strong chains of carbon atoms, while each chain is bound less firmly to other chains. And we find, in fact, that this arrangement is extremely common, especially among the substances that are used in the formation of living bodies.

STRUCTURE OF THE LONG CHAIN MOLECULES.

The simplest known form of such a chain consists of a zigzag of carbon atoms, the two atoms at either end being furnished with three hydrogens and every other with two. The X ray analysis has been applied with great success to these structures, especially by Dr. A. Muller and Dr. G. Shearer at the Royal Institution. It is found that each carbon atom is again at a distance of 1·5 Angstrom units from the next, from which we infer that the strong bond is in action, and that the peculiar zigzag form is such as could be carved out of the diamond. The slanting edges of the model in Fig. 1 show carbon atoms arranged in this zigzag form. The distance between a carbon atom and the next but one is 2·52 units. In fact, there is a strong though not complete likeness between the three structures. This particular form of chain is, of course, known as a paraffin. The regular periodicity of 2·52 Angstrom units along its length and the less perfect periodicity of 1·26 units are the regularities of arrangement which the X ray analysis at once reveals.

The chemist has shown us that these carbon chains are also to be found with many varieties of terminal. If we take away one of the three hydrogen atoms from one end and substitute an oxygen with a hydrogen attached to it we have an alcohol; if we take away the remaining two hydrogens and replace them by a single oxygen we have a "fatty acid." Changes may be made also on the sides of the chains; an oxygen may be attached in place of two hydrogens forming a so-called "ketone," and so forth. There is an immense number of different molecules, some long, some short, fringed and terminated in different ways, but always there is the backbone of the single line of carbon atoms, joined by the strong diamond bond. It is a strange thing that different plant products should have place in their constitutions for chains of characteristic length, as for instance palmitic acid, the fatty acid with 16 carbons, which is found in palm oil, valeric acid with five carbons in valerian root, and so on.

We are now, of course, approaching the range of structures found in living bodies; the long carbon chain is characteristic of all fats and oils.

CELLULOSE.

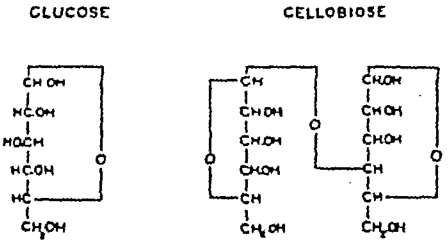
The initial successes of the X ray analysis in giving us the accurate geometry of some organic substances, and in particular the long chain compounds, has led to its tentative application in some difficult cases where an answer would be of great scientific or industrial value. It was natural that an early attempt should be made to investigate the structure of cellulose. The problem was especially difficult because the crystals of cellulose are so minute; the arrangement which X ray analysis depends on for its usefulness is present in the cellulose mass, but the mass consists not of one crystal, but an immense number of small crystals in disordered array. This adds greatly to the difficulties of the X ray technique. Moreover, the chemistry of cellulose had not, when the work began, been perfectly worked out; and it is a great help to the determination of structure if the composition of the molecule is first known. Nevertheless, the persistent attacks on the problem seem now to have attained success, at any rate as regards the more important features of the design. There may be modifications of detail yet to come. This work is largely due to H. Mark and his collaborators, first at the Kaiser Wilhelm Institut in Berlin and recently at the research laboratories of the I.G. Farbenindustrie Aktiengesellschaft at Ludwigshafen.

The solution of the cellulose problem is a step on the way to the more complicated cases of wool, hair, and muscle. Let me therefore sketch very briefly the present position of the cellulose investigations. In this I am following Mark's account, versions of which are to be found in various German journals, scientific and industrial.[1] Other cellulose workers, for example, K. Hess and his collaborators, are not in complete agreement as to the interpretation of the results so far obtained. But my present purpose is rather to show how the research is being pushed forward than to give a critical examination of the various methods of procedure.

GLUCOSE.

Mark assumes the structure of the glucose molecule as suggested by Prof. Haworth of the University of Birmingham. According to the conventions of chemistry it is expressed so:—

FIG. 5.


GLUCOSE CELLOBIOSE

The backbone of the molecule is the chain of six carbon atoms joined together by diamond bonds. The diagram shows a curious linking of the first atom of the chain to the fifth by way of a single oxygen. If we would picture to ourselves the actual arrangement in space of the atoms in the glucose molecule, we must imagine that the major portion of the carbon chain is bent round as to form, with the oxygen, a hexagonal ring. We are quite familiar with carbon chains which are bent round to form rings: the immensely important case is the six-membered ring of benzene. The enormous development of organic chemistry rests largely on the discovery of the benzene structure, and it is an essential portion of the chemical theory that the atoms of the ring are bound together by very strong bonds. It is not surprising, therefore, that X ray analysis of benzene derivatives has found a centre-to-centre distance in the ring which agrees very closely with the corresponding distance in diamond—viz., 1·5 A.U. (Angstrom Units). The centre-to-centre distance in the combination of carbon and oxygen can also be determined from the X ray investigation of various substances, such as calcite, where the oxygens and carbons are strongly tied together. It varies from 1·2 to 1·3. It is important to observe that centre-to-centre distances can be expected to be similar only under similar circumstances. When oxygens lie close together, as in the silicates, but are not tied together by bonds of the strong sort, they behave as comparatively large spheres having a diameter of 2·7 A.U. My son and his colleagues at Manchester have shown that these large oxygen atoms are packed tightly together to form the bulk of the earth's crust, being held together by the relatively smaller atoms of silicon, aluminium, magnesium, and others.

In the glucose ring we should expect the oxygen atom to behave as a smaller atom, as it does in substances where it is equally tightly bound. The glucose ring, according to the diagram of Fig. 6, must have much the same dimensions as the benzene ring.

Two glucose molecules combine, according to Haworth, to form one molecule of cellobiose, in a manner represented by the formula. The join is effected between the first carbon atom of one ring and the fourth of the other. One oxygen and hydrogen pair, a so-called hydroxyl group, on each of these atoms is broken up; two hydrogens and one oxygen are removed, forming a molecule of water, and the remaining oxygen is the link between the two chains.

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[1] For example, Die Struktur der Zellulose und ihre technische Auswirkung, Melliand Textilberichte, Heidelberg, 1929, Nr. 9; or Über den Bau des Krystallisierten Anteils der Cellulose II., Zeit. Phys. Chem., Abt. B, Bd. 2, Heft 1–2.

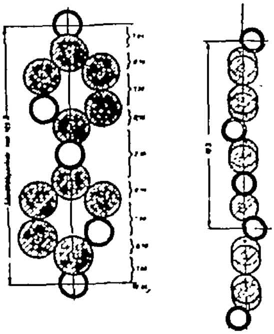
We may represent this by the model shown in Fig. 6 which is due to Mark, the dimensions of the model being in accord with previous X ray work on other substances.

In exactly the same way other glucose molecules may be connected up with the cellulose pair, and in fact a long chain may be formed resembling the simple carbon chain in the existence of strong linkages all along the line, though the links themselves are more complicated. The dimensions of the structure are shown in the diagram; there is a perfect periodicity of 10·3 A.U. along the line, and an imperfect periodicity of half that amount. Any one ring can be made to coincide with its neighbour by moving it 5·15 A.U. along the line and turning it round the line through 180°. There is, in crystallographic language, a screw axis.

This structure, we must remember, is arrived at by combining Haworth's chemical determination with the results of X ray measurements on the diamond and other crystals. The next step is to bring the X ray analysis to bear on the structure itself.

An X ray diagram is not so easily obtained from cellulose as from a substance more simple in its crystallisation, but careful technique has finally given results which are sufficient for the test of the supposed structure. It is found that agreement is excellent. The X ray diagram of a substance built of cellulose—e.g., ramie fibre, shows a perfect periodicity of 10·3 A.U., an imperfect periodicity of half that amount, and a screw axis. There is, therefore, good reason to suppose that the structure of Fig. 6 is actually existent in cellulose.

FIG. 6.



Model of cellobiose.—Shaded circles represent carbon atoms; oxygen atoms are drawn as double rings to show the limits between which their diameters probably lie. This model, due to Mark, shows two glucose rings, stripped of atoms unessential for the purpose of showing the method of combination, and joined together by an oxygen to form the kernel of the cellobiose molecule. Two views of the model are shown. It should be compared with the diagram of Fig. 5.

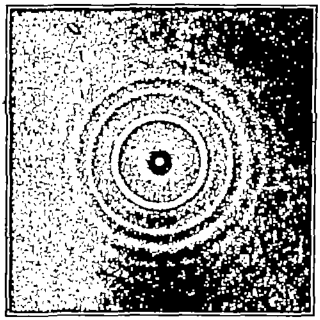
CHAINS TO CRYSTALS.

But the picture is not yet complete. In what way do these long chains combine to form the minute crystals? If we go back to the simple carbon chains we find them arranging themselves side by side, like cornstalks in a field; a sheet is formed in which the long molecules lie transverse to the sheet. The whole crystal is formed of many such layers lying on one another like the leaves of a book, as we found in graphite. Usually a mass of such a substance as stearic acid consists of a multitude of little crystals formed in this same way, the separate crystals lying in disorder with respect to one another. A single crystal, or perhaps one should say a mass of crystals nearly aligned to one another, is not easy to find, but, when found, is of great assistance to analysis. Good single crystals of stearic acid have actually been obtained and examined, so that the structure is well known. The chains of stearic acid are all of the same length and the layering is perfect. I ought to add that it is when we have such combinations of chains into single crystals that the X ray effects are most observable and valuable.

We are led to expect something of the same kind in cellulose, and it is actually found to exist. Cellulose chains do lie side by side in little bundles. The X ray diagrams tell us that there are periodicities not only along the chain but also in the side-by-side arrangement of the chains. The diagram of Fig. 6 shows the design of the structure and the dimensions as given by Mark.

It is possible to go one step further, and to find in the X ray diagram some information as to the size of the bundles in which these regular chains are arranged in regular fashion. This is done with the help of a certain principle of optics. If the spots in the diagram are sharply defined the minute crystals must be big enough to contain thousands of molecules, but when the number is small the spots are diffuse. From the appearance of the spots Mark deduces that there may be twenty to fifty links in each chain and that some dozens of chains go to the making of a bundle. The bundle corresponds to what has been called a "micell." Our picture is now fairly complete. The atoms form the glucose rings; the rings are linked together by strong bonds into a chain; the chains are drawn together side by side by much weaker forces; and a bundle of chains forms a micell.

FIG. 7.



Cystine.—This kind of diagram, due to W. T. Astbury, is typical of a substance consisting of a multitude of very small crystals, not arranged with respect to each other.

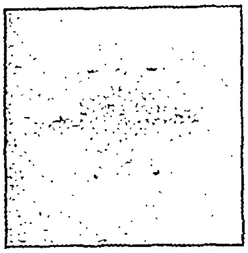
If a fibre is thus composed we should expect that when it is stretched the bundles are brought more or less into line. The X ray diagram shows at once that this is the case. When a fine pencil of X rays is passed through a specimen in which the crystalline bundles lie anyhow, rings are formed upon the photographic plate, as in Fig. 7, but when the fibre is stretched in a direction at right angles to the X ray pencil the direction of stretching must be somehow reflected in the picture, and indeed we find the rings drawing themselves together into spots along their circumferences until finally we obtain a diagram of spots approaching to the effect shown in Fig. 2, which it will be remembered is due to a single crystal.

STRETCHING OF FIBRES.

When a stretching force is gradually applied to a fibre there is, for small forces, a complete recovery as soon as the stress is removed. The small bundles are being pulled into alignment, but not so as to break any attachments. As the force increases some of the attachments are broken, but the bundles now get the benefit of lying more nearly parallel to one another and so of being in better position to exert their sideways attachments; in this way the increasing stress is resisted. But when all has been done that can be done in this way, a still larger stretching force will cause the bundles to slide past one another like threads that have been dipped in some sticky fluid. The substance *flows* and finally breaks.

It is clear that to pull a bundle in two would require the breaking of the strong bonds in the separate chains; if this marked the limit of the strength of the fibre it would, as Mark has pointed out, be many times as strong as steel. And why not? The links between atom and atom in a diamond are usually much more difficult to break than those between the atoms of a metal. A fibre breaks for a different reason—namely, that the side attachments of the chain and bundles are not able to prevent the chains from sliding past one another. It is strange to think that the spinning of a thread, which is designed to place the fibres in such a way that they resist being drawn past each other, is exactly what is done on an exceedingly minute scale in the structure of the fibre itself.

FIG. 8.



X ray diagram of mercerised cellulose.—This diagram, due to R. Andress, is similar in character to that of Fig. 2; it has comparatively few spots because the cellulose material does not present the simple problem of the single crystal. If it is examined carefully it will be observed that many of the spots are drawn out horizontally, but not vertically. The interpretation is that during mercerisation the long chains are pushed away from one another by varying amounts because foreign molecules wedge them apart. The chains themselves are not broken.

It would take too long to describe how on this point of view the effect of wetting alters the strength of a fibre; how the mercerisation of cotton pushes the chains apart without altering their length (see Fig. 8); why it was difficult in the first manufacture of artificial silk to avoid unevenness in gloss and in receptivity to dyes, and many other more or less complete explanations of industrial problems.

Let me now proceed to consider what has been done towards the application of the X ray methods to animal substances. Cellulose occurs in animal as well as vegetable structures, and is found to have the same form in both. Leaving this on one side we come to a vast range of substances which make up the living body, and if the X rays can show anything at all we are obviously in front of a series of very interesting researches.

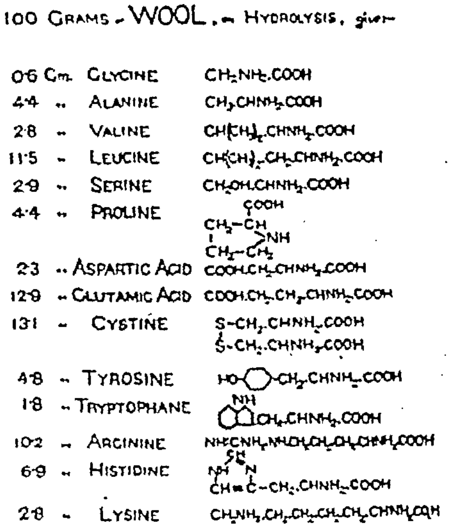
HAIR AND WOOL.

Just as the X ray examination of cellulose has been pressed forward in order to obtain a better understanding of the properties of cotton and artificial silk, so also, in the interests of the textile industries, it has been applied to the study of hair and wool. The problem is far more difficult because the animal fibres are complicated mixtures of many constituents. Below is a list of the substances obtained from the hydrolysis of wool; I owe it to Mr. W. T. Astbury, of the Textile Research Department of the University of Leeds.

The complexity of this list shows at once why the work with wool is not so far forward as in the case of cellulose. Enough has been done, however, to show that apart from characteristic differences there is a great similarity in the general behaviour and construction of the two.

To begin with we have the well-known fact that the behaviour of the two classes of fibre under stretching forces are very much alike. There is the same reversible effect for small forces, and the same region of irreversible effect for larger forces. The effect of moisture and of heat are in the main parallel. It is true that wool has a greater power of recovery, and that wetting has a peculiar power of facilitating recovery, as if water could act as a lubricator, removing certain frictional effects and allowing the restorative forces to act. But such differences may readily be ascribed to the known differences in composition. If the physical properties of cotton are explicable on the hypothesis of micells composed of long chain molecules, it would be difficult to ascribe the behaviour of wool to some entirely different mechanism.

But apart from this general conclusion, the X ray evidence argues strongly in the same direction. It is possible to obtain X ray photographs with single fibres of hair and wool, and these show the same characteristics as cellulose. There are obviously small bundles of arranged molecules. Sometimes the bundles may show much disorder of arrangement, but in general the stretching of the fibre is accompanied by changes in the photograph which show an increasing alignment. Some of the spots on the photographs become very clear as the tension is increased, and Astbury finds that these indicate a size for the unit of pattern which has also been found in natural silk. This may possibly be due to the fact that two of the amino-acids of the table—viz., alanine and glycine—are found in silk also. The fine X ray photograph of cystine which Mr. Astbury has sent me contains three lines which agree with those found in wool. In general, the X ray photographs show just the same sort of changes where wool is stretched, or wetted, or chemically treated as appear in the cellulose photographs, allowing for the greater complexity of the case. Clearly there is an immense amount of work yet to be done before each of the wool constituents can be examined as to its structure, but there can be no doubt that in general there must be the same kind of arrangement in wool as in cotton. And what is found in wool and hair will surely be found in nerve and muscle.



100 GRAMS - WOOL. - HYDROLYSIS, gives

0·6 Gm.	GLYCINE	$CH_2NH_2.COOH$
4·4 ,,	ALANINE	CH_3CHNH_2COOH
2·8 ,,	VALINE	$CH(CH_3)_2.CHNH_2.COOH$
11·5 ,,	LEUCINE	$CH(CH_3)_2.CH_2.CHNH_2.COOH$
2·9 ,,	SERINE	$CH_2OH.CHNH_2.COOH$
4·4 ,,	PROLINE	$COOH$ CH_2-CH $>NH$ CH_2-CH_2
2·3 ,,	ASPARTIC ACID	$COOH.CH_2.CHNH_2.COOH$
12·9 ,,	GLUTAMIC ACID	$COOH.CH_2.CH_2.CHNH_2.COOH$
13·1 ,,	CYSTINE	$S-CH_2.CHNH_2.COOH$ $S-CH_2.CHNH_2.COOH$
4·8 ,,	TYROSINE	$HO-\bigcirc-CH_2.CHNH_2.COOH$
1·8 ,,	TRYPTOPHANE	NH $CH_2.CHNH_2.COOH$
10·2 ,,	ARGININE	$NH:CNH_2.NH.CH_2.CH_2.CH_2.CHNH_2.COOH$
6·9 ,,	HISTIDINE	CH $NH \quad N$ $CH=C-CH_2.CHNH_2.COOH$
2·8 ,,	LYSINE	$CH_2NH_2.CH_2.CH_2.CH_2.CH_2.CHNH_2.COOH$

A COMMON PRINCIPLE.

The suggestion forces itself on the mind that one and the same principle is in constant use by Nature to form living tissues which have strength and resilience, which may also be overstrained and finally broken. The adjustment of the means employed is a very striking feature of the scheme. Along the molecular chain strong bonds, of the same class as those that make the diamond, hold the links together and give the chain comparative permanency; lesser forces bind the chains into ordered bundles or micells and the micells into the general mass. I think we may justly say that we have now in our hands a method of analysis which has not only confirmed previous results in a novel manner but has opened up new ways for the study of living matter.

THE ÆTIOLOGY AND PROPHYLAXIS OF POST-ANÆSTHETIC SICKNESS.*

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EVERY anæsthetist must be conscious of the rapid progress which surgery has made in recent years. It is true that anæsthetics made modern surgery possible, but surgical technique to-day has outstripped anæsthetic technique and, it seems to me, threatens to leave our specialty behind.

Some of the delay in post-operative convalescence and a percentage of post-operative mortality might quite properly be assigned to the after-effects of the anæsthetic and its administration, and modern surgeons at home and abroad are turning to local and regional methods of anæsthesia in an endeavour to avoid the evil after-effects of general anæsthesia upon the patient. The clamant demand of surgery is for an anæsthesia which will at least not militate against the post-operative convalescence or recovery of the patient. It is obvious that if the status of the anæsthetist is to be raised and the importance of anæsthetics recognised by the surgical world and the public, then the anæsthetist must accept a larger share of responsibility for the surgical patient both before and after anæsthesia.

Vomiting.

The chief factors involved in the act of vomiting are: (1) violent contraction of the diaphragm and of the muscles of the abdominal wall; (2) violent contraction of the muscular fibres of the stomach with relaxation of the cardiac sphincter; and (3) reversed peristalsis in the small intestine, giving rise to relaxation of the pyloric sphincter and the passage of bile and intestinal contents into the stomach.

The vagus, phrenic, and spinal nerves as well as the sympathetic are intimately concerned in the act of vomiting. In retching the same parts come into play, except that the cardiac sphincter does not relax and there is no violent contraction of the muscular coats of the stomach.[1 2 3] Nausea is the sensation of sickness which precedes the act of vomiting. It is caused by an increased tension in some part of the alimentary tract; if this tension increases to the extent of producing pain, the nausea culminates in vomiting.

Post-anæsthetic sickness and retching occur as the result of irritation of the vomiting centre in the medulla by stimuli from three main sources: (1) the direct action upon the vomiting centre of toxins circulating in the blood stream; (2) the indirect action of reflex stimuli which reach the vomiting centre through afferent nerve-fibres in the stomach, intestine, peritoneum, bronchi, and special senses, and those set up by pathological conditions in the patient; and (3) the influence of the higher brain upon the vomiting centre. This last varies widely in individual cases and is very difficult to estimate, but evidence is accumulating to show that the faculties of emotion, imagination, anxiety, and reason may create such a disturbance during the pre-anæsthetic period as to excite active sickness in the post-anæsthetic period.

Even the mild type of post-anæsthetic sickness is of the highest importance to the patient, the surgeon, and the anæsthetist for the following reasons:—

(a) It is a source of much post-operative discomfort, misery, and distress to a considerable percentage of patients, especially after abdominal operations.

(b) In the mind of the patient it is frequently the most serious objection to any future surgical interference.

(c) It frequently prolongs convalescence and may actually turn the balance against recovery. There is little doubt that vomiting is an important element in the production of post-operative adhesions and hernia. These are usually difficult cases both to the anæsthetist and the surgeon.[4] The peritoneum may have been difficult to close and, as the result of some such effort as vomiting, a piece of omentum bulges through, ultimately forming a ventral hernia or, with further effort, a rupture of the abdominal wound.

(d) It is a familiar sequela of every anæsthetic agent, even gas-and-oxygen, and may follow any method of administration: endotracheal, colonic, spinal, and local infiltration.

(e) It is a standing reproach to anæsthetics and the anæsthetist, and not less to surgery and the surgeon. The subject has not received from any member of the surgical team the attention it deserves, and as a consequence our knowledge of how to recognise, in the individual case, the factors which predispose to post-anæsthetic sickness is very circumscribed, while our treatment is empirical and largely devoted to curative rather than to preventive measures.

In my experience there are four outstanding predisposing factors to post-anæsthetic sickness—namely, the psychic element in the patient, the preoperative preparation, the anæsthetic agent and its administration, and surgical trauma.

The Psychology of the Patient.

The influence of the phenomena of the mind is present throughout the conscious, subconscious, and unconscious state of anæsthesia, and the personal peculiarities of physical and mental organisation known as temperament—in the one case phlegmatic and in the other emotional—dominates, in many patients, the whole pre-anæsthetic, anæsthetic, and post-anæsthetic period.

1. *The Pre-anæsthetic Period.*—It has been stated that "dread of the anæsthetic is the arch-enemy of the anæsthetist,"[5] but much more is it the arch-enemy of the patient. The effect of apprehension, fear, dread, or anxiety regarding the operation or the anæsthetic, and their success or failure, is underestimated. Much will depend upon whether the particular emotion has been expressed or repressed during the pre-anæsthetic stage.[6] If the former, it may be confidently expected that the post-anæsthetic effects will be reduced to a minimum, whereas in the latter they are usually increased to a maximum. The unusual environment of the hospital or nursing home disturbs the patient's mental equanimity in no ordinary degree. This emotional state engenders anorexia, with much diminished carbohydrate consumption. It inhibits the secretory function of the gastro-intestinal tract and its concomitant glands and impairs digestion, assimilation, and motility.

Glycosuria is not uncommon in the pre-anæsthetic period. It may be first detected on the morning of the operation. If the urine contained no sugar on previous examinations it may be taken that the sudden appearance of glycosuria is due to pre-anæsthetic emotional metabolic disturbance. It is held by psychologists and physiologists that the primary cause is an emotional stimulation of the suprarenal glands with an excessive secretion of epinephrine[7 8] which, on the one hand, depresses the gastro-intestinal function and, on the other, excites an abnormal breaking down of liver glycogen with resulting hyperglycæmia and glycosuria.

Pain—acute, continuous, or recurrent—controls in a remarkable degree the psychic element in the surgical patient. It appears to increase the safety and simplicity of general anæsthesia and to modify the after-effects.

This explains why obstetric patients are anæsthetised so easily and recover so well. In the surgical patient anxiety arises partly from fear that the surgeon may commence the operation before they are properly asleep or that they may not wake out of the anæsthetic, and partly from dread of what may be found at the operation or that they may not recover. This mental agony may have continued for several days. In obstetrics and to some degree in emergency surgery the opposite condition prevails. Here the anxiety is to get an anæsthetic to relieve the pain; the patient is confident not only that she will waken but that when she does her pain and trouble will have disappeared.

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* Being the presidential address to the Scottish Society of Anæsthetists on Oct. 26th, 1920.

2. *The Anæsthetic Period.*—The ordeal to a patient of entering an anæsthetic room and meeting there for the first time the anæsthetist—a person about whom the patient was not consulted, probably never saw before, and whose name conveys nothing—has to be experienced to be understood. From the practical, humane, and economic point of view there can be no doubt that a visit from the anæsthetist on the day preceding the operation, the examination and assurance that all is well for the anæsthetic, a friendly greeting when the patient arrives in the anæsthetic room, and a word of encouragement as he halts on the brink of oblivion do much to create and maintain the anæsthetic equanimity so essential to the well-being of the patient before, during, and after operation.

The sensation of tension in the head or of suffocation or of strangulation which may occur in the early stage of the induction is a very real and dramatic one. It gives actual form to the emotional apprehensions of the pre-anæsthetic stage and creates the mental impression of impending disaster. The climax is reached in the second stage of the induction when acute brain-storms break over the patient. These are expressed in sudden excitement, active resistance, and rigidity followed by depression and exhaustion of the vital medullary centres. Is it surprising that the psychologist is interested to known what the post-anæsthetic effects of these profound impressions are and whether there are any prophylactic measures which might reasonably be taken to protect the patient?

For practical purposes the conscious mind, the sensation of pain, and the cortical reflexes are out of action during surgical anæsthesia. On the other hand, it appears that the subconscious and unconscious mind of a patient under surgical anæsthesia may be abnormally active and alert. I have frequently noted that in the course of even a short anæsthetic, years of personal history, long forgotten or recent, pleasant or otherwise, may be reviewed by the patient, with corresponding consequences in the returning consciousness. The normal control of the spinal reflex by the upper neuron is in abeyance during the early stage of surgical anæsthesia, and the knee-jerk and ankle-clonus are both exaggerated. Ether tremor arises in the same way and all three disappear in deep surgical anæsthesia, to become exaggerated again in the early recovery stage of anæsthesia. In surgical anæsthesia the optic thalamus forms an important subcortical station for the reception of sensory stimuli, especially those of pain and visceral sensation. The shrugging of the shoulder —usually the left—the local muscular rigidity which frequently occurs in exploration of the upper abdomen, and the moaning and sobbing which may accompany exploration of the female pelvis arise from local sensory stimuli which reach the optic thalamus and produce a passive protest against indelicate handling of the abdominal or pelvic contents.

These points have been emphasised to show that processes of nerve excitement and exhaustion, begun in the pre-anæsthetic period, may continue and gain force throughout surgical anæsthesia and cause profound disturbance to convalescence.

3. *The Post-anæsthetic Period.*—Sickness and vomiting often occur in the subconscious stage of the return journey from unconsciousness in anæsthesia. Every anæsthetist is familiar with the clinical picture of approaching sickness upon the table. This subconscious vomiting is probably due either to the awareness by the cortical brain cells of stimuli which reach them from the operation area or to the lesser influence of the anæsthetic on the medullary centres. The patient has no consciousness or memory of this vomiting on the table.

Local infiltration of the operation area with ¼ per cent. or ½ per cent. novocaine appears to protect the patient against stimuli reaching the vomiting centre, even when the ocular reflexes have returned. I have often observed in the process of de-etherisation that patients who have had novocain show clinical signs of approaching sickness much less frequently than those who have had no infiltration analgesia. The more rapidly the patient is de-etherised the more likely is retching or vomiting to occur upon the table and to discontinue thereafter.

Much more frequently vomiting occurs first in the conscious stage of the recovery from anæsthesia and recurs at intervals during 12–24 hours. Children are less liable to post-anæsthetic sickness than adults, and infants less than children. Several factors may account for this. In infants and children the preparation for anæsthesia is much less an interference with Nature, the condition demanding surgical intervention is more often the only pathological process at work, and the psychic disturbance during the pre-anæsthetic period is much less pronounced, since emotion, imagination, and anxiety are immature. Gas-and-oxygen is much more often the anæsthetic of choice, and the duration of the anæsthesia and the surgical trauma are on an average less than in adults. Probably the most important factor is that in infants and children the central nervous system is less specialised, and the higher brain neither receives nor redirects afferent stimuli to the same degree as in adults. Animals rarely suffer from post-anæsthetic sickness, irrespective of the anæsthetic agent or the duration of the anæsthesia (Table I.).

TABLE I.—*Sickness in 500 Cases.*

250 children.	Under 1 year.	1–2 years.	2–5 years.	5–12 years.	Total.
No. of cases	40	42	66	102	—
No. sick	5	8	12	15	16 per cent.
Male	3	3	7	7	20 cases.
Female.. ..	2	5	5	8	20 „

250 adults.	12–18 years.	18–35 years.	35–50 years.	Over 50 years.	Total.
No. of cases	45	95	65	45	—
No. sick	30	80	40	25	70 per cent.
Male	16	42	21	10	89 cases.
Female.. ..	14	38	19	15	86 „

Preoperative Preparation.

In the preparation of the surgical patient there is a misdirected zeal which dies hard. The nearer the patient can be brought to or allowed to remain in the normal standard of physiological efficiency, the easier and less interrupted will the convalescence be. One of the surest methods of reducing a patient's vitality and resistance to infective processes is to subject him to purgation, enemata, and starvation. It is the proverbial burning of the candle at both ends.*

Purgation.—In recent years our views regarding preoperative aperients have undergone considerable change, but in my estimation they are still drastic and require further modification. If the patient has had a regular daily stool, then the less the normal is disturbed the better, both upon the operation table and during convalescence. There is no objection to a mild aperient such as cascara, compound liquorice, or milk of magnesia 48 hours before operation, but any complete or watery evacuation of the gastro-intestinal tract, such as results from castor oil or sulphate of magnesium, promotes conditions which tend to handicap the patient, the surgeon, and the anæsthetist; more especially if the aperient is given, as so often happens, 12 hours before operation. A drastic aperient given to a patient in the unusual surroundings of the hospital or the nursing home not only disturbs and actually interrupts the rest and sleep so essential to normal physical vitality, but agitates the mind and dissipates the nerve energy which should be conserved for what may be the ordeal of his or her life. It irritates the mucous membrane of the intestinal tract and renders it red and swollen, while the gut may be empty and collapsed or distended with gas, the worst possible conditions for surgical intervention and technique. Further, it depletes the body of essential fluid containing chlorides. It hurries partially digested food along the intestinal tract, producing fermentation, tympanites, abdominal distension, and much discomfort. It produces excessive peristalsis, exhausts the muscular coats of the intestine, and is a fruitful cause of paralytic ileus.

Enemata.—There is no part of the preoperative preparation which more disturbs the psychic balance of the patient than the time-honoured enema, which often seems to be considered the necessary complement to drastic and complete evacuation of the gastro-intestinal tract. By the majority of patients the *enema is anticipated with dread, borne with patience* and courage, and remembered with apprehension. An enema on the morning of the operation not only curtails the patient's rest and sleep but stimulates and exhausts the lower bowel. Apart from rectal cases, it is difficult to follow the rationale of this measure in the routine preparation of surgical cases, *and I am of opinion that except in special cases it is* definitely detrimental to the best interests of the patient.

Has the surgeon any views upon the matter, or has the anæsthetist? If so, why is such an important item in the preoperative preparation of the patient left largely to the discretion of the nursing staff? *My own view*, as an anæsthetist, is that drastic evacuation of the gastro-intestinal tract and irritating enemata not only reduce the surgical patient's physical and nervous vitality and thus delay convalescence, but are potent factors in the causation of post-anæsthetic nausea, vomiting, tympanites, and paralytic ileus.

Starvation.—Any considerable modification of the preoperative diet or nutrition of the patient, such as tends to produce inanition or disturb metabolism, is highly detrimental to post-anæsthetic convalescence. The inanition may arise in several ways. It frequently happens that food has been withheld or that there is no appetite, or that the food is taken and promptly ejected, or that the power of digestion and assimilation is temporarily altered. There is no question about the power of the mind over the processes of digestion and absorption, and even the suggestion of an anæsthetic or of an operation is sufficient in some people to produce anorexia, immotility of the alimentary tract, and defective digestion of its contents.

I am convinced that in many cases too little time is spent by the nursing staff in attempting to coax or persuade the surgical patient to take food. It may not be good manners but it is certainly good policy, for food is the agent which produces normal gastro-intestinal peristalsis; it should be given in abundance and in an easily digested, semi-solid form right up to within a few hours of the time of operation. Carbohydrates have a much greater preoperative and post-operative food value than proteins, and yet the cup of beef-tea or bovril is offered when a teaspoonful of glucose or a cup of weak tea with plenty of sugar would do infinitely more good. The absorption of carbohydrate commences almost as soon as it is taken, and it has been shown that the amount of sugar absorbed per hour is constant for four hours if a sufficient quantity has been given.[10]

One of the conditions which definitely alters the absorption of carbohydrate is starvation. The coefficient of absorption of carbohydrate after 24 hours' starvation was found experimentally to be 0·266 g. per 100 g. of body-weight per hour, whereas after 48 hours' starvation this figure was reduced to 0·178 g. per 100 g. of body-weight per hour.

Any deficiency of carbohydrate in the diet rapidly causes a diminution of the glycogen stored in the liver. It appears that this depletion of the liver glycogen is but a temporary phase and that the glycogen content rapidly increases and remains more or less constant throughout the period of carbohydrate deficiency. The loss of liver glycogen is presumably made good from the storage of glycogen in the muscles and from the *protein of the tissues.* It is at this stage and in this way that the general metabolism of the surgical patient is first disturbed. The complete oxidation of fat depends upon the normal carbohydrate content of the blood and tissues. As a result of the incomplete oxidation of fat, oxybutyric and diacetic acids are produced with acetone as a by-product. Any degree of ketosis is generally recognised as an exciting factor of post-anæsthetic sickness.

Many surgical patients appear to be the potential victims of a vicious circle before they reach the operation table: (1) starvation and purgation producing hypoglycæmia; (2) hypoglycæmia causing incom*plete oxidation of fat*; (3) the products of incomplete oxidation of fat causing ketosis; (4) ketosis possibly causing post-anæsthetic sickness; (5) vomiting producing hypoglycæmia.

The Anæsthetic Agent.

The anæsthetic agent has too long been made the *scapegoat of post-anæsthetic sickness, whereas it is* at most only an isolated factor in the ætiology, and in many cases has no responsibility. There are patients who tend to have post-anæsthetic sickness irrespective of the agent used to produce anæsthesia. They belong to the highly emotional type whose endeavours are concentrated upon concealing their dread and apprehension of *the operation* and the anæsthetic and who volubly express their complete indifference to both. Bitter experience has taught me to regard their repressed emotion with suspicion; in the language of Shakespeare, "methinks the lady doth protest too much." Here is the record of such a patient.

A female, aged 50, was to have perineal repair and hysteropexy done in two stages. Every precaution was taken in her preparation. She indulged in loud laughter, and emphatically asserted that she was pleased to have her anæsthetic and operation. It was an easy gas-and-oxygen anæsthesia with a trace of ether, but she was actively sick for three days. Two weeks later the hysteropexy was done. Increased precautions were taken against a repetition of the sickness and the patient expressed, with much laughter but no tears, that she had neither dread nor fear of the anæsthetic or the operation. Gas-and-oxygen plus ether was given and as on the previous occasion she was very sick for two days. Examination of the urine, vomit, and blood gave no clue to the ætiology, and I was forced to the conclusion that this was a case of repressed emotion irritating the medullary centres and producing post-anæsthetic sickness.

There is another type of patient who suffers post-anæsthetic sickness with local infiltration or regional analgesia but not with a general anæsthetic. This type has a dread of being awake during the operation, and the nerve tissue suffers immeasurably more irritation with local or spinal than with a general anæsthetic (Table II.).

TABLE II.—*Anæsthetic Agents and Method of Administration.*

250 children.	E.	Ethyl chloride+E.	N_2O+O_2 +E. Bag.	N_2O+O_2 +E. Endotracheal.	N_2O+O_2. Bag.
	Open or perhalation.				
No. of cases	25	20	145	30	30
No. sick ..	10	10	15	2	3

250 adults.	E.	Ethyl chloride+E. Perhalation.	N_2O+O_2 +E. Bag.	N_2O+O_2 +E. Endotracheal.	N_2O+O_2. Bag.
No. of cases	50	100	50	40	10
No. sick ..	45	92	23	10	5

In general hospital anæsthetic practice the agents most frequently used are ether (open, perhalation, closed, colonic, or endotracheal), or ethyl chloride and ether, chloroform, gas and oxygen with or without ether, local infiltration of novocain, or spinal analgesia. The largest percentage of post-anæsthetic sickness occurs after some form of ether anæsthesia. There are various ways in which the anæsthetic agent may predispose the patient to sickness, and the particular system through which the vomiting centre is stimulated is largely determined by the susceptibility of the individual. In one case it may be by the direct toxic action of the anæsthetic agent carried by the blood stream to the vomiting centre in the medulla. In another it may be by afferent stimuli which reach the vomiting centre through nerve-endings in the stomach and bronchi or the organs of taste and smell.

Evidence is accumulating that in all cases of general anæsthesia the quantity and quality of the internal secretions of such organs as the suprarenals, the pituitary, the liver, the pancreas, and the thyroid are much disturbed before, during, and after the administration.[11 12] For example, an ether anæsthesia stimulates the suprarenal glands and they secrete an excess of epinephrine which stimulates the breaking down of the glycogen in the liver, resulting in a hyperglycæmia which may overcome the renal threshold and cause glycosuria. In a series of estimations of the blood-sugar before, during, and after ether anæsthesia I found that it gradually rose from the normal level, 0·1 per cent., to 0·2 per cent. and even 0·25 per cent., and remained at this high level throughout the administration. There was no evidence of any reduction of the percentage of blood-sugar during prolonged anæsthesia and it only very slowly came back to normal on cessation of the anæsthetic. It has been demonstrated by experiment on animals that the injection of adrenalin will produce hyperglycæmia and that the hypoglycæmia which arises from the injection of insulin, when the carbohydrate in the blood and tissues is deficient, can be modified or actually counteracted by the administration of adrenalin.

Further, it is claimed that the secretions of the pituitary and thyroid glands play an important part in the metabolism of carbohydrate and that the danger of hypoglycæmia following upon injection of insulin is much diminished if a dose of pituitrin is given along with or immediately following the insulin. This partly explains the benefit to the patient from repeated small doses of pituitrin or adrenalin after an operation. Thus, as the result of ether anæsthesia the suprarenals are stimulated and liver glycogen is broken down in excess, resulting in hyperglycæmia, followed in the post-anæsthetic period by exhaustion of residual epinephrine and depleted body glycogen, with a potential hypoglycæmia and ketosis in each case.

The influence of morphia as a factor in post-anæsthetic sickness depends upon the susceptibility of the individual patient, and my experience in the great majority of cases is that the evil effects of preliminary morphia are far outweighed by the measure of repose, well-being, and indifference with which the patient arrives in the anæsthetic room. The duration and depth of anæsthesia have an important bearing upon post-anæsthetic sickness, and closely allied is the dangerous factor of incipient anoxæmia.

Surgical Trauma.

There are surgeons whose dexterity and gentleness in handling tissues is such that it almost appears of small consequence what anæsthetic agent is used, for their patients are already in a fair way to an easy and rapid convalescence. From the anæsthetist's point of view the surgeon who pushes his fist through a small opening in the peritoneum and sweeps from liver to spleen and forthwith digs into the pelvis, is doing incalculable damage, from which the patient will suffer in the post-anæsthetic period. It is here that the surgeon and anæsthetist, working in complete harmony and with one aim in view—namely, the conservation of every particle of energy, physical and nervous, can perform prolonged and difficult operations with the minimum of evil effects.

Prophylactic Treatment.

At the present moment there is no preventive treatment known that will protect every surgical case against post-anæsthetic sickness. The ætiological factors at work are so diverse that only by the study of the individual case can we hope to make any progress in this important subject.

Let me indicate the lines along which, it appears to me, the anæsthetist ought to work.

1. The surgical patient should come under the preanæsthetic supervision of the anæsthetist at the earliest moment after reaching the hospital or nursing home and should remain under his supervision until the danger of post-anæsthetic sequelæ has passed.

2. Purgation and enemata should only be done by the express instructions of the surgeon and in ordinary cases never within 48 hours of the operation.

3. Starvation should not include more than one meal before operation. It is very important to maintain a high glycogen content of the liver and muscles; to accomplish this not only should food rich in carbohydrate be continued until within a few hours of operation, but it should be given at the earliest possible moment after, in the form of orange juice, sweetened water or tea, or glucose with pancreatin. It is essential that the patient be encouraged in this course.

4. Insulin was hailed as a specific against post-anæsthetic sickness,[13–16] but it was soon realised that insulin in the absence of a sufficiency of carbohydrate was a dangerous agent. It is not easy to be sure of the absorption and oxidation of carbohydrate[17] when given per rectum, and I doubt whether there is any justification for giving insulin in routine cases except in conjunction with intravenous glucose saline.

5. Stomach lavage before and after the anæsthetic is a procedure which in my experience has considerable merit and deserves to be more extensively practised. Normal saline solution with 10–20 per cent. glucose is excellent for the purpose, and a few ounces of the fluid should be left in the stomach after each lavage.

6. Intravenous hypertonic saline solution has been used after critical operations, in many cases with most brilliant results, including the absence of any post-anæsthetic sickness.

7. In order to combat any tendency to acidosis or depletion of the alkaline reserve it has been customary for anæsthetists and surgeons to prescribe alkaline fluids. From recent experimental work by Haldane[18] and Goldblatt[19] it appears that the ingestion of sodium bicarbonate in such amount as is likely to produce any degree of alkalosis is fraught with the danger of causing ketosis. Goldblatt has shown in rats that the ingestion of sodium bicarbonate not only hinders the metabolism of carbohydrates and the deposition of glycogen in the liver and muscles but that it prevents complete oxidation of fat with resulting acetonuria.

8. The anæsthetist ought to make an accurate estimate of the surgical risk involved, both immediate and remote. Such an examination makes the pleasant impression upon the patient that every precaution is being taken for his safety and comfort. It is important that the anæsthetist should conduct himself during his visits with a quiet optimism and thus engender in the patient assurance, equanimity of mind, appetite, and sleep.

9. The anæsthetic should be chosen with due consideration for the patient, the surgeon, and the duration of the operation. The chief point regarding the anæsthetic, after the agent and the method of administration have been decided, is that the minimum which will produce efficient anæsthesia should be used throughout the operation. Anæsthetists tend to forget that the ideal in anæsthesia is not how deep with safety to the patient, but how light with efficiency to the surgeon.

10. Anoxæmia should be carefully avoided throughout the operation by supplying oxygen, and de-etherisation practised by hyperventilation with carbon

dioxide.[20] This procedure corrects and maintains the acid-base balance of the blood and restores tone and peristalsis to the gastro-intestinal tract.

11. The patient should be assured of a restful night before operation by means of veronal or bromidia, and should not on any account be disturbed.

12. Dr. Joseph Blomfield[21] recommends glucose ℥i., aspirin grs. xx., bromide of potassium ʒi., in half a pint of water per rectum as soon as the patient returns to bed, and I have found this very valuable. I have used small doses of pituitrin (0·25 c.cm.)—one dose before leaving the theatre and repeated at intervals of one hour—with what appeared to be considerable success.

In conclusion, I wish to acknowledge the valuable assistance in the examination of blood and gastric contents I have had from Dr. Alexander Lyall.

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A CASE OF
TUBERCULOUS POLYSEROSITIS WITH PREDOMINANT PERICARDIAL INVOLVEMENT.

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UNDER the generic term "polyserositis" is included a well-defined group of cases with chronic inflammatory thickening of the membranes lining the great serous sacs; often there are recurrent effusions, and the chief symptoms may be those of congestive heart failure. Many of the cases are regarded as "probably tuberculous," but clear proof of their exact nature may be difficult to produce. The following case is an example of polyserositis in a relatively early phase and running a more acute course than usual. It is reported because the tuberculous nature of the infection was established by culture, and the primary focus was discovered post mortem.

A previously healthy woman of 40, admitted for substernal pain, breathlessness, and continuous fever, was found to have a large pericardial effusion from which tubercle bacilli were grown in culture; there followed in succession left and right pleural effusions, ascites, and œdema of the legs. Enlarged supraclavicular glands were present from the outset, the liver became enlarged later, and the spleen was just palpable. An infection of the left quadriceps bursa developed, and from this also tubercle bacilli were grown. The general condition remained remarkably good for many months in spite of continual fever, but it gradually deteriorated, and the patient died two years after the onset from slow congestive heart failure and œdema.

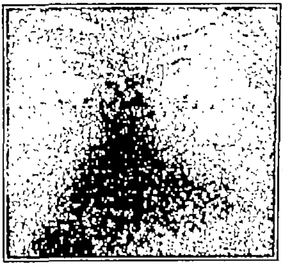
The post-mortem findings were:—

1. Long-standing caseating tuberculosis in one Fallopian tube (symptomless during life).

2. Tuberculous infiltration of the spleen with fibrosis, but little caseation, and infiltration of the same type in the cervical glands.

3. Chronic serositis of the pericardial, pleural, and peritoneal sacs.

FIG. 1.



Radiogram of chest taken on June 7th (patient standing). Transverse enlargement of cardiac shadow; no indication of pericardial effusion.

The early clinical aspect of this case was that of primary pericarditis with massive effusion, and resembled the group of cases published recently by J. A. Clarke, jun., as "clinically primary tuberculous pericarditis"[1]—i.e., cases in which active tuberculous lesions cannot be demonstrated elsewhere. This writer gives an analysis of 11 proved cases already published, and reports two others; he notes the long duration up to 22 months, the insidious onset, the continued fever, and the supervening cardiac failure and œdema with absence of signs of tuberculous disease elsewhere. The diagnosis was established in many of the cases by guinea-pig inoculation of the pericardial fluid, and in only one case were tubercle bacilli demonstrated in films from this source. Miliary tuberculosis was present in six out of nine necropsies, and active pulmonary disease was found only once; caseous mediastinal glands were found three times. The original focus of disease does not appear to have been established in the other cases.

Clinical History.

The patient, aged 40, at the onset of her illness had been in good health until May, 1926. She had been subject to "bilious attacks," and had been treated for minor chronic mastitis for a year or two. There was no history of respiratory trouble, and no personal or family history of tuberculosis. The illness began with a sense of oppression and pain under the lower end of the sternum, with breathlessness and fever. She was admitted to the Elizabeth Garrett Anderson Hospital on June 3rd, 1926, about four weeks after the onset. The symptoms then were substernal pain, pain and tenderness in the epigastrium, and cough of a few days' duration. The temperature was swinging between 100° and 103° F.

The præcordial dullness was slightly increased, but could not be defined on the left, where it merged into an area of dullness in the axilla; the heart beat and sounds were somewhat obscured, though normal in character. There were no signs of apical disease of the lungs, but there was dullness with weak breath sounds at the base of the left lung in the axilla. The abdomen was not distended, and there was no effusion; there was a tender epigastric swelling, but the liver was not apparently enlarged. There were several moderately enlarged and tender glands above the left clavicle; they were soft and not adherent. X ray examination showed increase in the cardiac shadow transversely, but was not diagnostic of pericardial effusion (Fig. 1).

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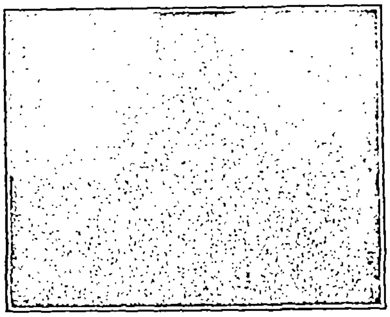
[1] Clarke, J. A., jun.: Amer. Jour. Med. Sci., 1929, clxxvii., 115.

Two weeks later the diagnosis was still in doubt. There was increasing epigastric pain, and rigidity and swelling with persistent fever. The leucocytes were 10,000 to 16,000 per c.mm., with a normal differential count; the Wassermann reaction was negative; the urine was normal; there was some diarrhœa, but the stools were not abnormal; the urinary diastase index was found to be raised to 100 in a 24-hour collection. A diagnosis of pancreatitis was considered and, as the patient was acutely ill, laparotomy was performed on June 14th.

FIG. 2.



Radiogram of chest taken on June 24th (patient sitting). Typical globular shadow of pericardial effusion.

There was no general or localised peritonitis; the pancreas and stomach appeared normal, and the liver was moderately enlarged. The distended pericardial sac was bulging down through the diaphragm, and had displaced the left lobe of the liver downwards and forwards, simulating a tumour in the epigastrium. The appendix was removed, but no disease was detected in the neighbourhood.

On June 24th the pericardial effusion had increased, and the X ray plate now showed a typical globular shadow (Fig. 2). The pericardium was tapped, but only 25 c.cm. of fluid were withdrawn, owing to difficulty in aspiration; the fluid was straw-coloured, and contained a few polymorphonuclear leucocytes and red cells; no organisms were seen. Tubercle bacilli were grown subsequently from the fluid by Dr. Lepper, who thus provided the definite diagnosis.

From July to December, 1926, the patient had open-air treatment with complete rest. There were attacks of breathlessness and one slight hæmoptysis; pleural effusions developed, but did not require tapping, and the abdomen became distended but without ascites. From January to July, 1927, the patient was in Brompton Hospital under Dr. Burrell. The serous effusions became larger, and were repeatedly tapped, and oxygen replacements were given in pleuræ and abdomen. Abdominal discomfort appeared to be relieved a few days after the introduction of oxygen into the peritoneum, and at the same time the temperature fell towards normal and the effusion reappeared more slowly than before.

In July, 1927, the patient was again transferred to the E.G.A. Hospital. The liver at this time was enlarged to the umbilicus, though the spleen was not palpable and there was still much pericardial effusion with attacks of breathlessness and præcordial oppression. Five months' open-air treatment followed, with slight improvement in the general condition at first. An infection of the left subquadriceps bursa developed during this period, however, and the tubercle bacillus was grown from this.

In March, 1928, the patient was definitely deteriorating. In April she was transferred to the Royal Free Hospital. Ultra-violet light treatments appeared to improve the condition for two weeks, when relapse occurred and treatment was stopped. On two occasions during these last months the pericardium was tapped in the axilla; 200 c.cm. of blood-stained fluid were removed, the first time with relief of symptoms, and the second time 600 c.cm. were removed but without relief. The pleuræ were tapped almost weekly, and amounts from 600 to 1000 c.cm. were removed. General œdema increased, and death occurred on June 2nd, 1928, after 25 months' illness.

Fever was continuous for the whole period; the temperature was never normal for more than two or three days at a time until about ten weeks before death, when the reaction failed. The symptoms and fever were rather more acute in the first six to nine months than during the middle period of the illness; the appetite and general nutrition were well maintained, and the general resistance of the patient seemed so remarkably good that until the last six months recovery seemed possible.

Summary of Pathological Examinations during Life.

Pericardial Effusion.—The tubercle bacillus was obtained in culture when examined in June, 1926, and in January, 1927, it was demonstrated in films.

Pus from Bursa.—Tubercle bacillus grown in culture.

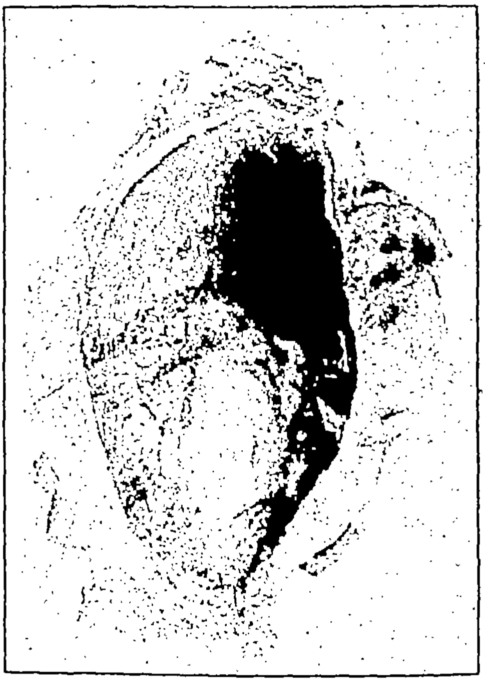
Pleural fluids, peritoneal fluids, and *sputum* were examined on several occasions, but the tubercle bacillus was not found.

Post-mortem Report.

Pericardium and Heart (Fig. 3).—The pericardial cavity is enormously dilated, and contains about a pint of clear fluid with flakes of fibrin. The visceral pericardium is generally thickened and fibrotic, and the parietal layer is a quarter of a centimetre thick. There are masses of fibrin adherent to the visceral pericardium over the left ventricle and in the posterior part of the sac. Microscopically there is extreme fibrosis of the parietal pericardium with a few foci of lymphocytes and plasma cells; in one or two areas giant-cell systems are present.

Pleural Cavities and Lungs.—Both cavities contain from one and a half to two pints of straw-coloured fluid. There is no thickening of the pleura except some light adhesions over the apex of the left upper lobe, which is partially collapsed; the lower lobe is completely collapsed. The right lung is congested but contains air. At each apex there is a single, very small, puckered scar. There is no active tuberculous disease.

FIG. 3.



Pericardium and heart.

Peritoneal Cavity.—There are dense adhesions in the upper part binding the organs together; in the lower part there is a little clear fluid with few adhesions. The peritoneum is slightly thickened.

The liver is much enlarged; there are dense adhesions over the surface, and it is bound to the neighbouring structures. The capsule is thickened. The cut section is firm and the lobular pattern clear; the centres of the lobules are congested, and the outer portion pale. Microscopically there is a slight irregular increase in fibrous tissue, chiefly periportal. In the centres of the lobules are widely dilated capillaries, and the peripheral cells contain fat vacuoles. There is no evidence of tuberculosis.

The spleen (Fig. 4) is very slightly enlarged, 11 cm. in length, rounded and firm with a thickened capsule. The cut surface is smooth, and shows the congested pulp with whitish, somewhat transparent-looking areas diffusely scattered throughout the organ. The smaller areas are fairly discrete, but the larger ones tend to become confluent and have no sharply defined margin. Only a few of these larger areas (1 cm. in diameter) show a yellowish opaque centre. Microscopically the pulp contains a large percentage of red corpuscles and a few lymphocytes; there is a diffuse increase of fibrous tissue, and the Malpighian bodies are very small. Throughout the whole spleen are areas which in some cases present typical giant-cell systems, and in others consist of necrotic, cellular debris and large pale-staining cells with pyknotic nuclei. Increase of fibrous tissue is considerable around these areas. No tubercle bacilli can be demonstrated in the sections.

Lymphatic Glands.—The mediastinal and supraclavicular glands are enlarged and fibrous. There is no caseation, but microscopically there are many typical giant-cell systems with considerable peripheral fibrosis.

The kidneys and suprarenals show no evidence of tuberculous infection.

The Fallopian Tubes.—The right tube is distended with caseous pus, and lies in the midst of dense inseparable pelvic adhesions. This is the only focus of caseating tuberculous inflammation in the body.

The left *subquadriceps bursa* is fibrosed.

Discussion.

The oldest tuberculous lesion discovered was the caseating focus in the Fallopian tube; the lungs were free from infection. In spite of the long history (two years), and the slow but widespread lymphatic spread of the bacilli from this focus to the serous sacs, the spleen, and the mediastinal and cervical lymph glands no other lesion was found which showed naked-eye caseation, although bacilli were actually grown from the fluid of the pericardial sac and quadriceps bursa many months before death. The absence of tissue necrosis and the marked degree of productive and protective fibrosis found in the spleen, the lymph-glands, and the thickened serosa were in strong contrast with the progressive caseation usually associated with widespread tuberculosis, where the symptoms and mode of death are due to the specific infection and toxæmia. In this case the symptoms and signs of congestive cardiac failure were prominent, and the effects of the widespread infection and of toxæmia relatively slight.

It seems reasonable therefore to suppose, on the clinical, pathological, and histological evidence afforded by this case, that chronic tuberculosis of the great serous sacs progressing to the production of "polyserositis," is a condition associated with a high degree of immunity to the infection, and that in more chronic cases than ours the infective element is slowly submerged as the clinical picture becomes one of mechanical obstruction to the heart and circulation.

Clinical and Laboratory Notes.

BREAD OR TOAST FOR DIABETICS?

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THE question whether bread or toast is better tolerated by diabetics does not seem to be definitely settled. Theoretically it might be expected that, weight for weight, toast would be worse, because it contains more carbohydrate than bread in the proportion of 70 per cent. to 50 per cent., water being driven off in the process of toasting and the carbohydrate concentrated. There is also no evidence that any chemical change from starch to dextrin involved in toasting makes the carbohydrate of toast more slowly absorbed or capable of producing less glucose on digestion. However, some recent observations by Payne[1] suggested that toast, in the form of rusks, was better tolerated than bread. As most diabetics prefer to have any bread allowed in the form of toast (the taste of dextrin being usually considered more appetising than starch), it has seemed worth while to decide the question by the following experiments.

The effect on the blood and urine sugar of 2 or 3 oz. of bread was observed in two people with mild diabetes, and on subsequent days the effect of the same weight of bread, off the same loaf, toasted hard. It will be noticed that such toasting reduced the weight of the bread to nearly half. Tea and a little butter was given along with the bread or toast, to make the conditions of the experiment as normal as possible. The meal was given fasting in the morning.

Remarks on the Experiments.

The blood-sugar concentration before and after the meal is shown in the Table as mg. per 100 c.cm. The degree of glycosuria corresponded closely and is not reported.

Time in hours :—		0	½	1	1½	2	3
Case 1 (aged 16).	Bread 3 oz. ..	99	213	221	199	165	—
	Toast 1½ oz. ..	95	216	243	181	163	—
Case 2 (aged 60).	Bread 3 oz. ..	143	—	250	—	191	153
	Toast 1⅝ oz. .	123	193	310	—	150	103
	Bread 3 oz. ..	114	170	200	—	104	82
	Toast 1⅝ oz. .	100	181	260	—	186	130

It will be noticed that there is no constant difference in the blood-sugar curve produced by bread and its toast equivalent. In Case 2, where four experiments were carried out, there is considerable difference in the degree of hyperglycæmia, sometimes in favour of bread and sometimes of toast. The high fasting blood-sugar in the first experiment was certainly caused by an admitted excess of diet for the previous few days, which no doubt influenced unfavourably the whole level of the curve. With this exception, the curves tend to show a more rapid absorption and higher hyperglycæmia after toast than bread. But it is felt that any differences observed are within the range of error in such experiments and may be caused by slight natural variations in rate of digestion, absorption, and conditions of the carbohydrate stores and tolerance. Again, as the blood estimations were not carried out at very close intervals, the highest point of the curve may have been obtained in one experiment and missed in another.

The conclusion may be drawn that no appreciable difference can be observed in the diabetic with amounts of bread and starch which contain equal amounts of carbohydrate.

Summary.

The hyperglycæmic effect of bread has been compared with that of an equal amount of bread thoroughly toasted and no appreciable difference has been observed in two mild cases of diabetes. One may reasonably infer that, weight for weight, toast is worse tolerated than bread because it contains more carbohydrate.

EFFECT OF ULTRA-VIOLET RADIATION ON THE INCIDENCE OF TAR CANCER IN MICE.

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IN THE LANCET last year (1928, ii., 1070) Dr. G. M. Findlay reported that "when mice are tarred and exposed to ultra-violet light at the same time the period necessary for the induction of cancer is shorter than when either tar or ultra-violet light alone is employed." In the hope of obtaining tar cancers rapidly for treatment it was thought expedient to use Findlay's method. The results (which for some unascertained reason differ from Findlay's) are reported below.

Methods.—All the mice were tarred twice weekly with a gasworks tar kindly supplied by Dr. E. L. Kennaway.

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[1] Payne, W. W.: THE LANCET, 1927, ii., 1336.

(1) A batch of 20 mice were tarred twice weekly and also irradiated daily by means of a mercury-vapour lamp of the same make as that used by Findlay (Hewittic Co.'s Ulviare Y.2 burner, at 18 inches distance). Each irradiation lasted at first two minutes, but the time was gradually increased to five minutes, and was after eight weeks maintained at that dose. Fig. 1 shows the periods at which warts appeared in the 14 mice which survived long enough.

FIG. 1.

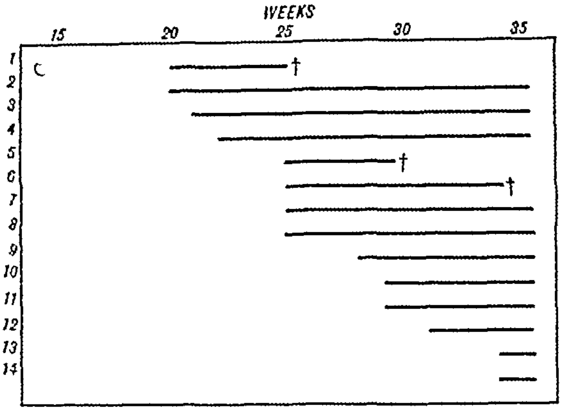
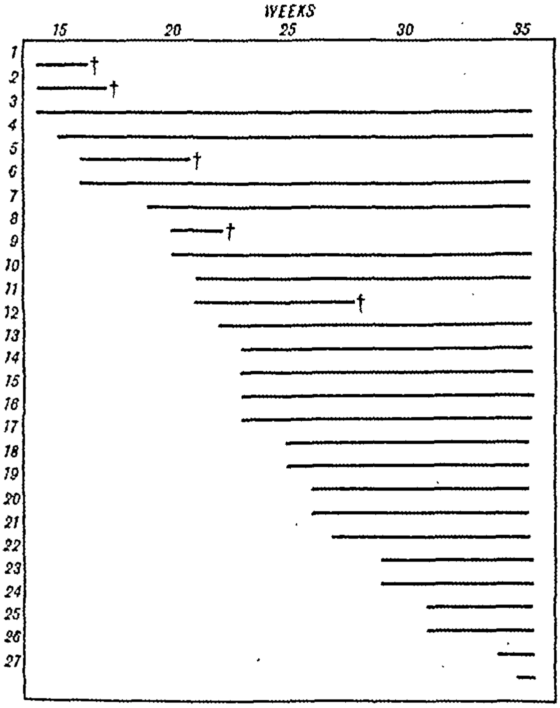


Chart showing the results of tarring mice and exposing them to ultra-violet radiation (old lamp). In this, as in Figs. 2 and 3, the black lines begin on the date at which warts appeared, and the cross indicates death.

(2) As controls for the above a number of mice were tarred in the ordinary way without exposure to ultra-violet radiation. Fig. 2 shows the time of wart formation in 27 of these which survived until warts appeared. These controls indicate that the tars used by Findlay and by myself were about equally potent.

FIG. 2.



Control series of mice, tarred only.

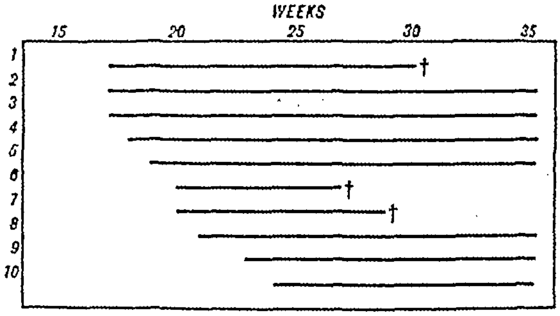
(3) Since there was no acceleration of wart formation in the tarred and irradiated animals, a second series of mice were similarly tarred and irradiated, but with a different (new) lamp of the same make. Fig. 3 shows the result of this experiment.

(4) A further series of 28 mice were given similar doses of ultra-violet light only (without tarring); 10 of these were radiated for eight months and 18 for six months; no warts have appeared in the 15 survivors up to now—i.e., a month after the radiations were stopped.

(5) Eight rats were tarred and irradiated as above for six months. One of these showed persistent dermatitis, but none of them developed warts.

It is evident from the figures that the ultra-violet light did not shorten the time necessary for wart production in the above experiments. While Findlay got ulceration of the skin with two to three minutes' exposure daily, in my experiments no ulceration occurred even when the exposure was increased up to five minutes. In the radiated mice the hair grew more rapidly over the epilated and treated area than in the controls; they were therefore re-epilated with sodium sulphide in the fourth and seventh weeks; later, since sodium sulphide alone sometimes causes ulceration, the treated area was epilated with forceps. In the third experiment epilation with forceps was employed from the start. The reason for employing a new lamp in this experiment was that the lamp used in the first instance was old and might therefore have been deficient in short ultra-violet rays. It will be seen that, although warts appeared slightly more quickly in the mice on Fig. 3 than in those on Fig. 1, in neither was the wart formation more rapid than in the controls (Fig. 2) which were tarred but received no ultra-violet radiation.

FIG. 3.



Results of tarring, together with ultra-violet radiation (new lamp).

It is difficult to decide why these results differ so markedly from Dr. Findlay's. It seems possible that his epilations and radiations may have produced more skin injury than mine, and that the acceleration noted by him was due either to this or to some other as yet undetermined cause. It does not appear to have been due to ultra-violet radiation alone.

Conclusion.—Under the conditions of the experiment irradiating mice with ultra-violet light as an adjunct to tarring was not found to produce warts more quickly than tarring alone.

I wish to thank Dr. Thomas Lumsden for help and criticism, and the British Empire Cancer Campaign for a grant.

NORTH STAFFORDSHIRE HOSPITALS.—The Bishop of Lichfield recently dedicated seven endowed beds in the Henry J. Johnson Ward of the North Staffordshire Royal Infirmary. The trustees of the will of the late Miss Dora Twyford have just allocated to the Infirmary a sum of £50,000, in addition to £13,000 already assigned to it from the same source.—The Orthopædic Hospital of the North Staffordshire Cripples Aid Society is to be enlarged at a cost of £18,000 to £20,000. The new buildings, which will comprise a new out-patients' department, an operating theatre, an X ray department, and additional accommodation for the staff, are said to be regarded by the Ministry of Health as "a model for orthopædic hospitals." A canteen will be provided for the use of out-patients and those accompanying them. Eighty per cent. of the patients in and out, are cured. In-patients cost £2 9s. per week.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on Dec. 9th with Mr. DONALD ARMOUR, the President, in the chair, a discussion on

HEAD INJURIES

was opened by Mr. WILFRED TROTTER. This branch of surgery, he said, was encrusted with tradition embodying doctrines of which some were still useful and living while many had outlived their vitality but were unable to die. If it was possible for abdominal surgery already to be encumbered by superseded ideas, it was natural to find that the old and slowly developed surgery of head injuries showed the same tendency in a much more marked degree. In fact it might be said that one of the chief needs of this branch to-day was a resolute overhauling of its inheritance of ideas.

Knowledge of head injuries had developed in three stages which were distinct enough to be usefully recognised. The first was a period of slow progress extending up to but not far into the last third of the nineteenth century. This might be called the early period; it passed into the middle period, which comprised a space of some 30 years or so from the 'seventies of the last century and was chiefly characterised by the entry of the experimental physiologist into the subject. Finally, the last 20 or 30 years might be regarded as a third period whose essential feature had been the harmonising of experimental and clinical knowledge and a resulting tendency to simplification.

The characteristic of the *early period* was that the subject was completely dominated by fractures of the skull. Fracture came to be looked upon as the essential event in head injury—cerebral manifestations being mere complications—and this conception persisted long after it had ceased to be useful and had become misleading. It survived to-day, though no doubt in diminishing strength, among medical men, and in the lay and especially the legal mind it persisted with indestructible vitality. In fact, the presence of a fracture made it probable, though not certain, that considerable distortion of the skull had occurred, and therefore gave a rough measure of the violence to which the brain had been exposed. But the absence of a fracture was no evidence that the skull had not been considerably distorted and the brain seriously damaged. The term "concussion of the brain" perpetuated the view that the familiar instantaneous traumatic paralysis it described was due to the brain having been shaken about inside the skull and having sustained some mysterious though happily transient detriment thereby. The evidence now available showed that the doctrine conveyed by this word was not correct, and that the state in question was due to the momentary and general anæmia of the brain which accompanied a general distortion of the skull.

In the *second period* the help of the experimental physiologist had transformed the surgery of head injuries from a largely empirical art into something approaching an applied science. They showed that circulatory disturbance was the chief mechanism by which cerebral symptoms were produced, and taught what symptoms were produced and how they were produced by a progressive lesion compressing the brain. Yet it must be admitted that their work had not resulted in as much progress on the clinical side as it had seemed to promise. The exposition of the new doctrines was apt to seem to the clinician abstruse and remote from practical reality; and the subject was so much dominated by the theory of the localised compressing lesion that the surgery of head injuries had inherited from this middle period a fallacious clinical impression that head injuries were largely a matter for urgent operations which could and should be undertaken in a considerable proportion of cases with reasonable expectations of success. Expositions of theory which had come down from the experimental school contained the principles necessary to a practical grasp of traumatic cerebral lesions; yet they did not always reduce the confused and multitudinous events of clinical experience into order and significance.

The Typical Traumatic Lesion.

In the *modern period* surgeons had been chiefly concerned with contusion, the typical traumatic lesion of the brain. Recognition of the importance of distortion of the skull had made it clear that besides direct and polar (or contrecoup) bruising to which the brain was liable under violence, the whole organ was subject to stresses and deformations which must expose its whole surface and substance to damage. Probably widespread bruising was always present after any injury at all severe, and though not in itself seriously destructive, it gained very rapidly in gravity according to the extent to which the parts of the brain in the posterior fossa of the skull were involved. Contusion here was perhaps the commonest cause of death and the commonest cause of ultimate failure in apparently successful operations for hæmorrhage. In every case of severe injury all the clinical manifestations were sketched on a background of contusion phenomena of all grades of definition. While contusion was so largely responsible for the gravity of head injuries it had in comparison with gross hæmorrhage one very favourable character—viz., that it could scarcely give rise to pressures beyond the order of the venous pressure. It could not therefore produce gross capillary anæmia and the accompanying paralytic states. Thus it rarely called for urgent operations and in so far as it was amenable to treatment at all could, and should, always be dealt with by milder measures—at any rate in the early phases. The remedies arranged roughly in the order of increasing severity of symptoms to which they were applicable were: rest, posture, hypertonic derivation (oral, rectal, or intravenous), lumbar puncture, and decompressive operation. None should be neglected and each was capable of giving brilliant results.

During the late war a large group of clinical phenomena, previously assigned to the uninviting chaos of "traumatic neurasthenia," had been found to be due to definite organic brain injury in the nature of minor and unresolved contusions of the brain substance. As soon as their true pathology was known, their symptoms were found to be well defined, the three characteristic elements being headache, giddiness, and minor mental changes. This clinical picture was a very common result of head injury of any grade. The unresolved contusion showed itself as an indefinitely persisting but variable elevation of the intracranial pressure, and its symptoms had that close dependence upon the state of the venous pressure which experimental studies had proved must be present in such circumstances.

The Clinical Picture.

Dr. C. P. SYMONDS said that Mr. Trotter had done more than anyone else to illuminate this subject. The picture which Mr. Trotter had drawn of cerebral contusion had enabled others to recognise what was a very clean-cut clinical syndrome. The lawyer was always looking for objective evidence, and what he liked to be able to show was a radiogram of a fracture of the skull. It was necessary to teach the lawyers not only that severe cerebral injury could occur without fracture of the skull, but that the symptoms of such cerebral injury were quite well defined. The symptoms of cerebral contusion were easily recognisable by those who took a careful history; for a long time they had gone by the ill-used name of "traumatic neurasthenia"—a name which usually concealed all that it was intended to cover. The difficulty of diagnosis rested largely on the absence of physical signs in these patients, so the symptoms had to be critically analysed. They usually presented themselves under three headings—headache, giddiness, and symptoms of minor mental disorder. The mental symptoms were often difficult to evaluate because of the complicating factor of the "compensation neurosis" which was often added to the organic cerebral symptoms. Headache and giddiness were, therefore, symptoms of great importance. A point about the headache of cerebral contusion which he found it difficult to understand was the latent interval which was common between the accident and the onset of disabling headache; this interval might be of days' or even weeks' duration, and it was something not likely to be invented by a malingerer. The patient described it in terms of pain rather than discomfort. A man with neurosis might complain of agonising headache, but he would say it was a numbness or pressure rather than a splitting or throbbing pain; and it was more continuous. The headache of contusion, on the other hand, was intermittent, or if it was continuous it showed remarkable exacerbations, likely to be associated with increase of intracranial pressure—e.g., in stooping or straining at stool. The giddiness of which contusion cases complained was a transient affair—a momentary sense of loss of equilibrium—which bore a definite relation to posture; thus it might come on when resuming the erect posture after lacing the boots; or after quickly turning his head to see if the way was clear the patient might become incapable of crossing the street. These symptoms together formed a very characteristic picture of a bruised brain. The value of the mental symptoms was harder to assess, though critical analysis of them would often allow distinction from those of a neurosis. The neurotic patient might complain of inability to concentrate, and of excessive mental fatigue, though he might still manifest surprising agility in debate. In true cerebral disease there was a slowing of thought, a defective memory, a true mental fatigue.

The long interval between the injury and the development of symptoms was no doubt often due to the fact that so long as the patient rested he was free from symptoms, but this was not always so. Histological research, especially in the laboratories of Otaka and Penfield, had shown that minor injury to the brain might result in very slow changes in the neuroglia—changes which in themselves led to vascular displacement and possibly to vascular congestion.

Radiography of the Skull.

Mr. H. K. GRAHAM HODGSON demonstrated a series of films illustrating the radiographic appearance of the skull after fracture. In radiographing the skull, one threw complicated shadows on the plate, and unless standard views were used, in which the skull bore a definite angle relationship to the film, the picture was hard to interpret. Such measurements as the nose-chin, or nose-chin-forehead, were fallacious, owing to the varying sizes of noses, and of projection of chin and forehead. Therefore in cranial radiography it was essential to take a definite line, such as the outer canthus of the eye to the external auditory meatus, and make it bear a definite angle to the film. Further, if only one or two anteroposterior radiograms and a lateral one were taken, many fractures of the skull would be missed; so it was necessary to search by means of 7 or 8 standard views. At the suggestion of Messrs. Kodak, he had tried superimposing two films, and this showed the nasal bones, cartilages, and soft parts outlined, and also the alteration in the contour of the nose. Another important view of the nasal bones was taken with the film underneath the nose, looking straight down through the vertex of the skull.

Dr. GEORGE VILVANDRÉ said that at the London Hospital it was the routine practice to take stereoscopic views of skulls about which any question arose. He thought that the lateral view and the anteroposterior view were of only limited value, and that no really useful knowledge could be gained with X rays unless stereoscopic views were taken. Looking at a picture of a cranial fracture was liable to lead to excessive concentration on actual bony damage and to comparative neglect of the injury to the brain. Thus the heads of two schoolboys collided in a game of football, and one of them got a depressed fracture of the frontal bone. From the appearance of the fractured bone it was judged that an operation would be necessary, but nothing operative was done, and the boy made a good recovery. Sometimes a radiogram might give a misleading impression and sometimes the patient was so ill that radiography was for the moment out of the question.

Contusion Headaches.

Dr. GEORGE RIDDOCH said that like Dr. Symonds he was puzzled by the nature of headaches coming on after cerebral contusion. As had been pointed out, the brain might be injured without a fracture and consciousness might be lost as a result of concussion. But contusion headaches might follow head injury where consciousness had never been lost. This class of case presented great difficulty, especially in the absence of physical signs, even in the presence of severe contusion headaches. Though P investigations might do something to eluc origin of headaches developing after a lo period the question was not yet answe There were changes in the brain, but Dr. thought there might also be external ch the meninges, comparable to the chronic a itis or meningitis serosa circumscripta s found after spinal injuries. He urged the ance of keeping head injury cases in be than was customary. Though this was in a general hospital an attempt should be improve on the usual few days' rest before the was shunted off to an infirmary. This i he thought, would eliminate some of the mild In the attempt to reduce intracranial pre had found it very beneficial to keep the propped up in bed and give hypertonic sal rectum and magnesium sulphate twice a day. patient should be asked to retain the rectal in for a quarter of an hour. For severe cases h recently tried replacing some cerebro-spinal with air; in a proportion this had allayed headache, perhaps by altering the condition arachnoid in the region of the superficial contu and by re-establishing the cerebro-spinal fluid circ tion. The decompression operations successfu practised in the late war had not proved so successf he thought, for the more general injuries of ci life. Their failure was especially marked if th patient was demoralised and neurasthenic befo operation. In such people the last condition wa often worse than the first.

Sir JAMES DUNDAS-GRANT recalled to the meeting a statement by Erichsen in connexion with "railway spine"—namely, that in contusion and concussion of the spine, after the more acute symptoms had passed off, great relief was afforded by small doses of perchloride of mercury. The speaker had seen many cases with definite vertigo without apparent injury to the internal ear in which this drug gave gratifying results. The reason was clearer now it had been found that slow and more or less inflammatory degenerations took place in the neuroglia.

Mr. TROTTER, in a brief reply, confessed he was unable to answer the one question which Dr. Symonds had put to him. It concerned one of the most mysterious problems in cerebral pathology; that a patient might enjoy apparently normal health for a definite period, and then develop disabling symptoms from an injury which must be considered to have been present all the time. He had been particularly interested to hear of the cases of depressed fracture which had recovered without operation. He had long felt that the ancient doctrine that (except in the very young) any fracture must be operated upon, was wrong. The reason for the view had been the risk of epilepsy. He now believed that the risk of epilepsy from a simple depressed fracture was no greater than the risk of epilepsy from an operation involving incision of the dura mater.

HUNTERIAN SOCIETY.

At a meeting of this Society on Dec. 16th Dr. **Ernest Young**, the President, took the chair, and a discussion on

Whitlow and its Complications

was opened by Mr. **Zachary Cope**. He deplored, he said, the tendency in the medical profession to instruct students minutely in the diagnosis and treatment of such rare conditions as pituitary tumour, while omitting any detailed information on common and important affections such as whitlow. The average student was woefully ignorant on this subject and the text-books allowed it the most casual and scanty description. In a recently published American text-book, "Nelson's Loose-Leaf Living Surgery," there were 100 pages devoted to this condition, while an important English text-book allowed it only 15½ lines.

The word "whitlow" was derived from the word "whitflaw," meaning a "rent" or "tear," and not (as he had been at first inclined to suppose) "from white flow," or flow of pus. And, in fact, the infection nearly always did enter through an abrasion, though occasionally it might be blood-borne; further, it was specially liable to occur when the patient was run down. The simplest form of whitlow was the subcuticular variety. This type, which was annoying but not dangerous, was caused by an invasion of the subcuticular tissue by the organism, usually either a streptococcus or a staphylococcus. The streptococcus was the commoner causative organism in these cases, and the more troublesome, often giving rise to the condition of paronychia or perionychia. The successful treatment depended entirely on thorough drainage; the overlying cuticle must be removed and if the infection had extended under the nail this must also be cut away as far as was necessary. It was useless to leave even a small area of infection covered by nail, as the finger would not heal unless the whole septic area had adequate drainage. In the second, or subcutaneous, form of whitlow the condition was much more serious because the infection was in a prison, bounded posteriorly by the bone and anteriorly by the dense skin, while at the base of the phalanx it was on dangerous ground owing to the propinquity of the tendon sheath. This form of whitlow was rightly described as a "felon," and Mr. Cope proposed to show what routes the felon, or rather the microbe, might follow in making its escape.

In the first place it might make use of the blood stream. This he likened to invasion of territory by means of aeroplanes; it could not be stopped and was usually fatal. Secondly, the infection might follow the lymphatics. This corresponded to a state of affairs in which the invading army had captured the railways. It was slower than a blood stream infection, and the lymphatic nodes represented stations, or points at which the invasion could be held up. The third method was invasion by cellular contiguity; the army was entering by the country roads, often rough ones. This method was slow unless the army struck an arterial road, which was represented by the tendon sheath.

Treatment.

The first principle to be followed in the treatment of whitlows was anatomical diagnosis. It should always be remembered that tension was the cause of pain, and that tenderness on pressure gave the site of tension. In the palmar space, he added, the pain might not be marked because the space was larger and therefore the tension less than elsewhere. In diagnosing the site of the pus, swelling, tenderness, position, and movement of fingers should all be taken into consideration. It was a bad policy, though followed by most general practitioners, to incise over the maximum swelling. An anatomical diagnosis should be made first, and the best incision employed for the condition found. Infection of the tendon sheath of the ring finger led to bulging in the palm, of those of the middle and index fingers to bulging of the thenar eminence. The pain in a distended palm becomes less as the tissues become sodden and the nerves poisoned by the toxins of the pus.

Preventive measures were important. These should consist of early treatment of abrasions with iodine, all horny skin being first shaved away from the region of the cut. A dressing should always be used, and a strapping dressing was essential if it was to keep in place. In the United States the percentage of whitlows in factories had been enormously reduced by these simple measures. When incision was necessary it was important for the surgeon to see what he was doing, and to give himself plenty of time to see. For this reason the incision should always be made under a general anæsthetic or gas, not under a local anæsthetic such as ethyl chloride. A tourniquet was extremely valuable as it gave one a dry field and enabled one to see the pus. Drainage tubes should never be put into the palm; a gauze wick or a piece of rubber tissue was enough. Finally, the drainage must at all costs be adequate. In making incisions it must be remembered that finger incisions should be at the side, not in the mid-line. A circular flap was sometimes used but the speaker did not think this was necessary. If the palmar space was infected the incision should run the whole length of the hypothenar eminence, and a slight incision should always be made above the wrist on the ulnar side. An incision over the thenar eminence should always stop half an inch above the wrist to avoid damage to the deep palmar arch or its branches. After-treatment should consist of moist or dry dressings and baths. Active movements should be begun as soon as the inflammation had subsided. Radiant heat and ultra-violet light were valuable, and passive hyperæmia could be used, but only after incision.

Septic hands, Mr. Cope concluded, caused more loss of working time than acute appendicitis, and to anyone of discrimination appendicitis was preferable.

A Branch of Major Surgery.

Mr. **Herbert Carson** said that the surgery of the hand was major surgery which had been too long masquerading as minor. It was relegated to junior members of hospital staffs who had had no adequate preparation. In reality the subject was simple once the anatomy of the part was thoroughly mastered, and if the case was seen early. As a rule, patients came late with the whole hand swollen, which greatly increased the difficulties of diagnosis. As far as prophylaxis went all factories should be supplied with a casualty room and a competent nurse. Unfortunately, many cases occurred in sempstresses and scrubbers, who did not work in factories.

The four types of whitlow were: pulp infections with or without paronychia, tenosynovitis, invasion of the fascial planes, and lymphangitis, in which the general condition was serious and the local signs comparatively slight. The danger in pulp involvement was necrosis of the terminal phalanx owing to interference with the blood-supply by the swelling. In tenosynovitis sloughing of the tendon was to be feared, and the same result might occur in the third type. In the case of lymphangitis there was danger of death without local loss. In the case of the two earlier conditions treatment should be by immediate and adequate incision. In the case of abscess between the fascial planes there was time for thorough examination and exact diagnosis. When lymphangitis was present no operation must be performed until absolutely necessary, for premature operation might do more harm than good. Mr. Carson advised all surgeons interested in this subject to read Kanavel's book, which, though arranged in a confusing manner, realised is that it galvanises existing hospital dispensary work in eye diseases." India has a population of 320 millions, and eye disease is only one of the many important medical problems which confront the authorities. It is obvious that only a government agency, or one working closely with the government, could deal with the problem as a whole, and that all existing medical agencies might have their place in any comprehensive scheme. The question that arises is what is the standard of their treatment? Is it not capable of improvement? It must be admitted that the teaching in ophthalmology during the ordinary medical curriculum in India, as in other countries, has in the past been decidedly scanty, and the efforts now being made to remedy the deficiency cannot affect men who have already qualified. Those who work in outlying dispensaries are apt to fall into a routine application of favourite remedies, not necessarily the most efficient. In the ordinary post-graduate classes as a rule not much attention is given to eye work; if an examination for promotion to a higher grade follows the course, as used to be the case in India, matters of detail, so essential to successful treatment, tend to take a secondary place. A well-thought-out short "refresher" course in the treatment of trachoma, of a week's duration, given by an expert at a big hospital in a suitable centre, would do much good.

Such was the practice in Vienna before the war. The course here included lectures and demonstrations of suitable cases, and daily attendance in the trachoma clinic, where the usual operations on the lids were taught to practitioners working in trachoma districts, who went back to their work keen to carry out what they had learnt. There is an inevitable tendency in districts where trachoma is common to get bored with the treatment and to devote more time and energy to (say) operations on cataract, which give more dramatic results. It should not be forgotten, however, that inefficient treatment, or the failure to do a lid operation at the proper time, may result in a trachoma patient losing the whole or part of his sight and being a burden to himself and the community for perhaps 50 years; whereas the expectation of life of a senile cataract case is only a fraction of that period. If it were possible to send out a keen man, well trained in ophthalmology, who would camp for a short period near each outlying dispensary, who would see the patients with the sub-assistant surgeon in charge, offering him suggestions and advice, and generally helping him with the treatment of his eye cases, it would tend to raise the standard of his treatment. And this could be done without casting any slur on the present workers in India. The teaching in ophthalmology in Austria before the war was as good as, if not better than, any in Europe, yet they found it useful to adopt a system of "refresher" classes.

THE HARBEN LECTURES AND VITAMIN B.

By some curious twist of taste or habit, very few people generally go to the Royal Institute of Public Health in Russell-square to listen to the annual Harben Lectures. It is a pity that this should be so, for learned and distinguished lecturers commonly have personality as well as something to say and they will say it all the better under the stimulus of a good audience. We hope at any rate that plenty of people who did not hear the series lately given by Prof. R. A. Peters of Oxford on the "Coördinative Biochemistry of the Cell and Tissues" will read his discourses which are in course of publication in the *Journal of State Medicine*; they tell us a good deal and, which is better, suggest much more. Prof. Peters begins by pointing out that descriptive biochemistry has developed into dynamical biochemistry. At first it was necessary to isolate and identify the various chemical substances in live animals and plants and there is still evidently much to be done in that line. But just as biological theory has arisen on the descriptive foundation of the early naturalists, and zoologists now want to know how animals live as well as what animals there are, so biochemists are becoming more and more concerned with how live matter works on the basis of the substances which have been identified.

Life consists of a continued and orderly stream of reactions; there is nothing chaotic about it and Prof. Peters addresses himself to the imagination of some structural system on which this fundamental characteristic might depend. It is obviously not enough to appeal, as many have done, to the colloidal condition of the substance of cells; a colloid mush might reach any limits of incoördinate behaviour. He points out that some units of living matter are so small that the ordinary statistical physico-chemical laws can hardly apply. An organism which is just visible (0·25 μ) occupies about the same volume as 555 million molecules of water and by our ordinary conceptions will contain only one hydrogen ion at pH 7·0; filter passers, with perhaps one-hundredth the bulk, will be still more remote from the common circumstances of chemical reactions. The perceptible histological structure of a cell fails altogether to provide a framework on which the due sequence of its activities might be arranged. Prof. Peters suggests that it is now legitimate to imagine a molecular framework. It is known that molecules at surfaces are orientated in a regular fashion; the molecules of palmitic acid, for instance, spread in the thinnest possible film on water, are like sausages tightly packed together with the methyl group always towards the air. The interior of a cell may have an elaborate molecular structure made up on this kind of plan and ultimately based on the surfaces of the proteid constituents which form a sort of central mosaic from which chains of other molecules radiate in an orderly way. The activities of this structure are controlled in the main by changes of reaction and consequent changes in absorption, and in this way, the lecturer urged, it was possible to picture the dynamic chains of chemical reactions taking place, controlled inside the cell not by the ordinary laws of mass action but by "the exigencies of the matrix;" he did not, however, explain whether by this he meant the needs of the proteid basis in a teleological sense or the inevitable results of its constitution. Such disciplined speculation needs no defence, and from it Prof. Peters turned to the hard experimental facts about vitamin B to which he and his collaborators at Oxford have devoted so much attention. The simple fact that there was something in rice polishings and yeast which prevented and cured beri-beri has developed into a complicated and tangled tale. Prof. Eijkmann's original discovery in applied bacteriology has indeed been so fruitful in opening up new fields of knowledge that the award of a Nobel Prize to him the other day seems particularly appropriate.

We now have B_1, which cures polyneuritis in pigeons, and B_2, which cures a dermatitis in rats, which seems to be the same thing as pellagra in man; on these and their certain distinctness Goldberger, Chick and Roscoe and other observers are agreed.

B_1, or "torulin" as Prof. PETERS calls it, seems to be generally necessary for the growth of all cells—rats, pigeons, bacteria, and tissue cultures; yeast cells can make it for themselves. But to these a third, and possibly a fourth, factor in the vitamin B complex, both necessary for rats, have to be added, and yet a fifth, needed by pigeons (which can do without B_2) but not by rats. All of these minister in some way or other to the maintenance of the normal metabolism of animal organisms; at the moment the complexities of the situation are evidently beyond anyone but the experts. We suspect, however, that Prof. PETERS is right when he claims that a definite test such as the ability to cure polyneuritis in a pigeon fed on polished rice is a safer guide than the measurement of a vastly complex event such as the growth of a young rat. And in his third lecture Prof. PETERS takes up a very interesting and relatively neglected side of the vitamin question—how the deficiencies produce their symptoms. Animals deprived of vitamin B in a broad sense waste because their tissues cannot use the food. Food is absorbed but there is an internal starvation which leads secondarily to loss of appetite. This failure is shown by the fact that glucose injected into the blood of animals deprived of vitamin B does not disappear as quickly as in normal animals. Prof. PETERS and his co-workers have endeavoured especially to ascertain what B_1 does and they make out a good case for believing that this is the fraction particularly concerned with carbohydrate metabolism, and especially with the removal of lactic acid in the Meyerhof cycle. The symptom of opisthotonus in pigeons appears to be directly due to an excess of lactic acid in the brain and it is cured most quickly by injecting concentrated preparations of torulin locally. Absence of another fraction of B leads to heart-block and a remarkably slow pulse, and the puzzling question of œdema (emphasised in the clear clinical distinction between "wet" and "dry" beri-beri) may find its solution in another factor which coöperates with torulin in regulating the distribution of water in the body. Finally, there is evidence of a factor concerned with the proper metabolism of proteids, present in yeast extracts containing B_2. The answer to the question whether vitamin B is concerned with metabolism as a whole or with proteid alone or carbohydrate alone is that it influences all three. Exactly how remains to be discovered. Meanwhile we should all do well to take Prof. PLIMMER's advice and eat plenty of it.

COSHAM HOSPITAL.—The report of the committee appointed to inquire into animadversions upon the administration of this Ministry of Pensions hospital has now been published, and is a complete vindication. It will be remembered that a coroner's jury which sat upon the death of a patient found a verdict that he died as the result of unnecessary violence and declared in a rider that "very grave maladministration" existed at the hospital. The committee are "satisfied that there is no ground to justify" the rider, and add that "on the contrary, we find that the hospital is well and properly administered, and we have formed a high opinion of Dr. Paul's capacity as an administrator of this institution." Their efforts to obtain the testimony of witnesses who could bring criticisms to bear on the administration of the institution proved singularly unsuccessful, only one such witness coming forward. Other witnesses who had responded to their invitation "could only speak well of the hospital." The committee consisted of Sir Frederick Willis, Mr. J. Bromley, M.P., Major J. B. Brunel Cohen, M.P., Mr. Isaac Foot, M.P., Sir Adair Hore, and Dr. E. Mapother.

Annotations.

"Ne quid nimis."

EPSOM COLLEGE.

WITHIN a few days Epsom College will reach the seventy-fifth year of its life, having been established as a public school with a Royal Medical Foundation in 1855. The details of the Foundation are set out this week in an advertisement received from the College, and the claims in that advertisement are so accurate and so well advanced that we ask readers to consult what the College can say about itself, without repeating the story here. It is sufficient to say that a life of three-quarters of a century has been a record of increasing usefulness. But the message of the advertisement is—Why not subscribe to the support of an institution whose activities are so practical and whose design is so good? John Propert founded the College with the intention of providing education for 50 boys, the children of medical men whose circumstances precluded the boys from enjoying the opportunities usually at the disposal of the sons of the professional classes. From a further fund pensions are granted in response to suitable applications from medical men or their widows. The net result is that at least £9000 is required annually to meet the joint demand. And only a small fraction, some 6 per cent., of registered practitioners support the Foundation. Once again at this season of the year we urge upon our readers the strong claims upon them of Epsom College. The Medical Foundation is an integral part of the constitution of the College, and the College is a public school open to all, where the sons of medical men in association with lads of a comparable class can obtain a first-class education. One of the greatest anxieties which a medical man may have, an anxiety that haunts many during their professional life, is in regard to the education of his children. For the most part he pursues a calling which may not enable him to make large savings, knowing the while that incapacity to practise will as surely as death make the education of his children and the sustenance of his wife impossible for him.

The work of the College is carried on with energy, and its story through a long period of years has been, one of progress. But that progress has always been made in the face of financial difficulty. We believe that, at the season when the hearts of all are open to just appeal, that we in the medical profession can find no worthier object of generosity than the Medical Foundation of Epsom College, with its linked generosity towards our widows and orphans.

FIRST-AID IN CARBON MONOXIDE POISONING.

THE ever-increasing incidence of cases of poisoning by carbon monoxide, particularly by exhaust fumes from motor cars, points the need for organised first-aid treatment. In this matter New York seems to be ahead of our great cities. Yet science owes it to the researches of Haldane that the way in which carbon monoxide produces unconsciousness has been grasped. It acts by suspending the capacity of the blood to convey oxygen to the tissues. The air-hunger which results stimulates breathing, whereupon carbon dioxide is unloaded from the blood. But carbon dioxide is the main stimulus to breathing, and in its absence, apnœa may result, just when deep breathing is most needed. Full understanding of what occurs has led to a method of resuscitation in which carbon dioxide is used to stimulate deep breathing. The patient is made to breathe a mixture of oxygen and carbon dioxide; if he is unconscious, artificial respiration is carried out with the mixture. The combination first recommended was 5 per cent. carbon dioxide and 95 of oxygen, a mixture which some anæsthetists keep ready to hand in cases of respiratory failure. Reasons are now given for increasing the carbon dioxide to 7 per cent., which doubles the normal minute-volume of breathing without causing undue discomfort. We learn from the *Journal of Industrial Hygiene* for November, 1929, that the Consolidated Gas Company of New York at the present time have ten emergency trucks supplied with the needed inhalation apparatus, manned by crews of three. They respond to all notifications of leaking gas, to fires, and to all sorts of situations where asphyxia has occurred or is a hazard. The crews are thoroughly drilled in giving artificial respiration, and in handling unconscious patients. In 1926 they treated 789 cases; in 1927, 715; and in 1928, 850; in these cases the 5 per cent. mixture was used. Since March, 1929, the 7 per cent. mixture has been issued on 300 cases, with great advantage, in the opinion of the trained and expert crews.

THE PORT OF LONDON.

THE 70-mile reach of Thames from Teddington lock to the open sea forms the Port of London, in which one-third of the commerce of the United Kingdom is carried on. Dr. Charles F. White, who was appointed medical officer of health in September, 1928, tells us that in that year 27,711 ships entered the port, 15,936 from abroad. Of these 17,522 were inspected, and in 1463 conditions prejudicial to health were found: 1391 had dirty quarters, 97 leaky decks, 77 bad ventilation, 65 defects in sanitary conveniences, and 55 defects in lighting, while in 48 the crew's quarters were verminous. Rather over half the structural alterations ordered were made before departure. Water is usually taken from the mains, but there are 17 water barges, the water in which was never found contaminated. The water of a ship, among the crew of which several cases of diarrhœa had occurred, had been taken on board at Batoum and showed *B. coli* in 25 c.cm., and *B. ent. sporog.* in 10 c.cm.; its tanks were emptied and cleaned. Infectious cases are sent to the Port authority's hospital at Denton (Gravesend), and the ship spaces are disinfected by fumigation with sulphur followed by washing with izal. Fifty-four cases of tuberculosis and 20 of enteric fever were landed from ships. Handbills concerning free treatment for venereal disease are distributed among the crews; 121 cases came to notice, most of them gonorrhœal. No case of small-pox, plague, or yellow fever appeared, but six plague-infected (black) rats were found in a ship from Bombay. On this ship 30 rats were trapped, and 25 found dead, that is 55 in all, before fumigation by hydrocyanic acid, after which 22 more dead rats were found; no human case occurred. One group of five enteric cases were traced to water taken on board at Buenos Ayres. Of the total number of rats destroyed 11,425 were on board, 9890 ashore; of 1420 examined, only the six mentioned above were plague-infected. On 128 ships fumigated with sulphur the highest number of rats found dead was 320, the average 35, and 58 ships had none. On 47 ships fumigated with hydrocyanic acid the highest number was 106, the average 6, and 29 had none. We might perhaps deduce that hydrocyanic acid fumigation was favoured most by ship-owners who took most trouble, by rat-proofing and otherwise, to reduce the rat population of their ships. There was an outbreak of German measles on one of the six training ships lying in the Thames, otherwise these ships were healthy; only one case of tuberculosis was reported from them. Food inspection led to the destruction of 6018 tons of unsound food or its appropriate disposal. Of 50,000 ox-tongues, 6 per 1000 were found affected with actinomycosis; last year the figure was 20 per 1000, suggesting that shippers are now more careful. Caseous lymphadenitis was found in 4 per cent. of Australian and South American mutton carcasses, and condemned accordingly. No undue use of preservatives was observed in imported food. The sanitary regulation of the Port is being continually tightened up, for under the Infectious Diseases (London) Regulations, which came into force in 1927, while trench fever is no longer notifiable, induced malaria (if liable to relapse) must be notified four days before discharge from an institution to the medical officer of the district in which the patient intends to live, while enteric and dysentery carriers must be prevented from contaminating the food or drink of others. During the year 128 inspections of canal boats were made, one owner being fined £1 for not providing suitable heating aboard, and 200 new water-closets were provided in the area in continuation of a policy initiated four years ago.

A DIRECTORY OF THE LONDON HEALTH SERVICES.

A SERVICEABLE handbook, which contains information not so conveniently combined in any other work known to us, has been compiled by Dr. T. T. B. Watson and Dr. A. Welply, under the title of The Medical Signpost and Directory of the London Health Services, 1930.[1] The first part, about a quarter of the whole book, gives general notes, completely documented, on subjects which range alphabetically from Adoption Societies to Zymotic Enteritis. A description follows of the health administration of the 29 metropolitan boroughs, three or four pages being devoted to each. The information given about the boroughs includes the name and official address of the medical officer of health, and the facilities available in the way of hospitals, clinics, and convalescent homes; what diagnostic help is to be had and where the coroner and the relieving officers can be found; what charitable organisations exist and how their help can be enlisted and so forth.

A few pages at the end of the book are left blank except for headings under which practitioners are urged to provide notes for the use of locum-tenents. It frequently happens that the doctor whose practice is being taken over is unable either through illness or through absence to hand on information verbally to his temporary successor, and when the locum is not aware of the daily routine the practice must suffer. It is suggested that the practitioner who buys the book should at once fill in the details, so as to have ready prepared a list of practical points which may well be forgotten in the bustle of the change. The locum wants to know the methods of keeping accounts, the addresses whence nurses, drugs, instruments, and bottles are usually obtained, the nursing homes habitually used, the appointments held, the consultants whose advice is valued. The lay-out of the dispensary, the names of other doctors in the district, the fees charged and how they are collected, all these have to be passed on, and considerable time is saved if the locum knows exactly where to find instruments, throat swabs, and stationery forms. A blank sheet is left for a sketch map of the district.

We find singularly few omissions in any portion of the work. Such new ventures are mentioned as the Chelsea infant welfare centre for the professional classes, but no note is made of the centres where instruction on birth control is given by medical men and women. Among institutions devoted to cancer, the new Marie Curie Hospital appears, but not the Mount Vernon Hospital, Northwood; evidently the Parliamentary Act sanctioning the change in the objects of this hospital was not noticed by the authors, since two beds for tuberculosis at this hospital are still said to be allocated to the Borough of Hampstead. The list of the fees charged for pay-beds in various London hospitals are set out, also the procedure as regards medical fees and the extent to which the warded patient's practitioner can keep in touch with him. The days for attendance of out-patients in the special departments of the teaching hospitals will be appreciated. Altogether this is a useful compilation whose authors deserve the thanks especially of those practitioners who are newly resident in any district.

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[1] Published by Stanley Woodfield, Enfield, Middlesex. 1929. Pp. 210. 10s.

THE DIFFICULT CHILD AND THE TEAM METHOD.

THE difficult child has doubtless been with us as long as the poor, but has only lately been dignified with the title of a social problem. It is probably true that far more children are "difficult" nowadays than they were before the war. That conflict acted in various ways. Primarily it was, after all, only a gigantic symptom of psychopathic disease in the world's organism, the outward and visible sign of an inward problem to which the delicate psychological adjustments of the child are peculiarly sensitive. That disease is not yet cured. Secondarily, war meant that one generation of children was brought up under very abnormal conditions, often with little or no paternal influence and with a maternal element distorted by war work, privation, or anxiety. Thirdly, it made a profound difference in the outlook of the youth of the period, and their uncertainty in a tottering world is reflected in their children to-day. Those who recognise a very large and very grave "child problem" are divided in their views as to the best method of dealing with it. A method which has found much favour in America is the team method, or child guidance clinic, where psychiatrist, pædiatrist, psychologist, and lay social worker pool their efforts in an attempt to help the child to adjust to the reality of its environment. This was described at the recent discussion reported in our columns last week (p. 1261). American methods do not always suit this country, but the child guidance scheme seems likely to be of very great value if wisely and temperately organised and executed. The child guidance clinic at Islington was only opened this year, but has already proved its worth; the clinic at Clarendon-road, West London, has just issued its first annual report on 55 children referred to it for unmanageableness or other sign of disharmony with environment; and it is now five years since the Jewish Health Organisation inaugurated its splendid scheme, of which the outstanding feature is a Child Guidance Clinic at Spitalfields.

The past year in this clinic has—"fortunately," says the report—been free from dramatic developments, but has seen a steady progress towards more rapid diagnosis and greater facility in placing cases into their proper category for treatment. After the preliminary conference, a child is usually grouped in one of four classes: (1) for social investigation and social and familial correction or adjustment; (2) for educational and scholastic adjustment; (3) for personal psychological investigation by the psychiatrist; and (4) for joint activity of the whole clinic unit in association with any bodies interested in the case. The work then proceeds until the physician calls another conference for the coördination of investigation. The clinic had the courage from the start to reject hopeless cases instead of wasting its time and endangering its reputation by spending weeks on obstinate material too deeply buried in the social morass or too entangled in the meshes of constitutional defect to yield to an attack of any kind. The psychologists are agreed that cases are on the whole being seen too late; the majority of the children are between 11 and 12, and figures indicate that a large number of cases pass unnoticed until the problem reaches a sufficient degree of intensity to be remarked by parents or teachers. A poor physical constitution, it has been found, is a far graver factor in prognosis than a bad heredity, and the "backwardness" which appears so often in the complaint is far more often relative and emotional in origin than inherent. So far the work has been intensive and every case has been investigated with great thoroughness, but the clinic hopes in future to take another type of case for tentative advice and superficial study only, and thus to enlarge the scope of its work. Another project is to enlarge the waiting-room, with its stock of toys and books, into an elementary nucleus for occupation therapy. A ward for observation is urgently needed.

Another activity of the Jewish organisation is the supervision of evening schools, the hygienic conditions of which are often far from satisfactory. There seems to be a lack of appreciation of the serious dangers of insanitary and uncomfortable evening schools. Among other activities are research work, health education, and work for Jewish mental defectives. Dr. A. Sourasky is investigating the visual defects of Jewish boys and the incidence of cancer amongst Jews, and Dr. Emanuel Miller is to start an inquiry into the distribution of mental disorder among them. The Islington clinic is helped on its way by a grant from the Commonwealth Foundation in America, but the Council of the Spitalfields clinic feel acutely that their work is not sufficiently known to attract the funds they need and is yet so essentially personal and intimate that it cannot be advertised. The really difficult cases seen at the clinic, for instance, are too technical or unsuitable for illustrations, and those where the problems are superficial do not give a good idea of the arduous work or heavy expenditure involved. Their report is an extremely interesting document which should be read by all interested in the public health as well as by all members of the Jewish community. We shall look forward to the first report of the Islington Clinic next year.

PHENYLHYDRAZINE IN POLYCYTHÆMIA VERA.

THE value of phenylhydrazine in the treatment of polycythæmia was discussed at a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on Dec. 10th. A number of speakers testified to the value of this treatment, by which it is possible to reduce blood counts of eight or ten million red cells to normal levels in a few weeks. The technique usually adopted is to give capsules of 0·1 g. of the substance by mouth; the total dose, which is decided by observations of the blood count at frequent intervals, being usually not much in excess of one gramme. The ingestion of a gramme or more within a few days can produce toxic effects. Several observers had reported the incidence of jaundice, with bile-pigments in the urine, and an immediate direct van den Bergh reaction following treatment. But nothing more serious than a transient jaundice was observed by any speaker. As regards the general condition of patients treated with phenylhydrazine there was a general agreement amongst speakers that the giddiness, headaches, clouded intellect, and other common symptoms of polycythæmia vera, showed a notable improvement. Emphasis was laid on the fact that from the patients' point of view the method is much less disturbing than treatment by venesection or by irradiation of the bone-marrow. At the same time certain potential dangers must not be ignored. The toxic effects are probably due to hepatic poisoning, and in patients who have jaundice before treatment, further damage to the liver might easily prove serious. Cirrhosis of the liver has been known for many years to be an occasional accompaniment of Osler-Vaquez disease, and in its presence any drug with a toxic effect on the liver might be dangerous. Dr. L. E. H. Whitby drew attention to the frequent warnings in the literature that the appearance of a leucocytosis is a danger-signal during the administration of phenylhydrazine: in a series of experiments on animals he had failed to make any observations in support of this warning, *and in the cases reported at the meeting by Dr. Izod*

Bennett and Dr. D. T. Davies he had found that a rise in the white count ranging from 15 to 30 thousand was almost invariable, and did not indicate the onset of toxic manifestations. As regards the future of these patients, unfortunately the reduction in the red cell count was never more than temporary, although small doses of the drug given occasionally would keep the polycythæmia within reasonable bounds. Whether such treatment continued over a period of years will produce permanent damage to the liver is a question which present experience cannot answer.

THE M.R.C. AND GOOD ENGLISH.

THE lot of the writer of monographs is a hard one, for he must have done some hard thinking, and it is not made easier by the Medical Research Council which, in our view, imposes upon him salutary rules inspired by wisdom and experience. He is advised not to commence an article, he must begin it. He cannot have been engaged in a study of his subject; he has just studied it. He should not write in conjunction with a friend; but just with him. And he should not collect a considerable amount of material or a considerable number of facts, he should only collect much or many of them. In short, restrictions of liberty have been suggested, so that his manuscript will undergo a 20 per cent. reduction (or, as one might say, be one-fifth shorter) and eventually he may find himself writing quite good English without the help of the Publications Department of the Council. In the Notes upon the Preparation of Reports for Publication, which have just been issued in a revised edition after an interval of nearly nine years, the advice remains substantially the same except for the addition of two useful appendices: one of shorter and better equivalents for long words or phrases, the other a list of abbreviations of the names of journals taken from the World List of Scientific Periodicals prepared under the direction of the Keeper of the Department of Printed Books in the British Museum. The Notes have not been placed upon sale, but have been widely distributed among research workers in medicine. The advice is not oppressive or cramping to an author's style; by surrendering his liberty in non-essentials he will gain the freedom in essentials which really matters. The Notes are free from the touch of irony or subtle malice which seems almost incumbent on those who desire to impose their own literary style on others. It was a wise author who admitted the many ways of writing tribal lays every single one of which was right. The Council's censor has refrained from such banal quips as advising a would-be author to add a bibliography to his paper rather than a list of references and never to write the patient died but to say he ceased or "exitus lethalis." He might have said: If you feel the urge to write a medical article do not restrain yourself merely because you have nothing new to say and hardly know how to say it; facts and theories in medicine must be repeated again and again to drive them home. It is this sort of advice that estranges the earnest young writer and puts him off his stride when a more sympathetic mentor would be helpful in setting his feet on the narrow path of successful authorship.

Comparison of the Notes of 1929 with those of 1921 reveals one alteration for which we are profoundly grateful. In counselling the avoidance of obscure and misleading abbreviations the Publications Department has now fallen in with the continental practice of using the single letter g as an abbreviation for the gramme when standing alone or in its various compounds (kg., cg., mg.). Owing to the unfortunate similarity of the abbreviations used for the words gramme and grain these words should always be spelt in full if there is any possibility of doubt as to which unit is specified, but the Council has seen the wisdom of adopting the symbol g. for the gramme which is slowly but surely taking its place as the unit of weight throughout the civilised world. Rather singularly in doing so the Council has gone back on its abbreviation for cubic centimetre, which in 1921 was given as c.cm. and is now c.c., an exception to the rule made, it is stated, in order to conform with the general practice. But here, again, we feel that to make the exception is to introduce disorder into the very heart of exactitude. No doubt to those who are brought up in chemical laboratories a hundred-see-see measure or a ten-see-see bottle has become a habit of mind; to the chemist the see-see is the only unit, and the exception scarcely matters, but the biochemist has to do as much or more with the cubic millimetre, with its orthodox abbreviation. There can surely be no hardship or ambiguity in writing c.cm. and we trust that in this particular writers of monographs will assert their individual judgment against that of the Medical Research Council.

PSITTACOSIS.

IT is only recently that any real headway has been made in the investigation of the complex salmonella group of bacteria. It is now recognised that mankind shares infection by this group with a great variety of animals, and that the normal source of infection is the animal. A prominent member of the group, and a very widespread one, is *Bacillus ærtrycke*, which is often described under one of its very numerous synonyms. Among the rarer manifestations, at any rate in man, is the infection of parrots known as psittacosis, which seems to be transmitted from sick birds to man, and is held responsible for the recent death of Dr. D. L. Thomas, M.O.H. for Stepney.

In the latter part of the last century much attention was paid to the condition, especially in Paris and in Rome; a correspondent of THE LANCET in 1899 wrote with disgust of the hundreds of deaths from this disease in imported parrots, and in 1897 we published accounts of a number of fatal human infections in Italy. In Paris, in 1892, a real epidemic was recorded, with a case mortality of 45 per cent. Nocard, in 1893, recovered an organism from the bone-marrow of an infected bird, and Gilbert and Fournier, in 1896, from a human case, which has since been known as *B. psittacosis*, until it was recognised as the familiar *B. ærtrycke*. So recently as July 20th of this year Dr. A. P. Thomson reported in our columns a case in which the patient appeared to suffer from atypical fever, with a positive agglutination to *B. paratyphosus* B. She had nursed a sick parrot, and her little niece solved the problem of her illness by suggesting that "auntie has what the parrot had." From a developing parotitis (suitably enough) an organism was recovered which was stated to agglutinate slightly with paratyphoid B serum. Agglutination, however, does not seem to have been tested with *ærtrycke* serum, and the organism was at first described as Gram-positive. Three other less well-authenticated cases were recorded in the same district.

Many authorities deny that an infection is transmitted by parrots. To-day, at any rate, psittacosis is exceedingly rare in man, and, indeed, very uncommon in birds. At the London Zoo it is unknown, and it is possible that the disgraceful methods of transportation which our correspondent discussed in 1899 have to-day been abandoned, to the advantage of man and of parrot. The condition is so seldom met with that the diagnosis is scarcely one that should spring to the lips with confidence. The essentials in making out such diagnosis are a fulminating infection, with a positive agglutination to the salmonella group of organisms, the recovery of an organism of that group, and its identification with *B. ærtrycke*. If combined with the recovery of an identical organism from the incriminated bird such a history would be convincing. It is hardly necessary to add that the risk of contracting the infection from domestic parrots is remote, though it is probably wise to beware of such birds as develop an illness soon after importation into this country.

THE MEDICAL DIRECTORY.

THE new Medical Directory reaches us on Dec. 11th, well up to time. It is the eighty-sixth annual issue and the publishers have almost left off looking for new features, being as contented as are most of their subscribers with the present arrangement of the material. Graduates and licentiates in dental surgery, whose names were excluded from the Directory in 1925 to appear in a separate Dental Surgeons' Directory, are justified in regarding the discontinuance of this volume as a grievance. We do not know what may be felt by others who use the Medical Directory for constant reference—we have heard regret expressed for the omission of the year and the key-names at the head of the page—but the two inconveniences which we encounter with any frequency are the absence of private addresses under the heading of Naval, Military, Indian, and R.A.F. Services, and the absence of an alphabetical index covering the names in all seven sections. The latter might be rectified by a sudden act of grace in 1931 but the former might take long to achieve. The volume has increased in size by about 30 pages this year, owing principally to the inclusion of 391 more names. This annual increment, by far the smallest in the last ten years, is the net result of a profit and loss account, for the sections headed Scotland (−93) and Ireland (−120) have diminished, while those headed London (+48), Provinces (+304), Wales (+4), Abroad (+232), and Services (+16) have increased, although in unequal measure. We have given the actual figures in parentheses. It is, no doubt, time that the rate of increase did diminish unless new fields of medical practice are to be explored, for there has been the enormous increment of 10,257 names during the decade 1920–30, and obviously this could not go on safely. A special word of commendation might be given to that part of the introduction which treats of the health resorts of the British coasts and has been fully revised. An island may have its drawbacks, but it ensures a coastline sufficient to supply the needs both of its own workers and of visitors from other countries. The English littoral is estimated at 2350 miles, that of Scotland at 2300 miles, and of the British Isles at not less than 6000 miles, even were the circumventor to jump all the narrow creeks. We welcome the care and enterprise of the publishers in producing so valuable a work of reference. The publishers are Messrs. J. and A. Churchill and the price is 36s. net.

A NEW CAUSE OF INFLUENZA.

THE recent statement in the lay press that Prof. Falk, of Chicago, has discovered the cause of influenza in a pleomorphic streptococcus does not excite bacteriologists as much as it might have done 15 or 20 years ago. Many alleged causes have been discussed to the point of weariness and it has been realised that any such discovery would require long and searching criticism before it found general acceptance. In the first place, neither the definition of influenza in general nor its diagnosis in a particular patient are simple tasks. Under the convenient name of influenza are included illnesses with a very wide range of symptoms. The clinical recognition of such an indefinite disease is not beyond dispute, unless many synchronous cases occur in the course of a widespread outbreak which is comparable in type to previous acknowledged epidemics. The disease cannot readily, if at all, be recognised in animals, though monkeys, which are said to have been used by Prof. Falk for his experiments, appear to be the most hopeful subjects. The ætiological candidates for the position of causal organism in influenza pandemics have been many: they include Pfeiffer's bacillus, *Bacterium pneumosintes*, various streptococci, and an unknown filter-passing virus, which latter has of late claimed many adherents. None of these has established its claim, but all have much in their favour, especially in connexion with particular outbreaks or certain areas. It is possible that two or more infections may be associated in the same outbreak or even in the same case. The pleomorphism or uncertain morphology of Prof. Falk's micro-organism, which is said to resemble one described by Dr. D. and Dr. R. Thomson in our columns,[1] adds to his difficulties in establishing its importance, since irregularity in shape and size do not make for conclusive recognition. If his conclusions, based on the successful experiments which he is said to have made, withstand the criticism to which they will no doubt be subjected by other bacteriologists, bacteriology will be the richer for a micro-organism pathogenic to both man and monkeys, whose importance is in proportion to its prevalence. Whether the disease it produces is rightly called "influenza" is a problem which will require for its solution observations extending over a long time and a wide area.

THE house and library of the Royal Society of Medicine will be closed from Monday, Dec. 22nd, to Saturday, the 28th, both days inclusive.

AT a recent meeting of the Court of Assistants Lieut.-Colonel C. T. Samman, J.P., was elected to represent the Society of Apothecaries of London on the General Medical Council for one year, in succession to Mr. Samuel Osborn, who has resigned.

THE Royal College of Physicians of London will be closed for the Christmas vacation from Tuesday Dec. 24th, to Monday, Dec. 30th, both days inclusive.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. T. C. H. Neil to be Surg. Lieut.-Comdr.

The following appointment is notified: Surg. Comdr. J. F. Haynes to *President*, for R.A.F. and Medical Officers' Course, and to *Glorious*.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub.-Lt. E. G. Thomas to be Surg. Lt.

Proby. Surg. Sub-Lt. H. E. Holling to be Surg. Sub.-Lt.

ROYAL ARMY MEDICAL CORPS.

Capt. E. P. N. Creagh to be Maj. (prov.).

Maj. J. Heatly-Spencer is apptd. a Professor, R.A. Med. Coll., vice Lt.-Col. W. P. MacArthur, vacated.

TERRITORIAL FORCE.

Capt. W. L. S. Cox, to be Divl. Adjt. 53rd (Welsh) Div., T.A., vice Maj. J. K. Holland, who vacates the appt.

Capts. W. Gault and W. B. A. Lewis resign their commns.

Capt. J. Rowland, from T. A. Res. of Off., to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. to be Col.: Bt. Col. E. A. Walker.

Temp. Lts. to be temp. Capts.—B. R. Bhaskar, H. K. Handoo, L. D. Sarronwala, P. N. Satho, D. N. Basu, H. S. Ahluwalia, M. N. Pal, and T. R. R. Pal.

Dev Datt to be Temp. Lt.

Maj.-Gen. R. W. Anthony retires.

A PROVINCIAL HOSPITAL FUND.—Sir Gomer Berry, High Sheriff of Bucks, last week opened two new wards of the Royal Buckinghamshire Hospital at Aylesbury. He suggested that a fund for provincial hospitals, similar to the King's Fund for London, should be established and that permission should be asked to call it King George's Fund.

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[1] THE LANCET 1927, i., 253 and 1125.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

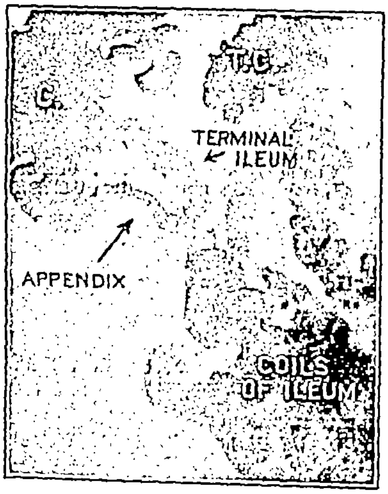
LVII.

INTERPRETATION OF RADIOGRAMS OF THE ALIMENTARY TRACT.

PART IV.*—THE SMALL INTESTINE: THE APPENDIX.

ORGANIC lesions of the small intestine are, fortunately, rare. Symptoms are vague or absent and there are seldom any localising signs. Owing to the divided state of the food when it passes through the small intestine, it is liable not to be seriously delayed or obstructed till a comparatively late stage. Moreover, so far as my limited experience goes, there is little if any indication of spasm, and the lesions that have been found at operation have always shown marked organic narrowing. We depend for diagnosis entirely on the detection of a definite coil of intestine that is distended and in which we note peristaltic movements that fail to pass the opaque food onwards. By manipulation and palpation we attempt to isolate this coil and endeavour to note if the distal end of it is fixed, if there is any tumour, and so forth. If we note such a condition and find one end of the coil fixed, the diagnosis lies between adhesions, cicatrisation of ulceration, or growth. Apart from detecting the resistance of a tumour there are no guiding signs.

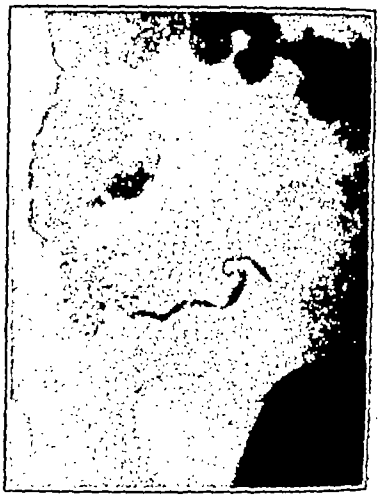
FIG. 21.



Condition of cæcal region when patient comes for examination on the second day, having been re-fed five hours previously. There is more food in the terminal ileum than normally on the technique employed and slight stasis. The cæcum is well filled and the appendix is of a large wide gauge type. No concretions noted in it. If the cæcum and appendix were freely movable and there was no pain on pressure on the appendix, this degree of stasis could well be overlooked. C = cæcum. T.C. = transverse colon.

When an obstruction is advanced, however, its presence is always indicated by the *fact that in our* preliminary examination in the upright position we note the appearance of a number of irregularly scattered air spaces in the abdomen, each with a horizontal fluid lower margin—like the air space in the stomach. Such a picture, *apart from* the effects of a purgative that is still acting, is certain information that we are dealing with an obstructive lesion in some part of the intestinal tract—perhaps even as low down as the rectum. Whether the radiologist should pursue his investigation and attempt to locate the lesion more than doubtful, for the condition is possibly already one of urgency so far as the intestine is concerned, even though the clinical picture is still vague and does not apparently call for urgent measures. The responsibility for pursuing the examination, which would necessarily entail delay, should be placed on the surgeon. In one instance known to me the surgeon, who operated at once, found an almost gangrenous length of gut in a patient who certainly presented no clinical evidence that such a finding was at all likely.

FIG. 22.



Appendix as seen 24 hours after food. On double feeding this appearance is often noted on the third day of the examination. Note the loaded condition of the rectum.

The detection of appendicular trouble depends entirely on the technique and experience of the radiologist. Given a standard technique, the radiologist can determine whether there is any delay behind the ileo-cæcal valve. If there is, it is of some importance. He should palpate the filled cæcum and terminal ileum; if he finds it to be abnormally fixed this also is of some importance. He may have to employ posture in addition to palpation in order to bring the cæcum out of the pelvis in certain cases. If in the course of his palpation he finds a definitely tender spot located to the site of the appendix it provides evidence of the utmost value. These three points—delay, abnormal fixation, and localised tenderness—taken together, if they are all positive, make an absolutely definite diagnosis of a chronic appendicular lesion. Tenderness localised to the exact site of the appendix is the one sign that is of conclusive value. The filling and visualisation of the appendix itself is not of great moment (Figs. 21 and 22). If we see it filled, we can palpate it and note whether it is free or fixed in the pelvis or elsewhere. but fixation of the appendix has not necessarily any present pathological significance. If the radiologist has the opportunity of observing the patient for some days, and finds that the opaque food is retained for a prolonged period, he is probably justified in saying that the appendix is not functioning normally. The longest period during which I have known opaque food to remain in the appendix is three weeks. During the game season, however, it is comparatively common to find shot, perhaps quite a number of them, lodged in the appendix for long periods.

The acute appendix is seldom seen in the X ray department. It gives rise to so much localised irritation that we find an empty condition in the cæcum and terminal ileum at a time when we should expect to find them filled. This appearance is suggestive, if not of a comparatively acute appendicular lesion, at least of some irritative condition in the cæcum or thereabouts. The appearance, however, is not at all uncommon in tuberculous disease of the cæcum, an infection that is comparatively rare apart from tuberculous disease in other regions.

A. E. BARCLAY, M.D. Camb.,
Lecturer in Radiology, University of Cambridge.

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* arts I., II., and III., respectively on the Œsophagus, the h, and the Duodenum, appeared in THE LANCET of Dec. 7th, and 14th. The concluding part on the e will appear next week.

Special Articles.

SOME OBSERVATIONS ON SCANDINAVIAN SURGERY.

By T. HOLMES SELLORS, B.M. OXF.,

G. H. HUNT TRAVELLING SCHOLAR, UNIVERSITY OF OXFORD; SURGICAL REGISTRAR, MIDDLESEX HOSPITAL.

III.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

SANATORIUM treatment in Scandinavia differs little from the routine observed in this country, but in certain types of pulmonary tuberculosis surgical measures are far more freely utilised. All such surgical intervention may be classed as "Collapse Therapy," and the principles on which it is based depend largely on the extent and stage of the disease in *both* lungs. Immobilisation and rest are the ideal and essential features in the treatment of any form of tuberculosis, but in the lungs these are difficult to obtain. Furthermore, the contraction that should result from fibrosis during the process of healing is hindered by the rigidity of the chest itself. Apart from the local disease, the patient has to combat the general effect of the tuberculous toxin. His immunisation and resistance against this are admittedly favourably stimulated by sanatorium régime. The Scandinavians as a rule treat the exudative or progressive infiltrating forms on general lines, but find that the proliferative or fibrosing form requires further measures. Cavities may form and being unable to contract because of their peculiar situation in the lung tissue are secondarily infected; the patient's powers of resistance are diminished, and a troublesome cough inevitably follows. Collapse therapy aims at immobilisation of a part or the whole of one lung by assisting its natural tendency towards retraction. When the lung does retract, cavities are drained of pus and debris, and cough and expectoration soon relieved. The resulting diminution in the numbers of tubercle bacilli is an important social factor as soon as the patient returns to normal surroundings.

Before contemplating collapse of a lung the condition of the opposite side must be taken into careful account, for while one healthy lung is adequate for ordinary respiration, one slightly diseased may not be able to stand the strain thrown upon it when its fellow is out of action; its resistance to infection may be reduced. The set-backs consequent on incomplete retraction are also to be remembered; the risk of exacerbation in the uncollapsed areas of the affected organ is serious. The liability of the right side of the heart to embarrassment from pressure is another possible complication. Ideally the lung that is to officiate should be free from tuberculous lesion, but as this is rarely feasible every effort should be made to exclude the presence of the exudative form which is capable of giving rise to an acute and perhaps fatal broncho-pneumonic "flare."

The selection of cases really resolves itself into the estimation of the degree of activity of the disease in in the more healthy lung. Most dependence is placed on radiographical findings, but not to the exclusion of other clinical methods. Selection of the doctor to undertake the treatment is more difficult since an extensive surgical operation is outside the physician's sphere, and a surgeon may not be qualified to assess the general fitness of the patient and extent of the disease. In a few notable instances ideal coöperation obtains between physician and surgeon—Profs. Key and Jacobæus, of Stockholm, to wit. The alternative lies in complete control by a specialist in tuberculosis, like Dr. Gravesen of Vejlefjord, Denmark, who with a unique experience has complete control of treatment in all stages and forms of pulmonary tuberculosis. Before entertaining the procedures included in collapse therapy it must be realised that the patient's general condition is too often poor, partly as the result of the disease itself, partly from the absorption of toxins from secondarily infected cavities. The existence of tuberculosis in other organs, if mild, is not an absolute contra-indication, though each case has to be judged on its own merits as to what particular form of collapse therapy is to be employed and as to the fitness of the patient to stand the measures suggested. The patients themselves are generally willing to take a risk in the hope of an improvement that will raise them from their chronic unfitness.

In addition to the general indications for collapse therapy as have been mentioned there are also more urgent conditions, such as recurrent hæmoptyses, which may derive considerable benefit.

The operations included in the term collapse therapy are:—

Intrapleural—
- Artificial pneumothorax (A.P.).
- Thoracoscopy with division of adhesions.
- Division of adhesions by open operation.

Extrapleural—
- Phrenic evulsion.
- Extrapleural "plugging"—apicolysis.
- Thoracoplastic operations.

Artificial Pneumothorax.

The indications and technique of artificial pneumothorax in Scandinavian practice are very similar to ours, but its exploitation is more extensive both as a preliminary and as a supplement to some other form of treatment. Many authorities, notably Gravesen, hold that A.P. should be reserved for cases definitely demanding lung retraction, and not for early exudative disease, which would probably respond satisfactorily to sanatorium régime. The advantages of A.P. lie in the easy control of the process, so that re-expansion of the lung can be permitted when it is judged that the disease has been arrested or when there are signs of activity on the opposite side. In bilateral disease it can be used alternately or simultaneously, though care must be taken to leave sufficient healthy lung tissue available for ventilation. It can be said that all cases which may require pulmonary collapse should be started with an attempt at A.P., even though pleural adhesions are anticipated, since the estimation of these cannot be made until the pneumothorax has been attempted. The importance of adhesions is demonstrated by Gravesen, who quotes figures for advanced cases over 2–12 years, in which the capacity for work became 70 per cent. in cases without adhesions, whereas the percentage fell to 33 with localised and to 11 with extensive adhesions. The ease and elasticity of the treatment is somewhat countered by the necessity for "refills" which have to be performed every few weeks. Mobility of the previously fixed mediastinum may produce flutter and cardiac embarrassment, but adhesions with consequent fixation, if not already present, soon form after treatment has been started. Should the lung re-expand by accident or intent generalised pleural adhesions may obliterate the pleural space and prevent further injection of gas.

Thoracoscopy and Division of Adhesions by Cautery (Jacobæus's Method).

The presence of pleural adhesions is a serious drawback to the efficiency of complete artificial pneumothorax. A comparatively small strand may prevent collapse of the very spot that is maintaining infection. Division of selected adhesions may allow satisfactory collapse and maintenance of a complete pneumothorax. Gravesen's figures in A.P. illustrate the importance of adhesions as affecting the end-result, and show that thoracoscopy with division of adhesions allows 50 per cent. of the treated to return to work as opposed to 11 per cent. to 33 per cent. if the A.P. is continued in their presence.

This operation is regarded in most clinics as the routine precursor to a possible thoracoplasty in cases with an inefficient A.P. Thoracoscopy can be undertaken on out-patients for direct examination of adhesions, and is to be preferred to radiography, which may fail to give an accurate idea of their type and situation. Selection of those suitable for division is difficult, but the problem is more easily solved as the operator gains experience. Long cords give better results than short bands. Tissues other than pulmonary may have been pulled out of their normal site even into the adhesion itself, and jeopardise the success of the operation, perhaps even the life of the patient. The presence of lung tissue in an adhesion is a grave source of danger, for damage to a diseased area may produce an empyema with pleuro-bronchial fistula. Fatalities have been recorded from cauterisation of the subclavian vein, but dangers from adhesion stumps and intercostal vessels are negligible. Smoke frequently obscures vision, and has to be blown or sucked out of the pleural cavity.

Prof. Jacobæus, Dr. Gullbring (both of Stockholm), and Dr. Gravesen use this thoracoscopy with marked success, and in their hands the operation is delightful to watch. The technique, originated by Prof. Jacobæus, consists in the introduction of a wide trocar and cannula through an intercostal space near the site of an adhesion previously indicated approximately by X rays; the second or third spaces anteriorly or the highest space in the axilla are the usual locations. The tissues are thoroughly novocained, the instrument inserted, and an endoscope passed thereby into the pleural cavity, which can now be inspected for some distance. If, then, it is decided to divide an adhesion a second cannula is passed at the same level about 90 degrees further round the chest. A long, slightly hooked platinum electrode is then applied to the adhesion at a dull red heat, and division is accomplished under view through the endoscope. The cannulæ are similar so that endoscope and electrode are interchangeable, and access to the adhesion can thus be obtained from two points. Some degree of reaction and simple pleural effusion follow in most cases, and a certain amount of subcutaneous emphysema is almost inevitable, but these are of little consequence and A.P. can be resumed in a few days.

Division of Adhesions by Open Operation.

This is occasionally practised by Prof. Denk, of Graz, Austria, on selected cases. He is not a strong supporter of division of adhesions through the thoracoscope on account of the difficulties encountered, the long manipulation, and the risks of opening diseased lung tissue. The open operation can be performed under local anæsthesia with good exposure of the affected region.

Phrenic Evulsion.

Simple division of the phrenic nerve in the neck produces a temporary or partial paralysis of the diaphragm, but permanent paralysis can only be obtained by evulsion of as much of the nerve as is possible, so that the accessory branches (notably that accompanying the nerve to the subclavius) are included in the removal. Evulsion is the most satisfactory method of preventing regeneration of the nerve. The reduction in size of the thoracic cavity produced by elevation of the diaphragmatic dome is most apparent at the base of the lung, so that the lesions which respond best are situated in that region. A certain degree of improvement may accrue to cases with apical infection, but this is naturally dubious; the operation may, however, if performed at a lucky moment in an exudative process, prevent the formation of otherwise inevitable cavities. It does relieve paroxysmal cough of diaphragmatic origin, and give relief to some of the symptoms of pericardial adhesions.

Phrenic evulsion is certainly the most simple means of obtaining permanent reduction in pulmonary volume, and for this reason has been suggested as a termination to protracted A.P. treatment. Some degree of fibrosis and contraction must follow prolonged collapse of a diseased lung, and if cavities had been present before the collapse was undertaken the volume of the lung must have been considerably reduced. The lung re-expands on cessation of the A.P., and becoming adherent to the parietal pleura, tends to resume its original size. Were the chest wall sufficiently elastic to subside correspondingly, the end-result would be satisfactory, but where rigidity rules diaphragmatic ascent following phrenic evulsion will at all events give the lung less room to expand.

The indication and frequency of the operation vary with different authorities. Some use it as a preliminary to complete thoracoplasty with the object of revealing any undetected focus of tuberculous activity by a slight general reaction or of gauging the patient's behaviour towards the more serious experiment. Profs. Key, Denk, and Nyström reserve evulsion for basal lesions, and for a few cases in which thoracoplasty has not been entirely satisfactory. Dr. Gravesen uses it more as a preliminary to a thoracoplasty less extensive than that which most surgeons employ. Its comparative simplicity and ease make it valuable for the aged or debilitated consumptives, though its beneficial effects are small compared with those achieved by plastic operations of wider scope. Scandinavian teachers regard phrenic evulsion as an overrated procedure, with, however, a definite, if small, field of usefulness.

Local anæsthesia is always employed, and a short skin incision is made parallel to the posterior border of the sternomastoid muscle in the lower part of the neck, sometimes for cosmetic reasons, along the upper edge of the clavicle. The platysma and cervical fascia are divided, and the outer border of the scalenus anticus identified. The phrenic is seen running almost vertically downwards below the fascia, and may look surprisingly small. Novocain is injected into the nerve, which is then crushed and divided. The distal portion is seized with forceps and slowly twisted upwards. Deep-seated but not severe pain is felt in the chest, and occasionally a pain is referred to the shoulder. The nerve with its branches gives way or may be divided if about 10 cm. have been avulsed, though the length sometimes obtained reaches 25–30 cm.

Extrapleural "Plugging"—Apicolysis.

If pressure is exerted through the parietal pleura over a cavity in lung tissue it may have the effect of compressing it, so long as it is situated near the surface. Occasionally cavities in the region of the apex persist in spite of radical measures directed towards their collapse. In these cases it may be of advantage to apply extrapleural pressure by means of fat taken from the abdominal wall or paraffin "plugs," but these must be accurately placed if they are to be of any value. In addition it is not practicable to use plugging over a wide area.

The common indication for this type of operation lies in the persistence of an apical cavity following such a procedure as thoracoplasty. Once the cavity is accurately localised and shown to be sufficiently near the surface of the lung access may be gained by resection of the second rib anteriorly (Gravesen), or else by removal of the second, third, or fourth ribs posteriorly (Denk, Clairmont). The intact parietal pleura is then pushed down without injury over the cavity in the lung, and the space thus formed filled with the graft or plug. The superficial layers are carefully approximated.

Criticism is levelled against the operation on the grounds that the graft may not take, or that the plug may slough, and also that there is a considerable risk of infection from the subjacent lung. Rarely the plug has been known to migrate from its site as a result of imperfect fixation, but on the whole the results in selected cases can be distinctly gratifying. In other parts of the thorax plugging is a satisfactory method of obtaining adhesions as a preliminary to a transpleural operation.

Thoracoplastic Operations.

Several types of operation on the chest wall are in use, but the most common is the paravertebral (Wilms-Sauerbruch) thoracoplasty; the Schede and Estlander have been discarded. Anterior and lateral division of the ribs is employed only in cases where the paravertebral has proved inadequate. Failure of A.P. is the usual indication for the operation. It provides a permanent, rigid collapse and throws the responsibility of ventilation on the opposite lung for all time, and therefore should be reserved until the less drastic measures have been tried and failed. Total thoracoplasty is a severe operation, and should only be performed on patients whose general condition is comparatively satisfactory, and who show no signs of activity in the other lung, otherwise a fatal exacerbation is bound to ensue. About 40 per cent. to 50 per cent. are able to return to work within a year, and with judicious selection the results are really remarkable, since the majority have been operated upon more or less as a last resource when they are complete invalids. In Sweden, especially, thoracoplasty is regarded as a common surgical measure. Operation mortality is from 0 per cent. to 10 per cent. Failures and deaths are due to acute "flares" or gradual spread of the disease in the uncollapsed lung. The risk of right heart embarrassment in right-sided rib collapse has to be kept in mind. Should the thoracoplasty prove inadequate as a collapsing agent—as may happen with a very rigid apical cavity—supplementary rib resection or extrapleural plugging may be called for. Profs. Clairmont (Zürich), Key, Nyström, and Denk use a two-stage thoracoplasty; others prefer a single stage operation, which is bound to produce a severe degree of shock in an already debilitated subject, but which is free from the possibility of faulty rib-fixation which may occur if the interval between the stages is unduly prolonged. Partial upper thoracoplasty, often supplemented by phrenic evulsion, finds favour with Dr. Gravesen, but not with the above-mentioned surgeons.

Anæsthesia is generally local with the patient in a half-sitting position. Gravesen supplements local with light open ether and has no ill-effects therefrom. Speed is important, and if good collapse is to be procured, four to eight inches of the ribs must be removed right up to the level of the transverse processes. Division of the first rib is essential, and if possible an inch should be resected with due regard to the presence of great vessels and nerves. Prof. Key's resections are more extensive than those of other surgeons, and, with the exception of Prof. Nyström, resections are subperiosteal. All insist on the avoidance of any inward thrust or pressure during operation lest the parietal pleura be damaged, and the success of the whole proceeding endangered.

After-treatment is very important. The pain following the operation is severe and must be relieved. Sputum from cavities which are being compressed has to be evacuated, therefore coughing is encouraged, and the posture of the patient best arranged for that purpose. Sleep is necessary, but not at the expense of over-filled cavities. The object of the operation is attained when the mobilised ribs, having gradually fallen in and down towards the vertebral column, remain fixed against it. This may be assisted in the early stage by pressure with bags of shot, and later by some form of elastic belt. The resulting deformity is surprisingly small, and includes but a slight dropping of the shoulder with emphasis of pre-existing hollows. Scapular function is invariably excellent. Most surgeons who have performed this operation are impressed by its efficiency, and comment on the gratitude of patients who have been transferred from a state of chronic ill-health to comparative well-being.

MEDICINE AND THE LAW.

Doctor's Successful Appeal: Alleged Partnership Document.

A MEDICAL practitioner has successfully appealed against conviction in a recent case which, though lacking any special feature of medico-legal concern, is perhaps of general interest as showing how forensic and judicial irregularities can vitiate a criminal trial. The appellant was charged at the London Sessions some time ago with the larceny of stamps. In the course of his defence he had, as the lawyers say, put his character in issue. That is to say, he had claimed that his character was good and had put the fact forward as a reason why the jury should believe him innocent of the charge on which he was being tried. Now if, in defending himself, an accused person makes any positive assertion of his own good character or makes any attack upon the character of witnesses for the prosecution, he is liable to be cross-examined as to his credit. Under this rule the accused doctor was asked questions in cross-examination as to an alleged confession which it was suggested that he had signed, admitting dishonesty, on the dissolution of a medical partnership. He denied having made any such admission. The document was not produced to him though counsel for the prosecution seems to have displayed in his hands a paper which was visible to the jury. The accused man was pressed with a stream of questions about the alleged confession and, when some controversy arose as to whether the cross-examination was proper or improper, the jury—in spite of the protest of counsel for the defence—were asked to retire while legal argument was heard upon the point. This proceeding naturally tended to intensify the atmosphere of suspicion. The Criminal Procedure Act of 1865 lays down that a witness may be cross-examined as to his previous written statements without the writing being shown to him, but that, if it is intended to contradict the witness by the writing, his attention must first be called to the parts of the writing which are to be used against him. Apart from this specific statutory provision, the proceedings at the London Sessions seem to have been conducted with less than the usual fairness. In the upshot the accused man was convicted and was remanded in custody to the following sessions when sentence was passed to the effect that he be bound over for two years. The Court of Criminal Appeal found that three irregularities had occurred. In the first place, in cross-examining the defendant about the alleged document which was not produced, there had been a breach of a statutory rule. Secondly, in allowing the jurors to be sent out of court the tribunal had introduced an element of mystery and suspicion; indeed in the opinion of the Court of Criminal Appeal it is difficult to imagine any occasion when the jury could be asked to leave the box except at the request or with the assent of the defence while statements were made in their absence. Finally the judge at trial had summed up unsatisfactorily to the jury on the issue of criminal intent. For these reasons the appeal succeeded and the conviction was quashed.

It has befallen not a few medical practitioners to be mulcted in substantial damages for some alleged failure or mistake in the professional treatment of a patient. They will observe with envy that distressing mistakes can be made in the administration of justice without any liability being imposed upon judges or prosecuting counsel to pay any compensation whatever.

Suicide at Christian Science Home: Jury's Censure.

An inquest at Ealing on Dec. 14th upon a case of suicide at a Christian Science home at Greenford disclosed a difference of opinion between the jury and the coroner. The deceased woman was not a Christian scientist but was sent to the home at the instance of a relation who was presumably a Christian scientist and who had supported her financially; he explained to the coroner that he suggested her removal to the home as preferable to having her certified and sent to an asylum. The deceased's daughter stated that her mother had threatened to jump out of the window. When her mother was taken to the home her case was fully explained to the proprietress; it was then said that the windows were fastened. Next morning the deceased asked for some hot milk with her breakfast; as the attendant nurse went downstairs to get it, there was a call that someone was at the window. The dead woman had taken a chair from her bedroom and had climbed from it to the landing window. This happened at 9 A.M.; some 12 hours later she died from her injuries. Dr. M. H. Renall, in his evidence at the inquest, said that death was due to a compressed fracture of the spine. At 9.45 A.M. the daughter telephoned to the home and was told that her mother had passed a restless night and was being kept in bed; the daughter was not told of her mother's injuries till 11 P.M., when her uncle (the relative already mentioned) brought the news of her death. There was evidence that after her fall the deceased did not complain of pain or ask for a doctor, and that her injuries would have been difficult to detect without expert aid. There was also evidence that there had been no previous complaint of the conduct of the home; an attendant had slept in the same room as the deceased. The coroner summed up the case as one which might have happened in any home, and suggested that fault should not be found merely because the accident occurred in a Christian Science home. The jury, nevertheless, in returning a verdict of suicide during temporary insanity, added a rider that they accepted Dr. Renall's evidence that the dead woman must have suffered considerable pain and that they considered the proprietress guilty of neglect (1) for not taking any precaution to protect the deceased from the tendency of which she was made aware; (2) in not immediately calling a doctor; and (3) in omitting to inform the relatives at once of the occurrence. On these grounds they considered the proprietress of the home deserving of censure. The coroner dissociated himself from this verdict. It should be noted that earlier in the proceedings the coroner had asked the proprietress of the home, whether she would have called in a doctor if she had realised that the deceased had been badly hurt. The answer was "Yes." The proprietress had also explained that her husband was a trained medical attendant and had examined the deceased after the accident without finding any serious injury. This was not, therefore, it seems, a Christian Science home where the rules entirely forbade recourse to ordinary medical and surgical treatment. The incident indicates that, if the admission of mentally unstable persons to such homes is to be regarded as an alternative to skilled treatment in institutions provided or supervised under the Lunacy Acts, Parliament may have to pay attention to the consequent dangers.

THE LEAGUE OF MERCY.

THE Prince of Wales, Grand President of the League, took the chair at the thirtieth annual meeting of presidents, which was held at St. James's Palace on Dec. 11th. After reading a congratulatory message from the King, he referred with regret to the death of Lord Lambourne, a most valuable and enthusiastic supporter of the League. The new charter of the League, he said, would give it an opportunity of increasing the numbers of those serving on the council, and he mentioned that the ball held at Grosvenor House in June last had brought in a sum of £1535. Among the splendid contributions to the League during the past year was a donation of £1000 from Lady Melchett, while the gift of a League of Mercy film, the expenses of which had been borne by Mr. John Maxwell and Mr. Joseph Grossman, of the British International Pictures, Elstree, was greatly appreciated where it had been shown. Lady Tree's broadcast appeal had brought in £700.

The Voluntary System.

As a result of recent legislation affecting the health services of the country an attempt was being made by the county councils and county boroughs to bring all hospitals into close touch with one another, and it seemed clear that authorities still recognised the importance of retaining the voluntary system. It would be the privilege of the workers of the League to persuade people to open fresh districts for carrying on the work of the League. Only by this means could the ever-increasing financial demands of modern medicine and surgery be successfully supplied.

Financial Position.

Lord Cornwallis having been appointed chairman in place of the late Lord Lambourne, the Rev. W. H. Hornby Steer, deputy chairman, and the Rev. E. G. Gordon, hon. secretary, the members of the executive council were appointed, and presentations of the Order of Mercy were made by the Prince of Wales. Lord Marshall, the hon. treasurer, then made a statement with regard to the income of the League which had more than equalled last year's total. The income from collections amounted to £12,727, amounts promised to £11,373, while the estimate of amounts to come was £2300, making a grand total of £26,400, compared with £26,143 last year. A special donation of £1000 was given to the Thanksgiving Fund for the King's recovery, the donation to King Edward's Hospital Fund was £17,000, the same as last year, and the grants to extra-metropolitan hospitals amounted to £8300, making a total of £26,300, compared with £25,200 in 1928.

Lord Moynihan, in an address, said he welcomed the opportunity to express on behalf of the medical profession their profound respect and congratulations to the members of the League for all that they had done for the hospitals. There never was a time when hospitals were so well equipped and served by members of his profession, or were held so high in public esteem.

A vote of thanks to the Grand President and the Lady Grand President, to which Princess Mary briefly replied on behalf of her brother and herself, closed the meeting.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

National Health Insurance: Views of the Approved Societies.

THE annual meeting of the Approved Societies' Association of the Irish Free State, held last week, gave an opportunity for consideration and criticism, both of the present working of National Health Insurance and of the changes proposed in the Bill at present before the Irish legislature. The most important decision of the representatives at the meeting was a resolution stating: "That this Association is of opinion that a National Medical Service should be instituted in the Free State." This is the first time that the approved societies have given their support to the demand for a National Medical Service, as distinct from a demand for medical benefits. Hitherto, indeed, some of the societies have insisted that a system of medical benefits, if established, should be administered by the societies. That they have now adopted the policy supported and urged by the medical profession is a matter for satisfaction. The Association, in another resolution, again expresses its dissatisfaction with the present method of providing evidence of sickness, and states that "there is grave and increasing laxity on the part of certain medical certifiers in the issue of certificates of incapacity." The Association asks the National

Health Insurance Commission to take steps to remedy the present state of affairs, and to deal effectively with any medical certifiers found guilty of irregularities in the issue of certificates of incapacity. An increase in the number of medical referees is also demanded. Discontent was expressed with the proposal in the Government Bill to abolish insurance committees. It is clear, however, that in recent years these committees have had few duties to perform; their existence led to unnecessary duplication of work, unnecessary expense, and delay in providing treatment for insured persons. The Association is opposed to the expressed intentions of the Government to introduce legislation to facilitate, if not to compel, amalgamation of the smaller societies. One speaker expressed his opinion that there were only two ways of administering health insurance, either the present system or nationalisation. Another speaker drew attention to the high cost of central administration. Attention was drawn to the fact that the present Government Bill left all the main recommendations of the Report of the Committee of Inquiry untouched, and dealt only with a few of the less important. In contrast with this was the statement made last week in the Senate of the Minister for Local Government and Public Health that the Bill was intended mainly to give effect to the recommendations of the National Health Insurance Commission.

Chair of Surgery in the Royal College of Surgeons.

Mr. Arthur Chance was last week elected to the Chair of Surgery in the School of the Royal College of Surgeons in Ireland, left vacant by the resignation of Mr. A. A. McConnell. Mr. Chance is surgeon to Dr. Steevens Hospital, and Lecturer in Applied Anatomy in the School of Physic, Trinity College. He is a son of the late Sir Arthur Chance.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A Libel Action.

A LIBEL action has arisen in connexion with a so-called "specific" against tuberculosis, which a layman claims to have discovered as a result of treating his own wife. The public press has given extravagant prominence to his claims with the result that patients in sanatoriums have become excited and upset. In one sanatorium the excitement rose to such a pitch that the patients rebelled against orthodox treatment and attempted to induce the medical staff to discontinue all other measures and substitute the new specific. Many half-cured patients have left the sanatoriums, with distressing results. A certain Dr. Nast, a physician of some standing, attempted to serve the public by publishing a pamphlet in which he explained the situation, showing no mercy to the inventor of the remedy. He asserted, and his findings appear to have received independent confirmation, that the "specific" was composed of cigarette paper soaked and crumbled. In the present state of the law Dr. Nast will probably be fined for libel since no one can deny that he called the inventor of the remedy a thief and a quack. The verdict will be pronounced next week, and it is anticipated that Dr. Nast will be let off as lightly as possible. It is also believed that the inventor himself may get into trouble for practising medicine without a qualification, which, I need hardly remind you, is illegal in my country although not in yours.

The Social Insurance Law.

A new social insurance law is to come into force on Feb. 5th and Parliamentary committees are now busy adjusting some of its provisions. Medical men have secured some important amendments of the original draft. As a result of protests fees will still be paid direct to the doctors and will be fixed by them according to their usual scale, the insured patient being awarded a round sum as an indemnity from which to make necessary payments. Free choice of doctor will be allowed, and the doctor will be at liberty to prescribe any drug except certain special ones. The selection of these has not yet been made, but it is probable that an official list of authorised special remedies will be compiled, similar to that in use for medical work under the poor-law. If the proposed law gets through both Chambers in its present revised form it will involve but little change in current medical practice.

A New Faculty of Medicine at Marseilles.

Marseilles is the second largest town in France, with a population of about a million. Up to now it has had only a "school" of medicine; that is, students could only take part of their course there and had to go for nearly all their examinations to another town. Generally they went to Lyon or Montpellier—where there are faculties of medicine, though Montpellier has hardly 100,000 inhabitants. Jealousy between the neighbouring towns has hitherto prevented the development of the medical school of Marseilles, but since at such a big port an extraordinary variety of diseases may be observed it is satisfactory to learn that university status has now been achieved. The faculty at Marseilles will develop the department of tropical medicine and pathology, and it is hoped that in the course of a few years it will become an important centre for teaching and research.

Stationary Cars in Paris.

An automobile club of doctors has been started in Paris under the presidency of Prof. J. L. Faure. The first object of the club is to settle with the prefect of police the question of leaving cars in streets. A half-hour limit is shortly to be enforced in the main streets of Paris, and the members of the club hope to secure exceptional treatment for cars belonging to medical men.

Dr. Charles Nicolle, head of the Institut Pasteur of Tunis and winner of a Nobel Prize for Medicine, has been made a member of the Académie des Sciences, of which he was already correspondent. Prof. Lépine, Dean of the Faculty of Lyon and member of the Académie de Medécine, has been elected corresponding member of the "Académie des sciences morales et politiques" in the section of philosophy. He is professor of clinical neurology and psychiatry. Prof. Gosset will be this year's chairman of the National Society of Surgery. Dr. Lhermitte will be the chairman of the Society of Neurology, and Mr. Tissier will preside over the Society of Forensic Medicine, which has a mixed membership of doctors and lawyers.

MILLER GENERAL HOSPITAL, GREENWICH.—At the annual meeting of this hospital last week it was stated by Lord Queenborough, the President, that the response to a recent appeal had been only five shillings. The income has gone up by £5000, but the expenditure has increased to an even greater extent, and there is a net deficit on the last two years of £1360. During the year patients' payments amounted to £2707.

THANK-OFFERING FUND.—This Fund, which has now been closed, amounts to £680,507. Out of the money subscribed for the purchase of radium £100,000 has already been paid to the National Radium Trustees to enable them to claim the equivalent Government grant and a further £50,000 has yet to be handed over. "Audax's" donation of £105,000 to King Edward's Fund is being invested and the income will be used to swell the amount available for annual distribution. A balance of £37,000 subscribed for radium will be given to the King's Fund for the purchase of radium to be lent to the London hospitals. The King's Fund will make a special distribution in aid of extensions of and improvements to hospitals. The donations received before August 1st earmarked for individual hospitals have been paid over, and the balance is now being distributed. The number of separate distributions has amounted to nearly 500.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of four large towns, which suffer excessively from atmospheric pollution, and of two smaller towns more favoured in this respect. The variations in the rates of young child mortality are striking.

Name of town and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Manchester .. (767,530)	16·8	12·9	1·29	1·44	2·6	1·5	91/34	44	4·1
Newcastle-upon-Tyne (281,500)	19·2	13·1	1·32	1·54	1·8	1·9	83/38	44	5·0
Salford .. .. (241,500)	16·9	13·3	1·42	1·32	3·2	1·3	106/—	48	4·2
St. Helens .. (110,600)	21·8	12·0	0·95	1·09	2·5	1·6	98/48	50	4·6
Poole .. .. (52,940)	17·3	11·9*	0·77	1·42	1·8	1·5	50/30	24	8·7
Colchester .. (44,880)	15·8	10·5	0·69	1·80	0·9	1·7	42/—	17	1·3

Relation of stillbirths to live births: Manchester 6·2 per cent., Newcastle 6·1 per cent., Salford (those notified) 5·0 per cent., St. Helens (notified) 4·4 per cent., Poole, 2·7 per cent., and Colchester 3·9 per cent. * Standardised rate 10·0.

Manchester.

Dr. R. Veitch Clark reports that the infant mortality-rate was five higher than in 1927 and four higher than in 1926. The increase was chiefly due to the later persistence of diarrhœal and wasting diseases during the fourth quarter and to the prevalence of whooping-cough, and a definite outbreak of acute respiratory catarrh in the city during the same period.

A special report on diphtheria immunisation made to the city council in June shows that during the ten years 1917–26 there was a yearly average of 758 cases of diphtheria with 69 deaths, and that half the deaths occurred in children under 5 years and 96 per cent. of the deaths in children under 15 years. The case fatality of Manchester children who have contracted diphtheria during this period has been 10·5 per cent. The cost to the municipality of providing treatment for this disease is estimated as being nearly £14,000 for 1926 and £9000 as an annual average. Examples are given to illustrate the benefits of immunisation schemes in other places, and it is mentioned that in Monsall Hospital no fully immunised member of the nursing staff has developed diphtheria since immunisation was adopted in 1925. The city council, as the result of the report, approved a scheme for the free provision of the necessary material for immunisation to medical practitioners and hospitals and for the carrying out of immunisation through the maternity and child welfare centres, school clinics, &c. Towards the end of the year a beginning was made and 490 immunisations were carried out at the child welfare centres.

The cases of encephalitis which came to light during the year numbered 50, of which 17 began to be ill in or prior to 1926, 11 in 1927, and 22 in 1928. The deaths caused by this disease numbered 41, 17 being those of persons notified in previous years. Children suffering from post-encephalitis are fairly well provided for by the guardians in Swinton Home. Adults who are bedridden and only require nursing care are provided for in the poor-law hospitals, but there remains a group of patients from the age of 14 years upwards, but mainly adolescents, for whom at the present time there is no suitable provision. This group largely suffer from moral defects or milder degrees of parkinsonism, and a scheme for their benefit is being considered by a joint committee of the health and education committees and the guardians.

The registration of stillbirths came into force on Jan. 1st, 1928. The principal causes of stillbirth in 130 cases investigated in the practice of midwives were: albuminuria of pregnancy 23, breech presentations, 24, antepartum hæmorrhage 11, and twin pregnancies 8. The attendances at the antenatal clinics showed an increase from 2746 in 1927 to 4800 in 1928. The ten clinics were attended by 1711 new cases, while the total births were 12,909. The cases of puerperal fever and pyrexia which ended fatally numbered 29, of which 8 were cases of abortion and 4 came from outside districts. The particulars are given of 45 other maternal deaths investigated, and if these are added to the 25 deaths from sepsis the maternal mortality from childbirth becomes 5·4. The admissions to the Monsall Hospital puerperal fever ward numbered 154, of which 21 ended fatally, but 6 died within 48 hours of admission. Dr. D. S. Sutherland states that septicæmia has not been found difficult to treat provided the focus of infection can be successfully dealt with by repeated glycerin-iodine intra-uterine injections. The intramuscular injection of metarsenobillon has given promising results when the septicæmia is treated early, and it is hoped to give in the 1929 report sufficient evidence as to its efficacy or otherwise. Dr. Clark reports that handicraft work has been developed at Baguley Sanatorium, and that good progress has been made in the building of the new children's sanatorium at Abergele. An increase is noted by Dr. D. P. Sutherland (tuberculosis officer) of the notifications of pulmonary tuberculosis between the ages of 25 and 34 in both males and females, and of the deaths at the same age-period only among the males.

Artificial light treatment is thought to be an advantage to the child in-patients at Abergele, but Dr. Sutherland is much more doubtful as to the benefits of light treatment given to out-patients. For lupus it is undoubtedly a benefit; but in other varieties of non-pulmonary tuberculosis the results are often indifferent. On the other hand, the use of artificial light for the treatment of children selected from the different maternity and child welfare centres and suffering from rickets, malnutrition, and debility following illness, is thought to give good results when the attendances are regular. Benefit is also claimed in the case of children suffering from adenitis, asthma, and nervousness, and of nursing mothers with failing lactation.

There were several introductions of small-pox by tramps and 68 cases in all with no death. Eleven cases of bacillary and two of amœbic dysentery were notified. The Flexner bacillus was responsible for seven cases and the Sonne bacillus for four. A boy of 3 years died from Sonne dysentery. Of the amœbic cases, both contracted in Mesopotamia during the war, one, aged 48, died. Early in the year there was an outbreak of ergot poisoning in North Manchester. The first cases occurred in private practice and one of the hospitals. The number of persons affected is unknown and it is not mentioned how severe the cases were. The use of the ergot-infected rye was prohibited and its sources investigated. The Ministry of Health has continued the inquiry and taken action to prevent the recurrence of the trouble. The new cases of syphilis and gonorrhœa treated were about the same as in the previous year. About one-quarter of those treated failed to complete the treatment up to the final tests. The use of antitoxin for the treatment of scarlet fever is being extended at Monsall, and it is estimated that the duration of stay in hospital can be thereby safely shortened by about seven days. Hitherto the serum has been injected intramuscularly. It is also being used for the immunisation of diphtheria cases admitted. The bed-isolation ward at this hospital has proved extremely useful, 317 cases of various illnesses having been admitted without any case of cross infection. Pemphigus neonatorum is notifiable in Manchester. Among the 106 cases reported there were 58 of infants under 11 days old and the total deaths numbered four, two being in institutions. Except for one outbreak of 22 mild cases in the same practice, the majority were isolated cases.

The city farms accommodate 951 cows, and amongst these one tuberculous udder and two cases of pulmonary tuberculosis (not advanced) were found. The percentage of tuberculous country milks was unusually high—viz., 694 samples with 122 tuberculous, or 17·6 per cent. Of 102 Derbyshire samples, 24·5 per cent. were tuberculous; of 348 Cheshire samples, 18·1 per cent.; of 101 Staffordshire samples, 16·8 per cent.; and of 110 Lancashire, 10·0 per cent. The regional smoke abatement committee has interested itself especially in standards for smoke emissions, by-laws, and the provision of solid smokeless fuel. The Manchester Committee on Cancer has attained some success in discovering a method for producing a purified oil which is non-carcinogenic and therefore safe for industrial use, whilst its lubricating power is unimpaired.

Newcastle-upon-Tyne.

Dr. Harold Kerr reports that in spite of trade depression, increased unemployment, and much demand for assistance from the guardians, the infant mortality and tuberculosis death-rates were lower than ever before—a tribute to the efficiency of the relief organisations. The hours of sunshine recorded at Armstrong College were 1109 as compared with 899 in the previous year. The city only has three-quarters of the sunshine available in the neighbourhood. A comparison shows that the deposit from the atmosphere in the residential district of Westgate Hill contains 3 per cent. of tarry matter and 50 per cent. of ash, whilst the deposit at the quayside contains 2 per cent. of tar and 66 per cent. of ash, indicating more complete combustion in the industrial area. Dr. Kerr deplores the high cost of the smokeless fuels on the market, and evidently Newcastle lacks the advantage of the dry coke from vertical retorts available in Salford. The behaviour of the corporation chimneys has improved, and a satisfactory smoke prevention apparatus has been installed at the new baths. The tramways chimney has substituted the emission of grit for that of dense volumes of black smoke. The attempt to form a regional smoke abatement committee has temporarily failed owing to apathy and indifference or to the jealousies of neighbours. There were 76 cases of small-pox, all of the mild type, though two of the male patients, aged 60 and 69, died from cancer.

During the year bacillary dysentery was recognised in the city. The first indication of its presence was the occurrence of five mild cases in a house in Cowgate during March. Prior to bacteriological examination food poisoning was suspected. In April two sudden deaths of children were investigated by the coroner and found to be due to "bacillary dysentery." The medical practitioners of the city were notified. In all 66 cases, six of which came from outside, were brought to notice and the majority were treated in the city hospital. There were ten deaths, two at the age-period 1 to 5, seven at the age-period 5 to 15, and one over 45. Eight of the deaths were of females, two of males. The outbreak was peculiar in that five types of the Flexner bacillus, the Sonne bacillus, and a newly isolated germ (the "Newcastle bacillus") appeared to be the causal organisms. An unusual occurrence was an outbreak of poisoning among the employees of a firm. The management provided lemonade during the hot weather which was mixed in enamelled buckets. The illness was caused by tartaric acid releasing antimony compounds from the enamel which was not of a high quality. Fifty-six patients were removed to the Royal Infirmary, but most of them were able to resume work after some hours and none of them showed after-effects.

The duration of stay in hospital for scarlet fever has been considerably shortened by the use of antitoxin and also by the work of the oto-rhinologist. The average stay for scarlet fever patients was 29·3 days, and the return case-rate 1·3 per cent. Since protective inoculation was adopted for scarlet fever, diphtheria, and enteric fever there has been no case of any of these diseases among the hospital staff. Newcastle has generally had a smaller maternal mortality than the rest of the country, but during 1928 the rate jumped up to 4·97 and the death-rate for puerperal sepsis (1·66) was more than double that of the previous three years. About a quarter of the mothers attend the antenatal clinics. Dr. Kerr suggests that a consultant's opinion ought to be made available for confinements generally and not only in cases of puerperal fever, and that sufficient use is not made of the sterilised outfits on sale at the antenatal centres. Of 376 samples of milk examined for tubercle 3·7 per cent. were positive, but the endeavour to track out the infecting animals at the 11 Northumberland farms implicated was not very successful. The condition of the water of the swimming baths provided with a continuous system of filtration and aeration is much superior to that of the baths the water of which is changed twice or thrice a week.

The chief sanitary inspector, Mr. C. Raimes, describes the efforts made to effect a reduction in the number of van dwellers and the difficulties created by the lack of low-rented houses. For example, in the hearing of an application for ejectment orders, the rent of the tenants was 4*s.* per week and the alternative accommodation offered 11*s.* to 12*s.* a week.

Salford.

The headquarters of the public health department, 131 to 155, Regent-road, with some of the ground floor shop windows used as health exhibits, forms the frontispiece of Dr. H. Osborne's report. In this block are housed the public health and school staff, the public analyst, the bacteriologist, the tuberculosis dispensary, the new municipal V.D. clinic, and the new artificial light clinic. Up to March 31st, 1928, the V.D. clinic was conducted at the out-patients' department of the Salford Royal Hospital. On April 1st the work was transferred to the municipal clinic, and the first nine months' working have falsified all the theoretical objections to an ad hoc clinic. The premises have been specially equipped; there is a whole-time staff; the clinics are held more frequently and at convenient hours, and intermediate treatment is available daily for both sexes for a total period of 71½ hours weekly. As a result there has been a very large increase in the attendances since the transfer, and steps are being taken to still further perfect the methods adopted. Two new maternity and child welfare centres are being established, and the decision to have an out-patient light centre is based upon the excellent results obtained at the municipal babies' hospital.

Two health weeks were held from Dec. 2nd to 15th, and a health exhibition which attracted 30,000 visitors. A feature of the exhibition was a demonstration of "vertical" coke and other smokeless fuels burning in fire-brick grates. In order to remove doubt in the public mind as to whether Salford vertical coke is suitable for heating an oven Dr. Osborne has carried out experiments which demonstrate that this fuel is entirely satisfactory for the purpose. He points out that the supply of such fuels is still very limited but is certain to increase as the public demand grows. He would like all gas undertakings to consider the vertical retort when they are making new installations, and he makes a wide distinction between dry gas coke and the ordinary wet gas coke. He points out that the deposit from the atmosphere contains much more tar in Salford than it does in Birmingham, Glasgow, and Leeds, as one would expect in "a working-class dormitory city packed with small dwellings having open ranges burning bituminous coal." There are only 100 cows kept in the city and amongst these the veterinary inspector found two cows with clinical tuberculosis and one with tuberculosis of the udder.

Of 445 "outside" milks examined 37 were tuberculous. Cheshire milks always come out worse than Lancashire. Of the 37 incriminated farms, 10 had one cow with tubercle of the udder, 7 had two, 1 had three, and in the remainder no cows were found affected. In several of the latter cases the owner admitted that a cow which was wrong in the udder had been disposed of after the sample had been taken.

The public analyst, Mr. H. H. Bagnall, describes the shortcomings of the new Food and Drugs Consolidation Act which came into force on Jan. 1st, 1929. He also refers to an unusual feature in the milk samples taken during the first two quarters of 1928. Many samples from many farms were low in non-fatty solids, and this phenomenon followed on an extraordinary rise in the percentage of fat during the last quarter of 1927 which continued during the first quarter of 1928. Two noteworthy successful prosecutions are described: one for selling factory-made "lemon cheese" (not made from butter, sugar, eggs, lemon juice, and rind) as "home-made"; and the other for the sale of cod-liver oil tablets from which vitamins A and D were entirely absent.

St. Helens.

Dr. F. Hauxwell's report conveys the impression of a very efficient public health medical service working for the individual. He describes the year's work of a real antenatal clinic, not one of the non-medical or social type, but conducted by a doctor with a view to detecting abnormalities and making appropriate arrangements for a safe confinement. This scheme has been helped by the provision of the new maternity block at St. Helens Hospital and will be still further strengthened by the proposed municipal hospital for 15 maternity cases and 24 children. The orthopædic scheme has proved successful in getting in touch with cripples at an early stage. During 1928 the orthopædic surgeon, Mr. T. P. McMurray, had under his charge 40 cases of tuberculosis, 165 children under 5 and 105 non-tuberculous school-children. A considerable number of these children received in-patient treatment in the Liverpool and Wirral hospitals. Dr. Hauxwell notes that after the post-war years there was a distinct fall in the new cases of venereal disease attending the clinic, but that since 1922 there has been a steady increase up to 1928, most marked in gonorrhœa. Increased popularity of the clinic would hardly account for the figures being nearly doubled in six years. Cases, however, attend earlier and more regularly than formerly. The investigation of maternal deaths shows that if all the deaths associated with child-birth are reckoned with the maternal death-rate becomes 7·1 per 1000 live births instead of 4·6.

During the months February to May milk samples were unusually poor. Of 141 samples only 94 were above the low standard of the regulations. Poor quality of hay was alleged as a cause and the quality improved when the cattle were turned out to pasture. The chief industries of St. Helens are coal-mining and glass-making, and a table shows that St. Helens compares unfavourably with London, Birmingham, Cardiff, Huddersfield, Rotherham, and Wakefield as regards the amount of dirt deposited from the atmosphere. Only one of the stations in Newcastle-upon-Tyne is shown as giving a worse result. Dr. Hauxwell has many complaints to make with regard to environmental hygiene. The rivers and streams are seriously polluted with sewage; over 1200 privy middens and pail-closets need conversion; the refuse tip causes an unnecessary nuisance; and there is urgent need for the provision of smaller and cheaper houses in order to cope with overcrowding.

Poole.

Dr. R. J. Maule Horne reports that owing to the erection of new houses in outlying districts cesspools have increased from 400 in 1926 to 783 in 1928. It is hoped that 325 of these houses will be caught up by sewer extension during 1929. Endeavours are being made to select a better refuse disposal system than the existing tips. The open-air tidal swimming bath on the foreshore is well used during the summer, and a new sea-water swimming enclosure is to be provided in the public park. Mosquito control, by spraying the lakes and ponds with paraffin, has been continued. Oysters dredged from the harbour have to be relaid for 14 days in the Shipstal beds and the bacterial tests periodically carried out show the dependability of the relaying process. During 1927–28 50,000 oysters were dredged, but owing to two cold spatting seasons the number has now to be reduced to 25,000. Dr. Horne conducts the antenatal clinics, which are closely coördinated with the maternity department of Cornelia Hospital, where another antenatal clinic is held for the mothers, who await admission to the wards, by the obstetrician who will attend them.

Colchester.

Dr. W. F. Corfield shows how the deaths of children under 5 have decreased in recent years. During 1928 17 of these children were nursed by the district association when ill. An antenatal clinic was started in March and Dr. Grace G. Griffith, of Bures, was appointed (part time) medical officer in charge. For the first nine months the new patients attending numbered 71. The Ministry did not approve the two houses suggested for conversion into a maternity home and it seems probable that this long-delayed scheme will await the imminent changes in the poor-law. The orthopædic clinic conducted by Mr. B. Whitchurch Howell dealt with an increased number of cases, and many deformities are being treated before they have had time to do serious damage. As in the case of Poole building in outlying districts has caused an increase in the number of cesspools—and in addition of private wells. In August there was an outbreak of enteric fever in a mental hospital. Full investigation threw suspicion on the food, and the cause was considered to be infection by a member of the kitchen staff, who had, a short time previously, suffered from an indefinite attack of illness. None of the staff was affected, but there were 81 cases among the patients with 28 deaths.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 7TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 252 (last week 198); scarlet fever, 3388; diphtheria, 1743; enteric fever, 54; pneumonia, 1253; puerperal fever, 57; puerperal pyrexia, 100; cerebro-spinal fever, 7; acute poliomyelitis, 9; acute polio-encephalitis, 2; encephalitis lethargica, 19; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 95. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 10th–11th was as follows: Small-pox, 353 under treatment, 15 under observation (last week 308 and 10 respectively); scarlet fever, 2745; diphtheria, 2008; enteric fever, 70; measles, 501; whooping-cough, 123; puerperal fever, 23 (plus 12 babies); encephalitis lethargica, 123; poliomyelitis, 0; "other diseases" 12. At St. Margaret's Hospital there were 12 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 2 (1) from enteric fever, 27 (10) from measles, 10 (4) from scarlet fever, 19 (2) from whooping-cough, 43 (5) from diphtheria, 45 (10) from diarrhœa and enteritis under two years, and 53 (15) from influenza. The figures in parentheses are those for London itself.

The death from enteric fever outside London was reporte from Hull. The highest figures for diarrhœa were fro Manchester 5, Liverpool 4. Measles claimed 4 deaths Wigan, whooping-cough 3 deaths at Liverpool, diphthe 5 deaths at Liverpool, and 3 at Merthyr Tydfil. The number of stillbirths notified during the w was 244 (corresponding to a rate of 40 per 1000 births), including 39 in London.

Correspondence.

"Audi alteram partem."

TREATMENT OF CAVERNOUS NÆVI.

To the Editor of THE LANCET.

SIR,—On p. 1251 of your last issue Dr. G. B. Dowling advocates the treatment of cavernous nævi by injections of quinine and urethane. In the course of his remarks he says that surgical excision "is undesirable in an infant and in some situations impossible." I am not here concerned with the proposed substitute, but it is surely time that the profession as a whole realised that the excision of a nævus is one of the most satisfactory little operations in the surgery of childhood. Time is a most important factor. Nævi which at birth are a few millimetres in diameter often grow at an appalling rate. Excision becomes impossible and the electro-cautery is quite properly used. This is often successful, but a matter of moments has become a matter of months and the hapless child is branded with a pock-marked area of lepra-like integument. The early doors of a children's hospital are besieged by pathetic sufferers *from spina bifida, syndactyly, and hypospadias*, while lanugo yet lingers on their brows—but the cavernous nævi stay at home and wait for the warmer weather.

Admittedly, excision of nævi in some situations is impossible from the beginning, but the impossibility is as often caused by procrastination as by position. If we must have a slogan let it be "a nævus excised is a tragedy averted"—and the earlier the easier.

I am, Sir, yours faithfully,

Wimpole-street, W., Dec. 16th, 1929. ERIC I. LLOYD.

IRRADIATED MILK *v.* COD-LIVER OIL FOR RICKETS.

To the Editor of THE LANCET.

SIR,—May I reply to Dr. Bodman's letter in your issue of Dec. 7th? My opinion of the very low antirachitic potency of non-irradiated milk is based on the examination of 11 different samples, of which five were bought in the open market and six were sent from the makers of the irradiated milks for comparison. The method of testing for vitamin D adopted in these laboratories is Mr. Collum's "line" test, a method frequently described in the scientific literature on the subject and adopted by most laboratories in Europe and America. By assaying the antirachitic potency of any substance in terms of our standard preparation of irradiated ergosterol (described in the *Quarterly Journal of Pharmacy*, 1928, i., 27) it has been possible to collect and compare figures for the antirachitic activity of substances over a period of nearly three years.

The examination of 11 samples of fresh milk showed negligible quantities of vitamin D in seven samples, 0·1 unit per gramme in one sample, and 0·2 units per gramme in three samples. The vitamin D potency of non-irradiated milk appears to be particularly low when it is compared with the vitamin A potency, a comparison which may be drawn in two ways. When rats have ceased to grow on a diet deficient in vitamin A which, according to Mellanby, is a direct result of the development of various pathological conditions, 1 c.cm. of milk given daily will almost invariably cure these disorders and growth will be resumed. On the other hand, when rats have developed a severe degree of rickets on a rachitogenic diet (deficient in vitamin D and with a Ca : P ratio *of 4 : 1), 1 c.cm. of milk daily gives no indication* of healing; in fact one sample of milk produced no healing in a dose of 20 c.cm. daily. While the different conditions of the rats given on the one hand no vitamin A, and on the other no vitamin D cannot be considered exactly similar, yet they afford a useful basis for a practical comparison of the respective *amounts of vitamins A and D in milk*. The comparison may also be drawn by reference to the vitamin content of cod-liver oil. A fairly good sample of cod-liver oil will cure the disorders resultant on a deficiency of vitamin A and promote good growth by means of a dose of 0·01 gramme daily. The same dose of cod-liver oil will *completely cure* a very severe degree of rickets. Thus it may be said that an average sample of milk has about one-hundredth of the vitamin A content of our average sample of cod-liver oil. It has, at the most, one five-hundredth of the vitamin D content; one sample examined had less than one ten-thousandth.

In Sherman and Stiebeling's experiments I would point out that the inclusion of 5–10 per cent. of dried milk in the diet of rats on whom the experiment was performed would ensure that the rat ate about 0·5–1·0 gramme dried milk per day. Assuming 12½ per cent. dry matter in milk, this would be equivalent to 4–8 grammes fresh milk per day, which would doubtless be sufficient of *some* samples of milk to afford protection from rickets and promote growth in rats, especially when the basal diet is, as stated, adequate in all other respects including mineral content. These results are not "quite opposed to" our own, as Dr. Bodman thinks. They confirm them by emphasising the large amount of milk necessary *to protect rats from rickets even when the rest of the* diet is as nearly perfect as present knowledge can make it.—I am, Sir, yours faithfully,

KATHARINE H. COWARD,
Nutrition Department.
Pharmaceutical Society of Great Britain, Pharmacological
Laboratory, Bloomsbury-square, London, W.C.,
Dec. 16th, 1929.

ENCEPHALOMYELITIS FOLLOWING VACCINATION.

To the Editor of THE LANCET.

SIR,—*Dr. C. D. Coyle and Dr. E. W. Hurst close* their interesting article on this subject in your last issue with the words: "Any investigation must . . . aim at discovering a common factor responsible for the production of identical histological lesions in a number of very different conditions." May I suggest that if these conditions are regarded ab initio as "very different," and if it be assumed that the common factor is to be "discovered" rather than demonstrated, there is some danger of a block on the line of progress.

The conditions actually mentioned are small-pox, vaccinia, measles, and after antirabic treatment. All these are occasionally associated with encephalomyelitis. We may add to the list chicken-pox and rabies as well as those idiopathic examples which may or may not be associated in human beings with influenza and in animals with distemper. But however we construct our preliminary group it becomes clear that there is a type of reaction to infection of which encephalomyelitis is one of the characteristics. We are not unacquainted with types of reaction in a broad sense. Thus the lesion which occurs after the lodgment of germs of the tuberculosis-streptothrix order is of a very different character to that associated with the genus streptococcus. Each is different again to that caused by the many varieties allied to *B. typhosus*, and typhosus infections are not easily confused with mycotic diseases. Bearing such broad groups in mind, it is interesting to observe that many of the encephalitic group have been shown to be associated with diseases caused by a virus and that none of the group has been shown to be caused by any other sort of organism.

It is possible that virus infection is the desired "*common factor*" *underlying these* "*very different* conditions." If that were so, we might hope to be able to identify some general type of reaction analogous to the general type favoured by other groups of infective agents. Of this general type encephalitis of occasional occurrence would be one feature. Another might be the tendency to epidermal vesicular lesions. A third might be the type of response identified in the tissues by the microscope—i.e., the response by lymphocytic proliferation rather than the evidence of tissue destruction which is also seen.

It is not for the writer of this letter—a general practitioner—to define the group with exactitude. But it sometimes happens that those who have had no opportunity to make a close study of the trees happen upon a vague but useful idea of the general size and shape of the wood. It is quite likely that viruses differ among themselves and that only certain of them react as members of the encephalitic group. But if we concentrate on those different conditions mentioned and seek to elucidate all the points which they have in common, we may well find a group in which occasional encephalitis will be no more surprising than is an occasional bone abscess in typhoid. We might then cease searching for the germ of encephalitis and concentrate on those factors which make every virus in the group potentially encephalitic. And although micropathology will doubtless have its share in the quest, it will perhaps not enjoy the position of almost exclusive pre-eminence which it has attained to-day. It has reached this position by the skill of its devotees, and the fault (if there be any) is that of the general pathologists, the students of morbid physiology, who have been too content to view this subject through the microscope.

At least, so the writer feels and signs his name, with some trepidation,

Yours faithfully,

Sevenoaks, Kent, Dec. 15th, 1929. GORDON WARD.

CLINICS FOR RHEUMATIC CHILDREN.

To the Editor of THE LANCET.

SIR,—Dr. Burnet's letter raises points of first importance. Its main object is to urge the development of special clinics for rheumatic children and there appear to be several reasons why we should hesitate to recommend the formation of such clinics all over the country.

In the first place, rheumatism of childhood in its different aspects and degrees of severity is so widely spread and the numbers involved are so great that it would probably mean the attendance of about 20 per cent. of the elementary school-children. If the chief object of such clinics would be to prevent rheumatism in its more severe forms then unless the potentially rheumatic or so-called "pre-rheumatic" child is to be included in the attendance at these clinics, the clinics from the point of view of prevention would be useless and a waste of money. Apart from the use of salicylates in some of the active cases and provision of rest for the heart cases there is hardly anything that can be offered in the way of treatment. The rheumatic problem is a social one and is entirely one of prevention, and it appears to me that we can no more prevent rheumatism by rheumatic clinics than we can prevent a wet day by putting up an umbrella.

I would, however, be in agreement with Dr. Burnet in the development of investigation centres which would have as their main object the intimate study of the disease in all its aspects, and with him I would urge the provision of more beds for the heart cases in all the large centres.

Again it would be a mistake to divert active rheumatic cases from the private doctor who is so closely in touch with the home conditions or from the hospital clinics who have for so many years been engaged in the important work of investigation and the teaching of the medical student. A great part of our knowledge of child rheumatism has been won by the hospital physician, and the names of Cheadle, Barlow, Lees, Poynton, Carey Coombs, and Reginald Miller should be remembered in connexion with this. Hospital teaching and investigation have already suffered much by the loss of tubercular cases, and it would be unwise to allow this to happen in the case of the rheumatic affection.

It appears to me that as regards the prevention of this appalling disease the public health services, and more especially the welfare centres and school medical services, have a great opportunity. Dr. Burnet is, I think, rather too severe in his criticism of the medical officers staffing these services. Agreed that many of the doctors are at present accepted for service without adequate children's experience and that their time is largely taken up by that soul-destroying business of amassing statistics for annual reports, yet there is undoubtedly in being a body of men and women eager, I feel sure, to tackle this urgent problem if only their administrative heads will organise a campaign. What can be done? In the first place, prevention of rheumatism must start with the "well" child of one year and must continue up to the last day of the school period. The welfare centres and the school services must therefore at once be linked up under one administrative head, and I suggest that through their combined agency a really comprehensive campaign should be instituted with regard to the efficient feeding of the child. The medical officer must be prepared to pick out all those children who are potentially rheumatic and not merely those who are frankly rheumatic, and these children should either be fed at school or steps taken to insure that they are efficiently fed at home. Those children with frank, active rheumatism should be brought in immediate touch with the private doctor or hospital clinic, and here again a far closer coöperation must be instituted between the different medical agencies than at present exists. The development of the nursery school and the open-air school must also form an important part of the measures to be undertaken with regard to the disease.

There are those who still believe that the beginning and end of the rheumatic problem lies in the early removal of tonsils and adenoids. I fancy, however, that the number of such is getting less, although none of us will deny that the healthy nasopharynx is an important factor in the health and resistance of the child, and it would appear that the present school medical service is in a specially favourable position to attend to this important, but not the most important, factor in the prevention of the rheumatism of childhood. I hope, therefore, that the profession will whole-heartedly support and encourage the further development and work of the welfare centres and school medical service, for in their hands lies the future progress in the prevention of rheumatism with its resultant heart disease.

I am, Sir, yours faithfully,

C. WILFRED VINING, M.D., F.R.C.P.

Leeds, Dec. 7th, 1929.

LIVER TREATMENT IN ESSENTIAL THROMBOPENIA.

To the Editor of THE LANCET.

SIR,—In a paper on the Clinical Significance of the Blood-platelets which Dr. R. G. Bannerman and I contributed to your series of Clinical Interpretation of Aids to Diagnosis (THE LANCET, 1929, i., 1048) we gave reasons for thinking that the liver treatment of pernicious anæmia is likely to be of therapeutic value in other conditions in which there is a primary thrombopenia. A case of essential thrombopenia which has been so treated, and apparently with success, has been published by Dr. S. A. Holbøll in *Hospitalstidende* for August 8th (p. 841). As the Danish journal is unlikely to be accessible to many of your readers I venture to draw their attention through your columns to this paper which seems to justify the application of liver treatment to cases of essential thrombopenia before the alternative and more heroic treatment by splenectomy is adopted.

I am, Sir, yours faithfully,

W. CRAMER.

Imperial Cancer Research Fund, Queen-square, W.C., Dec. 11th, 1929.

MALIGNANT GROWTH AND PELLAGRA.

To the Editor of THE LANCET.

SIR,—Dr. Trevor Heaton describes in your issue of Oct. 12th (p. 762) how the growth of malignant tumours in rats may be arrested by the injection in large doses of certain extracts from malt. He suggests that this effect is due to a "growth inhibiting factor" which is present in the extracts. He states that "after the growth of their tumours had been arrested the animals usually died." This appears to me to be a very important point in that it shows that the vitalities of the tumours and the tissues of the rats were more or less equally affected by the treatment. It is well known that the degree of growth of malignant tumours often varies with the general health and vitality of their hosts. They grow more rapidly in young and vigorous patients than in the old and decrepit; and occasionally carcinomas cease to grow and may even disappear in the case of very senile patients.

Many years ago when I was resident surgeon to the hospital in St. Lucia, British West Indies, a mulatto woman consulted me for a tumour of the breast, I diagnosed it as a scirrhus carcinoma and urged her to be admitted to hospital for operation; she refused. Several months later she was brought to hospital suffering with pellagra, and then I was unable to find any signs of the tumour in the breast. The woman died and a post-mortem examination was made and an examination of the breast and axillary glands showed only fibrous changes and no signs of the tumour. The pathology of pellagra may be summed up as a cellular degeneration affecting all the tissues of the body; so that there is general emaciation and profound wasting of the epithelial tissues and the visceral organs. Therefore it would not be astonishing if the general cellular degeneration also affected carcinomatous tissue. Carcinoma of the buccal mucosa (betel chewer's cancer) is common in Ceylon; and several years ago I treated a few patients having inoperable growths with large doses of extracts of carcinomatous tissues which had been removed at operation from other patients. These extracts produced much debility and increased the wasting in the patient; and in all cases the carcinomatous masses diminished in size. Only two patients could be induced to continue the treatment and in both cases the tumours disappeared leaving large excavations in the cheeks. These patients were shown before the Ceylon branch of the British Medical Association. They were in a very low state of health, but it was hoped that they would recover after the cessation of treatment. But both of them died of progressive wasting and debility in a few weeks. A post-mortem examination was obtained on one of them, and no remnants of carcinomatous tissue could be found either macroscopically or microscopically.

The point which I wish to bring out is that malignant growths (especially those of epithelial origin) are almost unique in pathological processes in that they are more or less profoundly affected by certain types of generalised cellular degeneration taking place in their hosts. This degeneration may be the result of the injection of foreign substances, or the result of such a disease as pellagra or due to senility. This is not only of ætiological significance, but may be of importance in the treatment of patients. The result of Dr. Heaton's treatment of rats harbouring Jensen's sarcoma was the same as in the case of the two patients treated by me—the tumours disappeared but death followed. Extracts of tissues or malt in small doses might enhance the effects of radium treatment. Perhaps a more promising method would be the production dietetically of a mild generalised degeneration.

Though the cause of pellagra is not definitely settled it is very probable that it is a food deficiency disease. Goldberger and Wheeler in America claim to have produced the disease in prisoners by giving a diet rich in carbohydrates and deficient in proteins. But more recent work indicates that the absence of a vitamin may play a part. This vitamin is abundant in yeast and was designated P–P by Goldberger, B_2 by British biochemists, and G by American biochemists. When this vitamin is withheld from the diet of rats, their growth is arrested, and their skins become susceptible to various rays and exposure to these will produce epidermal degeneration with the destruction of the superficial layers of the epidermis. A similar condition takes place in patients suffering with pellagra, and they are exceedingly susceptible to the sun's rays. The proteins of various foods have not the same value in growth promotion; this has been called the biological protein value. This value depends on the relative amounts of the amino-acids, tryptophane, and lysine present in the protein molecule. It is probable that a double deficiency of vitamin B_2 and of proteins of high biological values are concerned in the cause of pellagra.

It is too much to hope that the production of a mild pellagrous condition in patients afflicted with malignant tumours would be sufficient to cause the arrest and absorption of the tumours. Yet it appears that a diet deficient in growth-promoting factors and which renders the cells susceptible to injury by rays is indicated for patients being treated with X rays or radium.

I am, Sir, yours faithfully,

LUCIUS NICHOLLS, M.D. Cantab.,
Director, Bacteriological Institute, Ceylon.

Colombo, Nov. 16th, 1929.

OLD EPSOMIAN CLUB.

ANNUAL MEETING AND DINNER.

THERE are at the present time 877 enrolled old scholars of Epsom College, of whom 118 attended the annual meeting and dinner of the Club at the Wharncliffe Rooms on Dec. 12th. This was the fifty-second gathering of the Club and the attendance was the same as last year and larger than on any other occasion. Leavers of nearly every possible year were represented under the genial chairmanship of Brig.-General T. G. Mair (1865–69), late Colonel Commandant of Sierra Leone. We add the dates of his school years to emphasise the fact that the common bond was that of having lived and played rather than worked together. The Chairman, in proposing "Floreat Epsomia," said that 300 of the present boys are members of the Officers Training Corps, the remaining 100 being ineligible owing to youth or health—a 100 per cent. record. He spoke of the death of the President, Lord Rosebery, to whom the school owed its very name, and of the appointment of Lord Burnham to succeed him. He welcomed the presence of Sir Henry Dixon Kimber (1873–81) who is standing next year as a Sheriff of the City of London, and he paid tribute to the Headmaster as "a live wire in everything he does." Mr. A. C. Powell, replying, gave some of the school's current academic records—46 matriculations, six with honours, 12 first M.B. passes during the last 12 months, entrance scholarships at three London hospitals—but was followed with greater acclamation when he set out the record of the cricket XI. with eight wins, three draws, five losses, and of the Rugby XV. with nine wins, one draw, and no loss. The toast of The Guests was proposed by Mr. A. C. C. Parkinson (1890–1903) who dealt searchingly with the gaps he had observed in medical knowledge which, he said, resembled wire fencing in being "a concatenation of lacunæ." Response for the guests was made by Dr. A. Middleton Hewat, senior medical officer, L.C.C., not an old scholar but with two sons at the school. The toast of The President was proposed by Mr. J. S. Cotman (1887–93). In the course of the evening Sir Cecil Armitage (1884–85), late Governor of Gambia, presented the golf championship cup to Mr. H. L. G. Hughes (1903–10). The meeting took for granted the services of the hon. secretaries of the Club, to whose labours its success was so largely due—namely, Mr. R. M. Handfield-Jones (1907–10) and Major W. L. Giffard.

Obituary.

DANIEL LEWIS THOMAS, M.R.C.S. ENG., D.P.H.

WE regret to announce that Dr. D. L. Thomas, medical officer of health for Stepney, died on Dec. 10th at the age of 60. His record in the public health service commanded general respect, while his personal characteristics won many friends and brought him a warm welcome in many different quarters.

Daniel Thomas was born in Newcastle Emlyn, South Wales, and served a year's apprenticeship there with the late Dr. Lloyd before entering on his medical course in London. He always felt very thankful for this year; he used to say that it was one of the best preparations a man could have, and he remained one of Dr. Lloyd's closest friends. In 1886, he entered the London Hospital and thus formed an association with the East End which continued uninterruptedly to his death. Immediately after qualifying in 1892 he started as a general practitioner in the Mile End-road and he soon had a lucrative practice, but in spite of increasing responsibilities, he found time to read for his D.P.H., and in 1896 when there was a vacancy for the post of medical officer to the Limehouse District Board of Works Thomas was elected. On securing this appointment he studied law and was called to the Bar in 1900.

DR. D. L. THOMAS.

[Photograph by Elliott and Fry.

He remained medical officer to the Limehouse Board of Works until the district ceased to exist as a separate sanitary area. Under the Local Government Act of 1899, Limehouse was united with Whitechapel, Mile End, and St. George's in the East, and formed into the present Borough of Stepney. In the autumn of 1900 Dr. Thomas was elected the first medical officer of health of this borough, where he had worked since his entering the London Hospital as a student. Although the conditions of general practice at that time had something to do with his decision to enter the public health service, undoubtedly the course of events proved his decision to be the right one. He entered into his work with all the ardour of youth and the enthusiasm of the pioneer; and both were needed, for the difficulties with which he had to contend appeared almost insuperable. He was the first whole-time medical officer of health for Limehouse, and also for Whitechapel, Mile End, and St. George's in the East. His predecessors were all doctors in general practice. The soil was practically virgin soil. The infantile mortality was in the neighbourhood of 200 per 1000 births. The credit of being the first district to appoint a health visitor is claimed by many towns and probably the honour is due to St. Helens, but Stepney was one of the first London boroughs to make such an appointment, and from this beginning was built up an elaborate system of child welfare centres, day nurseries, and antenatal clinics. A feature of the work at Stepney was the numerous voluntary agencies which worked for the public health, and to Dr. Thomas is the credit for smoothly coördinating these agencies and fitting them into one scheme for maternity and child welfare.

In his early days as medical officer Thomas had to fight grimly against the sophistication of food and the sale of diseased meat. It is probable that he was more than any other health officer instrumental in the prevention of the sale of diseased meat. He was, of course, backed by his council and ably supported by the late Mr. Dickenson, who was then the magistrate at the Thames Police-court. Some of the offenders suffered imprisonment and the new medical officer was threatened with all kinds of penalties if he proceeded against the law-breakers. But neither threat nor cajolery could effect any deviation from what he considered to be the strict path of his duty. His district bordered on the river and contained some of the largest wharves in London. Food inspection early claimed his attention, and in those years he was constantly called upon to give expert evidence upon the condition of tinned food. Stepney suffered severely in the small-pox epidemic of 1901 and 1902, and recently in the present epidemic of mild small-pox. He had seen thousands of cases of small-pox, and as his clinical acumen was of a very high order, he was recognised as an authority in the diagnosis of the disease. He published privately a brochure on diagnosis in the present outbreak, and the medical practitioners of Stepney to whom it was issued found its contents extremely valuable and suggestive.

During the war Dr. Thomas undertook night duty at the London Hospital in order to relieve the overworked staff, and he was one of the few medical officers of health appointed as local food officers. He acted as executive food officer for his borough during the period of food control and also during the general strike. With its cosmopolitan population Stepney was one of the most difficult districts to administer, and abuses were prevented only by his wide and deep knowledge of its citizens.

It has been said of Thomas that he was "a Celt to his finger-tips, with all the national characteristics and prejudices of the Celt. He was in some respects a paradox. In the office he was a strict administrator, utilitarian in his views; outside he was a dreamer and an idealist. In public he was efficient and economical; in private generous. He was a mystic, but he was also intensely sociable." Possibly it was on account of the blend of mysticism and sociableness that Freemasonry appealed to him. He admired its ritual and welcomed its opportunities to exercise the virtue of charity. He was a Past Grand Director of Ceremonies, a founder of several lodges, and a liberal supporter of all the Masonic charities. For many years he was chairman of the London Welsh Rugby Football Club, and he was connected with so many other organisations that no social function amongst the London Welsh seemed complete without the presence of "Dr. Dan" as he was affectionately called. The association with Wales was retained to the end, for he spent his summer vacation every year on the Cardiganshire coast, and was known by fame to large numbers of his fellow-countrymen, even in remote parts.

Dr. Thomas died of psittacosis in the London Hospital, with which he had been connected directly or indirectly since his student days. He leaves a widow with a son 8 years of age.

JOHN SADLER CURGENVEN, M.R.C.S., L.S.A.

Dr. Curgenven, whose death occurred in an attack of angina pectoris on Nov. 25th at his home at Chiddingfold (Surrey), was educated at Merchant Taylors' School, and entered St. Bartholomew's Hospital as a student in 1881. Four years later he took the qualifications of M.R.C.S., L.R.C.P., L.S.A., and joined his father, Dr. John Brendon Curgenven in a well-established practice at 12, Craven Hill Gardens, Bayswater. Both father and son were much in request for the treatment of childish ailments, and the son wrote for the use of his own patients a little book, "The Child's Diet," which has had a wide circulation in three editions since its first appearance in 1905. *On the retirement of his father in 1890* he carried on the practice singlehanded until 1916, when he joined the R.A.M.C.; in the last year of his service with the Corps he was P.M.O. for the district round Bath. On demobilisation he retired to the country and lived at "Granthams," Chiddingfold to the time of his death.

Dr. C. W. Emlyn writes: "Curgenven was a very eminent practitioner, and a man of fine character and great personal charm. He never enjoyed robust health and the weight of his large practice often tried his strength, though he worked on cheerfully and thoroughly. He looked forward keenly to the leisure of retirement, and to having a garden of which he was very fond. Like most Cornishmen he was irresistibly drawn to the rugged scenery of his ancestors, and from his cottage at Coverack he devoted *himself to sea-fishing with the rod.* He *knew a lot* about church architecture, and an excursion with a friend who shared the same enthusiasm was one of his chief delights."

Dr. Curgenven married Ethel, second daughter of Mr. Maurice Grant of Lancaster Gate, Bayswater, who with their only daughter survives him. He was buried at Brookwood on Nov. 29th, within two days of his sixty-seventh birthday.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE MENTAL TREATMENT BILL

IN COMMITTEE IN THE HOUSE OF LORDS.

ON Tuesday, Dec. 10th, the House went into Committee on the Mental Treatment Bill, the Earl of DONOUGHMORE, Chairman of Committees, in the chair.

Power to Receive Voluntary Boarders.

Clause 1 provides that any person suffering from mental *disorder who is desirous of voluntarily submitting himself* to treatment, and who makes written application, may be received as a voluntary boarder in an institution without a reception order.

Lord SANDHURST moved an amendment to omit the words "suffering from mental disorder" in order to make it as easy as possible for persons suffering from incipient symptoms to become voluntary boarders. It should not be necessary for a person to be so far gone in the disorder as the words in the clause implied before submitting himself to treatment. Under the corresponding section of the Lunacy Act, 1890, there was no definition of a voluntary boarder. All that was necessary was that a person should be desirous of voluntarily submitting himself to treatment.

Earl RUSSELL accepted the amendment in a slightly altered form, and it was agreed to, the clause then reading "any person who is desirous of voluntarily submitting himself to treatment for mental disorder," &c.

Viscount BRENTFORD moved an amendment to alter from 18 to 21 the age at which any unmarried person suffering from mental disorder, whose parent or guardian is desirous of submitting him to treatment, may, if the parent or guardian makes written application, be received as a voluntary boarder. He said it was a little questionable whether a person of 18 should be allowed under any circumstances voluntarily to place himself or herself in a mental home.

Earl RUSSELL explained that the age of 18 was adopted from an amendment which the House inserted in the Mental Treatment Bill of 1923. It was thought well to follow that Bill. He suggested that Lord Brentford should agree to a later amendment in the name of Lord Danesfort to accompany the consent by a medical certificate.

The amendment was accordingly withdrawn.

Consent of Parents in Adolescent Cases.

The Earl of CRANBROOK moved an amendment to provide that where an unmarried person was not under 16 his consent to the application by the parent or guardian should be given in writing. He said that he was moving the amendment on behalf of the London County Council, which had a great many mental institutions of considerable experience in dealing with people suffering from mental disorder. The Council felt that the age of 18 was too high for the parent to have sole control.

Earl RUSSELL said that it would be better not to accept the amendment in view of the one to which he had alluded, which would reinforce the judgment of the parent or guardian by a recommendation of a medical man. In that case their lordships would feel that a person whose parents expressed a desire that he should be treated voluntarily would be protected if the application were supported by a medical man. The Government proposed to use the word "recommendation" rather than "certificate." They wished to avoid the use of the word "certificate," which suggested the certification of a patient.

The Earl of CRANBROOK pointed out that persons of 16 who were able to marry—a much graver step than going for treatment to a mental hospital—should have a voice in their own affairs.

Lord DAWSON said that if they were dealing with people of normal mind he would give his support entirely to a young person having the right of decision, but unfortunately Nature had decided this matter, and these mental disorders, which might easily develop into insanity properly so-called, very often arose at the ages of 16 and 18. The very existence of these mental disorders, slight as they might be at that stage, made these young people very difficult. Sometimes it was almost impossible to cure them in their own homes. They were, in a sense, anti-social, and therefore they needed rather more pressure than persons who were normal. In fact, these young people *suffering from these incipient disorders* were to be looked upon more in the light of normal persons who were younger by two years, and it was because of the conditions which they had to meet that it was desirable to put a little more power in the hands of the parents in respect of this particular type of ailment. If they provided that there should be a medical certificate or medical recommendation—which, he agreed, was the better term—they would meet the difficulty and safeguard the Bill against abuse.

Viscount BRENTFORD said that the whole tenor of Lord Dawson's speech made him anxious. The clause related to the voluntary right of a person to shut himself up. It was not a question of pressure, but of a condition of mental disorder under which the patient was not able to take a voluntary decision. Under the clause a young man of 18 might, if he wanted, make a voluntary decision and go into a mental home without any doctor's certificate.

Lord DAWSON: With a doctor's certificate.

Lord BRENTFORD: Without. The voluntary judgment of this so-called voluntary patient was to be taken away, and pressure was to be put on him by the parent and the doctor who was prepared to sign the recommendation. The very essence of the clause was that it was voluntary and the amendment would be an improvement. It would make the Bill more popular as well as more reasonable.

Lord BANBURY said that he agreed with Lord Dawson that the clause was not a voluntary one, but one which might lead to pressure.

The amendment was withdrawn.

Lord DANESFORT moved an amendment to provide that a young person under 18 might be received as a voluntary boarder if the written application of the parent or guardian were accompanied by a medical recommendation. He said he understood that the Government were prepared to accept the amendment. It was quite possible that in some cases there might be parents or guardians who would like to lock up a child who might be a little unruly or disagreeable, and in the interests of the liberty of the subject it was desirable to have some further protection in the Bill. On the second reading, Lord Dawson and others had suggested that this incarceration of a young person should not take place unless there was a medical certificate or recommendation stating that it was desirable for him to be so detained. He moved the amendment as being, at any rate, a partial remedy for what might have been a great evil.

Earl RUSSELL said that if it was desired to afford an expression of will in regard to persons between 16 and 18 he would consider the matter before the Report stage.

Viscount BRENTFORD expressed regret that a young person under 18 could be locked up in any home or asylum without judicial proceedings. Under the clause as it was proposed to be amended, a young person who might be a troublesome or even unwanted child was to be locked up on the recommendation of one doctor without the right, which he had to-day, to go before some kind of judicial officer, even a magistrate.

Lord ATKIN urged that some provision should be made to meet the case of a young person whose consent had been obtained to being placed in a hospital to begin with, and who could only be removed at the request of his parents or guardian.

Lord MERRIVALE said it would be a grave innovation on the Common Law rights of His Majesty's subjects if, instead of the age of 16 which for generations had been known as the age of right and responsibility on the part of individuals, they substituted an arbitrary age without any safeguard except the certificate of one medical man.

Earl RUSSELL agreed that this was an invasion of the Common Law right of personal liberty, which was recommended in the interests of the patient. It would be for the House to decide whether or not, on balance, the course proposed would be in the interests of those patients and would lead to their recovery. The question of the consent of the person of 16 had not been met because the suggestion that he should consent before going in had not been before them until that moment. It followed naturally that if the patient over 16 had to consent to go in for this treatment he must continue to consent when he was there. That would be one of the matters which he would consider on the Report stage.

The amendment was agreed to.

Boarders who become Incapable of Volition.

Clause 2 provides for notice of reception, death, or departure of voluntary boarders and makes provisions for boarders who become incapable of volition. The third paragraph of the clause provides that if any person received as a voluntary boarder becomes at any time incapable of volition he shall not be retained as a voluntary boarder for longer than one month, but shall on or before the expiration of that period be discharged, unless in the meantime he has again become capable of volition or steps have been taken to deal with him either under the principal Act as a person of unsound mind or under this Bill as a person incapable of volition who is likely to benefit by temporary treatment.

Lord SANDHURST moved an amendment to provide that the medical superintendent or other person in charge of the institution should decide whether the voluntary boarder had become incapable of volition. He said that somebody should be made responsible for formulating an opinion as to the patient's incapacity of volition. Nobody could more properly be made so responsible than the superintendent of the institution, or the person into whose charge the voluntary patient had gone.

Earl RUSSELL accepted the amendment, which was agreed to.

Temporary Treatment without Judicial Authority.
Lord Brentford's Amendment.

On Clause 5 (Provision for treatment without certification of persons temporarily incapable of volition),

Viscount BRENTFORD moved in Subsection (1) to leave out the words "on a written application duly made in accordance with the provisions of this section but without a reception order." He said that the question he desired to raise was whether these patients who were suffering from mental disorder, and who were incapable of volition but likely to benefit by temporary treatment, might be shut up under the decision or certificate of two doctors without the judicial authority which up to the present had been regarded as of vital importance. The Royal Commission did not take the view which the Government had adopted, and he (Lord Brentford) desired to move an amendment which embodied the proposal of the Commission. It had been drafted by a lawyer with that purpose in view. He suggested that the Royal Commission's view was the right one, and that the Government's view was wrong. In order to save the expense he proposed that instead of two doctors there should be only one, but that there should be a magistrate who should see the patient, and his friends if necessary, and decide whether it was really desirable in the interests of the subject that the liberty of the subject should be done away with. That was a very important matter. Up to the present they had never allowed that liberty to be interfered with by any advisers, except under judicial authority. If the form of judicial authority proposed was objected to he would assent to any form which met with the approval of Lord Russell. But was it not a very great alienist who said that the number of wives who came to ask him to certify their husbands was only equalled by the number of husbands who came to ask him to certify their wives? There was nobody who was directly the friend and adviser of the incipient patient except a judicial authority who was quite independent of those who desired to place the patient under control. The question had nothing to do with the skilled opinions of medical men as against those of the law; it was a question whether there should be any person unconnected with the patient, unconnected with the medical adviser, somebody representing the law of the land, called in to consider if the patient should be locked up or not.

Earl RUSSELL said they might take it that this amendment was a test amendment covering the whole of the suggestions which Lord Brentford had made on this part of the Bill.

Viscount BRENTFORD: Certainly.

Earl RUSSELL said that neither he nor the Minister of Health had any objection to a judicial authority in itself. The objection, unfortunately, came from the patient and his relatives. It was quite true that a judicial authority was recommended by the Royal Commission with great reluctance, but it was thought very much better for the patient that the matter should be done in a less formal way. They wanted under this Bill to treat incipient mental disorder without the stigma of certification. He would beg Lord Brentford not to talk about persons being "locked up," and being "put away." Those were the very expressions which it was desired to get out of the mind of these patients. They wanted to talk to them about being treated for their health, and to assimilate the treatment as far as possible with the treatment for ordinary illness. Detention might be a necessary part of it, but it was not the part on which they desired to insist. He would ask their lordships to reflect on the protection given by the Bill. Did they suppose that if two competent medical men had signed a certificate giving perfectly clear facts on which they based their conclusion that a justice would take upon himself in the ordinary way to override that certificate? The most he could do would be to see that everything was regularly done. That, of course, became the duty both of the superintendent of the institution to which the patient was taken and of the Board of Control who received the certificate. They were much more competent to perform that duty than the ordinary justice. He asked their lordships not for the sake of a fetish to throw away a reality, and to resist Lord Brentford's amendment.

Lord DARLING said that Mr. Hugh Macmillan, K.C., who was the Chairman of the Royal Commission, was of opinion that what was proposed in the Bill was the proper way of dealing with these incipient mental cases. He was not a doctor; he was a justice of the peace for every county in England, because he was a member of the Privy Council, yet he had come to the conclusion that the intervention of justices of the peace would be bad for the patient.

Lord LAMINGTON said he hoped Lord Brentford would withdraw his amendment.

Lord SANDHURST said that Lord Brentford had referred to the fact that for 200 years the law had been such that a patient's liberty could not be interfered with except with judicial authority; but 200 years ago views on lunacy were entirely different from those of to-day. He hoped that the amendment would not be carried.

The Earl of ONSLOW said that he quite saw the point made by Lord Russell and by other speakers that it was very difficult to distinguish in the public mind between a certificate for temporary treatment of a man who was not a lunatic and a full certificate. He (Lord Onslow) would suggest that it might be possible to entrust the endorsement of the recommendation of the two medical men to the Commissioner or the Assistant Commissioner of the Board of Control, or at any rate to the authority of that Board rather than to a judicial authority.

Lord MERRIVALE said he hoped that Lord Russell would consider Lord Onslow's suggestion. In 999 cases out of 1000 it was most desirable that these people should be under treatment, but everyone knew that the odd case occurred, whether through interest or malice, or some indirect motive, and produced mischief. Certainly it had been the practice in this country to safeguard the liberty of the subject. The present procedure was really not a safeguard. For a delicate matter of this kind he thought they might have a body of referees nominated in the public interest as proper persons. There would be a panel of qualified persons in whom medical men and everyone else who know anything about the matter would have confidence.

Lord HANWORTH said that he hoped that the Government would hold to the Bill. If the matter was pressed to a division he would vote against the amendment. The same reluctance would be shown to go before a board of referees as to go before the magistrates. The stigma was really the same and such a step would interfere with the recovery of these patients. So long as the matter was left in the hands of the medical man, and treatment was given by the medical man, there was some hope for them. After all, they were only going to be treated for six months with the safeguards provided in the Bill.

The Marquess of SALISBURY said that their lordships would appreciate that the matter was one of some difficulty.

The decision was not a purely medical one. Unless Lord Russell was willing to consider the difficulty of determining what the actual volition of the patient was, and whether he had exercised it, then he (Lord Salisbury) would feel a great difficulty in regard to his vote.

Earl RUSSELL said that he did not think that the difficulty would arise in practice. The person was not necessarily comatose—confusional was rather the word. A great many of the confusional cases were so excited and upset by the procedure of certification, and by seeing a justice, that it very often put them back as much as six weeks before they began to make progress in the quiet surroundings of the asylum. That kind of excitement was very bad for their unstable brain. The patients were very well protected, and he hoped that their lordships would reject the amendment.

Viscount CECIL of CHELWOOD suggested that a way out of the difficulty might be to insist that one of the two medical practitioners who were to sign the recommendation for temporary treatment should be a person who had been proposed for the purpose by the Board of Control.

Earl RUSSELL said that that was a valuable suggestion, and he would certainly consider it before the Report stage.

The Medical View.

Lord DAWSON said he would like to make it clear that the medical profession had no objection to safeguards, provided those safeguards were such as would not prejudice the cure of the patients. They frankly admitted that those patients with which this Bill dealt constituted a class that had not hitherto been dealt with by the legislature. They were people for the most part living in small houses and earning small incomes. The difficulties were much less among the well-to-do. They had large houses where persons mentally sick might perhaps have two nurses and where the treatment could be carried out quite easily. The class of patient to which this Bill referred was a class that was grievously suffering with very little or no opportunity of being relieved. Take the case of an out-patient at a hospital. That patient might have influenza or some simple illness. He went there with a feeling of depression under a power of self-criticism, subject to introspection, and might go step by step down to that absolute suffering which they all knew, and for which they were powerless to do anything under present conditions. If they wanted to do anything with such patients now they had to be certified. That brought him to the question of certification. The word conveyed notions of a madman and all the things that had been from generation to generation associated with that name. He was quite prepared to admit that many of the fears entertained were unreasonable, but they existed, and those who had to do with the sick constantly found these difficulties arising. It had to be borne in mind that the patient whom they hoped to help by this Bill was often a very sensitive, a very impressionable, and sometimes a very competent person—someone who was cut a little bit too fine for the environment in which he had been placed. These people were very easily wounded—he meant in their nervous system. They were a class which was increasing in the civilisation which existed to-day. They might be very competent in their work, they were very often efficient and capable of being leaders. They often came across them in the War. Such people might get some toxic condition arising from influenza; or, in the case of a woman, it might be due to childbirth. Under the stress or strain of that, or because of overwork, they began that down grade with which their lordships were familiar. They would have a want of confidence, would indulge in self-criticism and self-abasement, and might in the end become insane. There was no class which had to be more carefully handled by medical men. There was no class of illness which required a greater intuitive insight, a greater tenderness, and a greater sympathy. One false word and their influence had vanished. Very often they had carried the patients along and convinced them that all their distresses, their sleeplessness, that burden of life which had become a horror to them, was due to overwork and that by proper treatment they would get better. Then suddenly the patient turned and said: "Do you think I am mad? Do you think I am going to lose my reason?" They were so quick in feeling that. Supposing one had carried the patient along with one, or supposing he had reached the stage when the doctor had to put him under treatment, and at that time anything like certification was introduced the patient's friends and all the people in his social circle would entertain certain feelings towards him. It was a fact that certification was associated with a very grim past. Anything that interfered with the secrecy and the confidential relationship of medical advice was to be avoided, and that was why it was so important that the provisions of this Bill should be carried out. They could have precautions if they liked, provided they did not become so cumbersome as to render the measure nugatory. Their lordships knew how very anxious people were if there was any question of insanity in the family. It was for those reasons that he would like to emphasise the benefits of this Bill. It would enable the poorer classes to get at any rate some of the benefits which were now open to the more prosperous classes. Further than that, it would do what the medical profession, and those who had thought in this matter, desired: it would bring about the prevention of insanity. The Bill did not deal with insanity and therefore they asked that it should be kept away from all mention of the machinery of insanity. Its whole object was to take these people suffering from mental illness in the same way as they took people suffering from physical illness and treat each according to his need. If that was carried out, with any precautions that were suitable provided they did not run counter to the feelings of the people they desired to help, he was confident that this Bill would be of great service to the community.

Viscount BRENTFORD said that he realised the dangers and difficulties that might arise to the incipiently insane person, or the man or woman suffering from mental disorder, from the fact of the judicial inquiry which he had suggested, and that in consequence they might go over the line. But with all due deference to Lord Dawson, he (Lord Brentford) thought that the fact of finding themselves in a registered mental institution, or in a public lunatic asylum, was much more likely to have the effect of pushing these patients over the line than a more judicial investigation. He did not wish, however, to press his amendment either to carry it or lose it by a small majority. That would be undesirable in the interests of these patients and he proposed to withdraw the amendment and ask Lord Russell if he would consider the various proposals made by Lord Cecil and others which might get over this difficulty. They were worth consideration. He (Lord Brentford) would be very glad to discuss the matter with Lord Russell in order to arrive at a solution which he was sure the whole House desired.

Earl RUSSELL said that he would be only too delighted to confer with Lord Brentford on the matter.

The amendment was, by leave, withdrawn.

Extension of Temporary Treatment.

Lord SANDHURST moved an amendment to provide that where it was anticipated that a person who was undergoing treatment as a temporary patient under Clause 5 would not recover within the period of six months, but his early recovery appeared reasonably probable, that period might from time to time be extended for further periods of such length, not exceeding three months, as might be specified in directions given by the Board of Control upon the application of one of the persons making the original application, accompanied by such evidence or recommendations as the Board might by rules prescribe; provided that such further periods should in no case exceed six months in all. He said that the Mental Treatment Bill of 1923 contained a similar provision. It seemed to be obvious that if a patient having the advantage of temporary treatment without certification had not fully recovered, but was likely to recover, by the end of six months it would be a great pity to compel him to accept certification in order to complete recovery.

Earl RUSSELL accepted the amendment, which was agreed to.

Clause 5 was agreed to.

The Earl of ONSLOW moved on behalf of Viscount Brentford a new clause to provide that the rules made under the Bill should be subject to the sanction of Parliament.

Earl RUSSELL accepted the amendment, which was agreed to.

The Committee stage of the Bill was concluded.

BILLS ADVANCED AND WITHDRAWN.

THE Highlands and Islands (Medical Service) Additional Grant Bill was read a third time in the House of Commons on Dec. 9th, and was introduced in the House of Lords and passed through Committee without amendment on the 17th. On Dec. 12th the Children and Young Persons (Employment and Protection) Bill was withdrawn.

COLONIAL POLICY AND HEALTH SERVICES.

On Dec. 11th, in the House of Commons, Mr. MARLEY moved the following resolution:—

> "That, in the opinion of this House, the native population of our dependencies should not be exploited as a source of low-grade labour: no governmental pressure should be used to provide wage-labour for employers; due care should be taken of native social well-being; the native demand for land should be adequately and satisfactorily met and their rights therein properly safeguarded; where the native population is not yet fitted for self-government, direct imperial control of native policy should be fully maintained; native self-governing institutions should be fostered; and franchise and legal rights

should be based upon the principle of equality for all without regard to race or colour."

He said that it was not his intention, or that of the Labour Party, to make the coloured races and their problems the playthings of party politics in the House of Commons. It was generally recognised by the white races of the world that they owed a great deal to the coloured races, and that it was their duty to accept the trusteeship which economic power had given to them over the fortunes and destinies of those people. He would exclude India from the discussion, as that was the subject of a Commission whose Report in due course would receive a great deal of attention in the House and elsewhere. He appealed to the Government to see how far it was possible to institute a medical service or native hospital within the reserves. He was informed that there was only one native hospital in the whole of the East African territories, Uganda, Tanganyika, and Kenya. There was a medical service carried on by missionaries, very low indeed in regard to expenditure and very inefficient in regard to medical qualifications.

Mr. CHARLES BUXTON seconded the resolution.

Mutilating Operations on Women and Girls.

The Duchess of ATHOLL said she desired to bring before the House some reasons why some Members of the House who had been studying conditions among women and children in the Crown Colonies—women and girls particularly—felt that there was urgent need for more consideration to be given to the social well-being, health, and education of women and girls in some of the Dependencies than seemed to be the case at present. This small group of Members of all parties who had been considering this question for some months had met missionaries of different churches of long standing in different colonies, also laymen and women, including doctors, and they were all deeply concerned at many of the things which they had learned bearing on the the status, the health, and the welfare generally of women and girls. In particular they had been terribly impressed by what they had learned about the existence of a pre-marriage rite among young girls in African tribes, a rite which was frequently referred to as the circumcision of girls. This obtained in Southern Nigeria and among one tribe in Uganda, but it existed in its worst form among the Kikuyu tribe in Kenya. It was not a subject to deal with publicly, but she brought it before the House because none of them could afford to forget the responsibility for the Colonial Empire which was directly governed by that House. She doubted whether, apart from missionaries and doctors, and perhaps Government officials, there were many white people who realised what this rite was and what it meant to the health and well-being of the *girls and women.* The committee to which she had referred have been assured by medical men and missionaries who have attended these women in hospital and in their homes that the rite was nothing short of mutilation. It consisted in the actual removal of whole sets of parts connected with the organs of reproduction. The operation was performed publicly before one or two thousand people by the old woman of the tribe, who was armed with an iron knife. No anæsthetic was given and no antiseptics were used. The old woman went with her knife from one girl to the other performing the operation, turning the knife once or twice on each victim. A lady missionary steeled herself to see this operation not long ago and had given a description of it, fortified by photographs which she had taken. She told the Committee that the girl had a whistle put into her mouth so that her screams would not be heard. A medical man told them that the operation left great scarring and meant much contraction; the natural processes were gravely interfered with, and there was reason to believe that blood-poisoning resulted, with the consequence that there was terrible suffering at childbirth and the first child was rarely born alive. It was difficult to ascertain the extent of the mortality because there was no register of births or deaths, but one missionary who had attended many of these young women in hospitals on their confinement told her recently that out of 10 persons affecting 20 lives only six lives survived. She had also been told of a boarding house for 60 girls of this tribe where a death had occurred every year lately from sometimes a trivial cause. A cut finger might turn so septic, owing to the poisoning from which the girl had suffered, that that type of injury might cause her death. What was the policy of the Government in regard to this terrible thing? The Committee have also been assured by a medical man of standing in East Africa that while there was a lesser form of the operation, which was not so severe as form of mutilation as the one she had described, it was an operation which he would not sanction by anyone under his control. Surely one of the best ways in which to persuade people was to give them practical demonstrations of other and better ways; and that surely meant that every opportunity should be taken to help these people to be healthy, and to help the women to realise that if they did not go through the operation they could become mothers with much less suffering and danger to their children and to themselves. When they inquired as to what was being done in Kenya in the matter of the care of women in childbirth, they found that there were no midwives practising in the reserves; at least, that was their information. They were told that though there were several Government hospitals—Mr. Marley, who moved the resolution, she thought was misinformed on the question of hospitals—there were only women nurses in two of them. Therefore the majority of these hospitals were not very well equipped for attending women in their confinement. No doubt it might be difficult to find any women trained as midwives, but they could show a splendid example of what could be done in that way. They were informed that in the Protectorate there were 26 centres for maternity and child welfare, and as a result in the last ten years the infant mortality-rate had dropped from 500 per 1000 births—a terrible level—to not more than 130 per 1000 in Uganda. What was possible in Uganda should be possible in Kenya. Kenya had its mission boarding-houses and boarding-schools maintained by the various missions where African girls were admitted and given an all-round training for several years. She had no doubt that the training was the best possible training for practice as midwives. Referring again to the question of the pre-marriage rite, the Duchess of Atholl said that she had heard of a case of a Christian girl who wished to avoid being subjected to the more severe form of operation, but she was seized by her relatives and obliged to submit. Where the urgency of the question came in was this. An appeal was made to a native court for damages against the operator, but the magistrates ruled that no grievous hurt had been done to the girl.

Dr. MORGAN: What is the date of the prosecution?

The Duchess of ATHOLL said that she believed it was July of this year. The case was carried to the Supreme Court, where the decision of the native court was upheld, so that the woman who inflicted the terrible operation on this girl against her will only had to pay 30s. They must assume that the Supreme Court was carrying out the law, but in that case the law must be altered. She understood the policy of British Governments of all political complexions had been to avoid interference as far as possible with native customs, subject to this qualification, that they were not contradictory to justice and humanity. She asked the House what could be more inhuman that the practice which she had described.

Reply to the Debate.

After further discussion,

Dr. DRUMMOND SHIELS (Under Secretary of State for the Colonies), replying to the debate, said that the resolution referred to the social well-being of the natives. One of the first considerations in that connexion was health. In the Colonial Department increasing attention was being given to health questions. There were now 56 separate medical departments in the Colonies with 2000 qualified medical men and women. The Colonial Office served in some measure as an Imperial Ministry of Health. The Chief Medical Officer at the Colonial Office kept in touch with the medical problems of the overseas medical officers, and there was an advisory medical and sanitary committee and a medical research committee. These committees reviewed medical problems and stimulated and advised upon medical research. Very much more work and more research were required. They should be grateful to the Duchess of Atholl for raising the question of the pre-marriage rite. He could assure the noble lady that she was pushing an open door so far as he was concerned. He detested the practice, and he knew that the Secretary of State for the Colonies shared his view. It was his duty, however, to point out the difficulty of interfering with such traditional customs. While he did not say that that was an absolute bar to action, it did constitute a great difficulty. A number of the local Native Councils in East Africa had passed resolutions making illegal the severer forms of the operation. The Secretary of State was exploring the matter further, and collecting all the available information, and in the light of that, he might be able to take action which he hoped would satisfy the noble lady, and also satisfy the conscience of the House of Commons.

The debate was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, DEC. 11TH.

Colonial Health Services.

Duchess of ATHOLL asked the Under Secretary of State for the Colonies the numbers of the African populations of Tanganyika, Kenya, and Uganda, respectively; and, in the last year for which figures were available, what was the amount spent by the governments of these colonies, respectively, on midwives, hospitals, child welfare, and any other form of health service, and in the education of women and girls, distinguishing services supplied direct by government and services supplied by missionary bodies with the aid of a government grant.—Dr. SHIELS replied : The following is the information asked for. I may add that my noble friend is taking steps to ascertain what can be done to further the objects mentioned in the question and other matters of native welfare.

(1) The latest estimate of the numbers of the African population of these dependencies is as follows : Tanganyika, 4,740,706 Uganda, 3,241,543 ; Kenya, 2,838,022.

(2) In the last year for which returns are available the total Government expenditure in these dependencies on health services, exclusive of capital expenditure, was :—Tanganyika, £332,467 (1928–29) ; Uganda, £141,713 (1928) ; Kenya, £199,198 (1928).

(3) The following approximate amounts were spent on (*a*) upkeep of hospitals, and (*b*) construction and repair of hospitals (excluding in both cases expenditure on personnel).

(*a*) *Upkeep of hospitals.*—Tanganyika, £10,015 (1928–29) ; Uganda, £12,250 (1928) ; Kenya, £12,070 (1928).

(*b*) *Construction and repair of hospitals.*—Tanganyika, £14,974 (1928-29) ; Uganda £2,254 (1928) ; Kenya, £16,269 (1928).

(4) The other detailed information asked for as regards expenditure on Health Services is not available.

(5) As regards education, no figures showing separately expenditure on female education in these dependencies are available.

(6) The grants made by the three Governments to mission bodies in respect of health and educational services totalled :—(*a*) Tanganyika, £15,906 (1928-29) ; (*b*) Uganda, £30,641 (1928) ; (*c*) Kenya, £23,500 (1928). No information is available showing in detail the services on which these grants were expended.

Pensioners and Treatment Allowances.

Major COLVILLE asked the Minister of Pensions if he would consider amending the regulation in regard to treatment allowances which required that any payments from welfare or similar funds received by the pensioner during treatment should be deducted from the treatment allowance.—Mr. F. O. ROBERTS replied : The special allowances which may be payable during treatment are subject to the condition that the patient is found to be unable, in consequence of the course of treatment given to him, to provide for the support of himself and his family. It is, therefore, and always has been, a condition of the grant of those allowances that the patient shall not at the same time draw both the maximum allowance and also draw payment such as wages or sick pay in lieu of wages.

Married Men in Criminal Lunatic Asylums.

Mr. SORENSEN asked the Home Secretary whether he could give the figures of married men in the criminal lunatic asylums who were serving terms under commuted death sentence.—Mr. CLYNES replied : Two men now in Broadmoor Criminal Lunatic Asylum, having been transferred there while serving commuted death sentences, have wives living.

Health Insurance Benefits in the Services.

Sir KINGSLEY WOOD asked the Minister of Health whether he could state the additional benefits payable to members of the Navy, Army and Air Force Insurance Fund.—Mr. GREENWOOD replied : The additional benefits payable to members of the Navy, Army and Air Force Insurance Fund who continue their membership after discharge from His Majesty's forces are an increase of the normal rates of cash benefits by 4*s.* a week sickness benefit, 2*s.* a week disablement benefit, and 8*s.* maternity benefit ; payment of the whole cost of certain treatment benefits—viz., dental treatment and the provision of artificial teeth ; ophthalmic treatment and the provision of spectacles ; and the provision of medical and surgical appliances.

Position of Local Government Medical Officers.

Dr. VERNON DAVIES asked the Minister of Health if he had considered, in relation to the recommendation of the Royal Commission on Local Government (Final Report, page 107, paragraph 341), the case of medical officers of local authorities, such as a public vaccinator, a district medical officer under the guardians, and a medical officer of health to an urban or rural district council ; and whether he would issue a statement to local authorities as to the position of such officers in respect of membership of local authorities.—Mr. GREENWOOD replied : The recommendations of the Royal Commission are now under my consideration. I do not think that a special statement to local authorities on the matter is required at the present time.

Hospital Accommodation and Expenditure.

Mr. THOMAS GRIFFITHS asked the Minister of Health if he would furnish a return of the numbers and beds, comparable with that given in the House of Commons on 1st March, 1926, for hospitals provided by local authorities, voluntary hospitals aided by local authorities, institutions provided by Poor-law authorities, and giving, for the latest possible year, the expenditure in each of the three classes.—Mr. GREENWOOD replied : The following is the information asked for : So far as general hospitals are concerned, the information in my Department indicates that one large general hospital with 875 beds, and three relatively small accident hospitals have been provided by local authorities, but the total number of beds is not known. Local authorities are empowered by Section 84 of the Public Health Act, 1925, to make reasonable subscriptions or donations to voluntary hospitals to the extent of the produce of a penny rate. The amount subscribed by local authorities under that section in 1927-28 was £25,000. Under Section 38 of the Poor-law Act, 1927, Boards of Guardians may, with my consent, make contributions to public hospitals. In 1927-28 the amount contributed under this section was £44,000.

The information with regard to hospitals of the other classes referred to in the question is as follows :—

(A) Hospitals Provided by Local Authorities.

—	No.	Beds.	Expenditure of local authorities in 1927–28.
			£
1. For tuberculosis ..	160	12,787	1,802,000*
2. For acute infectious diseases	287*	36,833†	3,490,000†
3. Maternity hospitals (not including maternity wards in general hospitals or Poor-law Institutions) ..	79	1,034	201,447
4. Babies' hospitals.. ..	11	253	

* Including the expenditure in connexion with beds for tuberculosis mentioned in the following note.

† At 44 of these hospitals there are 2,205 beds for the treatment of tuberculosis. The expenditure on these beds is excluded from item 2.

(B) Voluntary Hospitals Aided by Local Authorities.

1. Tuberculosis hospitals ..	138	9,203	825,000†
2. General hospitals—			
(*a*) Used in connexion with tuberculosis schemes	164	—*	
(*b*) Used in connexion with venereal diseases schemes	130	—*	Not available.
(*c*) Maternity sections used in connexion with maternity and child welfare schemes	32	267	78,000
3. Maternity hospitals (not including maternity sections in general hospitals)	65	1,323	
Babies' hospitals	12	347	

* Available beds used as and when required.

† Including expenditure of the Welsh National Memorial Association on sanatoria and hospitals.

The figures under the above headings are exclusive of accommodation in homes for unmarried mothers and their babies, observation wards in connexion with maternity and child welfare centres, and convalescent homes. Those under *B* 2(*c*) are exclusive of accommodation used by local authorities in general hospitals for special or complicated maternity cases, as regards which figures are not available.

(C) Institutions Provided by Poor-law Authorities.

			£
1. Institutions wholly for the sick, exclusive of institutions for mental cases ..	73	40,000	4,119,000
2. General institutions (with a total accommodation of some 188,000)	542	83,000(*a*)	8,625,000(*b*)

(*a*) Beds in infirm and sick wards.

(*b*) Total expenditure on general institutions.

Vaccination Exemptions.

Mr. FREEMAN asked the Minister of Health whether he could announce any concessions in respect of the Vaccination Acts, which he promised to consider after receiving a deputation in October ; and whether he would arrange for a public inquiry, in view of the fact that more than 60 per cent. of the population claimed exemption for their children at birth.—Mr. GREENWOOD replied : I have under consideration the whole subject of vaccination, including the desirability of some further inquiry, but I am not at present in a position to make any announcement on this question. I may point out that the latest figures available—namely, those for 1927, show that in that year, not 60 per cent., but just over 40 per cent. of the parents made declarations of conscientious objection to vaccination.

The Standard of Overcrowding in the Census

Mr. SIMON asked the Minister of Health, whether he was aware of the standard of overcrowding adopted by the Registrar-General in the Census and by the majority of medical officers of health; and whether he would arrange for a more satisfactory standard to be adopted at the next Census, taking into account, in particular, the provision of the necessary bedroom accommodation to provide for the separation of the sexes.—Mr. GREENWOOD replied: This matter is receiving my attention in connexion with the preparations for the forthcoming Census.

Institutions for Mental Defectives.

Mr. EDE asked the Minister of Health how many local authorities had provided institutions for the residential care of the mentally defective; and how many had not up to the present made that provision.—Mr. GREENWOOD replied: Twenty-eight local authorities have provided institutions for the residential care of mental defectives. Eighteen have schemes in progress. Seventy-eight have not up to the present made any institutional provision of their own.

MONDAY, DEC. 16TH.

Appeal Tribunal in Pensions Cases.

Mr. GOULD asked the Minister of Pensions whether any steps had been taken with a view to securing a medical appeal tribunal to enable ex-Service men to submit their cases where conflicting opinions existed between the man's own doctor and the Ministry's medical advisers.—Mr. ROBERTS replied: The machinery of formal appeal to an Appeal Tribunal is, in my judgment, not the most suitable or most expeditious mode of determining such purely medical matters as the form of treatment appropriate to a particular case, where there is a difference of opinion on this point on medical grounds. I have, however, arranged that any difficult cases of this character, where representations are made by panel doctors, are reviewed at the Headquarters of the Ministry.

Deterioration following Final Award.

Mr. LONGDEN asked the Minister of Pensions if he would instruct area officers to grant the right of re-appeal for a renewal of pension, under the procedure for the correction of errors, where the ex-Service man claimed to be suffering from deterioration following a final award.—Mr. ROBERTS replied: I would point out that it is open to any pensioner in receipt of a final award to apply for treatment for a condition due to war service. If, as a result of such treatment, the award is found to have been seriously erroneous as an assessment for permanent purposes, a further grant can be made.

Married Inmates of Lunatic Asylums.

Mr. SORENSEN asked the Home Secretary the number of married inmates of lunatic asylums who had been certified for more than five years; and if he would give the figures of those who had been in asylums for ten years and upwards—Mr. WILLIAM WHITELEY replied on behalf of the Minister of Health: Statistics collected by special inquiry in 1921 showed that on Jan. 1st. in that year there were 43,871 male and 55,883 female patients under care in institutions for the insane in England and Wales. Of these, 14,058 men and 19,202 women were described as married, of whom 7,121 men and 10,801 women had been certified for more than five years. Information in regard to married patients who have been under care for ten years and upwards is not available.

Rent Restriction Act and Slum Clearance.

Dr. LITTLE asked the Minister of Health whether his attention had been called to the inquest conducted by the City coroner on Nov. 20th, 1929, on a death occurring in Clerkenwell slum property, where a tenement comprising six small rooms, occupied by 23 men, women, and children, could not be demolished and rebuilt by the owners by reason of the Rent Restriction Act; and whether he was prepared to introduce legislation, by way of amendment of the Rent Restriction Act, in order to provide that, where the owner of property bona fide desired to pull down the same for rebuilding, for commercial purposes or otherwise, he should be entitled to an order for possession, subject to his providing reasonable alternative accommodation for the displaced occupiers.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. In reply to the second part, I would point out that existing legislation provides that an order for possession may be granted by the Court when a dwelling-house is reasonably required for any purpose which, in the opinion of the Court, is in the public interest, and the Court is satisfied as to the existence of alternative accommodation, and that it would be reasonable to grant the order.

TUESDAY, DEC. 17TH.

Deaths from Cancer.

Mr. FREEMAN asked the Minister of Health the average number of deaths from cancer during the last 10 years, and whether there had been any substantial increase or decrease recently.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Minister of Health) replied: Particulars of cancer deaths and mortality-rates in each of the last ten years will be found in the Registrar-General's Statistical Review for 1928, Part I., Tables 4 and 5 on pages 10 and 24–25, and in the Chief Medical Officer's Report for 1928, pages 167–175. With regard to the latter part of the question, so many factors are involved in any discussion of the tendencies of mortality from this cause that I can only refer the hon. Member to the commentary upon the subject which is annually contained in the Text Volume of the Statistical Review, and of which the last example will be found commencing on page 58 in the Text Volume for 1927.

National Health Insurance Fund.

Mr. REMER asked the Minister of Health the amount paid into the National Health Insurance Fund by employers and employees during 1928.—Mr. GREENWOOD replied: The amount paid into the National Health Insurance Fund during 1928 in respect of contributions by employers and employees in England and Wales was £23,187,000, of which it may be estimated that the employers' share was approximately £11,703,000 and the employees' share £11,394,000.

Medical and Health Services in Uganda and Kenya.

The Duchess of ATHOLL asked the Under Secretary of State for the Colonies how many village dispensaries and maternity centres for the use of natives were now in existence in the Protectorate of Uganda; how many trained native midwives were now on the roll in that Protectorate; how many were trained annually by the Government, the Church Missionary Society, and the Third Order of St. Francis, respectively, in Uganda; and whether he proposed to suggest to the Government of Kenya that they should establish a scheme similar to that in Uganda for the provision of trained native midwives for the natives of Kenya.—Dr. SHIELS replied: The latest information available in the Colonial Office relates to the year 1928. There were then 66 district sub-dispensaries in the Uganda Protectorate in addition to 21 native hospitals at which dispensary treatment could be obtained and 41 maternity centres. Four new maternity centres were in course of construction. There were 93 native midwives on the official midwives roll on Jan. 1st, 1929. In 1928 the average number of student midwives in training by the Church Missionary Society was 24, and 15 passed the qualifying examination during the year. At the Mill Hill Mission, where the sisters of the Third Order of St. Francis work, the average number of students was 21 and three natives qualified. The Protectorate Government contributes annual grants to missions for the maintenance of midwifery centres and midwives. As regards the last part of the question, steps have already been taken in the matter in Kenya by the Government and by voluntary effort. At the end of 1928 there was a number of child welfare clinics in operation in Nairobi, Mombasa, and Kisumu, and additional centres were to be opened in Mombasa this year. The Lady Grigg Child Welfare League has maternity homes and child welfare centres in Nairobi and Mombasa. The training in midwifery of Indian and native women is undertaken at these centres.

BRISTOL HOMŒOPATHIC HOSPITAL.—Miss Wills last week opened a new children's ward at this hospital which has been given by Mr. and Mrs. W. Melville Wills. The hospital was originally built and equipped by Mr. and Mrs. Wills as a memorial to their son.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL.—This hospital, which has cost £65,000, was opened last week by Mr. Talbot Cliff who, with his uncle, the late Mr. Stephen Cliff, has been a large benefactor to the institution. It replaces the existing Frodingham Cottage Hospital and contains 72 beds; the complete scheme provides for 112 beds.

ST. BARTHOLOMEW'S LIGHTHOUSE.—The lighthouse on the top of St. Bartholomew's Hospital, the beams of which remind London that an appeal is being made for a fund of a million, is mounted on the roof of the new surgical and operation block, about 120 feet from the ground. The lamp is a Philips 5000 watt, 500 volts of standard type. The candle-power of the beam is estimated at 750,000, and the light has been seen as far away as Bedford.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council was held with Lord Moynihan, the President, in the chair, on Dec. 12th, when the Fellowship of the College was conferred on the following:—

Mani Shanker Khushaldas Joshi, Bombay and St. Bart.'s; Robert Malcolm Dannatt, St. Bart.'s and London; David John Jones, Cardiff and Westminster; Griffith John Griffiths, Cardiff and Middlesex; Edgar Frederick King, Bristol; James Ivor Griffiths, Cardiff and Univ. Coll.; Ambrose John King, London; Noel Ellis Laurence, St. Bart.'s.; Harry Vernon Wells, Charing Cross; Arkyl Staveley Gough, Guy's; John Francis Edward Gillam, St. Thomas's; Howard Livingstone Peake, Guy's; Frank William Law, Middlesex; Beatrice Gwendoline Smith, Univ. Coll.; John McNeill Milloy, Glasgow and London; Jack Gardiner Wigley, Cambridge and St. Thomas's; William Pickup Greenwood, St. Bart.'s; Allan Warren Linford Row, St. Bart.'s; Edward McLellan, St. George's; William Charles Wallace Nixon, St. Mary's; Reginald Eric Norrish, St. Bart.'s; Stanley Farrant Russell, St. Bart.'s; Shafik Shalaby, Cairo, London, and King's College; William Elphinstone Underwood, St. Bart.'s; Frank Forty, Univ. Coll.; Mahapitiyage Velin Peter Peiris, Ceylon, London, and St. Bart.'s; William John Hunt Montgomery Beattie, Cambridge and St. Bart.'s; Mohanlal Vanichand Modi, St. Bart.'s; Harry Silvester Waters, Cambridge and St. Mary's; Marcus Cole Rous, Cape Town, London, and Guy's; Harry Teesdale Simmons, Manchester and Guy's; Philip Wiles, Middlesex; Julian Ormond Smith, Melbourne and St. Bart.'s; James Dawson, Glasgow and St. Bart.'s; David Nathan Eppstein, Otago and Guy's; Alfred Laurence Johnston, Melbourne and London; Aubrey James Mason, Otago and Guy's; Arthur Rainsford Mowlem, Otago and London; Leith Alexander Riddell, Otago and St. Thomas's; Arthur Liddon Webb, Adelaide and St. Thomas's; and Frederick Edward Webster, Otago and Guy's.

Diplomas of Membership were granted to Eric Marks (St. Mary's) and Alison J. Rae (Royal Free).

Mr. Cyril H. Howkins, was re-elected a Member of the Board of Examiners in Dental Surgery. Lord Moynihan was re-elected the representative of the College on the Court of the University of Birmingham. The Blackburn and East Lancashire Royal Infirmary and the Hampstead General and North-West London Hospital were recognised for the 12 months' surgical practice required of non-Members before admission to the Final Fellowship Examination. It was reported that Sir Frank Colyer would give two demonstrations on the Odontological Collection on March 12th and 19th, 1930.

With regard to the resolution passed at the Annual Meeting of Fellows and Members on Nov. 21st affirming the desirability of admitting Members to direct representation on the Council, the following reply was adopted:—

> No evidence has been submitted to the Council that the change in the constitution of the College advocated in the resolution is desired by any considerable number of Members of the College, and the Council is therefore not prepared to reopen the question at the present time.

A recommendation from the Board of Examiners in Dental Surgery that a higher dental diploma for licentiates in dental surgery of the College should be instituted was further considered, and it was decided to consult the dental schools regarding the proposal. It was suggested by the examiners that the diploma should, if possible, be called diploma of Fellow in Dental Surgery, F.D.S. R.C.S. Eng., but the consideration of the title to be given to the diploma was deferred.

Primary Fellowship Examination.

At the Primary Examination for the Fellowship, held from Dec. 3rd to 13th, 165 candidates presented themselves and 49 were approved. The following are the names and medical schools of the successful candidates:—

H. J. B. Atkins, Oxford and Guy's; D. A. Beattie, St. Bart.'s; T. H. Berrill, M.B., Bristol; D. D. Boovariwala, M.B., Bombay and King's Coll.; J. T. Chesterman, M.R.C.S., Bristol, King's Coll., and Middlesex; H. O. Clarke, M.B., Dublin and Middlesex; Dorothy J. Collier, M.B., Oxford and King's Coll.; S. B. Cooper, M.B., and K. K. Dalal, M.B., Bombay and London; F. F. D'Arcy, M.S., Melbourne, King's Coll., and St. Mary's; N. D. Fadia, M.B., Bombay and King's Coll.; B. W. Fickling, King's Coll.; K. J. Gilchrist, Guy's; W. G. Gill, Cambridge, Guy's and King's Coll.; F. J. S. Gowar, Middlesex; A. J. Grace, Saskatchewan and Oxford; L. Greenfield, London; I. A. Hamilton, M.B., Adelaide, King's Coll., and Middlesex; Hariharan, M.R.C.S., Madras and King's Coll.; K. H. C. Hester, London; J. C. Hogg, B.Chir., Cambridge and St. Bart.'s; D. T. Ishmael, St. Bart.'s; E. Jacobson, M.R.C.S., London; Katherine M. Jones, Lond. Sch. Medicine for Women; R. A. Jones, Cambridge and London; G. S. Kelkar, M.B., Bombay and Middlesex; A. W. Kendall, M.B., King's Coll.; M. L. Kennedy, M.B., Dublin and Guy's; V. J. Kinsella, M.B., Sydney, King's Coll., and St. Mary's; R. S. Lewis, Cambridge and Univ. Coll.; K. Lumsden, M.B., Edinburgh and Middlesex; J. Mark, M.B., Otago and King's Coll.; S. N. Mathur, M.B., Lucknow, King's Coll. and Guy's; C. B. Melville, M.B., Melbourne, Middlesex, and King's Coll.; Gertrude M. B. Morgan, M.D., Cambridge, St. Mary's, and King's Coll.; H. F. Moseley, McGill and Oxford; W. Mushin, London; R. W. Nevin, Cambridge and St. Thomas's; *T. H. Parkman, King's Coll.; R. G. Pulvertaft, Cambridge* and St. Thomas's; J. R. Ratcliffe, M.R.C.S., Guy's; B. C. Rennie, M.B., Otago, King's Coll., and St. Mary's; V. C. Snell, Cambridge and St. Bart's; H. H. Stewart, M.D., Melbourne and Middlesex; G. O. Tippett, M.R.C.S., St. Thomas's; A. G. Williams, M.B., Cardiff and St. Bart.'s; H. M. Williams, St. Bart.'s; B. Willinsky, M.D., Toronto and Univ. Coll.; and D. S. P. Wilson, M.B., Dublin and Middlesex.

UNIVERSITY OF LONDON.—At recent examinations the following candidates were successful:—

THIRD EXAMINATION FOR M.B., B.S.

Honours.—R. K. Bowes (*c*, *e*), Univ. of Liverpool; C. R. E. Freezer (*b*), Guy's Hosp.; Archibald Gilpin (*a*), King's Coll. Hosp.; D. H. Haler (*b*), King's Coll. Hosp.; Harry Temkin (*a*) Univ. Coll. Hosp.

(*a*) Distinguished in medicine; (*b*) in pathology; (*c*) in forensic medicine; (*e*) in midwifery.

Pass.—H. W. Applin, Guy's Hosp.; C. B. Bloom, London Hosp.; E. J. C. Bockett, King's Coll. Hosp.; A. M. Boyd, St. Bart.'s Hosp.; Bertha A. Briant, L.S.M.W.; A. P. L. Cogswell, King's Coll. Hosp.; C. N. Cohen, Guy's Hosp.; Mabel J. Cooke, L.S.M.W.; Philip Dalzell, St. Bart.'s. Hosp.; C. C. Davis, Univ. Coll. Hosp.; G. H. Dobney, Middlesex Hosp.; C. J. East, St. Bart.'s. Hosp.; Lilian P. Edwards, L.S.M.W.; Muriel F. M. Evans Charing Cross Hosp.; M. J. Evans, St. Bart.'s Hosp.; A. D. Everett, St. Bart.'s Hosp.; B. M. Fonseka, Middlesex Hosp.; R. A. Furniss, Univ. of Liverpool; F. W. Gilbert, Guy's Hosp.; Alice E. N. Gilby, L.S.M.W.; Sibyl D. Goodwill, King's Coll. Hosp.; D. R. Griffith, St. Thomas's Hosp.; Grace M. Griffith, Univ. of Leeds; T. R. Griffiths, St. Bart.'s Hosp.; R. W. Haines, Univ. Coll. Hosp.; Margaret L. Hamburger, L.S.M.W.; E. O. Harris, Middlesex Hosp.; C. V. Harrison, Welsh National School of Medicine and Univ. Coll. Hosp.; G. F. Harrison, St. Thomas's Hosp.; G. B. M. Heggs, St. Mary's Hosp.; E. A. H. Hingbaugh, London Hosp.; R. C. Holderness, Univ. of Leeds; G. MacI. Houston, Guy's Hosp.; Simon Kin, *King's Coll. Hosp.; R. A. King, St. Mary's Hosp.*; K. E. Lane, Guy's Hosp.; L. P. E. Laurent, Univ. Coll. Hosp.; F. J. G. Lishman, Univ. Coll. Hosp.; Dorothy M. Lufkin, Univ. Coll. Hosp.; Gladys E. McCabe, L.S.M.W. and St. Mary's Hosp.; J. F. Mackenzie, Guy's Hosp.; J. R. A. Madgwick, London Hosp.; E. W. Martindell, Univ. Coll. Hosp.; Olive M. Midgley, L.S.M.W.; T. H. Nogus, St. Thomas's Hosp.; Doreen G. C. Nixon, Univ. of Bristol; Penelope A. Peach, L.S.M.W.; L. M. J. A. Pilot, St. George's Hosp.; N. E. Pitt, Guy's Hosp.; Raymond Purvis, St. Thomas's Hosp.; Sylvia M. Ransford, L.S.M.W.; N. W. Roberts, Univ. of Liverpool; W. P. Roe, Guy's Hosp.; Harry Selby, Guy's Hosp.; Rupert Shelley, St. Thomas's Hosp.; R. C. N. Shires, Univ. of Leeds; Samuel Shone, Guy's Hosp.; A. W. E. Soyes, King's Coll. Hosp.; Marjorie V. N. Sudds, L.S.M.W.; C. B. V. Tait, St. Bart.'s Hosp.; S. A. Underwood, St. Mary's Hosp.; L. E. Vine, Univ. of Bristol; W. H. S. Wallace, St. Thomas's Hosp.; Eileen A. L. Webb, L.S.M.W.; J. W. Wigg, Univ. Coll. Hosp.; E. M. Wijerama, Ceylon Med. Coll. and Univ. Coll. Hosp.; R. M. Williams, Guy's Hosp.; C. S. Wise, St. Bart.'s. Hosp.; H. S. H. Wood, Middlesex Hosp.; N. R. W. Wynn-Williams, Middlesex Hosp.

The following have passed in one of the two groups of subjects:—

Group I.—Kathleen L. Bland, Univ. Coll. Hosp.; Arnold Clark, St. Bart.'s Hosp.; T. V. Cooper, Westminster Hosp.; C. H. Dale, *St. Bart.'s Hosp.; H. B. A. R. Densham, Guy's* Hosp.; R. L. H. Harris, St. Bart.'s Hosp.; A. G. Harsant, London Hosp.; D. T. Jones, Guy's Hosp.; H. W. Jordan, Univ. Coll. Hosp.; Laura H. Macfarlane, L.S.M.W.; H. G. McGregor, Guy's Hosp.; F. M. Mallinson, Univ. Coll. Hosp.; C. E. H. Maycroft, Guy's Hosp.; L. H. Mottet, Univ. Coll. Hosp.; C. M. Ockwell, Guy's Hosp.; G. F. Peters, Guy's Hosp.; E. S. Pope, St. Bart.'s. Hosp.; Barkat Ram, St. Thomas's Hosp.; A. C. Riley, St. Bart.'s. Hosp.; N. L. Sheppard, King's Coll. Hosp.; Helana Sidarous, L.S.M.W.; Brian Stanley, Univ. Coll. Hosp.; Harris Teitelbaum, Welsh National School of Medicine.

Group II.—E. F. D. Baker, St. Bart.'s. Hosp.; R. C. Bennett, St. Bart.'s Hosp.; P. C. C. de Silva, King's Coll. Hosp.; F. A. Edwards, St. Bart.'s Hosp.; J. D. S. Flew, Univ. Coll. Hosp.; H. S. Hamlin, St. Thomas's Hosp.; K. W. D. Hartley, St. Bart.'s Hosp.; H. B. Hodson, St. Thomas's Hosp.; A. S. Hosseason, St. George's Hosp.; John Ives, St. Mary's Hosp.; A. H. M. McMullan, Univ. of Birmingham; Robert Machray, Westminster Hosp.; J. R. Murray, London Hosp.; R. K. Price, St. Bart.'s Hosp.; Everoll M. Shippam, L.S.M.W.; C. E. H. Turner, London Hosp.; R. C. Williams, St. Thomas's Hosp.

L.S.M.W.—London (Royal Free Hospital) School of Medicine for Women.

A HOSPITAL FILM.—A film has been made of the work of Birkenhead General Hospital, and will be shown at various cinemas in that town during the next two or three weeks.

UNIVERSITY OF BIRMINGHAM.—At recent examinations the following candidates were successful:—

M.D.

* J. W. Field and C. J. Polson.

M.B., CH.B.

T. A. Cooper, G. J. Garratt, I. B. Gumede, R. H. Hucknall, E. J. Kerr, E. J. Mann, P. H. Merlin, Ahmed Monib, J. D. W. Shedden, and Mary A. Tomlinson.

* With honours.

FINAL EXAMINATION FOR L.D.S.

W. J. Bate, N. L. Cookson, A. A. Dessouki, Boyce Douglas, R. J. Godfrey, W. B. Hales, B. J. O'Meara, D. A. Parsons, F. H. Richards, A. J. Simcox, A. E. Thomason, S. G. Watson, and W. B. Wood.

UNIVERSITY OF MANCHESTER.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR M.B. AND CH.B.

*Edith M. Booth, *F. N. Marshall, Alexander Allan, Hedley Boardman, R. O. Brooks, J. A. K. Brown, Christobel M. Hall, W. H. Harris, E. J. B. Sewell, and Nellie Wilson.

* Second-class honours.

Part I.—G. M. Lendrum.

FINAL EXAMINATION FOR B.D.S.

W. L. Lilley.

FINAL EXAMINATION FOR L.D.S.

W. J. Brown, and Norman Wild.

MEDICO-LEGAL SOCIETY.—The annual dinner of this Society was held at the Holborn Restaurant on Dec. 13th with the President, Lord Riddell, in the chair. Dr. Nathan Raw, in proposing the health of Medicine and Law spoke cordially of the work of the Medical Research Council and maintained that our lunacy administration was the best in the world. Lieut.-Colonel C. T. Samman, Master of the Apothecaries Company, replying for Medicine, contrasted the solid rock of the law with the fluidity of constantly changing medicine; the two professions touched at many points and had in common that they treated their clients' secrets as confidential and did not advertise. He suggested that the enormous increase in the use of opium and cocaine, due to the hectic and intensive life of the younger generation, called for the coöperation of both professions. Mr. A. E. Mitchell-Innes, K.C., replying for Law, compared medicine and law in that the object of both was to remove inflammation and restore the temperature of patients to normal. The main propositions of law had to be fixed and definite in character; he envied the medical profession the picturesque and much more highly coloured region of theory in which they enjoyed themselves. The barrister got back a little of his own when he demanded "a definite answer—yes or no" of the expert witness, but the speaker had never heard a competent expert witness fail to destroy the effect of the "yes" or "no" by his subsequent categorical explanation. He thought that the time might come when the well-known definition of insanity now acted upon in the courts would have to be adjusted. Progress in that direction would only be achieved by the best efforts of the best minds in both professions. Lord Greenwood, proposing the toast of the Medico-Legal Society, said that law and medicine represented the two indispensable foundations of the civilised state. The medical profession had no frontiers; but lawyers were localised in accordance with the civilisation in which they operated. The medical profession was the only one with a common ideal and common ground, and was freer than any other from the superstitions and fears that held back mankind. Lord Riddell, replying, said he had a great respect for great professions and compared himself with the old lady who always bowed when the name of Satan was mentioned. "Civility costs nothing," she said, "and you never know what may happen." The Medico-Legal Society's Latin maxim could be rendered, "Truth lies wrapped up and hidden in the depths." This applied to science, medicine, and above all to legal proceedings. The Society had been started by coroners with a view to assisting in the discovery of truth. Its main object was to provide weapons to enable doctors and lawyers to discover truth; sometimes they picked up golden nuggets and at other times dead cats. The badge of the Society depicted a well, on either side of which stood Sir Bernard Spilsbury and Sir William Willcox, looking very intently into the well, Truth being at the bottom, while the President and Members of the Society stood in the offing looking very anxious. Replying to the toast of The Guests, proposed by Sir John Collie, the Attorney-General, Sir William Jowitt, said that the administration of criminal law depended not only upon the doctors and the lawyers but also upon the press. Many years ago he had thought it a most essential reform that trials for blackmail should be held in camera; this reform had been brought about without any Act of Parliament, simply by the good sense of the press. Speaking of the system of coroners' inquests, he reminded the audience that it was much easier to destroy a system than to build it up. The coroners' system went back to dim antiquity. The fact that coroners conducted over 30,000 cases a year and that the public demand for the abolition of the system related to only two or three cases, proved how extraordinarily well coroners conducted the very useful work entrusted to them. Mr. Donald Armour, also replying, said that, although the son of a chief justice and a member of a very large legal family, he had been attracted to the senior profession of surgery—senior, because the first operation on record (a rib resection) had preceded the first legal quarrel as to who had actually purloined the apple in the Garden of Eden. The Medico-Legal Society could play a great part in the education of the two professions, for the majority of doctors were notoriously bad witnesses, while all lawyers were hopelessly ignorant of everything pertaining to the practice of medicine and the art of surgery. The doctor had to be taught to answer questions about what he knew and the lawyer to ask questions about that of which he knew nothing.

DONATIONS AND BEQUESTS.—Mr. R. S. Belfield, of Hawkhurst, Kent, left nearly £31,000 on the death of his wife to be divided among a number of charities, 5 per cent. being allotted to the Royal Hospital and Home for Incurables, Putney, 5 per cent. to the Tunbridge Wells General Hospital, and smaller percentages to various other hospitals and nursing associations.——Among other charitable bequests Mr. G. Strachan, of Glasgow, left to the Glasgow Royal Infirmary, the Glasgow Western Infirmary, and Glasgow Victoria Hospital £1000 each, and a sum for the endowment of beds; and to the Glasgow Eye Infirmary, the Princess Louise Hospital for Limbless Sailors and Soldiers, the Ralston Auxiliary Hospital of the Scottish Branch of the Red Cross Society, and St. Dunstan's Hospital for Blind Sailors and Soldiers, £500 each. To Glasgow Royal Hospital for Sick Children, £500, and to endow beds an additional £1500; to the Royal Samaritan Hospital for Women, Glasgow, and the Glasgow Royal Cancer Hospital, £500 each; and to the Elder Cottage Hospital, Govan, Glasgow, £1000, and to endow beds an additional £1500.—Mr. William Anderson, of Aberdeen, left £1000 each to the Aberdeen Royal Hospital for Sick Children, the Aberdeen Nursing Association, and the Convalescent Home, Cults; £500 to the Aberdeen Maternity Hospital; and £250 each to the Morningfield Hospital, Aberdeen, and the Aberdeen Asylum for the Blind.

Appointments.

BINGHAM, T. H., M.D., B.Ch. Belf., D.P.H., has been appointed Assistant Medical Officer of Health and School Medical Officer for Ealing.

KERR, J. A., M.D., Ch.B. Glasg., D.P.H., Assistant Medical Officer of Health, Birmingham.

MCLEOD, J., M.B., Ch.B. Edin., D.P.H., Assistant Medical Officer of Health for Motherwell and Wishaw.

ROBERTS, J., M.B., Ch.B. Liverp., F.R.C.S. Eng., Hon. Assistant Laryngologist to the Liverpool Royal Infirmary.

STENHOUSE STEWART, D. D., L.R.C.P. Lond., M.R.C.S., Honorary Assistant Ophthalmic Surgeon to the Hull Royal Infirmary.

WHEELER, E. R., F.R.C.S. Eng., to be one of the Medical Referees under the Workmen's Compensation Act for the districts of the Bath, Calne, Chippenham, Devizes, Frome, Hungerford, Malmesbury, Marlborough, Melksham, Newbury, Swindon, Trowbridge, and Warminster County Courts.

Birmingham Children's Hospital: ROSSER, MARGARET, C., M.B., Ch.B. Birm., House Physician; STAMMERS, F. A. R., M.B., Ch.B. Birm., F.R.C.S. Eng., Surgeon to Out-patients; and TATE, B. C., B.Chir. Camb., M.R.C.P. Lond., M.R.C.S., Physician in Charge of the Skin Department.

Certifying Surgeons under the Factory and Workshop Acts: HUGHES, E. R., L.R.C.P. Lond., M.R.C.S. (Holyhead); SCARBOROUGH, O. L., L.R.C.P. Lond., M.R.C.S. (Selby); and SIM, T., M.B., Ch.B. Glasg. (Ryde).

The Radium Institute: SMITH, A. J. DURDEN, M.B., B.S., Assistant in the Medical Department; and WILKIN, W. J., B.Chir. Camb., House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Barnstaple, North Devon Infirmary.—H.S. At rate of £150.

Birmingham General Hospital.—H.P. and Two H.S.'s. Each £70.

Birmingham, Monyhull Colony, King's Heath.—Res. Asst. M.O. £250–£350.

Birmingham, Selly Oak Hospital.—Two Cas. O.'s. Each at rate of £200.

Bolton, Townley's Hospital, Farnworth.—Second Asst. M.O. £225.

Bradford Children's Hospital.—H.S. and H.P. Each £120.

Bradford Royal Infirmary.—Res. Surg. O. £250.

Bristol General Hospital.—Two H.P.'s, two H.S.'s, Res. Obstet. O., H.S. to Special Depts. Each at rate of £60. Also Cas. H.S. At rate of £80.

Bristol, Ham Green Fever Hospital, &c.—Asst. Res. M.O. £300.

Burnley, Victoria Hospital.—H. S. At rate of £125.

Bury St. Edmunds, West Suffolk General Hospital.—H.S. £150.

Cairo, Egypt, Giza Memorial Ophthalmic Laboratory.—Pathologist and Bacteriologist. L.E.£1200.

Cardiff, Prince of Wales' Hospital.—H.S. for Crossways Country Branch Orthopædic Hospital. £120.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. First Asst. in Out-patient Dept. Also Third Res. H.S. At rate of £75.

Charing Cross Hospital, Strand, W.C.—Non-resident House Anæsthetist.

City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—Laryngologist.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Durham County Hospital.—Jun. H.S. At rate of £120.

Durham County Mental Hospital.—Jun. Asst. M.O. £350.

Edinburgh Royal Infirmary, Ophthalmic Dept.—Sen. Clin. Asst. and Clin. Tutor. £145. Also two Clin. Assts. Each £200.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Great Yarmouth County Borough.—Asst. M.O.H. and Asst. Tub. O. £600.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Clin. Asst. M.O. for Venereal Dept. £1 1s. per session.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also H.P. and H.S. Each at rate of £120.

Lancashire County Council.—Asst. County M.O., &c. £800.

Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.

Leicester Royal Infirmary.—Hon. Phys. and Hon. Surg.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150. Also Hon. Obstet. Surg.

Manchester, Ancoats Hospital.—Asst. Pathologist. £350.

Manchester, Baguley Sanatorium.—Asst. M.O. £350.

Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.

Manchester Royal Infirmary, Roby-street.—Jun. H.S. and Cas. O. £100.

Miller General Hospital, Greenwich-road, S.E.—H.P. and H.S. Each at rate of £125.

Newark Hospital and Dispensary.—Res. H.S. At rate of £160.

Northampton Education Committee.—Asst. School Dentist. £450.

Queen Mary's Hospital for the East End, E.—Hon. Asst. S.

Redruth, Cornwall, West Cornwall Miner's and Women's Hospital. Res. M.O. £200.

Rochdale Infirmary and Dispensary.—Jun. H.S. £175.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

St. John's Hospital, Lewisham, S.E.—Radiologist.

St. Mary's Hospital, W.—Asst. Pathological Chemist. £300.

Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. Each at rate of £100.

Sheffield Royal Infirmary.—H.P., H.S., Ophth. H.S., Asst. Ophth. H.S., and Asst. Cas. O. Each at rate of £100.

Shrewsbury, Royal Salop Infirmary.—Res. H.S. and Res. H.P. Each at rate of £160.

Southampton County Borough.—School Dentist. £450.

Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.

Swansea County Borough.—Asst. M.O. £600.

University College Hospital, Gower-street, W.C.—Registrar at Royal Ear Hosp. £50.

University College Hospital Medical School, University-street, W.C.—Asst. in Obstetric Unit. £250.

Walsall General Hospital.—Cas. H.S. At rate of £120.

Warrington Infirmary and Dispensary.—Anæsthetist. £105.

West Hartlepool, Howbeck Infirmary.—Asst. Res. M.O. £300.

West London Hospital, Hammersmith-road, W.—Asst. Dental. S.

Westminster Hospital, Broad Sanctuary, S.W.—House Anæsthetist. At rate of £100.

Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200.

THE Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Camberwell.

Births, Marriages, and Deaths.

BIRTHS.

BAIRD.—On Dec. 8th, the wife of Dr. J. C. H. Baird, Southampton-street, Reading, of a daughter.

WOOKEY.—On Dec. 8th, at Hendon, the wife of Eric E. Wookey, M.C., L.D.S. R.C.S., of a daughter.

DEATHS.

ALEXANDER.—On Dec. 9th, suddenly, at Gatefield House, Faversham, Sir Sidney Alexander, aged 60.

BARNARD.—On Dec. 13th, at King's College Hospital, after an operation, Walter Burrows Barnard, L.R.C.P., L.D.S., of Larpent-avenue, Putney.

HALL.—On Dec. 10th, at Woodways, Carbone Hill, Cuffley, Robert Mills Hall, O.B.E., M.B., C.M. Edin.

THOMSON.—On Dec. 10th, at St. James's-square, Bath, David Thomson, V.D., M.D., C.M., aged 85 years.

TUKE.—On Dec. 7th, suddenly, in Cheltenham, Lieut.-Colonel Arthur William Tuke, I.M.S. (retired) of "Stockwell," Cleevehill, aged 58.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

VOCATIONAL GUIDANCE.

AT a meeting of the London Association of the Medical Women's Federation, held on Nov. 20th, Miss F. M. Huxley took the chair, and an address on Vocational Guidance was given by Prof. Winifred Cullis. She gave an account of the establishment of the National Institute of Industrial Psychology, which grew out of the Fatigue Research Committee constituted during the war, and showed how valuable the Institute was proving at the present time, demonstrating the importance of the psychological factor in industry and its application to the workers in individual firms. The work done by the Institute was paid work, but no profit was made, for the balance was used for research. The advice of the Institute had been sought for various reasons—because of lessened output, and, on behalf of a firm of caterers, because of excessive breakages by the workers. By the correction of details of little apparent importance in routine work and by skilled observation of the workers, most dramatic improvements had been effected. As a natural outcome of the work of the Institute help was given to individuals in vocational selection, and tests had been devised which would show whether a prospective worker had a special aptitude for a given type of work. This was of great value, for otherwise haphazard and unscientific methods of selecting workers were employed. The head of a large dressmaking firm told one of the investigators that she always looked at the hands of prospective employees and if she noticed the nails were bitten she preferred not to engage the girl as she would probably prove to be bad tempered; the head of a rival firm said she used this same observation as a rough method of selection, but she showed a preference for candidates with bitten nails since they were often more artistic than the others. Vocational selection tests would show only whether a person was fitted for one particular type of occupation. The system had now been extended to embrace a scheme of vocational guidance, whereby an all-round examination would test both the innate intelligence of an individual and those qualities which cannot be tested by a written examination, the assessment of which is of great importance in determining the type of occupation for which an individual would be most suited. Experimental work on a large scale had been done on a group of elementary school-children. Two hundred children leaving school were chosen, 100 of whom were tested and advised as to the type of occupation in which they would do best. Wherever possible these children took up the suggested work. The other 100 children were not tested, and did not take up selected work. At the end of two years it was found that the children in the guided group had changed their occupation on an average twice, and those in the unguided group four times. The average wage in the guided group was considerably higher than in the other.

A further group of 600 children was being investigated at the present time, and there was scope for work on children from the secondary and public schools where individual choice of occupation was less influenced by economic pressure. The ages at which the tests were found to be of most practical use were from 16 to 18. The value of the vocational guidance tests was shown by some recent examples of individuals who had come to the Institute for help in choice of a career. One girl who had always been regarded as a dreary and eminently unsatisfactory child proved to be one of the most brilliant people ever tested. She was advised to go to a university if possible, and after six months' work she won a scholarship at Oxford where her latent abilities are having full scope, and the correctness of the Institute's estimate is being proved. Another girl who had already matriculated was found to be mentally aged about 10, and she was told that she would probably not do well in one of the learned professions. A boy destined to be a farmer was found to have an astonishing flair for colour and texture combined with great personal charm and a gift for handling men, and he had adopted a career where these would have fuller scope than on a farm. By making a more extensive use of these vocational guidance tests there would be fewer round pegs in square holes, and the sum of the world's happiness would be appreciably increased.

In reply to a question Prof. Cullis emphasised the effect of the speed at which a piece of work was done on the quality of the individual worker's output. When the rate of work was easily within a worker's capacity, A would work well and B would be bored and consequently work less well. By making the work harder B would do better but a strain would be put on A, and the practical difficulties of getting the optimum output from both A and B on the same work were considerable. Workers could be divided into "sprinters" and "stayers" and it was important to find the type of work for which each was suited.

ANCIENT EGYPTIAN MEDICINE.

THE learned author of a little book[1] entitled "Magician and Leech," is convinced that most of the accounts of Egyptian medicine published in medical histories are in need of revision. All down the ages the search has continued for means of prolonging life and averting death; the magician with his spells, the astrologist with his horoscopes, the alchemist with his search for the philosopher's stone, and the medical researcher of to-day with his up-to-date armamentarium, all follow the same quest.

Mr. Dawson, who is well known as an authority on ancient Egyptian medical texts, gives an interesting account of the lengthy process of making a mummy, and, incidentally, refers to the importance of the knowledge of human anatomy acquired thereby by the ancient embalmers. The medical papyri of Egypt antedate the earliest records of any other country by thousands of years; they are epitomised here in eight sections, while reference is also made to later manuscripts, such as the *London-Leiden Magical papyrus* and to Coptic texts. As a result of mummification "Egypt made it possible for the Greek physicians of the Ptolemaic age to begin, for the first time, the systematic dissection of the human body, which popular prejudice forbade in all other parts of the world" (Elliot Smith). During the process of mummification, the heart attached to its great vessels was almost invariably left in situ. Surgical instruments have been discovered, splints were used for fractured limbs, but there is no evidence that tooth-stopping, or any other form of dental surgery, was practised by the Egyptians in Pharaonic times. Mummies, with evidence of Pott's disease, have been discovered and statuettes of achondroplastic dwarfs. A short chapter introduces us to the drugs in general use; those derived from the animal kingdom can mostly be identified, but only a relatively small proportion of the very large number of vegetable drugs used are known. The book ends with a chapter on the survival of ancient medicine, containing an interesting account of the measures recommended to be taken to discover if a woman were pregnant or not, and if the unborn child was to be a boy or a girl.

The work is excellently printed and will be an acquisition to the library of one interested in medical history.

"FISGARD."

To the Editor of THE LANCET.

SIR.—"Etymologist's" query is answered by the subjoined quotation from the late Prince Louis of Battenberg's "Men-of-War Names" (Stanford, London, second edition, 1908, pp. 20), of which there is a copy in the Library of the Royal United Service Institution:—

"*Fisgard* (3d since 1797), originally *Fishguard*.—On Feb. 22, 1797, a French squadron of four vesels landed in Fishguard Bay, Pembroke, some 1300 criminals, armed and dressed as soldiers, with orders to ravish the country, destroy Bristol, and attack Liverpool. They were speedily captured by the Sea Fencibles, Militia, and Yeomanry, led by the first Lord Cawdor. Tradition says that the Frenchmen mistook the Welsh women, who accompanied the local forces in their tall hats and red cloaks, for additional soldiers. On March 9 the *San Fiorenzo* (36) Capt. Sir Harry Neale, and the *Nymphe* (36) Capt. J. Cooke, fell in with the *Résistance* (40) and the *Constance* (22) two of the above-mentioned French squadron, on their way back to Brest, and captured them. The *Résistance* was added to the Royal Navy under the name of *Fishguard*, later altered to *Fisguard*."

From Fishguard (Pembroke) steamers run to Rosslare Harbour (Wexford), and it was at one time attempted to make Fishguard a terminal port for transatlantic passengers

I am, Sir, yours faithfully,

Dec. 16th, 1929. SEA CAPTAIN.

HEALTH OF WEIHAIWEI.

IN a report for 1928 prepared by Mr. R. F. Johnston, the Commissioner, it is recalled that the leased territory of Weihaiwei, which has been administered by Great Britain since 1898, is situated in the north-east corner of the Chinese Province of Shantung, about 40 miles east of the treaty port of Chefoo. The area extends to 285 square miles and supports a population which at the last census (in 1921) was ascertained to be 154,177 but is now estimated at about 180,000, the increase being mainly due to the influx of refugees from other parts of the province, who having found the conditions of life intolerable under the gross misgovernment which has prevailed in Shantung during the past few years have been glad to find peace and security and a sympathetic administration under the British flag. There are over 350 villages in the territory, but the only port is a former Chinese village, now the thriving town of Port Edward, which is the administrative centre. The relations between the British authorities and the local Chinese population are said to be friendly and harmonious. The introduction of motor traffic, which had hitherto been absolutely prohibited, was perhaps the most notable and conspicuous innovation witnessed during 1928; there are now regular motor 'bus services from one end of the territory to the other.

Weihaiwei last year fully maintained its reputation as one of the healthiest spots on the Asiatic coast. In the foreign community there was only one death, and this resulted from drowning. The Chinese population suffered during the spring and summer from a rather severe epidemic of diphtheria and slight outbreaks of scarlet fever and measles. The medical officers trace these epidemics to the fact that during the year under review Weihaiwei was the resort of many half-starved refugees from other parts of the province, some of whom were either suffering from disease when they entered the territory or through privation and debility became easy victims to such causes of infection as existed locally.

State Hospitals.

There are three Government hospitals. The largest of them (under the direct superintendence of the British medical officers of the Government) is in Port Edward; the second is on the island of Liukung, where there is a Western-trained Chinese doctor under the supervision of the resident Surgeon-Commander in charge of the Royal Naval Sick Quarters, who holds the additional post of medical officer for the island, under the Civil Administration; the third is at Wên-ch'uan-t'ang in the heart of the territory, 13 miles from Port Edward, which is also in charge of a Western-trained Chinese doctor under European supervision. The total number of patients attending the three hospitals in 1928 was 20,311. This exceeded the number treated in 1927 by 1008. With regard to the locally prevalent disease of kala-azar, the medical officer reports as follows: "Eighty cases were under treatment during the year and they received 1830 injections; antimony tartrate is given intravenously in the majority of the cases, but in young children stibosan is used intramuscularly with good results. Sixty-four new cases were diagnosed, but only 48 returned for regular treatment; injections were given twice a week. The rapid increase in the number of injections indicates the popularity (and success) of the treatment and the faith of the patients in its efficacy, the figures being 796 in 1926, 1307 in 1927, and 1830 in 1928."

For the second consecutive year the territory was used for the purposes of a convalescent camp of 60 beds for the Shanghai Defence Force. Full use was made of this camp during the summer months of 1928 with highly beneficial results. A small sanatorium for the treatment of Chinese cases of tuberculosis—a somewhat prevalent disease in this territory—was established in 1928 near the seashore, about two and a half miles to the south of Port Edward. A new ward for Chinese paying patients was added to the Port Edward Hospital. The first patient to avail himself of this ward was a Chinese General, who, after defeat in a local civil war, became a refugee in Weihaiwei. For the first time in the history of the territory provision was made during 1928 for European patients by the addition of a ward of two beds to the Port Edward Hospital. Accommodation for Europeans in the small adjacent infectious diseases hospital was also made available by enlargement of the existing premises.

Leprosy.

Special interest attaches to the efforts made to deal with cases of leprosy in the territory by the adoption of the new treatment with alepol (intravenal hydnocarpate injections). The actual number of lepers in the territory is not great—official inquiries reveal a total of about 70. The new treatment is freely administered to all lepers, who submit themselves voluntarily to the doctor's hands. At the close of the year there were 15 patients undergoing regular treatment, and in several of these cases a marked improvement has already been noticed. A report (by Dr. Francis Clark, the senior medical officer) has been sent to the British Empire Leprosy Relief Association.

The rainfall during the first half of 1928 was much below the average, being only 3·7 inches. The drought was the cause of the almost total failure of the wheat crop and also gave rise to some anxiety with regard to the water-supply, which is derived from shallow wells. The total rainfall for the year, however, was 22·33 inches. Several additional wells were sunk by Government in the Port Edward area and fitted with pumps; and fears of a water famine were dissipated by the copious rains which began to fall in July. There are two thermal springs in the leased territory, the best known being that situated outside the East Gate of the walled city, on the outskirts of Port Edward, where bath houses were erected many years ago and are still in daily use.

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[1] Magician and Leech. By Warren R. Dawson, F.R.S.E. London: Methuen and Co., Ltd. 1929. Pp. 159. 7s. 6d.

Campbell Oration

ON

PROGRESS IN UROLOGY.

Delivered at Belfast on Nov. 8th

BY ANDREW FULLERTON, C.B., C.M.G.,
M.CH. BELF.,
SURGEON TO THE ROYAL VICTORIA HOSPITAL, AND PROFESSOR
OF SURGERY IN THE QUEEN'S UNIVERSITY, BELFAST;
PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS
IN IRELAND.

REMARKABLE advances have been made in urology since those of us who were contemporaries of Robert Campbell were students together. In those days the cystoscope was occasionally shown to us by our teachers as a sort of interesting toy which, like many another piece of apparatus, would in due time find its way to the scrap-heap. While thinking out the subject matter of this lecture, I took up a text-book of surgery in general use in my student days. There is not a word about the cystoscope in the chapters devoted to injuries and diseases of the urinary organs, and I cannot even find the word in the index. To-day we fairly bristle with cystoscopes, and a patient is fortunate if he escapes the ordeal of cystoscopy whatever his complaint.

In tracing the development of urology and the evolution of the cystoscope and urethroscope, frequent reference must be made to the work and writings of two great English-speaking urologists: Hurry Fenwick in England and Hugh Hampton Young in America. It would serve my purpose well if I had time and space to quote word for word the opening chapters of Fenwick's work entitled: "The Electrical Illumination of the Bladder and Urethra,"[1] published in 1889, and a paper by Young entitled: "The Renaissance of Urology,"[2] published in 1916. Young's account of the early history of urology is so full and interesting that I cannot do better than quote freely from it.

UROLOGY IN ANCIENT TIMES.

Urology was perhaps the first branch of surgery practised in ancient times. The inhabitants of India over a thousand years B.C. used the catheter to relieve retention of urine and the sound to dilate strictures. They were also, apparently, quite proficient in the operation of perineal lithotomy. In the Hippocratic writings (400 B.C.) will be found accurate descriptions of the formation of urinary calculi, of lithotomy and nephrotomy—and this at a time when practically no other operations upon abdominal viscera were attempted. By the Hippocratic oath the general practitioner was required to promise never to perform lithotomy, but to leave the operation to those who made a specialty of it. At the beginning of the Christian era operations for calculus, retention of urine, and urinary fistula were well conceived and skilfully performed. During the Middle Ages, while medicine was in the hands of the monks who disdained surgical operations, the practice of surgery was kept alive by the lithotomists. During this time the inhabitants of the town of Norcia, who were skilled lithotomists, were summoned to all parts of Europe and were frequently in the service of municipalities. The operation for stone, which up to this time had been almost entirely in the hands of these itinerant laymen, was finally taken up by the medical profession, through the work of a French surgeon named Germain Colot, about the year 1460. He went to Italy, ingratiated himself with a family of lithotomists, learned their methods and returned to France, where he commenced a series of experiments upon the cadaver, the results of which he reported to the medical faculty of Paris. He then applied to Louis XI. for permission to operate on a criminal condemned to death. Permission being granted, the operation was carried out in the churchyard, in the presence of the King. The patient made a good recovery and Colot was decorated by the King, appointed royal lithotomist, and became the father of a family which furnished France with its chief lithotomists for three hundred years. Although medical men, they kept the secret to themselves, just as the Norcians had done, until François Colot, the last of the family, gave the secret to the medical world in 1727.

General surgeons at this period seemed unable to make a success of lithotomy, so that the operation again passed into the hands of laymen, one of whom, a monk named Frère Jacques, marvellous to relate, invented and introduced the lateral operation for stone which requires far more precision and expert knowledge of anatomy than the median operation which was previously used. The story of Frère Jacques, his meteoric rise at court, the crowds that assembled to see his lightning-like procedures, his admission to the great hospitals of Paris (notwithstanding the protests of the surgeons), and his final departure in disgrace because most of his patients died, says Young, is one of the most thrilling histories of surgical literature. Frère Jacques died in 1720, and his operation, perfected by the English surgeon Cheselden, is notable as being based on the best anatomical principles. To this day the non-medical lithotomist flourishes in the East, and it is extraordinary how major operations in surgery have been largely left to uneducated persons. The famous Ambroise Paré learnt the operation of lithotomy from a Colot, and was one of its most accomplished exponents.

JOHN HUNTER AND AFTER.

Young pays great tribute to John Hunter as a pioneer in genito-urinary surgery. He says: "It was not until John Hunter came that the solid foundations of scientific surgery were laid." It is interesting to note that at that time there were two great surgeons in England, William Cheselden and James Douglas, who owed their reputation chiefly to their operations for stone. Hunter became the pupil of one of these, Cheselden, the author of the present lateral operation for stone, which he was able to perform in 54 seconds. It is very evident from a study of the clinical works of Hunter that his practice was largely genito-urinary in character. It was Hunter's custom to admit young men into his home as pupils, and it is not surprising to find that of these men who afterwards became famous the majority were particularly interested in genito-urinary surgery.

The history of urology in France during the eighteenth and nineteenth centuries comprises the work of almost all the celebrated surgeons of that period. Time will not permit me to mention the work of all who took part in the evolution of urology in France, but certain names, which include Civiale, Mercier, Maisonneuve, Guyon, and Albarran, are familiar to medical students of to-day in connexion with some special operation or some ingenious instrument. The most important invention of this time was that of stone-crushing by Civiale in 1818. Mercier's work on obstruction at the vesical neck and the ingenious instruments he devised were of great importance, but according to Young it was to Civiale first, and later to Guyon, that the medical profession owes most of the solid foundation upon which the superstructure of modern urology has been reared. Sir Henry Thompson in England, a brilliant pupil of Civiale, pursuing the careful research methods of John Hunter in anatomy and pathology, did more perhaps than any one man in the nineteenth century to bring urology into the very forefront of surgery.

It was not until about the middle of the nineteenth century that America, now one of the most progressive schools of urology in the world, began to exert an influence on this branch of surgery. About this time there were several surgeons in America who had achieved great success as lithotomists, and of these special mention must be made of Bigelow, who revolutionised the treatment of vesical calculus. In 1878, at Boston, he began his great work on lithotrity by inventing stronger and more efficient lithotrites and introducing a powerful evacuating bulb by means of which the stone, broken into small fragments, could be completely removed. It may be news to some of us that the name "litholapaxy," by which the operation is now known, was suggested by Oliver Wendell Holmes.

Towards the end of the nineteenth century Austria and Germany entered the field of urological research. About this time Simon of Heidelberg began his epoch-making work on the kidneys. No one knew at this time whether a kidney could be removed with impunity. Simon set to work to solve the problem, and performed nephrectomy in a series of 30 dogs. The results placed the operation on a sound basis. The operation was then carried out with success by Simon in a young woman with a ureteral fistula. This was in July, 1869, and is, so far as I know, the first recorded case of nephrectomy in the human subject. The operation, however, owing to its great mortality, made little progress, so that as late as 1879 Pilcher was able to find only 15 cases in the literature. The reason for the failure of nephrectomy to find a place in surgery was due in the main to sepsis, but the work of Lister in 1867 soon began to exert its influence, and the surgery of the kidney was assured. In 1885 Samuel D. Gross collected 450 cases of operation on the kidney and found the mortality of nephrectomy for various diseases to be between 20 and 60 per cent. The present mortality ranges between 1 and 5 per cent.

MODERN UROLOGY AND THE CYSTOSCOPE.

The period of modern urology was ushered in by the invention of the cystoscope by Nitze in 1876. In 1879 Edison's invention of the incandescent electric bulb paved the way for the perfection of the cystoscope and the accompanying array of ingenious apparatus now at the disposal of the urologist. The first attempt at endoscopy was by means of hollow bone urethral tubes through which sunlight was admitted. The history of vesico-urethral endoscopy is given by Hurry Fenwick in his work entitled "The Electrical Illumination of the Bladder and Urethra," and I will endeavour to give a short abstract of his account of the evolution of the cystoscope and urethroscope.

The first period commenced in 1805 with the invention by Dr. Bozzini of an apparatus which he termed the light conductor. Although the instrument was condemned by the Medical Faculty of Vienna on the ground of insufficient illumination the idea was grasped by the profession and a long list of investigators added to the literature of the subject and attempted to improve the instruments for visual examination of the bladder and urethra. Thus John Fisher of Boston, in 1824, invented a hollow metal tube with a reflected light, Paul Ségalas, in 1826, demonstrated before the Academy of Science of Paris an improved urethro-vesical speculum, and many others suggested and carried out various modifications and improvements.

The second period was opened in 1853 by Desormeaux, who is called "the father of endoscopy." This surgeon brought before the Academy of Medicine at Paris the first practical endoscope, and did much to further the development of the science of endoscopy. In 1865 F. R. Cruise of Dublin[3] made an important improvement in the Desormeaux endoscope. This consisted in concentrating upon a reflector the edge of the flat flame from an ordinary paraffin lamp. The apparatus was provided with specula through which the light from the lamp was reflected to the parts to be examined. To prevent inconvenience from the great heat evolved by the powerful light, the lantern was made of mahogany. The cannula for the bladder resembled a coudé catheter, with a little window of glass at the angle to permit the transmission of light. Various improvements and modifications of this instrument were made, and Christopher Heath used it at the Lock Hospital in London and introduced it to the profession in England in 1866. Beyond certain changes in the reflection of the light from plane or concave mirrors, and in the source of light, the endoscope underwent but little modification until the commencement of the third, or electrical, period in 1879.

The modern cystoscope owes its success to the use of electric light. Bruck of Breslau, a dentist, in 1867, employed a platinum loop, maintained at a white heat by means of a galvanic current, as the source of light for examining the mouth, and even advocated electric light for examination of the rectum and bladder some years before Nitze had his instruments for the urethra, bladder, and larynx sufficiently advanced to be used on the living subject. The original Nitze cystoscope had many failings when it was entrusted to Leiter, the well-known instrument-maker of Vienna, who simplified and perfected the water-cooling arrangements and improved the light. The result was the famous Nitze-Leiter cystoscope of 1879. This instrument, which was at once hailed by medical men from all parts of the world as a great advance in diagnostic methods, had grave faults, which for a time caused it to fall into comparative disuse. It was made in the form of a bladder sound of No. 21 French catheter gauge, with a sharp elbow and a longish beak. Depending on the part of the bladder to be examined, the window was placed in the concavity of the elbow (for the neck, anterior wall and sides) or in the convexity (for the posterior wall and base). The beak carried the electric lamp, and the shaft contained the telescope, the water-cooling tubes, and the insulated wire from the battery to the lamp. The ocular end was furnished with tubes connected with a water reservoir, so that a continuous stream of cold water could be kept running to absorb the great heat emitted by the platinum loop when in action. The ocular end also had a grip or binding screw for the attachment of the connecting cords from the battery. The heat evolved by the platinum loop was so great that a water-cooling apparatus was absolutely indispensable. To obtain the necessary heating and illumination of the platinum wire, an equable, constant current of a certain intensity was necessary. This could only be obtained from a large and cumbersome battery, fitted with a rheostat. The ease with which the platinum loop fused, even in competent hands, required the frequent services of a skilled electrician. Sir Henry Thompson, while demonstrating its use on a patient at the Royal Medical and Chirurgical Society in 1880, said that the instrument "should be under the care of a person well versed in the use of galvanic apparatus, and competent to adjust, or repair if necessary, the very delicate details which formed the essential parts of this somewhat complicated but very complete instrument." In short, the instrument was too cumbersome, too complicated, too unreliable, and too costly to be of general service to the surgeon, and it failed to achieve immediate success.

The next great advance was when the Edison incandescent lamp replaced the platinum loop as a source of light, and the year 1887 marks an era of which the far-reaching importance can hardly be estimated. From this time onward the instrument was improved from time to time until at the present day it is reliable, almost fool-proof, easily portable, cool even after prolonged use, and highly efficient. Every part of the bladder can now be inspected, the ureters can be easily seen and catheterised, and operations of considerable magnitude can be carried out inside the bladder under direct vision, with the minimum of discomfort to the patient. Similarly, the entire urethra can be inspected and treated, the ejaculatory ducts may be catheterised, and various operations, such as the removal of prostatic obstruction, urethral polypi, impacted calculi, and foreign bodies can be carried out with very little risk.

DIFFICULTIES IN CAMPBELL'S TIME.

A young surgeon commencing practice to-day can have no conception of the difficulties that beset those of us who started practice with Robert Campbell in the diagnosis and treatment of urinary complaints. Stone in the bladder was sometimes, but by no means always, detected by the sound. If it was secreted in a diverticulum or lying behind an enlarged prostate or covered with a coating of muco-pus, it was often unsuspected and the patient's misery continued. Tumours of the bladder, innocent and malignant, could not be diagnosed correctly without open operation, and the connexion between bladder symptoms and a lesion in the kidney could only be assumed by the presence of pain or swelling in the loin. It was not at that time fully realised that, in a large proportion of cases, disease of the kidney might not manifest itself by pain or swelling or, at any rate, not until late in the history of the case. When pain or swelling indicated disease of one kidney, the methods of ascertaining the presence and efficiency of a second kidney were crude and often misleading. Before the cystoscope came into general use various methods were employed to obtain the urine separately from the two kidneys. In the following account of these methods I have drawn largely from the article by Schede in Bergmann's "System of Practical Surgery."[4]

Tuchman was the first to obtain the urine separately from the two kidneys. He succeeded in compressing one ureter at a time, the urine from the other being allowed to collect in the bladder, to be drawn off for separate examination. He employed an instrument constructed on the plan of a lithotrite, which when passed into the bladder was made to slip over the elevation surrounding the mouth of a ureter. The blades were then manipulated so as to compress the ureter. The method proved, as might be expected, very uncertain. Silberman proposed the introduction into the bladder, through a catheter, of a thin rubber bag which could be filled with mercury and used to obstruct each ureter separately. The instrument was never perfected. Weir proposed to compress one ureter temporarily by an instrument introduced into the rectum. Ebermann suggested that this compression should be effected by two blades, one passed into the bladder and the other into the rectum.

Other equally useless methods were tried and abandoned. Even after the invention of the catheterising cystoscope, which required considerable practice and dexterity, attempts continued to obtain the urine from each ureter separately by other methods. The principle adopted in these later attempts was to produce an artificial division of the bladder into halves, each half retaining temporarily the urine from the ureter of its own side. Harris, of Chicago, invented an instrument by means of which a longitudinal fold could be produced at the base of the bladder, so as to form a watershed between the openings of the ureters. A lever was passed into the rectum or vagina to produce this fold, and a double catheter was introduced into the bladder. The halves of this double catheter were separated, after introduction, so that each half drained its own side of the bladder. I have used this instrument, but I cannot say that I have found it very satisfactory.

Luys, of Paris, invented a suitably curved, catheter-like instrument across the concavity of which a band of thin rubber could be stretched by means of a chain, manipulated by a screw at the handle. When the instrument was in position the rubber septum was projected by tightening the chain, thus dividing the bladder into halves, the fluid from each half being received into a separate bottle. I have used this instrument many times but I have not been satisfied that admixture across the middle line could be entirely prevented. When the bladder contained blood, pus, or other abnormal material, uncontaminated specimens from the ureters could not, of course, be obtained.

A similar instrument was suggested by Guyon in 1902 and perfected by Cathelin. Through a slit in the convex side of a catheter-shaped instrument a fine spring could be projected. The spring was covered with a thin rubber bag. The septum thus formed could be made to fit accurately the posterior wall of the bladder. Two fine catheters were passed through eyes in the main instrument so as to emerge on either side of the septum. The fact that this instrument was invented in 1902 shows that the catheterising cystoscope had not yet come into general use.

It is said that Simon was the first to succeed in catheterising the ureters. This was done in the female. He dilated the urethra with specula until he could pass his finger into the bladder. He then felt, with his left forefinger, for the little swelling round the ureteral orifice and guided the catheter into the ureter. Pawlik, again in the female, located the position of the ureters by two grooves, seen in the vaginal wall with the patient in the knee-elbow position and the perineum drawn backwards. These grooves are sufficiently distinct to be used as guides for ureteral catheterisation through the urethra. It is said that Pawlik's method was, for a time, the best available and that many successes were obtained.

Howard Kelly[5] was the first to make a useful instrument by means of which the orifices of the ureters in the female could be exposed and catheterised. The method was published in 1893 and was a great advance on all former attempts. The urethra was dilated to accommodate a speculum and the bladder allowed to fill with air. The bladder was lighted by means of daylight or electric light, reflected from a concave frontal mirror. The method was widely employed until it was superseded by the much simpler one of catheterising the ureters through the cystoscope.

Once the principles of the cystoscope had become established, additions and improvements followed with great rapidity until in a few years it became a very efficient aid to diagnosis and treatment. As instrument-makers, Leiter in Vienna, Wappler in America, Löwenstein and Wolf in Berlin, and Collin and Drapier in France, deserve much credit for advances in the construction of the cystoscope.

Those who have grown up with the cystoscope can have no conception of the thrill experienced by one who, accustomed to the older methods of examination, was privileged for the first time to obtain a view of the interior of the healthy bladder by the new instrument. As he viewed the mucous membrane, with its delicate colouring and its beautiful arrangement of vessels, and watched the rhythmic movements of the ureteral orifices which from time to time drew themselves up and ejected a little stream of fluid from their open mouths and subsided gradually into the resting position, he felt that a great vista of opportunity had suddenly burst upon his astonished gaze. As time went on and he became familiar with the normal appearances, he was able to detect in cases of disease alterations in the colour, thickness, and texture of the mucous membrane, blurring and obliteration of the vessels, and changes at the ureteral orifices, the significance of which he had yet to learn. One of the most fascinating pictures with which he now becomes only too familiar is the papilloma, with its finger-shaped processes into which a delicate system of blood-vessels can be traced, forming one of the most beautiful objects in surgery. Stones in the bladder can now be seen with the utmost clearness, their colour, shape, size, position, and number accurately estimated, and even their chemical composition fairly correctly foretold. These and many other abnormalities of the bladder are now diagnosed with the utmost accuracy and precision, suggesting methods of treatment that would have been impossible a few years before.

In the same way the urethra can be examined in its entire length, the presence and degree of stricture determined, the verumontanum and the orifices of the ejaculatory ducts clearly seen, alterations in the colour, resilience and thickness of the mucous membrane definitely displayed, and the state of the ducts and crypts opening into the canal ascertained. To one accustomed to the clumsy methods of the past, such accuracy and refinement of diagnosis beget an enthusiasm impossible to describe. My own experiences when I was suddenly translated from the darkness of precystoscopic days to the light of modern urology, in 1906, were of the most thrilling description, and from this time forward, as new methods were developed and fresh fields discovered, a perennial series of adventures into the newly found paths of cystoscopy and urethroscopy kept me in comparative contentment during the early and lean years of my professional life.

DISEASE OF THE KIDNEYS REVEALED BY THE CYSTOSCOPE.

When the cystoscope became sufficiently perfect and of real practical utility, urologists began to accumulate observations of great interest and importance, so that from visual inspection alone of the bladder and ureteral orifices conclusions of the greatest value could be drawn, not only on the state of the bladder but also on the condition of the kidneys. It was eminently satisfactory to be able to diagnose inflammation and ulceration, the presence of calculi, or other abnormalities of the bladder. But research did not stop here. By careful and repeated observation of the ureteral orifices, their movements and the character of the jets, the surgeon was in many cases able to hazard an opinion on the state of the kidneys. Hurry Fenwick was one of the most brilliant exponents of the art of careful and accurate observation and deduction. His work, entitled "The Value of Ureteric Meatoscopy in Obscure Diseases of the Kidney,"[7] published in 1903, will remain for all time a classic. In the preface he says: "It is not acknowledged—and by many the suggestion is even ridiculed in England—that an electric light illumination of the orifice of the ureter of the diseased kidney can render signal service to the operator. Not only is the bladder declared free from all cause of renal suffering, but the condition of the diseased kidney can be surmised, and the opposite kidney declared healthy or the reverse." Subsequent experience by competent observers has fully justified the claims made by Fenwick. There is no need in these days to labour the point. Every cystoscopist knows that disease of the kidney is very frequently represented in the bladder by easily recognisable changes at the ureteric orifice. In some cases the only objective sign of a disordered kidney is the emission of blood or pus from the orifice of the ureter, and it is well known that this may occur in the absence of pain or discomfort of any kind on the affected side.

The early cystoscope was not provided with a mechanism by means of which the bladder could be irrigated and the medium rendered clear with the instrument in position. This was accomplished more or less satisfactorily about the year 1888. About this time Brenner attempted to catheterise the ureters of females by passing a fine catheter through a tube in an instrument invented by him and made by Leiter of Vienna. He endeavoured to pass the catheter directly into the mouth of the ureter by shifting the whole instrument into a convenient position. In one female he succeeded, but failed in the male subject. Five years later James Brown, Young's predecessor at the Johns Hopkins Hospital, modified the Brenner instrument by passing a curved spring stylet into the ureteral catheter so as to give it the necessary curve for introduction into the ureter, and on June 9th, 1893, achieved the distinction of being the first to catheterise the ureter through the cystoscope in the male subject. Although Nitze was not the first to construct an instrument for ureteral catheterisation, he was the first to construct it on the right principle. In previous instruments the catheter emerged in the long axis of the cystoscope. This made it difficult to direct the catheter into the ureter. Nitze's instrument provided a tube which came off at an angle and directed the catheter towards the ureter when the cystoscope was in position. Casper, in 1895, remedied some of the defects of this instrument and provided means by which the angle at which the catheter emerged from the shaft of the cystoscope could be altered as required. Albarran, in 1897, made an important addition by providing a hinged lever, the position of which could be shifted from the horizontal to the vertical by a screw at the ocular end, thus altering at will the direction of the ureteral catheter. At first, cystoscopes were only provided with arrangements for catheterising one ureter at a time, but soon this was remedied and it was possible to catheterise both ureters simultaneously. It now only remained to improve the lenses, the lamp, and some minor details to render the instrument thoroughly practical and satisfactory for use in patients of either sex. Ureteral catheterisation through the cystoscope soon became a recognised method of diagnosis. This paved the way for the great strides which followed, especially in the treatment of unilateral affections of the kidney. The operation of nephrectomy, instead of being an exceedingly risky procedure, soon became one of the most satisfactory in the whole range of surgery. Allowing for the great improvement in surgical technique which followed the epoch-making work of Lister, a due amount of credit must be given to the attention which could now be paid to the condition of the presumably sound kidney by the ureteral catheter and other methods of investigation. In cases of renal pyuria and hæmaturia the ureteral catheter confirmed the diagnosis made by inspection of the efflux from the ureteral orifices, and in certain cases of albuminuria without pus or blood the condition was located to one kidney. More interesting still is the fact that the urine may be perfectly normal, as shown by chemical and microscopical examination, and yet a lesion may be demonstrated in one kidney by comparing the specific gravity of the specimens of urine taken simultaneously from the two kidneys. For instance, I have seen cases of aseptic renal calculus in which there was no demonstrable abnormality of the urine obtained from the bladder. In certain cases of tumour of the kidney I have seen the same phenomenon, and in hydronephrosis it occasionally happens that the urine, even that obtained by catheter from the affected side, is free from abnormal constituents. I have been interested for many years in the difference in specific gravity on the two sides in unilateral affections of the kidney.[8, 9] Shortly, in a large proportion of cases there is an increased flow of urine of low specific gravity on the affected side. To this phenomenon I have applied the term unilateral diuresis. This sign will be found of great value in diagnosis, especially when the urine obtained from the bladder is normal. A difference of specific gravity on the two sides indicates alteration of function and suggests that the case should be further investigated.

It occasionally happens that for some reason it is impossible to catheterise the ureters through the cystoscope. The bladder may be extensively ulcerated or so irritable that enough fluid cannot be retained, or the medium may be so clouded by blood, pus, mucus, and debris that the ureteral orifices cannot be seen. Various methods to obtain urine from each kidney separately have been devised: Iversen, in 1887, suggested catheterising the ureters through the open bladder; Czerny and Braun employed a temporary fistula of the pelvis of the kidney; Pinner incised the kidney on its convex border, or opened the pelvis and passed a catheter into the ureter for 2 or 3 cm. Other equally unsatisfactory methods have been recommended from time to time. Apparently no one thought of the very obvious and simple method of catheterising the ureters just above the brim of the pelvis, where they can easily be reached by an operation in the iliac region similar to that used for removal of the appendix. In September, 1923, I ventured on this method of approach in a case in which it was found impossible, from bladder irritability and bleeding, to catheterise the ureters. The ureters were exposed and a small incision was made in each to allow of the passage of a ureteral catheter towards the kidney. The small openings in the ureters were closed by fine catgut at the end of the observation and gave no further trouble.[10] It is very gratifying to find that this operation has been extensively adopted by other urologists.

TESTS OF RENAL FUNCTION.

With the march of progress in aseptic technique and in the methods of diagnosis made possible by the cystoscope and ureteral catheter, operations on the kidneys and bladder began to multiply. Surgeons soon found that the kidneys, if at all diseased, were very sensitive to operative interference at any part of the urinary tract. The aid of the chemist, the physicist, the physiologist, and the pathologist was therefore invoked to enable them to assess the functional capacity of the kidney and, if this was *found deficient, to take steps to restore it. Various* tests of renal function were suggested and carried out, with results which have thoroughly justified the enormous amount of research which has been brought to bear on this problem in recent years. Time will not permit me to recount all the methods which have been employed, but a few may be mentioned.

Estimation of the total quantity of urea secreted in 24 hours has not proved very reliable, for the amount varies greatly even under normal conditions.

Koryani and his co-workers found that the determination of the freezing-points of the urine and the blood gave valuable indications of the work being done by the kidneys. The freezing-point varies, of course, with the molecular concentration of the fluid examined. This test is very complicated and has fallen into disuse.

Mering discovered that an artificial renal glycosuria was produced by the administration of phlorizin. Casper and Richter made use of this discovery to determine the function of the kidney by estimating the amount of sugar excreted after the subcutaneous injection of a given quantity of phlorizin.

Various dyes have been used to determine the kidney function. Methylene-blue and indigo-carmine have been long in use, and the latter is much employed even at the present time. Delay in the appearance of the dye, diminished depth of colour, and prolongation of the time necessary to eliminate the colour from the urine indicate reduction of the excretory power of the kidney. These dyes have also been extensively used to disclose the position of the ureteral orifice by the deep blue colour which they impart to the efflux (chromocystoscopy). In 1910 Geraghty and Rowntree[11] introduced the phenolsulphone-phthalein test. This is a colour test of great accuracy, and is extensively used in America.

Accumulation of urea in the blood indicates deficient elimination by the kidneys. An estimation of the amount of blood-urea is, therefore, a test of kidney efficiency. The work of Folin and Denis, the American biochemists, so simplified the technique for accurate estimation of blood-urea that the determination soon became a routine measure in urological clinics.

For the past few years Maclean's urea-concentration test has been one of the favourites in this country. Calvert,[12] a graduate of our own medical school, has amplified this test by estimating the range of urea concentration, from the most dilute to the most concentrated, by suitable administration of fluids. Calvert's modification of Maclean's test is probably one of the best in use at the present time.

The diastatic test, the creatinin test, the chloride concentration test and many others are in general use, but time will not permit me to dwell on them.

RADIOLOGY.

The discovery of X rays by Rontgen in 1895 and the application of this discovery by Macintyre in 1896 to the diagnosis of renal calculi opened a new era in the study of urological complaints. Every year since, urology has benefited in some new way until, at the present time, it is not too much to say that radiography rivals the cystoscope in importance as a diagnostic measure. One of the first problems that confronted the urologist when shadows were first discovered in the region of the kidney, ureter, or bladder was to determine whether they were actually in the urinary tract or outside it. The opaque ureteral catheter and radiography settled the matter. Stereoscopic or antero-posterior and lateral radiograms defined accurately the position of the shadows relative to the opaque catheter and greatly facilitated the task of the surgeon. Another use of the opaque catheter is to locate foreign bodies lying in or near the urinary tract. In this way the position of bullets or fragments of shell in relation to the kidney or ureter can be accurately determined.[13]

The next great advance due to X rays was pyelography. In 1906 Voelker and von Lichtenberg[14] used collargol, which gives a shadow with X rays, to inject the pelvis of the kidney, and demonstrated its shape, size, and position. This substance was found to be unsatisfactory and various substitutes were tried, the most important of which was thorium. Since 1918, however, bromide and iodide of sodium have replaced former media, and of these iodide of sodium is most used. When a solution is introduced into the pelvis of the kidney, the ureter, or the bladder, or all three, beautiful shadows of the pelvis and calyces of the kidney, of the ureter, and of the bladder can be obtained. Alterations in shape, size and position, filling defects and diverticula can be demonstrated with the greatest clearness.

In the same way, by means of the urethroscope, the openings of the ejaculatory ducts may be localised and opaque media injected into the vesiculæ to obtain X ray evidence of their condition, and the urethra itself may be examined by filling it with the opaque medium. The diagnostic value of these examinations is daily becoming more universally recognised. Pyelography is especially valuable, and as experience accumulates the urologist becomes competent from a study of the pyelogram alone to form an opinion as to the condition of the kidney. He may thus be able to diagnose hydronephrosis, tumours, polycystic disease, tuberculosis and other affections of the kidney.

In this connexion may be mentioned a method of demonstrating the shape and size of the kidney introduced in 1921 by Carelli and Sordella and, independently, by Rosenstein. In a good X ray photograph the outline of the kidney can, of course, be seen, but if oxygen is introduced through a hollow needle into the perirenal tissues this outline is more clearly defined. The photographs thus produced are very striking and will no doubt be of service in diagnosis. Another method is to introduce the oxygen into the peritoneal cavity and take X ray photographs. The outline of the kidney after this procedure is seen much more clearly than in ordinary radiograms. The gas separates the kidney from the adjacent viscera, including the liver or spleen, and enables its shadow to be more easily recognised.

Another function of the cystoscope in diagnosis is intravesical photography. Nitze invented a camera with which he was able to take ten successive pictures of the interior of the bladder. I have experimented with a photographic cystoscope purchased in 1918 from Loewenstein of Berlin. I took a number of photographs with this instrument and obtained clear pictures of the orifices of the ureters, of the blood-vessels, and of calculi, but I could not get good definition of tumours, and inflammatory conditions could not be satisfactorily shown. During the war I intended to make use of this cystoscope, but I found a far better delineator in the person of Mr. A. K. Maxwell, the well-known artist, who was working in France under the auspices of the Medical Research Committee. He produced some of the most beautiful coloured cystoscopic pictures ever published of gunshot wounds of the bladder.[15] His drawings of gunshot wounds of the kidney, many of them coloured, were of equal merit.[16]

THE CYSTOSCOPE IN TREATMENT.

For treatment and for operative work[17] the cystoscope and the urethroscope have proved equally valuable. Nitze invented many additions to the cystoscope, including forceps, cauteries, snares, and stone crushers. He devised an instrument with which he was able to snare a polypoid tumour and cauterise the pedicle. Casper, Lewis, Buerger, Beer, McCarthy, Caulk, Young and others have added many ingenious instruments for use with the cystoscope. With these it is possible to remove foreign bodies, fragments of stone, and specimens for pathological examination. Additions have also been devised to dilate or divide the orifices of the ureters, and to perform the operation of litholapaxy under the direction of the eye. Minor operations through the cystoscope and urethroscope are of daily occurrence. By the ureteral catheter the pelvis of the kidney may be drained and irrigated, and by the urethoscope applications may be made to the utricle and, by means of a syringe and special cannulæ, the ejaculatory ducts may be catheterised and injections made, for therapeutic purposes, into the ampullæ and seminal vesicles.

THE USE OF DIATHERMY AND RADIUM IN UROLOGY.

In 1910 Beer[18] revolutionised the treatment of papilloma of the bladder by the use of the high-frequency current applied through the cystoscope. With the improved apparatus now at our disposal even multiple papillomata can be efficiently treated while the patient walks about and carries on his ordinary vocation. The advantages of this highly important discovery lie not only in the comfort and safety with which the treatment can be carried out, but also in the fact that a recurrence can be dealt with at the earliest possible moment without damage to the urethra, the abdominal wall, or any other part. The current is applied through a platinum-tipped ureteral catheter, and it is one of the thrills of surgery to see the leaves of the papilloma crumple up like singed feathers when the charged electrode is brought into contact with them.

For malignant tumours of the bladder, treatment by diathermy is only rarely applicable, but modern surgery has so progressed that it is possible to remove half, three-quarters, or even more of the bladder, together with the infected lymph channels and glands, the remaining portion expanding in a few months to accommodate itself to the altered conditions. Other uses of diathermy are to enlarge the ureteric orifice to allow of the passage of a calculus, and to treat resistant ulcers in the bladder, such as those due to tuberculosis.

The discovery of radium in 1898 by Professor and Madame Curie opened up another fruitful field in the therapeutics of urology, but it was not, I think, until 1911[19] that results began to be published. Since that time many ingenious instruments have been devised by means of which, through the cystoscope, radium in the form of emanation seeds or element in small needles can be placed in any part of the bladder for the cure of simple papillomata or malignant growth. At the Johns Hopkins Hospital, in which the first practical application of this method was made in 1914, many hundreds of cases have been treated, with results which show that radium applied through the cystoscope is one of the most important and successful methods at our disposal for dealing with tumours of the bladder.

NEPHROTOMY AND PROSTATECTOMY.

The treatment of renal calculi by modern methods is another of the triumphs of surgery. Sir Benjamin Brodie, writing in 1842,[20] says: "Some of the old surgeons have spoken of an operation for the extraction of calculi from the kidney. The proposal is absurd and dangerous." To-day the operation is almost without mortality if done before the calculi are allowed to block the ureter or to grow to such dimensions that extensive nephrotomies are required to release them.

Prostatectomy has proved a priceless boon to a large section of men who have passed the prime of life. Before the days of prostatectomy the condition of some of these patients was pitiable in the extreme, and many of them were willing to submit to any procedure, however drastic, that held out any prospect of relief. Partial prostatectomy, by the suprapubic route, was performed by surgeons long before complete enucleation was thought of. Amussat in 1827, Dittel in 1885, Belfield in 1886, and McGill in 1888 paved the way for the modern operation, which appears to have been first performed by Eugene Fuller of New York in 1894. P. J. Freyer undoubtedly first launched the operation in England in 1901 and by his strong personality and strenuous advocacy, combined with his own remarkably low rate of mortality, established it on a sound practical basis. Freyer must, therefore, be considered a pioneer in the operative treatment of prostatic hypertrophy.

Perineal prostatectomy was similarly foreshadowed by attempts at removal of portions of the gland at different times, commencing with Covillard who, in 1639, appears to have torn away a portion of the prostate after perineal lithotomy. Sir William Ferguson in 1840, Billroth in 1867, and others followed but, according to Young,[21] Goodfellow, who performed the operation in 1891, deserves the credit of being the first to make a success of it.

The French school, represented by Proust and Albarran, exposed the prostate in the perineum and excised it piecemeal, but the operation of conservative perineal prostatectomy was finally developed in 1903 by Young of Baltimore, who still remains its most brilliant exponent. Young has also invented a cautery punch for cases in which the obstruction is due to a median prostatic bar. By this instrument the obstruction can be removed without disturbing the lateral lobes of the gland. The operation is an endo-urethral one, and has been carried out in a large series of cases with remarkably good results.

Finally, mention must be made of the endo-urethral method developed by Georges Luys of Paris in 1911.[22] His method, "forage de la prostate," consists in removing through the urethroscope, by means of the galvano-cautery or by diathermy, those portions of the prostate which obstruct the outflow of urine. If the results claimed by Luys are obtained by other surgeons, this method of treatment should become a useful addition to the resources of the urologist.

The mortality records of Freyer, Young, Thomson-Walker and other well-known urologists are so good that it would seem almost presumptuous to suggest any improvement in technique, but I have felt for some time that the comfort of the patient might be increased and the incidence of sepsis diminished by a combination of the suprapubic and the perineal operative routes: removal of the prostate by the suprapubic and drainage by the perineal. By this means a continuous stream of fluid can be maintained through the bladder and the patient kept dry during his convalescence. An account of this method, which is at present on its trial at this medical school, has recently been published.[23]

A great medical school is not built up in a day, nor is it given to any one individual to be an outstanding factor in its development, but there are certain men who, by their ability, their foresight, their devotion, their industry, their unselfishness, and their personality, make a lasting impression on its progress. We recall with pride the names of such men as Thomas Andrews, Alexander Gordon, Peter Redfern, James Cuming, W. A. McKeown, Johnston Symington and others, who played no small part in building up the reputation of the Belfast medical school. No one will deny to Robert Campbell the right to stand as a peer among these great men who, in spite of many obstacles, materially advanced our standing as a centre of medical education. With men of the stamp of Robert Campbell to represent us in the world of medical science, the future of our medical school is secure.

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OBSERVATIONS ON THE
BRUIT D'AIRAIN (COIN SOUND, BELL SOUND).

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THE *bruit d'airain*, or, as it is commonly called in this country, the coin sound, is the most distinctive and the least understood of the pulmonary acoustic phenomena. It can be heard only when an air-containing cavity (a pneumothorax, a pulmonary cavity, and very rarely a pneumo-pericardium) is present in the thorax. The sign is not constantly obtained in pneumothorax, even when complete collapse of the lung exists. That is to say, the presence of the bruit d'airain is diagnostic of an air-containing cavity, but conversely the absence of the sign does not exclude the presence of such cavity. It was this fact which led to the study of the present series of cases in order to determine if possible the physical or pathological factors governing the incidence of the sign.

It will be convenient at the outset to state or re-state the following facts concerning the bruit d'airain, about which fairly widespread misconceptions have arisen since its original description.

1. The bruit d'airain is one of a group of metallic *phenomena* which *may* be heard in the thorax under varying conditions. The other members of the group are: (*a*) amphoric breath sounds; (*b*) metallic vocal resonance, either of the whispered or spoken voice; (*c*) metallic or tinkling crepitations; and (*d*) the (Hippocratic) succussion splash. All these signs are associated with the presence of an air cavity or cavities in the chest. For the production of tinkling crepitations and the succussion splash, fluid or secretion is a necessary additional factor.

2. The bruit d'airain is a clear ringing musical note exactly like that made by striking a sharp blow on a brass vessel (French: *airain* = brass), and it is elicited by listening over the anterior or posterior wall of the chest while an assistant percusses or taps two coins together on the same or opposite wall. Although it is more convenient to use two coins it must be emphasised that the note produced by two pieces of wood, or by simple digital precussion, is of exactly the same musical pitch and quality as that produced by percussion with coins, whether gold, silver, or copper.

3. Over some pneumothorax cavities a dull, wooden, non-musical note is sometimes heard. To this sound the term *bruit de bois* has been given by French clinicians.

4. In some cases of hydropneumothorax the bruit d'airain may be obtained over the air space down to the level of the fluid, but over the fluid itself a higher pitched, fainter, silvery note may occasionally be heard. To this is given the name of the *signe de Pitres* or the *signe de sou*, described by Sieur[1] in a Thèse de Paris in 1883.

Historical.

Laënnec,[2] in his "Traité de Médiate Auscultate," gave an excellent description of the physical signs of pneumothorax with the exception of the bruit d'airain. This sign was first described in April, *1857, in an anonymous paper*[3] entitled "Pneumothorax—nouveau signe pathognomique de cette affection." The writer reported a case of pneumothorax and said that a sign was present which had been discovered and reported several years before by A. Trousseau. It was obtained by auscultatory percussion, and the resulting sound was so intense as to hurt the ear, resembling the note given out by a brass vessel when struck sharply. He further stated that the sound was pathognomonic of air in the pleural cavity. Boursot,[4] in 1888, dealt with the bruit d'airain, and concluded that one of the most important signs of pneumothorax is the sound elicited by the combined percussion and auscultation of the anterior region of the chest. Harris,[5] in St. Bartholomew's Hospital Reports of 1887, reports five cases of spontaneous pneumothorax, and makes the following note about the bell sound:—

> "In conclusion I may remark that in my experience the bell sound is generally absent *at first*, and that it is then generally heard over wide areas. Later on the sound becomes more localised in extent and can only be heard on very careful and minute percussion with coins over the whole chest. Not infrequently, however, the bell sound may be replaced as the case progresses by some less clear sound, which is exactly like that made by a hammer striking an anvil. I do not know whether this sound has previously received such a name but I always call it the anvil sound."

In 1890 Chauffard[6] reported a case of left-sided pneumothorax following a violent movement of the left arm. The patient was admitted to hospital on the fifth day after the onset. No fluid was present. The whole chest was tympanitic with the absence of the respiratory murmur and vocal fremitus. No metallic phenomena, no tinkling, and no succussion splash were present, *but a splendid bell sound was obtained*. Hoover,[7] in 1898, considered that the coin sound depended, not on the tension of the gas, but on the tension of the walls of the cavity. In 1895 Osler[8] reported a case of chronic tuberculosis with a large cavity in the right upper lobe, with thickened, adherent pleura. In this patient during life the coin sound was heard with great intensity. Until this time the general idea was that the sign was distinctive of pneumothorax.

Emerson,[9] in his masterly and exhaustive monograph on pneumothorax in 1903, reports 48 cases, and in his section on the coin sound remarked that "it should be borne in mind that for the sound of the tap of the coins to be very clearly transmitted does not make the sign positive. The amphoric quality furnished by a resonant cavity is necessary." Unfortunately, in his analysis of cases he does not give his opinion as to why the coin sound was heard in some cases and not in others. Owing, however, to the full notes made on each case, we have been able to determine the type of case in which the coin sound was present or absent in his series.

Our analysis shows that 28 of these cases were investigated for the presence or absence of the bruit d'airain. The sign was present in 22 cases, suggestive in 2, and absent in 5. Fifteen out of the 22 positive cases were examples of pyopneumothorax, 5 of them were hydropneumothoraces and 2 were cases of pneumothorax. Of these two cases one was a case of pneumothorax of 12 years' standing without lung expansion. The other was a case of pure pneumothorax in which the bruit d'airain was heard. Of the cases not giving the sign, one was a case of pure pneumothorax and four were pyopneumothoraces before aspiration. No note was made on the bruit d'airain after aspiration.

F. T. Lord,[10] in Osler and McCrae's "Modern Medicine," remarks that the coin sound like amphoric breathing is probably due to the peculiar resonating qualities of the pneumothorax cavity. Fishberg[11] is of the opinion that the coin sound is due to the presence of fluid in the pneumothorax cavity.

Pratt and Bushnell[12] state that "the cavity of the pneumothorax acting as a resonator reinforces the metallic sounds as overtones of its fundamental note, and since the thoracic wall vibrates as a part of the resonator, the sound is heard by the ear, as it were, at the very place of its production." It is clear that this theory is based on the erroneous assumption that coins are necessary for the production of the coin sound. The remarks of Powell and Hartley[13] seem to have been influenced by the same idea.

The Italian physicians have paid considerable attention to the acoustic phenomena of pneumothorax cavity. Morelli[14] and Moron[15] stated that the bruit d'airain is more marked when the intrapleural tension is high. Cesare Minerbi[16] in a series of studies during 1913–14 pointed out that the necessary conditions for the production of the bruit d'airain are: (1) the cavity must be of sufficient volume: (2) the mediastinal and thoracic walls of the cavity must be sufficiently tense; and (3) that the shape of the cavity must be more or less regular.

In a further interesting series of studies, Minerbi, Mongoni, and Benassi[17] showed that in cases of complete therapeutic pneumothorax where the bruit d'airain was present two distinct tones were invariably found,* one a higher pitched tone corresponding to the extreme points of the diameter extending from the interscapular vertebral space to the base of the mediastinum, and a lower tone corresponding to a line joining the apex of the hemithorax to the costal margin—i.e., a high note corresponding to the short transverse diameter of the cavity, and a lower note corresponding to the longer vertical diameter. They also said that these two sounds were only obtained when the intrapleural pressure reached a level between zero and +1 of the water manometer—i.e., a slight positive pressure. Another observation which they made was that in the first 24 hours after re-establishing the pressure in an already complete pneumothorax the *bruit d'airain cannot be obtained, even if a positive* intrapleural pressure exists.

In a report by one of us (McL)[18] of a case of simultaneous bilateral artificial pneumothorax in which it was possible to study in the same patient the bruit d'airain in two pneumothorax cavities, in only one of which a pleural effusion had occurred, the statement was made that the bruit d'airain or coin sound is elicited in its most marked and characteristic form when the pleura has been thickened or sclerosed by the onset and subsequent absorption of a pleural effusion, either serous or purulent; further, that the main condition for its production, apart from the presence of an air-containing cavity in the thorax, was the hardening and increased elasticity of the wall of the cavity and not the tension in the cavity or the presence of a certain amount of fluid, as other observers had stated.

Analysis of Cases.

The cases examined in this series were 50 in number, of which 26 were males and 24 females. Artificial pneumothorax was induced on the right side in 28 cases and on the left in 24. In two cases a pneumothorax was *induced simultaneously on both sides.*

These cases were examined over a period of two years for the presence or absence of the bruit d'airain in relation to varying conditions, such as the development of pleural effusion, the condition of the walls of the cavity, intrapleural tension, selective collapse of the lung, hydropneumothorax, mediastinal displacement, and ballooning of the pleura. The sign has been investigated in all stages of lung collapse ranging from just after induction, when the air space in the pleural cavity is small, to the period of complete collapse of the lung. Each case was examined on many occasions for the presence or absence of the sign, and it should be noted that at certain stages and under varying conditions in the same cases the bruit d'airain was present at times and absent on other occasions. But in general of the 50 cases, two of which had simultaneous bilateral pneumothorax, the bruit d'airain was present at one stage or another over 28 pneumothorax cavities and in the other 24 it was absent in all stages.

On considering the 28 cases in which the bruit d'airain was heard, it was found that 23 developed pleural effusion during the course of the artificial pneumothorax. Of the remaining five, Case 1 had a previous history of a fibrinous pleurisy and showed signs of a rigid pleura (estimated by the resistance to the pneumothorax needle and by rapid increase of intrapleural pressure during a refill) with bronchiectasis at the left base. Case 7 developed an acute fibrinous pleurisy during the course of pneumothorax treatment. Case 15 showed clinical and radiological evidence of a mediastinal bulge. At this time the bruit d'airain was present but was not heard when the mediastinum returned to the normal position, although the lung was still collapsed. Case 27 did not have a pleural effusion during the course of artificial pneumothorax. A faint bruit d'airain was heard during a period of ballooning of the pleura. This patient also had dense consolidation of the underlying lung. She went to a sanatorium and no further notes are available on the incidence of the bruit d'airain in her case. Case 21 after a refill developed pleural pain which may reasonably be believed to have been acute fibrinous pleurisy. Following this a beautiful bruit d'airain was obtained all over the cavity and was still present two months later.

It is a remarkable fact that in the 24 cases in which no bruit d'airain was ever heard there was no incidence of pleural effusion or fibrinous pleurisy, either before or during the course of treatment. In the majority of these the lung showed good collapse, and in some cases complete collapse.

Pre-effusion Bruit d'Airain.

In four of the series the development of the bruit d'airain in cases where it had not been heard before led to investigation for signs of pleural effusion. In all four cases an effusion subsequently developed.

Case 12.—The bruit d'airain was present for the first time on Jan. 19th, 1928, after the pneumothorax had been established for eight months. There was no clinical evidence of pleural effusion. On Feb. 23rd fluid was found up to the level of the eighth dorsal spine. On referring to the notes of the intrapleural pressures, we find that on Dec. 19th, 1927, the pressure before a refill was −6 ±0. 525 c.cm. of air were injected and the final pressure was ±0 +6. On Jan. 19th, 1928, the day on which the bruit d'airain was first heard, the initial pressure was −2 +5. 800 c.cm. of air were injected, making the final pressure +8 +16. The sudden increase in intrapleural pressure when only 300 c.cm.

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* In an annotation in The Lancet (1927, ii., 981) it was stated that in all their cases of complete pneumothorax the bruit d'airain was found. On reading the monograph we find that this is not so. Only those cases in which the bruit d'airain was present were selected for experiment.

of air were injected seems to be strong evidence that the pleural membrane was hardened and more rigid than normal.

CASES 18, 31, 44 presented the same features as Case 12.

As an explanation of this pre-effusion bruit d'airain we would suggest that the inflamed pleura is in a hyperæmic and turgid state making the walls of the pneumothorax cavity harder and more rigid. This point is illustrated above in the note on intrapleural pressures in Case 12. It would seem, therefore, that the most favourable factor necessary for the production of the bruit d'airain (as we hope to show later) is present in these cases. The shape and volume of the cavity, the actual presence of the fluid, or increased intrapleural tension do not apparently influence the incidence of the sign. It will be noted, especially in Case 12, that the bruit was present (1) when the intrapleural tension was negative (before the refill); and (2) before pleural effusion had occurred.

Post-effusion Bruit d'Airain.

Repeated examinations of the cases which developed an effusion into the pneumothorax showed that in general the bruit d'airain became more intense as the effusion absorbed and as the pleural membrane became drier and more rigid. This was the most common finding in the majority of cases. In a few, of which Case 2 is an example, the fluid was absorbed fairly rapidly without aspiration. In these cases it was found that the bruit d'airain reached its maximum intensity about four months after the onset of the effusion.

CASE 2.—A girl, aged 20, with a left-sided pneumothorax induced on Oct. 25th, 1926, developed an effusion into the pneumothorax cavity on May 20th, 1927. The bruit d'airain was heard in its maximum intensity on or about Sept. 19th, 1927, when the pneumothorax cavity was dry, and the pleura on puncture with the needle was found to be tense and resistant.

In many cases no bruit d'airain was to be heard until the onset of effusion. Four cases illustrating this point are quoted above. When once the effusion was established the bruit d'airain disappeared, only to reappear perhaps faintly as the effusion cleared, but finally as the pleura became rigid and dry the note became more musical and was heard over a larger area.

CASE 3 was that of a man aged 47. Artificial pneumothorax was induced on the right side on Sept. 9th, 1926. Pneumothorax was well established in one month with fairly complete collapse. A small adhesion was present at the extreme apex. On Jan. 18th, 1927 (three months after induction), a radiogram showed that the apex remained collapsed while the lower lobe had almost completely expanded (illustrating the doctrine of selective collapse). One week later he became ill, and developed an aspiration *broncho-pneumonia in the right lower lobe. Until April 8th,* 1927, no bruit d'airain had been elicited over the pneumothorax cavity. On this date, however, a slight bruit d'airain was heard at the right base. No succussion splash or other signs of effusion could be detected at this time. On May 10th, 1927, the slight bruit d'airain having persisted, a small effusion was discovered at the right base. The effusion did not increase appreciably in amount for some months. Sometimes it appeared that the fluid had been absorbed but it began to reaccumulate in somewhat larger quantities until on April 17th, 1928, one and a half pints of fluid were aspirated and replaced by air. It was noted during the whole of this time of intermittent effusion that the bruit d'airain began to increase gradually in intensity until on May 16th, 1928, a perfect bruit d'airain was heard all over the cavity. At the time of writing a small effusion still exists and an excellent bruit d'airain is heard down to the level of the effusion. The question of the relationship between the incidence of the bruit d'airain and the intrapleural pressures in this case will be discussed later.

Bruit d'Airain in Bilateral Pneumothorax.

Case 20, which has already been reported in THE LANCET,[18] was one in which a girl, aged 17, had simultaneous bilateral pneumothorax induced. The case is of value in relation to the bruit d'airain on account of the fact that in the same patient two pneumothorax cavities were present, in only one of which pleural effusion occurred. The left pneumothorax cavity remained dry throughout the whole period of collapse. On the right side an effusion developed early. The fluid was aspirated and replaced with air three weeks later. Repeated examinations showed that the bruit d'airain developed on the right side two months after the aspiration and became more intense and musical as the pleura became drier and more rigid. The bruit d'airain persisted until the lung was allowed to re-expand one year later. It was present until the cavity became very small—i.e., it could be heard over a partial pneumothorax. On the left side, although the amount of collapse was equal to that on the right side and was more regular, the bruit d'airain was never heard.

Case 40, a man aged 23, in whom bilateral pneumothorax was present, showed the same features as Case 20.

Relationship between Intrapleural Tension and the Incidence of the Bruit d'Airain.

Most observers attribute the fact of the presence or absence of the bruit d'airain to either a negative or a positive intrapleural tension. Widal[19] seems to be in a position of splendid isolation when he stated that the sign was absent when the tension was high and present when the tension diminished. Béclère[20] in 1897 stated that the bruit d'airain was accentuated when the intrapleural tension is increased. Bendove[21] in 1926 found that the bruit d'airain was present in all cases of pneumothorax, whether open or closed, in which the pressure was at atmospheric or above, regardless of the size of the pneumothorax cavity. Although radiograms and histories of illustrative cases indicate that the pleura was thickened in those patients in whom the bruit d'airain was found, Bendove does not mention this as a factor in the production of the sign.

Reference to this series of cases shows that if certain factors are favourable the bruit d'airain is found, whether the intrapleural tension is negative or positive. In many cases before a refill a beautiful bruit d'airain was elicited and on insertion of the pneumothorax needle the intrapleural pressure was found to be negative, e.g., −8 −2. On raising the pressure by injection of air to a positive figure, little alteration was found in the intensity or character of the bruit d'airain. This feature was so constant that the theories stating that a positive intrapleural pressure must be present before a bruit d'airain can be elicited can be dismissed as erroneous.

Reference to the table will illustrate this point.

Case.	Intrapleural tension before fill.	Amount of refill.	Intrapleural tension after fill.	Presence of bruit d'airain.
		c.cm.		
3	−11 −3	400	+10 +16	Present before and not altered by refill.
	− 9 −0	250	+ 5 +11	
4	− 6 +1	375	+ 4 +12	Present before and after refill.
	−10 −3	600	− 3 − 4	Present before—more intense at base after refill.
7	− 8 +1	600	− 4 + 6	Faint before—more marked after.
	− 8 ±0	200	+ 8 +10	Present before—more intense after.
8	−14 +2	200	+10 +20	Present all over before and only over upper zone after.
	− 9 −1	550	− 3 + 5	
31	− 5 −1	300	0 + 3	Present before—duller after fill.
	− 5 +1	350	+ 1 + 7	Present all over before—duller and practically absent after fill.
38	−11 −1	750	− 1 + 6	Present before and after fill.
40	−21 −7	500	+ 1 + 9	Present before and after refill.
42	−10 −5	600	− 4 + 4	Ditto.
44	−13 −5	300	− 8 + 1	Ditto.

Cases 2, 5, 6, 12, 17, 18, 42 illustrated similar phenomena fully represented by Case 3.

It will be seen that in many cases a bruit d'airain was heard when the intrapleural pressure was negative (see Cases 38–44). In some instances the bruit d'airain was heard better after the refill, as in Case 4. It will be noticed, however, that even the final intrapleural pressure was negative. In Case 7 the bruit d'airain was heard better after the fill when the intrapleural pressure became positive. These cases are in the minority and the improvement in the bruit d'airain can be ascribed to other factors such as the increase in the volume of the pneumothorax cavity.

Relationship of Bruit d'Airain to the Size and Volume of the Pneumothorax Cavity.

After the induction of an artificial pneumothorax the shape alters and the volume of the cavity gradually increases until, if no adhesions are present, complete collapse is obtained. If the pleural membrane retains its normal thickness and resilience, and neither mediastinal displacement nor ballooning of the pleura occurs, no bruit d'airain is obtained. This is well shown in Cases 22 and 24, in which collapse was induced in a normal lung for the purpose of transpleural operation on a carcinoma of the œsophagus.

Variations in the shape and volume of the cavity depend on several factors:—

1. *Presence of pleural adhesions.*—A firm adhesion in any situation will prevent the uniform collapse of the lung and hence the production of a regular cavity. The situations of adhesions may be: (*a*) apical, (*b*) mid-zonal, (*c*) basal. For instance, in this series of cases 15 had a free pleura with no adhesions, 17 had apical adhesions, 3 had mid-zonal, 3 had basal, and 2 cases showed both apical and basal adhesions. On the remaining six cases no notes as to the presence of adhesions were made. In some instances the adhesions stretched into long ribbon-like structures and did not prevent the even collapse of the lung. In other cases broad, sheet-like adhesions prevented even collapse of the lung and thus altered the shape of the pneumothorax cavity. It is in these cases that breath sounds are well heard locally over the site of the adhesions. Presence of adhesions per se did not appear to have any appreciable influence on the bruit d'airain, except in so far as their presence rendered the patient more liable to the onset of pleural inflammation and subsequent effusion. Apical or basal adhesions, while diminishing slightly the size of the cavity, did not prevent the formation of a fairly regular pneumothorax. Cases in which adhesions did play a definite part in the disappearance of the bruit d'airain were those in which an obliterative pleurisy developed.

2. *Selective collapse.*—The pneumothorax cavity is sometimes altered in shape by the fact that the diseased areas of lung tissue tend to remain collapsed whilst the healthy areas re-expand. In this series of cases where there was radiological evidence of selective collapse no bruit d'airain was heard. In cases which had a pleural effusion this phenomenon of selective collapse was never seen after the effusion had cleared. The explanation seems to be that the whole pleura is thickened as a result of past inflammation sufficient to prevent the re-expansion of the underlying healthy lung. In those cases which never had an effusion, the pleura, being normally elastic, did not prevent re-expansion of the lung. The absence of the bruit d'airain in these cases of selective collapse might be due to irregularity of the pneumothorax cavity. Further reference, however, to these cases shows that when the lung was evenly collapsed by a further injection of air, the bruit d'airain was still absent. This point was well illustrated in Cases 3 and 45. The explanation of the absence of the bruit d'airain seems to lie rather in the fact that the pleura was not thickened and the shape of the cavity played little or no part.

3. *Hydropneumothorax.*—The presence of an effusion into an artificial pneumothorax cavity definitely alters its shape and lessens the volume. If the cavity is completely or almost filled with fluid the bruit d'airain is not found owing to obliteration of the air cavity. If the fluid occupies about a half of the pneumothorax cavity a good bruit d'airain is usually heard above the level of the fluid. In a few cases the signe de Pitres was obtained over the fluid. This, however, was not constantly observed. Biermer's[22] "change of sound" was found in those cases in which there was a moderate effusion and a fairly complete pneumothorax. The sign consists in an alteration of the pitch of the bruit d'airain when the patient is examined both in the horizontal and upright positions.

4. *Mediastinal displacement and ballooning of the pleura.*—These conditions are sometimes produced during the course of establishment of an artificial pneumothorax by the too rapid compression of the lung. A patient with a lax mediastinum is especially liable to these complications. In displacement, the whole of the mediastinum is displaced to the opposite side and in the other case the pleural reflection is ballooned across the mediastinum without there being much displacement of the mediastinum itself. In both conditions the shape and volume of the pneumothorax cavity is definitely altered. A faint bruit d'airain or a bruit de bois is occasionally heard over the base of the pneumothorax in cases with mediastinal displacement. The sign is obtained even in cases with no evidence of pleural thickening. Again, when there is ballooning of the pleura with either a negative or positive intrapleural pressure a faint bruit d'airain or sometimes a bruit de bois may be elicited over the pleural hernia, definitely outlining the shape of the bulge.

CASE 16 was an instance of right-sided pneumothorax in which there was a complete pneumothorax without adhesions or thickening of the pleura. During a period when there was over-displacement of the mediastinum a faint bruit d'airain was heard over the right base. When, however, the mediastinum returned to its normal position, the lung still remaining collapsed, the faint bruit d'airain disappeared.

CASE 27 was an example of partial pneumothorax in which there was ballooning of the pleura but no mediastinal displacement. Over the pleural hernia a faint bruit d'airain was found outlining the curved shape of the distended pleural reflection. When this distension was allowed to contract the bruit d'airain disappeared and was not obtained again up to the time the patient left for sanatorium treatment.

Relationship between Bruit d'Airain and the State of the Cavity Walls.

Thickening and rigidity of the cavity walls most commonly follows purulent or serous effusion into the cavity. Less commonly it results from an acute fibrinous pleurisy, and also from involvement of the pleura over a diseased area in the lung. Consolidation of the lung itself in some cases may cause rigidity of the walls. Temporary rigidity may be caused by an acute inflammatory process in the pleura occurring before the onset of an effusion. In all our cases in which rigidity of the cavity wall was present, bruit d'airain, either localised or generalised, was heard. This constitutes the main point of our thesis.

Relationship between the Bruit d'Airain and the Other Metallic Phenomena.

In some of our cases the metallic phenomena (bruit d'airain, amphoric breath sounds, metallic vocal resonance, tinkling crepitations, and the succussion splash) were heard at one time or another. Sometimes all five signs would be heard in the one case, as, for example, in Case 3, in which there was a consolidated, partially collapsed lung associated with hydropneumothorax. In such a case it was noticed that all the signs possessed the same note in the musical scale, and that the quality or timbre of each note was identical.

In a dry pneumothorax cavity, with the lung completely collapsed and the pleura hardened, the bruit d'airain was the only metallic phenomenon to be heard. If a collection of fluid was present in the pneumothorax cavity, the succussion splash as well as the bruit d'airain was elicited. Amphoric breath sounds were heard: (1) when the lung was partially collapsed with an area of consolidation around one of the bronchi; (2) when an uncollapsed pulmonary cavity was present; and (3) when a broncho-pleural fistula had formed. In no case were amphoric breath sounds heard in the absence of the bruit d'airain. Further, if the amphoric breath sounds were faint and distant or loud and echoing the bruit d'airain possessed similar characteristics. When in addition secretion was present in the lung tinkling crepitations were heard.

In regard to the significance of amphoric breath sounds over a pneumothorax cavity, we are unable to agree with Bendove who regards them as indicating a broncho-pleural fistula in every case. We are convinced that in certain cases amphoric breath sounds are those that would normally be heard as bronchial breath sounds in a consolidated lung or over a pulmonary *cavity, with a musical quality imparted* to them by an adjacent air-cavity. Again, although tinkling crepitations may in some instances be due to air bubbling up through fluid from a submerged fistula, as some observers state, we are inclined to agree with James,[13] Gerhardt,[14] and Kinghorn,[15] that they are in many cases ordinary crepitations modified by the resonating musical qualities of the adjacent pneumothorax cavity. Tinkling crepitations may also be produced in a pulmonary cavity when its volume and the rigidity of its walls are favourable.

The presence of tinkling crepitations and amphoric breath sounds over a pneumothorax cavity in our experience indicates that the collapse of the lung is incomplete. The bruit d'airain may be heard whether the collapse is complete or partial.

Localised Bruit d'Airain.

In many cases of partial collapse the bruit d'airain was heard only over the base of the cavity, occasionally over the upper zone, and in rare cases over the mid-zone, depending primarily on the situation of the air space. In one case of basal bronchiectasis with complete collapse the bruit d'airain was heard only over the base, presumably because the two layers of the pleura and the lung were thickened only in the lower region. As stated elsewhere, a faint bruit d'airain was also heard at the base in those cases where mediastinal displacement was present.

Discussion.

The term "coin sound" as a synonym for the "bruit d'airain" is misleading and should not be used. It has given rise to the misconception that the clear ringing note obtained is due to amplification of the metallic sounds. "Bell sound" is a better term because its use does not infer that the use of coins is necessary in the production of the sign. It seems best, however, to keep to the original term "bruit d'airain," which was originally described as a phenomenon to be elicited by auscultatory percussion.

The sign, whatever method is used to set up vibrations in the pneumothorax cavity, is a musical note of constant pitch and quality. Each cavity has its proper note—that is to say, that the bruit d'airain is inherent in the cavity and not in the method used to elicit the sign. A further interesting fact is that in some cases all or some of the following signs may be heard—succussion splash, tinkling crepitations, amphoric breath sounds, and the bruit d'airain—and in each case the fundamental musical note is the same *for all these signs.* The presence or absence of the bruit d'airain depends on many factors which are as yet imperfectly understood. But as a result of the prolonged study of these cases we have been able to establish factors which play an important part. The most important appears to us to be: (1) *The condition of the wall of the cavity*—namely, that the wall should be sclerosed and rigid, a state of affairs which most *commonly results from the onset of a pleural effusion* into the pneumothorax cavity. If the effusion is absorbed or is replaced by air, the drying and hardening of the pleura, accompanied by a beautiful bruit d'airain, reaches its maximum about four months after the onset of the effusion. From this time the sign persists in similar intensity until the lung is allowed to expand. The hardening of the walls of the cavity can also be ascribed, although less frequently, to pleurisy occurring before the induction of the pneumothorax, to consolidation of the underlying lung, and to acute fibrinous pleurisy occurring during the course of the pneumothorax. (2) *The size or volume of the cavity* is of moderate although not of paramount importance. The bruit d'airain, if present at all, is heard over an area of the chest wall usually in proportion to the amount of collapse. It was noted in a fair number of our cases that the sign was present over the base, probably owing to the fact that the volume of the pneumothorax was greater in that situation. But if the pleural membrane is hardened the bruit d'airain can be heard even over a small cavity. Conversely, *if the pleura is not hardened, and the volume of the* pneumothorax large, the bruit d'airain is in the majority of cases not elicited. (3) *The shape of the cavity* appeared to play only a minor rôle in the production of the bruit d'airain. (4) *In mediastinal displacement and ballooning of the pleura* a faint bruit d'airain may be heard. The explanation of this, although not quite clear, seems to lie in the combination of three factors—viz., the shape and volume of the cavity and tension on the cavity walls. (5) *Intrapleural tension* is not a factor which determines the absence or presence of the bruit d'airain, but with a positive pressure the sign is usually a little more intense. (6) In *hydropneumothorax* the bruit d'airain is heard when the effusion is small or moderate. In our opinion this is not due to the presence of fluid *per se*, but to the accompanying hardening of the walls of the cavity.

We *have not been able to confirm the observation* of Minerbi, Mongini, and Benassi that the bruit d'airain tends to disappear in long-standing cases of pneumothorax. If the pneumothorax is maintained, the bruit d'airain persists, and sometimes in greater intensity as time goes on. Nor have we confirmed their remark that the sign disappears in the 24 hours following a refill. In practically all our cases when the sign was present before the refill it was heard afterwards, sometimes more intense and usually over a wider area. But we agree with their interesting observation that in nearly complete and complete pneumothorax two distinct and separate notes are heard—the lower pitched note corresponding to the long axis of the cavity, and that of higher pitch to the short axis. In our experience the presence of the higher note was not governed by the fact that the *intrapleural tension was just above zero. In our* cases it was heard whether the tension was positive or negative.

Value of the Bruit d'Airain in Diagnosis.

The first important point to be observed is that failure to elicit the bruit d'airain does not mean that a pneumothorax is not present. Secondly, when the sign is found over the thorax, it gives an indication of the presence of *an air-containing cavity with tense and rigid walls.*

When the mediastinum is displaced the bruit d'airain gives an indication of the amount of displacement. For instance, in excessive displacement the sign can be found extending across the spinal column to the side of the uncollapsed lung. In ballooning of the pleura, the shape and extent of the bulge can be accurately marked out by means of the bruit d'airain. When a hydro- or pyo-pneumothorax is present, the sign is heard down to the level of the fluid, and in this way the amount and level of the fluid can be fairly accurately estimated. In this connexion the bruit d'airain is of much more value than the percussion note, especially in those cases (usually pyopneumothoraces) where a tympanitic or skodaic note is found over the effusion itself.

We wish to acknowledge our indebtedness to Dr. G. T. Hebert, who kindly allowed us to study and include his cases in our series.

(*References at foot of next page.*)

ASSAM'S MALARIA PROBLEMS

AND THEIR SOLUTION.

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IN a recent paper[1] I stressed the importance of *Anopheles minimus* as the main vector of Assam malaria and also the importance of controlling its breeding areas during the malaria season—i.e., in its monsoon or summer resorts. I said :—

> "The factor which determines the migration of *Anopheles minimus* from a winter to a summer resort is, of course, rainfall. *A. minimus* migrates to lay her eggs in breeding areas at higher and safer levels, free from the dangers of flooding and flushing. The usual monsoon breeding areas of *Anopheles minimus* are slow-running grassy-edged drains, streamlets and streams, sometimes certain types of seepages, and certain types of tanks. It is interesting to note that in its winter resorts *A. minimus* rarely migrates to low-lying drains. These areas are carefully avoided, like some seepages and swamps, owing to contamination with the products of iron-oxide bacteria. Likewise, certain types of stagnant water contaminated with certain types of algæ appear to be factors in restricting the winter breeding areas mainly to the clear water at the grassy edges of slow-running rivers and perennial streams."

As a result of a further study of the subject it is apparent that two of the factors I mentioned as controlling the breeding habits of *A. minimus*—viz., flooding and flushing—should more correctly be described as water contamination and high velocity of current. It has long been known that certain species of anopheline mosquitoes breed exclusively in clear uncontaminated water. A careful further study of anopheline breeding areas on the terrain under my supervision, which has been regularly surveyed during approximately the past three and a half years, has shown that the breeding habits of *A. minimus* are entirely regulated by the availability of clear, uncontaminated, slow-running, or stagnant water, completely or partially exposed to sunlight. The small pockets at the grassy edges of slow-running streams, streamlets and drains, the edges of grassy tanks, kutcha wells, pools, and borrow-pits; also grassy swamps and seepages if the water is uncontaminated and completely or partially exposed to sunlight, are therefore all potential breeding areas. This I have recently proved repeatedly and the classification of *A. minimus* as essentially a stream-breeder would lead to many dangerous breeding areas being left uncontrolled. The prevalence of *A. minimus* in slow-running grassy streams and drains is doubtless due to the mechanical filtering and clarifying effect on the water of vegetation (grass and weeds) growing on the banks and sometimes in the bed of drains and streams, in addition to its action in retarding the rate of flow.

Uneven Rainfall.

The solution of Assam's malaria problem is, however, mainly dependent on solving the effects of an uneven distribution of rainfall on the habits of *A. minimus*, the main natural carrier of malaria in Assam. In countries where the rainfall is more or less evenly distributed throughout the year it is obvious that the breeding areas of anopheline mosquitoes will be more or less permanent in perennial streams, swamps, and seepages. In his article on mosquito control in the Federated Malay States, published in Byam and Archibald's "Practice of Medicine in the Tropics," Sir Malcolm Watson writes that "anopheles breeding places are generally well defined, permanent, and easily recorded on a map. They can be abolished at once by appropriate measures." The problem in Assam differs from that in the Federated Malay States, because in Assam anopheline mosquitoes generally migrate from dry-weather to wet-weather breeding places.

The effect of an unevenly distributed rainfall in a country like Assam has to be studied over the same terrain throughout the year, and preferably over a period of years, thoroughly to appreciate the seasonal changes in the characteristics and distribution of surface waters.

At the break of the south-west monsoon there is usually a complete change in the characteristics of the majority of the dry-weather breeding areas. This change varies with the composition of soil and the presence or absence of bacterial or vegetable contaminations. *During the cold dry season* the undisturbed waters in rivers and perennial streams on low-lying flat land are usually clear. During the monsoon season these disturbed waters are either continually or periodically muddy or laden with silt. Mud and silt and bacterial and vegetable contaminations on low-lying land during the monsoon season are therefore responsible for the migration of *A. minimus* to the uncontaminated clear malariogenic waters at higher levels. Bacterial (iron-oxide bacteria) and vegetable (red and green water-surface algæ) contaminations play a most important part in Nature in restricting the available breeding areas.

The prevalence of bacterial and vegetable contaminations on low-lying land is due to the high percentage of organic matter—i.e., a suitable food supply for these organisms in soils at low levels. Bacterial and vegetable contaminations are present throughought the year on more or less stagnant waters in drains, swamps, seepages, and pools, but are more prevalent during the steamy monsoon season when the temperature and humidity are more suitable for their growth.

The incidence of malaria on varying types of terrain is closely co-related to the clearness of surface water during the malaria season. Some breeding areas are continually dangerous throughout the monsoon season; others are periodically malariogenic, being affected by periodic high velocity of current or periodic contamination; while other areas, due to continual contamination with mud or silt or with vegetable or bacterial contaminations, are constantly free from *A. minimus* and other species of *Anopheles* which breed in clear water.

The importance of water contamination has already been pointed out by Watson. In his book "The Prevention of Malaria in the Federated Malay States," he writes: "Long before I had used oil in ravines I had noticed that the presence of the 'felted alga' meant the absence of *A. maculatus*, and I had noticed its association with pollution of water." The association of felted algæ with water pollution is common in Cachar. We have also streams and drains in Cachar where the water, when seen in dry intervals during the rains, is apparently clear but contains felted algæ. A visit to these streams and drains during a heavy shower solves the puzzle. It will be seen that during the downpour the water has become contaminated with silt, often milky in appearance,

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[1] Jour. Trop. Med. and Hyg., December, 1929.

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which rapidly sediments after the cessation of the shower. Periodic contamination is also seen on healthy rice land, where the water may appear clear at dry intervals but becomes rapidly muddy during a shower.

A drought in the early part of the monsoon season considerably affects the incidence of malaria on low-lying terrain, for the effect of drought is to retard the period of migration of *A. minimus*—that is, increase of malaria on low-lying land. Likewise heavy rainfall or flooding in the early part of the year drives *A. minimus* from the now contaminated waters on low-lying terrain to the clear water at higher levels (an early formation of summer resorts) resulting in early epidemics of malaria on plateaux and high-lying lands, leaving the low-lying areas surrounded by contaminated waters as health resorts. The result is that during the normal monsoon season we have a paradox: health resorts are areas surrounded by healthy contaminated water, while areas with unhealthy clear water are death traps. Hence, by making drains, tanks, kutcha wells, pools, borrow-pits or other collections of water which remain continually clear during the malaria season mankind has unwittingly created much malaria. When periodically clear and uncontaminated over intervals long enough for the aquatic stages of *A. minimus* to be completed these areas may become periodically malariogenic. On low-lying land malariogenic water during the monsoon season is usually limited to the unshaded grassy clear water tanks used as drinking water supplies. Perennial streams are usually malariogenic only for short periods during the year—i.e., for about six weeks before and about six weeks after the south-west monsoon, but again the period of malariogenicity of perennial streams is entirely dependent on the soil composition of the area they drain and the amount of rainfall before and after the south-west monsoon.

Velocity of Current and Shade.

The second factor, high velocity of current, is an important but unreliable factor in mosquito control because variations in the rate of flow of a water channel are dependent mainly on the amount of rainfall. Further, high velocity of current is liable to erode the banks and bed of a water course and cause pockets or pools. Practical experience has taught me the dangers of pockets and pools. On several occasions I have found *A. minimus* safe and secure in the still water of a grassy pocket of a rapidly flowing stream. I have also frequently found it in the temporary pools left in water courses which only function as streamlets when there is continued rain. These dangerous temporary pools are most common during the north-east monsoon period or for a few weeks after the south-west monsoon. As a practical point when surveying a stream, I advise surveyors to walk against the direction of flow, as *A. minimus* larvæ are more easily caught when undisturbed by movement.

The third factor, the effects of heavy shade, is of the utmost importance when covering clear malariogenic waters. Clear malariogenic waters are usually above flood or contamination levels. The high incidence of fever on high-lying land in Assam has been well known for many years. That it resulted when heavy jungle was cut down and the land cleared for tea-planting was the experience and belief of at least one pioneer tea-planter of my acquaintance. My experience of the diseases among the local hill tribes has also shown me that the degree of malaria among the tribes living on the lower ranges of hills is intense. The reason is obvious when the areas are visited. Annually the hill tribes *jhum* (cut down and burn) the jungle to clear areas for the cultivation of hill-rice, thereby exposing streams, streamlets, and seepages. My predecessor, Dr. H. J. Glover, stated in 1910 that the commonest type of malarial attack in Cachar was "jungle fever." As synonyms for "jungle fever" Glover gave "bilious remittent fever" and "clearance fever." Had the "fever" been more appropriately named "jungle clearance fever," the *fons et origo* of the ill-health on many plateau and high-lying tea estates would have been recognised before the pathological importance of hookworms, a common factor on healthy and unhealthy tea estates, became unduly stressed and obscured the true cause.

The reasons why some anopheline species avoid shade whilst other prefer it have yet to be definitely ascertained. *A. minimus*, in common with most other anopheline species, undoubtedly prefers breeding areas where vegetation containing chlorophyll (grass, &c.) can grow, but extensive field experiences have given me the proverbial exceptions which prove the rule. On several occasions I have found *A. minimus* breeding in clear stony pools devoid of vegetation. Recently I also found larvæ sheltering in a small pocket of a stream covered with dense shade, and I have several times found the larvæ of the shade-loving *A. aitkenii* in clear grassy streams exposed to bright sunlight. The explanation in the latter cases is obvious when the areas are studied, as the larvæ have undoubtedly been accidentally flushed from their natural habitats to unnatural breeding places by a heavy downpour of rain. In the case of *A. minimus* the natural, grassy, exposed, known breeding place was only ten yards away from the heavily shaded sheltered pocket.

Laboratory Findings.

The results of my experiments in the artificial conditions of a laboratory have usually been contrary to my field experiences.

In the laboratory I have bred out *A. minimus* in water which was collected from a pool under heavy bamboo shade where the water was apparently contaminated with decomposing bamboo leaves. I have bred it out in darkened almirahs, in the water from "felted alga" streams, and in red iron oxide water, although the larvæ had an initial struggle to break the oil-like film. The thick scum of surface algæ, however, asphyxiates all anophelines—even *A. vagus*, a contaminated water breeder—within a few hours.

Mud and silt from muddy and silty waters rapidly sediment in hatching-bottles in the laboratory and *A. minimus* larvæ readily breed out in the clear supernatant water. Probably in nature, however, silt in suspension asphyxiates anopheline larvæ such as *A. minimus* from blockage of the respiratory organs. In its natural environment a certain degree of sunlight is apparently essential to provide the normal food-supply on which *A. minimus* larvæ feed, but until definite scientific reasons are forthcoming one can only conjecture that the habits of certain species of anopheles vary like those of the various races of mankind, who cease to procreate their species in unsuitable or unnatural surroundings.

Malaria Control.

In discussing the principles of mosquito control (loc. cit.) I stated that the practical application of Nature's methods of flooding or flushing can be artificially obtained in appropriate areas by mechanical means, such as sluice-gates, bunding, straightening streams, and silting loops. I would here like to emphasise the fact that, as a result of a further study of soil compositions, the appropriate areas where Nature's methods can be artificially applied by these means are very limited indeed. Flooding should never be carried out unless the resultant effect is effective water contamination; periodic flushing is liable to make pockets at the edges or leave pools in the stream bed. Bunding may result in a collection of dangerous clear water, and straightening streams, unless in very carefully selected areas, may not only be associated with the dangers which arise from flushing but, owing to increased velocity of the current, may increase the size of subsequent lower loops in the stream course.

For experimental purposes I have selected duranta to shade known dangerous narrow drains and streamlets, while *Cassia nodosa* or *javanica* has been selected for known dangerous broad main drains and streams. Duranta is the thorny privet hedge commonly seen around bungalow compounds. Animals will not eat it and, owing to the dense shade produced when thickly planted, it should simulate the degree of shade which is inimical to the habits of *A. minimus* and prove a cheap and permanent anti-malarial measure.

On broad streams under natural conditions I have found that heavy bamboo shade eliminates *A. minimus*. Unfortunately bamboos, which are used as building materials in house construction and for many other purposes, are liable to have an uncertain existence when they reach maturity in districts where bamboos are annually becoming more scarce. The two species of cassia, especially the indigenous *nodosa*, appear to be the most suitable type of shade for broad channels. These two species of cassia are rapidly growing leguminous trees, giving dense shade; they are deep-rooted, withstand storms excellently, and, like duranta, their foliage is not eaten by animals.

The more I study the malaria problems of Assam the more does the truth of Watson's statements in the Federated Malay States become apparent: "Work which leaves a trail of malaria behind is bad engineering. As we learn more, perhaps the time will come when we shall be able to say to one species of anopheles 'come' and to another 'go' and shall be able to abolish malaria with great ease, perhaps at hardly any expense." Man-made clear water-tanks, kutcha wells, pools and borrow pits, man-made clear water drains, exposed streams and streamlets, *and improperly constructed bunds or embankments* creating dangerous clear-water breeding areas, swamps and seepages where safe natural thick swamp vegetation has been cleared, are all found on the terrain on which I had been investigating malaria problems.

I have found that low-lying, well-shaded tanks are free from *A. minimus* during the rainy season. On careful examination it will be seen that these tanks are very easily contaminated with mud (rainfall and soil erosion) owing to the absence of a grassy-edged binding, because heavy shade prevents growth of vegetation. I have had no experience of well-shaded tanks at high levels, as all the tanks at high levels on the terrain under my supervision are exposed; I am carrying out experiments in this direction. I have attempted to contaminate clear water-tanks at high levels with surface algæ but, apparently owing to absence or insufficiency of an appropriate food-supply (organic matter) in high-lying clear water, surface algæ rapidly succumb. My researches have also taught me that work which can be carried out with impunity on *certain types of soil and strata* cannot be carried out on others, and that it is unfortunately easier to create malaria than to eradicate it.

The treatment of Assam's malaria problems is based on a complete knowledge in each area of the factors which are responsible for malaria, hence a thorough survey during the malaria season is absolutely essential. In the absence of definite knowledge of the effect of heavy shade around dangerous clear-water tanks, it is obvious that properly constructed wells or piped water-supplies would eliminate this source of man-made malaria. Dangerous clear-water pools, borrow pits, and functionless drains should be filled in. Exposed dangerous clear-water drains, streamlets, and streams should be covered with heavy shade. Swamps and seepages may be assisted to revert to their safe natural condition by replanting thick swamp vegetation such as tarapat. In many cases, however, and especially in the case of seepages, I have found it more practical—i.e., the areas can be brought more rapidly under control—to adopt Watson's drainage methods than to cover the resultant clear-water drains with heavy shade.

It should be clearly understood that there are in Assam many miles of harmless exposed waters in rivers, perennial streams, and drains; it would be a gross waste of human energy and money to cover these with dense shade or to fill in contaminated pools and borrow pits.

Until biological control can be restored, the cheapest and most effective method of controlling malaria is by larvicides, especially by oiling, but it has to be remembered that the control of malaria by oiling can only be compared to the control of the hyperglycæmia of diabetes with insulin; as soon as treatment is discontinued the disease returns. Further, cessation of control may be attended with disastrous results, owing to an increase in the non-immune population during the controlled period.

Clinical and Laboratory Notes.

A NOTE ON PAIN IN RELATION TO DUODENAL ULCER.

By Donald Macleod, F.R.C.S. Edin.,
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The most important factors in the investigation of the cause of that particular pain which is associated with duodenal ulcer are the anatomical disposition of the first and second parts of the duodenum and the behaviour of the contained gas derived from the stomach after a meal, particularly its pressure effect in the first part. There are many types and varieties of stomachs and duodena, no two being exactly similar. In every case, however, the direction and anatomical lie of the first two parts of the duodenum, in relation to each other, are the same. The first part runs upwards and backwards, and is suspended at its termination by the free edge of the gastro-*hepatic omentum, being freely movable*. From here the second part commences and runs directly downwards, *being more or less fixed*.

The most extraordinary features of an active duodenal ulcer (by "active" I mean "unhealed") are that, no matter how full the stomach may be after a meal, the patient is entirely free from pain, and it is only when the stomach is nearly or quite empty that he complains of pain. In other words, a large amount of food will pass over the ulcer for hours on end without causing any pain whatever. Another common but nevertheless strange fact is that taking liquid or solid food when pain is present will soon relieve it. Several theories have been advanced to explain the cause of this particular pain, but they are not altogether convincing. Consideration of the possibility of distension of the ulcer-bearing portion of the duodenum by gas coming from the stomach may, however, help to elucidate it. There is always a certain amount of gas in an empty stomach. After a meal this is greatly increased, a fact easily confirmed by percussion. Most of the increase is said to be due to swallowing atmospheric air, but it is not unlikely that there is some actual diffusion into the stomach itself.

In the last 20 cases of duodenal ulcer which came under my care I introduced an Einhorn's tube into the first part of the duodenum, verified its position under the upright X ray screen, and inflated that part of the gut. In each case I was able to satisfy myself that at a certain point of distension the same kind of pain could be reproduced as that complained of by each individual patient. The volume of air introduced in each case varied. These patients ultimately underwent operation.

Pain due to After-coming Gas.

It seems to me, therefore, quite reasonable to suppose that distension by after-coming gas from the stomach is at least one possible cause of pain in active duodenal ulcer. This gas follows the meal out of the stomach, making its way towards the antrum and pylorus, and eventually filling the first part of the duodenum. Distension follows, and pressure in an already over-sensitive ulcer-bearing area of peritoneum results in pain. This pain is not colicky or griping, but rather an increasing ache, gradually reaching a point of maximal intensity, and as gradually falling and diminishing. This is what one may well expect from slow distension. Owing to the localised inflammation accompanying the ulcer, there is a certain degree of paralysis of that portion of the gut. This in itself is sufficient to delay the expulsion of the contained gas, but much more important is the arrangement of the second part of the duodenum. This part, in the erect posture adopted by man, lends itself very effectively to obstructing and resisting the exit of gas from the first part because of its vertical position and its immobility. The effect is distension followed by pain. The third part of the duodenum offers no such resistance, owing to the slightly upward course which it takes. Food, on the other hand, passes rapidly through the whole duodenum, if it may be assumed that an ordinary meal behaves in the same way as a bismuth feed in cases of duodenal ulcer. The direction of the second part is rather an aid to its progress. As the gas in the stomach becomes less, so does that in the first part of the duodenum. It is slowly evacuated, the distension lessens, and ultimately—although some still may remain—there is not enough to reach that point of distension which will create pain in that particular duodenum of that patient. The duration of the pain depends upon the time which it takes for the volume of gas in the first part to fall below this point.

The ages of my patients ranged from 18 to 53. All except four were males. Six ulcers were situated at the junction of the first and second parts, in the angle between the two. Four were on the posterior surface; two of them were so small that they were only seen on opening the gut. Ten were placed along the anterior surface between the pylorus and the termination of the first part. A partial duodenectomy was performed in three cases, and a gastro-jejunostomy in 17.

The time of onset of the pain bears no relation to the size or position of the ulcer, or to its distance from the pylorus. It simply depends upon the period which elapses between the ingestion of a meal and the beginning of the painful response by the over-sensitive ulcerated area to distension by the after-coming gas.

Treatment Directed towards Lessening Tension.

The more common methods of treatment of duodenal ulcer are:—

(1) *Diet.*—A restricted diet is usually given. This necessarily lessens the intake of air into the stomach. Sippy's method, in my opinion, owes its benefits to the continuous displacement of air at the pyloric end of the stomach. In much the same way the disappearance of pain on taking more food may be explained; it prevents the further addition of gas to the duodenum.

(2) *Drugs.*—Alkalis are freely administered. Their effect, however, is probably due to relaxation of stomach tone, and so to retarding of the passage of gas into the duodenum, rather than to their action in neutralising or diminishing the acidity of the contents of a "duodenal stomach." The accompanying hyperacidity is in all probability not the cause of pain, as this disappears on fasting; the acid content is highest, for instance, in the early morning, and pain does not appear until some time after the first meal. Belladonna is another drug commonly used. One of its principal actions is to relax tonicity, and the effect is much like that of alkalis in delaying the progress of gas into the duodenum. Effervescing drinks merely cause "belching," and so eliminate the gas which is already present in the stomach.

(3) *Posture.*—Rest in bed improves the condition of the patient, and the pain becomes markedly less or disappears altogether. This, I consider, is accounted for by the fact that the second part of the duodenum is changed from a vertical to a horizontal position, thus lessening the resistance to the outlet of gas from the first part.

(4) *Surgical.*—Gastro-jejunostomy is regarded as the most satisfactory form of treatment. I think the effect here is not the neutralisation of the acid by the bile, but the additional opportunity afforded for the escape of gas or some of it through the stoma.

All forms of successful treatment depend upon lessening tension in the first part of the duodenum and so giving rest to the ulcer, and an opportunity to heal. This can be brought about by reducing the intake of air, retarding and preventing the passage of gas into the duodenum, posture, and diverting the gas in the stomach.

Most of the literature on this subject abounds with a mass of technical detail and physiological assumption, and although the cases I have quoted in support of my contention may be too few, I feel sure, having observed and dealt with a large number in the past, that the explanations advanced by the various workers in this field do not fit the facts.

I am indebted to Dr. J. B. Higgins, radiologist to the Infirmary, for allowing me the use of his department.

A NOTE ON

HÆMOSTASIS IN THE MASTOID OPERATION.

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In the course of the mastoid operation there are three separate stages in which the operator is confronted with hæmorrhage which has to be controlled before he can proceed. These stages are: (1) the incisional stage; (2) the osteal stage; (3) the plastic stage (in the radical or modified radical operation only). This division is both anatomical and practical, the bleeding being of a type peculiar to each stage.

Incisional stage.—The scalp has an exceedingly free blood-supply, so that incisions bleed very freely; the hæmorrhage is difficult to control and apt to prove more persistent than it is from incisions in any other part of the body. The bleeding arises from an anastomotic network of arteries, taking source from the posterior auricular, the occipital, and the superficial temporal arteries. The usual method of hæmostasis by artery forceps is time-consuming, and owing to the texture of the scalp no easy task. Moreover, ligatures tend to slip easily. An alternative procedure is to incise boldly down to bone and rapidly elevate the flap, ignoring the immediate bleeding, and controlling it by pressure of the retractor.

Osteal stage.—The chief blood-supply to the mastoid air cells arises from the stylomastoid branch of the posterior auricular, entering through the stylomastoid foramen, on the deep aspect of the mastoid process.

In the *plastic stage* the bleeding is from the vascular integument over the auricle, supplied by the posterior auricular artery.

The procedure to be described renders the incisional and plastic stage a bloodless one and will minimise to a surprising extent the bleeding in the osteal stage. It is applicable to adults and children. The method is not applicable to those cases in which a large *periosteal abscess is present over the mastoid.*

The mastoid area is prepared as usual, shaved and painted with iodine. The hair is kept off the field of operation by a broad strip of sticking plaster along the limits of the shaved area. This plaster is subsequently removed at the termination of the operation, while the patient is still anæsthetised. Ten minutes before the anæsthetic is begun the whole of the retro-auricular (mastoid) area is infiltrated with about 20 c.cm. of novocain solution (1 per cent.) to which about 8 drops of adrenalin solution (1 in 1000) have been added. The infiltration is from the mid-point of the incision, subcutaneous and also towards the periosteum. The needle is also carried along the posterior superior meatal wall and this region infiltrated. Another point to assist in a bloodless operation is to have the patient propped up at an angle of 30°. The sole function of this injection is to secure a bloodless operative field—it is in no sense a local anæsthetic.

The injection of the solution causes an ischæmia of the *tissues and this persists for over 60 minutes. The effect* produced is similar to that seen in the part of a limb distal to a tourniquet.

Stage 1.—The incision down to bone is through exsanguinated tissues. The exposure of the bone might well be as on the cadaver. There is no bleeding or oozing and no occasion to use an artery forceps; the whole exposure of the osteal operative field is performed in as many seconds as it usually takes minutes in the presence of hæmorrhage. Even the use of a swab becomes unnecessary in many cases up to this stage.

Stage 2.—As regards the osteal parts, the effect of the injection varies. In all cases the bleeding from the mastoid is minimised, and in some cases the oozing is so slight that the operative field is never obscured. Gentle dry swabbing at intervals will keep the field clear. The injection is carried along the posterior superior meatal wall, and thus the branch of the posterior auricular, which goes via the stylomastoid foramen to the air cells, comes under the influence of the injected solution. The vessel is "occluded" by the adrenalin and novocain and thus the blood-supply to the bone is diminished.

Stage 3.—At the end of the operation, when any plastic procedure becomes necessary—e.g., in the radical mastoid—the tissues are still blanched. The separation of the skin from cartilage is bloodless, and the removal of the cartilage therefore becomes extremely simple.

A CASE OF
EMPHYSEMA TREATED BY MECHANOTHERAPY.

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The treatment of emphysema is still so unsatisfactory that I am encouraged to report the following.

In a series of cases I lately had a patient, aged 73, with undoubted emphysema and history of right-sided basal phthisis as a boy. From the latter recovery was complete, and his health was excellent until six years ago when periodic attacks of bronchitis had begun. In spite of wintering in warm climates he still had bronchitic attacks and gradually became so short of breath that he found walking on the level difficult and upstairs impossible. A recent attack of severe bronchitis had left him sitting bolt upright in bed unable to lean backwards or sideways because of the coughing these movements induced, hence getting very little sleep. He had much pain in the right side on coughing, and had been examined several times in the previous weeks, but no active tuberculosis had been detected; neither could I find any. All the usual medicinal treatment had been ineffective.

When called to him I found all the signs of emphysema. The patient was sitting up in bed, very breathless, with a severe spasmodic cough, a barrel-shaped chest with the usual kyphosis. The chest-wall was immobile, percussion note hyper-resonant, and breath sounds barely audible.

I treated this patient entirely on mechanotherapeutic lines, using chiefly passive and active exercises designed to strengthen expiration and in general to diminish the volume of the chest. These were:—

1. Strong manual vibrations over the front of the chest, and stimulatory nerve frictions on the upper four posterior dorsal nerves which communicate with the posterior pulmonary plexus through the anterior spinal nerves and rami communicantes.
2. During attempted prolonged expiration, intermittent pressures (about 5–6 per expiration) manually, over the upper lobe anteriorly, first gently, then more strongly.
3. Strong manual vibrations over the apices, and gentler vibrations on the trachea to loosen the sputum.
4. Short, sharp flicking clapping with the finger-tips to the chest and firmer hacking with the ulnar edge of the hands between the scapulæ.
5. General abdominal manipulation just below the diaphragm, especially the gastric area.
6. Petrissage and circumduction of the legs to remove œdema.

As soon as the patient's condition permitted the following exercises were added:—

7. The patient semi-reclining, stretching above his head his hands, grasped by the operator, approximated his elbows in front of his face, and during forcible expiration drew them downwards on to his chest, against resistance.
8. The patient sitting upright with straight arms abducted to a right angle, carried his arms forwards during forcible expiration against the resistance of the operator's hands placed on the patient's wrists.

The last two exercises were repeated three times, the pressure of the contracting pectoral muscles assisting expiration. The patient was also told to practise expiration by himself several times daily, a few breaths consecutively.

Treatment on these lines daily for a fortnight resulted in increased elasticity of the thorax, diminution of the barrel-shape and kyphosis, the breath sounds became more audible. The pain in the side had gone and the patient had not coughed for two days. Sleep was good and walking quite easy. Six months later the improvement had been fully maintained.

In the course of 30 years I have treated about 200 cases of emphysema and have failed in but two cases to improve the condition. Even if some of the manipulations may not be known to the practitioner, I believe relief would soon follow merely from *intermittent* pressures on the front and sides of the thorax, provided they are done evenly, gently, and elastically during expiration—followed by exercises 7 and 8.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY: SUBSECTION OF PROCTOLOGY.

At a meeting of this Subsection on Dec. 11th, Mr. Cecil Rowntree, the President, opened a discussion on

Complications of Operations for Piles.

It might be said, he remarked, that there should be no complications of an operation for piles on an otherwise healthy patient. But patients were not always healthy, and no surgeon was competent all the time. These operations were attended by so little risk to life that they were often undertaken lightly, without a competent anæsthetist or assistant, and by those who were scarcely qualified to carry them to a successful issue. The easier an operation, the greater was the discredit if anything went wrong, and it was essential to be fully alive to the possibilities of trouble, even in a straightforward case. In dealing with patients who were aged, infirm, diabetic, or paralysed, or who had damaged hearts, there was all the greater reason for care in the minutiæ. In a recent book he noted that 18 possible complications and 6 sequelæ were described in connexion with operation for piles. The Section ought to try to settle some of the outstanding questions on which the text-books at present differed. The choice of anæsthetic had been discussed elsewhere a week ago,[1] but it might be noted that the surgeon's position in these operations prevented his keeping a watchful eye on the thoracic end of the patient. Sudden and complete relaxation of the anal sphincter should suggest the need of added watchfulness.

At operation it might be discovered that the diagnosis was wrong or insufficient. The diagnosis should have been established with the proctoscope, but this need was not always realised in practice. There must always be a good light for the operation. If the case was really one of piles and the operation was satisfactorily completed, the surgeon was often confronted by the problem of post-operative pain. Some patients had little or no pain; others had severe pain which he could not account for. A clumsy operation caused more pain than one in which the tissues were gently handled, yet some of his patients had had pain despite his best precautions. Mr. Lockhart-Mummery laid stress on the importance of maintaining asepsis, but the President had not found that pain was abolished in this way. As the pain came on within 24 hours or less, he did not think it could be due to sepsis. Neither did post-operative pain appear to depend entirely on what operation was done. Some said that the cautery operation was less painful than the ligature operation. For a long time he had been employing the latter, and his strong impression was that the pain was less with this, also that the pain was less severe in women than in men, and less in the aged and feeble of both sexes than in the young and vigorous; hence it might have some relation to muscular vigour and to spasm of the levatores ani. If the pain was due to reflex spasm, what induced it? Probably it was a matter of attention to minor details of technique. In applying the clamp it was necessary to make sure that no sensitive nerve-endings were included in it. The question arose whether the sphincter ani should be stretched. The President thought that stretching was a help, but unless it was done very gently, the tissues might be so damaged as to do away with any advantage it would afford. Where pain was present after operation only one drug was available—namely, morphia—and he used it, though he knew that some people were suspicious of it. The doses given were often inadequate; to dole out gr. 1/8th of morphia to a strong 12-stone man was to ask for trouble.

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[1] See The Lancet, Dec. 14th, p. 1258.

The most dramatic, and perhaps the most important, complication was hæmorrhage. Both recurrent (or primary) and secondary hæmorrhage followed, with varying frequency, every method of operating for piles. Could anything further be done to reduce the already small proportion of cases in which bleeding followed? He could only urge the need for attention to all the small details, such as avoiding bad anæsthesia, discarding ligature material which had been boiled once too often, and operating with deliberation. The strain on the ligatures was very great. The amount of blood coming away at one of these hæmorrhages would astonish the uninitiated, and inspection of the rectum through a speculum during such hæmorrhage needed caution for the observer's own sake. The bleeding-point had to be found and tied, and it was essential to have a good anæsthetic and a number of sponge forceps to grasp the soft and yielding blood-stained tissues without damaging them. Secondary hæmorrhage was more troublesome and more difficult to deal with, and it seemed clear that it was due to sepsis; it was strange that it did not occur more often. In this form of hæmorrhage the difficulty of finding and securing the bleeding-point in what might be a sloughing area was so great that the best results were obtained by plugging or packing the rectum. Sometimes a stricture formed after a hæmorrhage; both might be the result of sepsis in the operation area.

Another complication was retention of urine. Most of the books said that this ought not to occur after a properly performed operation for piles; yet the same books—assuming its occurrence—gave several alternative methods of dealing with it. This complication might follow every type of operation, and it would be well to know how it could be avoided. He thought it was partly the fault of the surgeon, and that trauma was a factor. It was relatively commoner in vigorous young adults, and he had not yet heard a convincing explanation for it. The passing of a catheter should not be left too long, for if the bladder was over-distended, catheterisation might have to be repeated. Post-operative retention was less common in women than in men. An important pitfall was unrecognised prostatic enlargement; the patient might not have had sufficient cause to seek advice for his prostate, but the rectal interference might be the last straw, and set up a train of prostatic symptoms. Other complications might be more or less coincidental. Thus, he had been asked to see a middle-aged muscular man who had been vomiting for three days after an operation for piles. His abdomen was distended and he had intestinal obstruction; a volvulus, already gangrenous, was discovered, and he died the same day. The speaker thought that the volvulus had been caused by post-operative vomiting. Sometimes fissure in ano developed during convalescence, but, as a rule, he considered the fissure was present before the operation was undertaken; it was overlooked through being tucked away between two piles. This, again, emphasised the need for good light and efficient exposure. The rarity of abscess and fistula after pile operations was a testimony to the care usually exercised in them.

In conclusion, the President pointed out that the patient who exchanged his piles for a stricture was reminded every day of his life what a bad bargain he had made. It was tempting to call strictures in one's own work "traction bands," and he wondered how far these bands were preventable. Occasionally they occurred after operations carried out under the best conditions. Were they due to fibrosis and contraction of the submucous layers, and was there agreement about the relative frequency of stricture in various types of operation? Was it less common in the operation in which the whole pile was ligatured en masse, without transfixion, or cutting except for the V-shaped incision in the skin, or after an attempt had been made to strip up the pile from the rectal wall until a definite pedicle was made, transfixing with a ligature? In the second there was certainly a raw surface left to granulate up, and so one which was exposed to sepsis. No detail should be considered too insignificant to demand attention.

Discussion.

Mr. **Haslet Baldwin** said he had seen but few cases of hæmorrhage after operation for piles. He agreed that maintenance of asepsis would prevent many complications. He always swabbed the rectum with an antiseptic before beginning the operation. After operating he gently dilated and examined the mucous membrane to see whether a stricture had formed. He never dilated the sphincter.

Mr. W. B. **Gabriel** held that post-operative ulceration was an important complication, because it led to chronic disability and needed prolonged after-treatment; and even so it might never return to normal. Operation should never be done on a septic pile; if ulceration was present it should be treated on expectant lines, with antiseptic compresses, and the patient in bed. A 5 per cent. solution of carbolic acid in oil gave good results in bad piles. For internal piles the Whitehead operation should not be done. He had seen severe complications after the clamp and cautery operation. The ligature operation was the method of choice. During the last year he had used local anæsthesia, which gave full relaxation of the sphincter. Post-anæsthetic vomiting was to be avoided in order to prevent external œdema. Piles should not be stripped up high. Ligation at the level of the anus reduced secondary hæmorrhage. Catgut was superior to silk because it gave smoother and more rapid healing.

Mr. **Cyril Norbury** said that at one time he did the high stripping operation and had a number of strictures. He now ligatured a little above the anal margin, and his results were better. He had had two cases of that serious complication, suppurative pylephlebitis, one of which had proved fatal on the eighth day. Absolute asepsis in the anal region could not be secured and the possibility of suppuration in the liver should be in the surgeon's mind. Another uncomfortable complication was irritation after the operation. Some patients had marked pruritus ani after it, but fortunately this responded as a rule to local measures.

Mr. E. T. C. **Milligan** spoke of strictures of the anal canal after pile operations, a complication which he contended could be avoided. The site of the stricture ring was the upper third of the anal canal. In a series of 282 operations stricture occurred in 32 (11·3 per cent.); while in another series of 290 there were 27 strictures (9·2 per cent.). When three or four large piles were removed by stripping up, a large bare ulcerating surface was left, and this, encircling the canal, might result in stricture. Ligature at different levels to obviate this complete encircling had been suggested but could not always be satisfactorily carried out. He did not strip the pile off the anal canal, and he left a good area of healthy intact skin and mucous membrane between the ligatured hæmorrhoids. If a constriction ring did not develop immediately after operation it would not develop at all.

Mr. V. Warren Low thought that most of the complications met with in hæmorrhoid operations were due to leaving raw areas. He carried out the operation devised by Mitchell, of Belfast, and never removed more than four separate hæmorrhoids. He had not had stricture in his cases and he had not seen hæmorrhage follow. In retention of urine in these cases he thought there was a large functional element; it was expected, and doctors for that reason generally complained of it in themselves after this operation.

Mr. W. S. Perrin said his practice was to divide the pecten band, and pain was practically non-existent in the first 24 hours. He objected to dilatation of the sphincter, and he had not had hæmorrhage after the ligature method. He preferred the old-fashioned ligature operation.

Cases were shown and discussed.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

A Fatal Case of Diverticulitis.

A meeting of this Section was held on Nov. 29th, Mr. R. Atkinson Stoney, the President, in the chair.

Sir William Wheeler described the clinical course of a fatal case of diverticulitis which perforated into the free peritoneal cavity. The patient, a man aged 44, had previously been healthy. Half an hour after a dose of salts, when his bowels had acted, he developed an excruciating pain in the left iliac fossa. He was seen within an hour, and the signs and symptoms were then exactly similar to a recent perforation of the duodenum or stomach, except that all were in the left iliac fossa. There was no difficulty in diagnosis, notwithstanding the absence of history. No left-sided appendicitis could have developed with such dramatic suddenness. The bowels had acted well. There was no distension, and the picture was one of inflammation and not of obstruction. Within three hours the abdomen was opened to the left of the middle line below the umbilicus. The pelvic colon was found loose (exceptional in diverticulitis) and the perforation was dealt with by leaving the loop of colon outside the abdomen. Subsequent resection by the Mikulicz method was contemplated. The cæcum was drained. The following day ominous black vomiting became almost continuous. Lavage only produced temporary relief. A high jejunostomy was performed under gas-oxygen and local anæsthesia, but here again the loop failed to drain. Enemata were introduced by a catheter through a stab in the extruded colon, but no evacuation resulted. Vomiting continued. The patient was induced to swallow a duodenal tube, and by means of this a total of three pints of orange-coloured material was aspirated in 12 hours. At first the patient's condition improved considerably following aspiration, but later there were signs of starvation from the loss of duodenal contents. A somewhat similar case published by D. P. D. Wilkie was quoted. Sir William Wheeler pointed out that in persistent high obstruction the surgeon was faced with a dilemma. On the one hand the duodenal contents were extremely toxic, on the other loss of these contents for any prolonged period produced a physiological death. He had adopted Wilkie's plan in a modified form. The fluids aspirated from the duodenum were immediately injected through the jejunostomy. Following this procedure, drainage commenced through the cæcal tube. Peptonised milk, panopepton, and other foods also were given through the jejunostomy. On the fifth day the patient announced that he felt at last he was going to recover. This improvement lasted for six hours, but a relapse followed. Regurgitation recurred, and the patient died. Twelve pints of 10 per cent. glucose solution combined with insulin were administered intravenously during the five days. Continuous saline was given by the drop method into each axilla. During the first three days the patient appeared to be in a condition of alkalosis and some tetanic spasm was noticed. Administration of calcium and increased quantities of chlorides together with glucose proved effectual. Towards the end, air-hunger, combined with diacetic acid and acetone in the urine, indicated acidosis. During the six hours in which recovery seemed likely the material drained from the cæcum contained bile. The bile was not mingled with the other contents but came away separately. Sir William Wheeler had noticed in some cases of chronic pancreatitis the bile did not mingle with the characteristic clay-coloured stools. There was evidence in the case described of insufficiency of both liver and pancreas.

Discussion.

The President referred to the fact that the cæcum had been brought out through the main incision; if a separate opening had been made on the opposite side, the cæcum might perhaps have drained itself and prevented the high obstruction.

Mr. A. Chance was inclined to think that the vomiting was not mechanical but toxic, and suggested that the whole condition might have been toxic.

Mr. H. Stokes wanted to be clear that there really was a diverticulum. He had come across many cases of perforation of the large intestine without diverticula. It was fatal to put tubes into dilated gut for drainage purposes.

Mr. F. J. Henry said that free perforating diverticulitis was a great rarity. In the only case in his experience there was no difficulty in closing the perforation and the patient recovered fairly easily.

Reply.

In reply, Sir William Wheeler said that the cæcum was loose and it was possible to perform cæcostomy through the primary incision. He believed that the obstruction which followed septic peritonitis was usually mechanical. Loose adhesions between loops were the cause of obstruction. The loop of bowel was removed after death, and the perforation of one of many diverticulæ demonstrated.

Mr. Oliver Chance read a paper on Some Experiences in an English Radium Clinic.

PAN-PACIFIC SURGICAL CONGRESS, HONOLULU.

(From our Australian Correspondent.)

Representatives of all the principal races bordering on the Pacific attended the Pan-Pacific Surgical Congress at Honolulu from August 14th to 23rd last.

A Honolulu Hospital.

The 13 delegates from Australia and New Zealand reached Honolulu four days before the Conference, and had a chance of studying the wonderful Queen's Hospital, built by public subscription, and containing 280 beds. It is under the directorship of Dr. Nils Larsen, a Swede of great ability and organising power, and it has reached a high level of efficiency.

Ninety-eight per cent. of the income comes from patients; the city and county pay for indigent persons who have been resident for more than five years, and there are 30 endowed beds for waifs and strays. Ward patients pay 10*s.* a day. Private wards are from £2 a day. The meals are brought to each patient, even in the ward, on a tray with a linen cloth and a vase containing one flower to give a home-like touch. The name of each patient is on a card on the treaty, and these cards are of different colours according to the diet, so that the sister in charge can see at once that no mistake has been made. The lighting of the wards at night is from a diffused dull electric light in the floor, which cannot be seen by the patient, but is sufficient to guide the sister to the different beds.

There are five resident medical officers in the hospital, and every man in the city who is a member of the medical society is entitled to send in patients under his own care. This, of course, complicates the work, and does not make for the most expert treatment of the patient; but the disadvantage has been countered to a certain extent by the director, who has instituted weekly meetings of all those entitled to send in patients. At these meetings every week any untoward event is brought up for discussion and criticism. The name of the medical man is suppressed, but, of course, is known to most of those present. The criticism is unsparing, and even if the responsible doctor has not attended the meeting he is very soon informed of it by his colleagues in the town. Another feature of this hospital is that director, residents, and nurses are regarded as one unit, having but one object in view. Thus when lunch was given to some of the selected delegates it was attended by all those members of the staff who could be spared, including nurses.

Hospital Standardisation.

An afternoon was devoted to a discussion on hospital standardisation which was illustrated by exhibits, including a model of the new King County Hospital of Seattle, which is considered the most modern hospital supported by charity. Another exhibit showed the standardisation of sponges used at operation. This subject was investigated throughout America, and it was found that the different varieties in use numbered over two hundred. These were standardised and seven varieties only are now recommended. Dressings have been dealt with in the same way.

Prof. O. JEFF MILLER (New Orleans) said that in the 12 years since hospital standardisation began in America it had spread into every branch of hospital work. Its annual survey included 3000 hospitals, of which nearly 2000 were on the approved list.—Dr. M. T. MACEACHERN explained hospital standardisation:—

It is a movement, he said, which has been carried on by the American College of Surgeons during the past 12 years with the object of providing better service to the patient. An annual survey of all hospitals of 25 beds and *over is carried out. The rating of each hospital is based on* what is known as the minimum requirements, of which the fundamental principles are: a properly organised medical staff; regular conferences for review and analysis of the clinical work; accurate and complete case records; and adequate laboratory and X ray facilities under competent supervision. This movement has done much to reduce the average stay of patients and mortality-rates in hospitals.

Surgery of the Alimentary Tract.

Prof. MILLER emphasised the need for early diagnosis and rapid operation in cases of intestinal obstruction. "This was a condition," he said, "in which the lowest mortality is achieved, not by the conservative surgeons, who operate only on definite diagnoses and for whom, ordinarily and properly, we have only praise, but by that other group of enthusiasts, whose resort to the knife is immediate, and for whom, ordinarily and properly, we have only condemnation. Their craftsmanship may be dubious, their surgical judgment is unquestionably dubious, but in this one contingency at least we should do well to emulate them, for they lose the fewest patients from this deadly disease." He outlined the medical *and surgical treatment in detail, and stated "that* the mortality rises approximately 1 per cent. with each hour of procrastination, and any mortality over 10 or 12 per cent. can be charged only to delay. The death-rate, which is popularly quoted as 30 or 40 per cent., actually is 55 or 65 per cent., and we are only stultifying ourselves when we refuse to face the true figures."

Prof. J. R. B. BRANCH (Shanghai), in a communication on the surgical treatment of intestinal tuberculosis, said that pictures after a barium meal showed two striking things—hypermotility due to ulceration, and filling defect in the cæcum and ascending colon, which might be due to hypermotility or actual *stenosis. Surgery was clearly desirable in some* borderline cases, in cases with stenosis, and in those which had resisted thorough medical treatment.

Dr. A. O. LOE (Seattle), speaking on acute perforation of peptic ulcers, pointed out that early diagnosis and operation were imperative. The mortality-rate was directly proportional to the time intervening between perforation and operation. Simple suture was a safe routine. Resection and suture might require secondary operation later, owing to obstructive symptoms or disturbed physiological action. Resection with Finney or Horsley pyloroplasty was the more ideal operation in early cases, *relieving symptoms and producing more normal* physiological relations between stomach and duodenum. The mortality-rate was low. Resection and gastro-enterostomy was indicated only in cases of large calloused ulcers and immobility of the duodenum.

Dr. HORACE J. WHITACRE (Tacoma, Washington), in a paper on duodenal surgery, said that loss of appetite, nausea and vomiting, dizziness, general malaise, and a great variety of vague abdominal symptoms were duodenal in origin. Duodenal adhesions secondary to cholecystitis, duodenal ulcer, duodenitis, and other abdominal conditions could and did cause these symptoms. "I now," he said, "look upon duodenal mobility and an unhampered duodenum as an objective, which, from the viewpoint of a complete cure, outweighs in importance the removal of the gall-bladder in a case of cholecystitis with adhesions." He described a peritoneal plastic operation which would restore free peristaltic mobility to the duodenum and which would cure the symptoms.

Goitre.

Dr. DAVID C. HALL (Seattle) reported observations on 30,000 students of the University of Washington, and said he had found the incidence of goitre to be high on mountain range slopes and low on plains and Puget Sound islands. Recent years show a marked decrease due to education, iodised salt, and iodine tablets.

Dr. CHARLES L. MIX (Chicago) said that adenomatous goitre could be wiped out by the administration of proper amounts of iodine to all pregnant women; in this respect veterinary surgeons were ahead of physicians. In pure adenoma, the administration of iodine might do harm instead of good. Dr. Mix was emphatic in his belief that any adenoma should be removed surgically as soon as discovered. Goitre of non-toxic type might become toxic at any time, *through abnormal innervation brought on by fright* or a number of other causes.

In goitrous regions one-third of the girls and one-fifth of the boys showed thyroid enlargement. The reason for the excess in girls was that they must store up enough thyroid secretion to last their offspring for a certain length of time. If they were unable to do this owing to an insufficient supply of iodine in food or water, the thyroid gland would enlarge by way of compensation in an effort to increase its secretion by increasing its capacity.

Dr. J. RUSSELL WELLS (New Zealand) stated that he had known a few instances of goitre in Maoris, but this was in a district where the Maoris had largely adopted the customs of the residents of British origin. He agreed with Dr. Mix that all adenomata should be removed.

Dr. R. E. MCKENCHIE (Vancouver) maintained that an ultramicroscopic organism is the probable *cause of goitre, while absence of iodine makes people* vulnerable to invasion by the organism.

The Lungs and Bronchi.

In a symposium on bronchoscopy and thoracic surgery, Dr. EMIL HOLMAN (Stanford University, California) read a paper on post-operative intrapulmonary abscesses. "An analytical study of 1908 cases of pulmonary abscess shows," he said, "that 29·6 per cent. followed some operation, and more than half of these followed tonsillectomy. The available experimental evidence corroborates clinical impressions that intrapulmonary suppuration may be produced both by the intrabronchial and intravascular routes. There is no experimental evidence to support the theory that the lymphatic system is a factor in the production of intrapulmonary suppuration."

Dr. **Leo Eloesser** (Stanford University) spoke on chronic bronchial stenosis. Whilst tracheal stenosis and acute bronchial stenosis (foreign bodies and massive collapse) had been closely studied, not enough attention, he thought, had been paid to the chronic condition. The causes were sometimes congenital and sometimes took the form of compression due to tumours, inflammatory processes, or foreign bodies. He uttered a warning against the use of iodides, and spoke of the danger of placing the patient on his sound side in the hope of draining secretions from the affected side.

"Stenosis is important," he concluded, "not only in theory but in practice. There is much to be done for it. There is also reason to suspect that bronchial stenosis is more frequent than has been supposed, and that it has been responsible for more pulmonary damage than has been cast to its account. I am convinced that lipiodol, the bronchoscope, and familiarity with these pictures will make bronchial stenosis a common disease."

Dr. **E. D. Roberts** (Honolulu), in a paper on iodised solutions as aids in X ray diagnosis, discussed the various methods of combining iodine with oleaginous and other subjects, and described some original experiments. He had first tried corn oil as a base for the solution, but now exclusively used "kukui" oil, a Hawaiian product. This oil had proved very satisfactory and was inexpensive.

Diseases of the Eye.

Dr. **Lloyd Mills** (Los Angeles) presented a cinema film illustrating the prevention of complications in the surgery of cataract. The modern preparation for the operation, he said, had largely eliminated many of the former difficulties. Vitreous prolapse, which resulted more from the patient's sudden reaction to unexpected pain than from heavy-handed surgery or predisposing ocular disease, had been reduced by adequate mental preparation for operation, perfect anæsthesia, and full suture of the wound. The use of a full conjunctival flap and its complete suture was applicable to any form of cataract extraction, save that with corneal incision. The difference between the final results of intracapsular and extracapsular operations in the hands of equally experienced surgeons who used full closure of the wound by flap and suture should depend solely upon the reaction of the eyes to retain lens substance.

Sir **James Barrett** (Melbourne) read a paper on visual standards for mariners and railway officers. In men of the first class, he said, the initial vision should be 6/6 in each eye, with normal eyes and colour vision and an error of refraction not exceeding 1 dioptre, including 0·5 of astigmatism, with a little flexibility as regards the error of refraction. For less responsible positions a larger error of refraction could be permitted if there was no eye disease. The vision of all those concerned in a railway or marine accident should be re-examined before they were allowed to resume duty.

Leprosy.

Dr. **Forrest J. Pinkerton** (Honolulu), reviewing 700 cases illustrating the surgery of the leprous eye, said that early surgery upon the lid in orbicular paralysis was imperative and should be done before corneal changes have begun. In iritis early medical treatment was essential. Novocain infiltration was the operation of choice for all surgical procedures on the leprous eye.

A demonstration of clinical leprosy was given at Kalihi Receiving Station.

A rural community has been established on a peninsula of the island of Molokai, in which the inhabitants live without restriction and enjoy all the privileges of an ordinary community. They may even marry one similarly afflicted, but children are removed from the settlement immediately after their birth. To this settlement are sent lepers, whose progress towards convalescence is slow or have become a burden to their friends, but before being sent there every individual is legally entitled to remain for six months at the Kalihi Hospital, which acts as the receiving station for the territory. Here they may be examined by three physicians: one selected by the Board of Health, one by the patient, and the third selected by the former two; or they may elect to accept the diagnosis and recommendations of the physicians in attendance at the hospital. Provisions are made for subsequent examinations in cases of doubt. *No children under 15 years of age are transferred to the* Settlement except at the wish of their parents.

Dr. **J. T. Wayson** said that since leprosy was first introduced into Hawaii it had spread rapidly. Fifty years ago there were two known cases to every hundred of the people. Since 1890 the annual number of admissions had continuously though slowly fallen.

Neuro-surgery.

Dr. **George W. Swift** (Seattle) gave an address on the dural venous sinuses and choked discs. He upheld the view that choked disc was mechanical in origin and caused by a damming of the venous blood, resulting directly or indirectly from pressure upon the cavernous and petrosal sinuses.

Dr. **Steele Stewart** (Los Angeles) presented a paper illustrated by cinematograph on a possible explanation for the effects observed following ramisection in cortical rigidity. He suggested that they were due to a segmental vasodilatation of the vessels of the cord, resulting in a lessened irritability of the anterior horn cells.

Dr. **E. B. Towne** (San Francisco) and Dr. **Makoto Saito** (Japan) read papers on radiographic localisation of cerebral tumours, and the latter showed a film demonstrating the technique of a fascial transplant from the thigh to replace adherent dura, excised in a patient suffering from traumatic epilepsy. For demonstration of the arteries of the brain he had, he said, discarded the sodium bromide recommended by Moniz and used an emulsion of lipiodol. The emulsion was injected through the superior thyroid artery after a temporary clamp had been put on the common carotid and external carotid arteries. The size of the droplets of the emulsion used was larger than a red blood corpuscle, but smaller than a white blood corpuscle. This method had been used in 40 instances without any untoward result.

Prof. **W. A. Osborne** (Melbourne) delivered an address on the surgical applications of recent advances in physiology. Dealing first with anæsthesia, he said that doses of atropine should be on the low side, since the absence of secretion removed a natural protection. Speaking of the so-called nerve patterns he maintained that "tendon transplantation is physiologically a far sounder procedure than any form of nerve implantation or nerve graft." Later in his paper he said: "The alimentary canal has duplicate chemical plant, but has only one tube for transport. Disorders of digestion are disorders of motility. Let the surgeon therefore satisfy himself about the motility, and let the chemistry look after itself."

Cancer.

Opening a symposium on cancer, Dr. **Edwin I. Bartlett** (San Francisco) pointed out that in cancer of the breast the earlier and smaller and more hopeful the lesion the more thoroughly should the operation be performed.

Mr. **Frederick L. Hoffmann** thought that in general cancer statistics were of little practical value. Most cancer discussions concerned cancer deaths and their relative incidence to a given population, often only roughly estimated. The calculation of specific death-rates by sex and for different age-periods involved a knowledge of data often out of reach. Hence the extreme urgency that it should be understood that most statistical conclusions were only a rough approximation to the truth. The questionaire method of research, while very useful, had endless fallacies.—At another meeting Mr. Hoffmann gave a detailed analysis of the cancer mortality records of

Hawaii for the five years ending June, 1928. The general cancer death-rate is low as compared with the United States registration area. The most outstanding feature of the analysis is the extreme rarity of cancer of the breast in Japanese women.

Out of 125 Japanese females dying from cancer during the five years under review, not a single death was attributed to cancer of the breast. For Chinese women, however, the proportion dying from cancer of the breast was 16·7 per cent. This compares with 6·1 per cent. for all races, 6·9 per cent. for Hawaiians, 8·0 per cent. for Caucasians. Unfortunately, for many of the races, the numbers are too small for a generalisation.

Amœbiasis.

Dr. Y. S. **Lee** (Korea) reviewed 200 cases of amœbic liver abscess treated at the Severance Hospital since 1912. The first 100 were treated by open operation; of the second 100, 27 were treated by operation and 73 by aspiration. Ludlow, in 1920, had reported 160 of these cases.

In discussing the predisposing causes he stated that climate would appear to have a definite rôle in producing liver abscesses in those who were not accustomed to tropical conditions. The incidence in the native army in India was 0·6 per cent., whilst in the European army it was 7·4 per cent. Whilst in India white people would appear to be predisposed to the condition, in Korea the figures showed just the opposite. Race in itself seemed to be an unimportant factor. The disease was much more frequent in males, but 19 females were affected in the 200 cases; of this there was no explanation. The use of alcohol appeared to be an important predisposing cause to liver abscess.

Indigestion was a constant symptom and was sooner or later followed by pain in the right lower chest or hypochondrium, attended in most cases with fever, sweating, and chills. A sign of the utmost importance was deep-seated pain in the region of the abscess elicited by a sudden thrust with the end of the finger. This was important not only for diagnosis, but is a guide for the insertion of the aspirating needle. Enlargement of the liver and bulging of the intercostal spaces occurred during the chronic stage, and when the abscess formed near the surface it may rupture into the abdominal cavity, pleural cavity, lung, abdominal wall, and, more rarely, into one of the adjacent hollow viscera.

In treatment, the early and energetic treatment of amœbic dysentery with emetine and the prohibition of alcoholic drinks was almost specific. In the early or presuppurative stage emetine alone was usually sufficient for a cure; when pus had formed aspiration of the abscess with subcutaneous injections of emetine was the method of choice. Aspiration should, as a rule, be repeated in from five to ten days. Open operation had been abandoned except for cases of mixed infection or sinus formation.

Surgical aspects of the treatment of bubonic plague were dealt with by Dr. **Wu Lien Teh** (China), and Dr. **Teishin Seo** (Japan) read a report on the results of splenectomy for the splenomegaly due to chronic schistosoma infection, which is endemic in various districts of Japan. He also demonstrated specimens of mycotic splenomegaly.

Medical Education in China.

Dr. F. C. **Yen** (Shanghai) said that great strides had been made in medicine, public health, and sanitation since the formation of the Nationalist Government in China. Work was unified under the Ministry of Health, and rules are being drafted for licensing medical practitioners. A national midwifery board had set up a standard for the practice of midwifery, and has just opened its first training school. A big modern hospital had been established in Shanghai for treatment, research, and the training of students and nurses; it was to be dedicated to the memory of a medical man, "who unified China and conferred great blessings on her 400,000,000 people—Dr. Sun Yat Sen." In China there were 24 medical colleges; 11 were Chinese, 7 were controlled by missionaries, 2 were under direct foreign control, and the remainder were managed jointly by Chinese and foreigners. The total number of students was 2050, whilst the number of practising physicians is estimated to be 4500. China thus had but one medical school for each 16,000,000 of population, and but one doctor for every 90,000 of population. After praising schools established by missions and by groups of Chinese and foreign citizens, Dr. Yen spoke of the type of medical school in China, which was controlled, conducted, and financed entirely by foreign Governments, as represented by the Medical Department of Hong-Kong University and the Japanese Medical College in South Manchuria.

> "While they have all helped in turning out doctors, yet it raises a very serious question as to whether their contributions are for the ultimate good of the Chinese medical profession. What China needs is a united profession, not one divided up into cliques, engaged in the less profitable work of proselytising British, French, German, American or Japanese medicine."

Anæsthetics.

Dr. **John S. Lundy** (Rochester, Minn.) read a paper on agents and methods used for the induction of anæsthesia in the Mayo Clinic from 1922 to 1928. Local anæsthesia alone or in combination had been employed, he said, in more than half the operations performed. The use of chloroform had been discontinued and had been supplanted by ether. The custom of giving ether by the semi-drop open method was decreasing, but there was an increase in its use through the anæsthetic machine. Dr. Lundy laid stress on the good results obtained with acetylene at the Mayo clinic. "With acetylene," he said, "it has been possible to produce anæsthesia and relaxation, with quiet breathing, without anoxæmia and without the necessity of adding ether." Besides ethylene, there had been an increase in the use of nitrous oxide, ethyl chloride, and carbon dioxide.—In a paper on anæsthesia for operations in the lower part of the abdomen Dr. Lundy said that the choice of anæsthetic was of less importance for the lower than the upper abdomen, but open ether was probably the method of choice. Nitrous oxide and ethylene, especially with ether, was often frequently indicated. It was with operations in this area that spinal anæsthesia found its greatest usefulness. "Surely," he said, "there is no place in anæsthesia for any method to be used as a routine, and with so great a variety of agents and methods at one's disposal there is no acceptable excuse for fitting the patient to the anæsthetic rather than the anæsthetic to the patient."

In the course of a further paper Dr. Lundy referred to the derivatives of barbituric acid, and especially sodium iso-amyl-ethyl-barbituric acid, generally known as amytal. Apart from its other uses, it appeared to be of great value in sea-sickness.

He reported the use of this drug in 1000 surgical and non-surgical conditions. In 617 surgical cases there was little if any delirium, rarely any nausea, and no difficulty with respiration; in the non-surgical cases amytal was used for such purposes as controlling convulsions—e.g., tetanus, hiccup. It was used with carbon dioxide and oxygen in these cases. Amytal was also of value in the treatment of post-operative psychoses and delirium. Following operation after the use of amytal, sleep lasted from 12 to 72 hours. After discussing the disadvantages, which seem to result largely from large doses, he stated that the barbiturates had many practical uses.

Urogenital Surgery.

Mr. S. **Harry Harris** (Sydney) reported that he had performed suprapubic prostatectomy with complete closure in 104 out of 112 consecutive prostatectomies, included in which were 15 two-stage operations. Of the 104, two patients died, one of pneumonia and the other 48 days after operation. Of the 112 cases, post-operative suprapubic drainage was necessary in eight. Complete control of hæmorrhage was accomplished by suture; further, obliteration of the prostatic cavity and reformation of the prostatic urethra was performed. He thought that "the comfort of the convalescence from the patient's point of view, and the simplicity of the nursing, are in marked contra-distinction to that usually experienced after the usual method of suprapubic drainage."

Mr. J. **Jenkins** (Dunedin) read a paper on the diagnosis and treatment of stone in the ureter. He said that after clinical and radiographic examination, investigation should be done under spinal or caudal *anæsthesia.*

After cystoscopy with an indirect cystoscope, this is changed to a direct instrument and a wax-tipped catheter passed along the ureter well lubricated with oil. This is passed beyond the stone, and if possible several catheters are then passed. The wax bulb is now withdrawn until it comes into contact with the calculus. With the stone thus gripped, intermittent elastic traction is applied by fixing a rubber band at one end to the catheters and to the leg at the other end. After two to three days the catheters work down with or without the stone; if without, the process is repeated a week or ten days later. If it is impossible to pass a catheter or bougie beyond the stone, several attempts are made, and, if still unsuccessful, operation is performed. If infection is superadded to obstruction, operation should be performed at the earliest possible moment. One tends to operate early, if the stone is very large, is impacted high up in the ureter, or infection of the kidney is present.

Dr. **ALEXANDER PEACOCK** (Seattle), speaking on the treatment of the neoplasms of the bladder, commented on the growing tendency to regard all neoplasms of the bladder as potentially malignant. Electric coagulation applied through the cystoscope seemed to be the most efficient treatment so far devised.

Fractures.

In a symposium on industrial surgery, Dr. **L. L. GOODNOW** (Washington) pointed out that fracture of the spine and skull were not always treated satisfactorily. In fractured spine all cases which did not clear up quickly should undergo laminectomy; fixation should be done at the same time by inlay graft. Lumbar puncture was indicated if operation was not done. In fractured skull the quantity of fluid removed by lumbar puncture should not be sufficient to reduce the pressure more than one-half at any one puncture. Compound fracture of the skull, as a rule, caused less temporary and permanent disability than the moderate so-called closed fracture. All depressed fractures should be elevated, and decompression should be performed in chronic œdema of the brain and all severe concussions with elevation of intracranial pressure. In another symposium Dr. **L. R. CHANDLER** and Dr. **J. T. WATKINS** (San Francisco) communicated a paper on non-union. This paper was an appreciation of the work of the late John Cowan of San Francisco.

The essentials of Cowan's operation are: to elevate the periosteum for a short distance on either side of the fibrous bond; to remove the fibrous bond; to open up the medullary spaces of the end of the fragments; and to prevent the recurrence of fibrous tissue ingrowth between the fragments. This is done with a portion of rib, split into halves. The thin cortex of rib is rolled up into a band or cut into short segments and inserted under the periosteum, about the ends of the fragments at the fracture line, and the periósteum is closed. The operation has been performed on 47 patients; bony union has occurred in every instance except one.

Dr. **EVERETT O. JONES** and Dr. **H. T. BUCKNER** (Seattle) presented a paper on fractures of the pelvis. These fell into three main groups: fractures of the wing of the ilium, of the acetabulum, and of the pelvic ring. The authors of the paper said their practice was to put up fractures involving the acetabulum in a Whitman cast as for fracture of the neck of the femur. Fractures of the pelvic ring were treated in a double plastic spica for three months, except where there was upward displacement of one-half of the pelvis—when skeletal traction was applied to the femur—and in upward displacement with lateral spreading, caused by separation of the symphysis, in which a special method of suspension is used. Non-union of a pelvic bone was almost unknown, but failure of the symphysis to unite was very common, and a disrupted sacro-iliac articulation never became normal again. The paper was based on 40 personal cases, and the records of 312 cases. The mortality-rate (15 per cent.) was not high, but the final results were not "surprisingly good." In their series of cases 41 per cent. were left with some degree of disability ranging from 5 per cent. to total.

The Ear.

Dr. **ROBERT PULLEINE** (Adelaide), in a communication entitled An Insufficiently Considered Factor in Chronic Progressive Hardness of Hearing, said that snoring and blowing the nose, continued over a long period, resulted in gradual impairment of hearing. The primary cause was hereditary spur of the nasal septum, against which treatment should be directed. In the past this form of deafness had shared the bad prognosis of familial deafness, and has often been wrongly treated by routine inflation—the form of treatment most detrimental to it.

Dr. **FRANK A. PLUM** (Honolulu), summarising a paper on meningitis of otitic origin, said that delay was often caused by a diagnosis of meningism. Diagnosis must not wait upon appearance of a turbid fluid containing organisms, for the only chance of success depended on operation, which entailed removal of the focus of infection and drainage of the subarachnoid according to the route of infection. A careful bacteriological examination should be made of every mastoid operated on, and in pneumococcal and streptococcal infection the immediate use of serum was desirable. In diffuse cases, drainage, intracranial lavage, cerebral, cisternal and spinal, and Kolmer's intra-arterial medications are indicated.

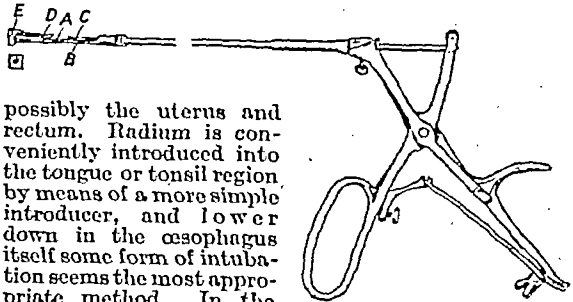
Dr. **A. T. WANAMAKER** (Seattle), in the course of an address on lateral sinus thrombosis, said that the Queckenstedt test was useful in diagnosing a mural clot, an obliterating clot, and narrow or absent lateral sinus on the non-infected side. A portion of the lateral sinus plate should be removed in all cases of mastoiditis with septic temperature. Experimental work on dogs had shown the value of not severing the jugular vein.

At the close of the Congress it was decided to hold a Pan-Pacific Surgical Conference at Honolulu every three years, the next to meet in 1932. Dr. George W. Swift was elected first President, Dr. Nils P. Larsen Vice-President, and Dr. F. J. Pinkerton Secretary.

New Inventions.

RADIUM-NEEDLE INTRODUCER.

I HAVE had constructed a radium-needle introducer for use in the less accessible parts of the pharynx (epiglottis, pyriform fossæ) and possibly the uterus and rectum. Radium is conveniently introduced into the tongue or tonsil region by means of a more simple introducer, and lower down in the œsophagus itself some form of intubation seems the most appropriate method. In the middle region of the lower pharynx, however, I have felt the need of an instrument which can be used through a direct laryngoscope, and the one shown in the illustration has proved slender enough for this purpose. Moreover, it affords a very accurate aim. The silk-threaded needle lies in the groove A in the shaft B, held down by a spring D and is propelled by a movable bar C through a countersunk opening in the square-ended, rough-surfaced foot-piece E which is held firmly on to the surface of the growth, all movements being slow and gentle to avoid damage to the silk thread.

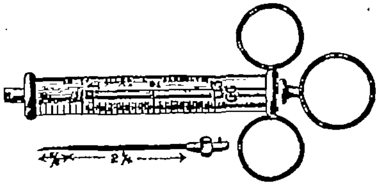


The instrument is made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.

DOUGLAS A. CROW, M.B., Ch.B. Edin.

A SYRINGE AND NEEDLE FOR THE INJECTION OF HÆMORRHOIDS.

HAVING adopted the treatment of internal hæmorrhoids by the high submucous injection of 5 per cent. phenol in vegetable oil, as described by Albright and Blanchard, I have had made a modification of the original Graeme Anderson outfit as shown in the illustration. The syringe holds 3 c.cm and is graduated in tenths of a c.cm. The valuable *bayonet fitting* for the needle is retained which permits immovable attachment of the needle to the syringe. The base of the needle is bored out as wide as possible and a No. 20 standard wire gauge stainless steel needle is now fitted. The total length of the needle has been increased to 3¼ in. The syringe and two needles are fitted into a small case as before. I find that the oily solution, even when cold, flows very readily through this needle with quite light pressure, and the high injection of the solution in adequate doses is rendered easy.

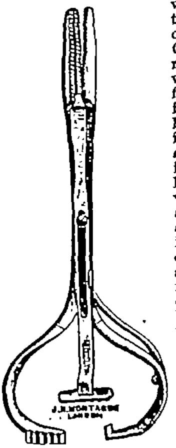


The instrument has been made for me by Messrs. *Allen and* Hanburys, Ltd., 48, Wigmore-street, London, W.

W. B. GABRIEL, M.S., M.B. Lond., F.R.C.S. Eng.

A PROSTATECTOMY INCISING CLAMP.

As is well known, after the actual enucleation of a prostate by Freyer's method a shelf often remains, which if not divided, may lead to partial or even complete occlusion of the vesical outlet. Cutting it with scissors may result in further hæmorrhage, while tearing it with the finger is not only crude but in some cases impossible. I have, therefore, designed the instrument shown in the accompanying illustration. It is about eight inches long, has an outer or handle portion with a self-releasing rack, and an inner portion consisting of a clamp and blade. The inner end for clamping and *cutting the shelf has flat* serrated jaws, each of which is deeply grooved down its centre. When the clamp has been applied the blade is pushed down the grooves to the end of the instrument. In this way the partition is not only divided but thoroughly crushed on each side of the incision, the process taking only a few seconds, and very much minimising the possibility of dangerous bleeding.



The instrument has been neatly and skilfully made for me by Mr. J. H. Montague, of New Bond-street, W.

W. K. IRWIN.

Reviews and Notices of Books.

INTERNAL SECRETIONS OF THE OVARY.

By A. S. PARKES, M.A. Cantab., Ph.D. Manch., D.Sc. Lond., Beit Memorial Research Fellow, Department of Physiology and Biochemistry, University College, London. London: Longmans, Green and Co. 1929. Pp. 241. 21s.

TEN years ago a book written upon the internal secretions of the ovary might have contained as much theoretical discussion, but it could only have included a fraction of the experimental facts which form the basis of Dr. Parkes's monograph. The rapid growth of the subject, to some of whose developments we recently called attention,[1] has not made his task any simpler, but has added greatly to his difficulties. It is easier to review the value of past discoveries than *to assess the importance of contemporary work*; there is always the possibility that some point at present apparently insignificant may suddenly become the centre of the picture. This possibility has recently been illustrated in the inter-relationship between the anterior pituitary and the ovary. As long ago as 1901 A. Fröhlich pointed out the connexion between pituitary disorders and aberration of sexual function, but it was not until 20 years later that the work of H. M. Evans provided a sound experimental foundation upon which B. Zondek and S. Aschheim in Germany, and P. E. Smith and E. T. Engle in America, have built up quite an imposing structure during the last three years. Their labours show that the anterior pituitary hormone, exercising influence on the gonads of both male and female, plays a much more important rôle than was previously supposed. *This is true of its effect on the ovaries* with which aspect of its activities the present volume is alone concerned, quite apart from the great part which the anterior lobe has been shown to play in promoting general bodily growth.

Dr. Parkes has well fulfilled his duties as a contemporary historian, and this in itself is an achievement. But he has done more than this. The value of his book is principally due to the fact that its author is himself in the vanguard of the small army of workers who are actively engaged in research upon these problems, and has thus been able to exercise a wise discrimination in the selection of his subject matter. There are few statements in this book that cannot be proved by direct experiments. Theoretical considerations receive adequate consideration, but Dr. Parkes has them well under control. Essential arguments are stated briefly but clearly, and at each stage the experimental evidence in their support is critically surveyed.

The book starts with a brief account of the morphology of the glands, the reader being referred for a detailed description to special anatomical and histological treatises. A fairly exhaustive survey follows of sexual periodicity and types of œstral cycle in those species of the female mammal in which it has been sufficiently well investigated. This *section is well illustrated, and will be found valuable*, particularly by those who are themselves carrying out experimental work in this subject. The ovary as an organ of internal secretion is then considered generally, in a section which forms an introduction to the more detailed one dealing with the œstrus-producing hormone. This latter occupies some fifty pages of the book and is the best account of this subject available at the present time. No important contribution seems to have been omitted and all are clearly presented as part of a coherent whole—an entirely successful conclusion to what must have been an exceedingly intricate piece of work.

The final sections of the book deal first with the anterior pituitary body and then with the corpus luteum, considered in their relation to the ovary and its function. Both these sections are well done, and the literature here, as elsewhere, is complete up to the end of last year. The final chapter on parturition will be of very general interest. For the selection of the bibliography of some 650 references we have nothing but praise, but this most valuable collection would have been made even more useful if the numbers of the page as well as the year and volume of the various journals had been included. The book is admirably produced and is illustrated by more than fifty excellently chosen photographs.

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[1] THE LANCET, Nov. 23rd, p. 1100.

SURGERY.

Beiträge zur praktischen Chirurgie. By Dr. ALBERT KRECKE. Munich: J. F. Lehmanns. 1929. Pp. 1094. M.12.

THESE reports from Dr. Krecke's private surgical clinic for the years 1923 to 1926 inclusive are well worth reading. The 18 sections deal with almost every branch of general surgery, and many of them make very interesting reading. The author makes no startling new suggestions but he describes clearly his methods of dealing with everyday surgical problems. He reviews critically the results of different treatments and his deductions seem to be based upon sound logic. A valuable feature is an analysis of his failures, which are faithfully described without excuse or extenuation. The reader may not agree with all the author's recommendations and ideas on different surgical problems, but will inevitably ponder these views and consider whether his own need revision. Much that is here written is mere commonplace routine surgery; yet the records are worth the attention of any surgeon, for there are sure to be interspersed here and there interesting clinical facts of which he is unaware.

MOVABLE KIDNEY.

Second edition. By WILLIAM BILLINGTON, M.S., Ch.M., F.R.C.S., Senior Surgeon, Queen's Hospital, Birmingham; Professor of Surgery, University of Birmingham. London: Cassell and Co., Ltd. Pp. 177. 12*s.* 6*d.*

IT is 19 years since the publication of the first edition of this monograph. When it appeared the subject of movable kidney occupied much attention both in this country and abroad, but since then nearly every surgical observer has become convinced that nephropexy is an operation seldom required. Perhaps the pendulum has swung too far in the direction of abstention. Mr. Billington obviously thinks so, for he says "movable kidney may be responsible for seriously lowered efficiency of mind and body and for widespread and persistent functional disturbance." This is a conclusion reached after an experience of operations upon upwards of 1500 patients. The reader may reasonably inquire what increase of surgical knowledge has accrued from this unusual experience of a single operation. He must judge by reading this book. It contains some stimulating suggestions, as when the author attributes the symptoms of movable kidney to imbalance of the sympathetic and parasympathetic systems. "Chronic recurrent over-stimulation of the nervous mechanism whether from constant tugging as in movable kidney, or chemical as in retained products of excretion, produces permanent changes in the nerves and ganglia." Such an explicit statement seems to require some supporting evidence which is not here offered. The author does, however, say definitely that the urine in movable kidney often contains albumin, which disappears after the fixation of the kidneys. A valuable observation is that a large proportion of movable kidneys show some structural change. In the diagnosis of this condition it appears to be a little difficult from objective signs to say when a degree of mobility is abnormal. A pyelographic examination is surely of more importance than Prof. Billington is willing to concede. It does at least show when dilatation is occurring, with consequent changes in the renal substance. Such conditions are really signs of hydronephrosis and not only of simple renal mobility. "A growth of the colon may be easily mistaken for a movable kidney and vice versa," says Prof. Billington; but the symptoms and signs are so different that this must surely be an unusual mistake.

In order to get a true estimate of results the author asked an independent physician to investigate 163 of his 1500 cases. There was "complete success" or "success" in 43 per cent. and improvement in 25 per cent. of this group. The evidence offered is invalidated by the fact that "by far the greater number which constituted groups 1 and 2" (that is "complete success" and "success") "have had appendicectomy as well as kidney fixation." The author does well to emphasise the fact that the operation has no moral value. Indeed he regards it as a further strain upon a mind and body already over-stimulated and exhausted. The last word on this surgical problem has not yet been said.

ON NEPHRITIS.

By A. CECIL ALPORT, M.D. Edin., M.R.C.P. Lond., Assistant to the Director of the Clinical Medical Unit, St. Mary's Hospital, London. With an introduction by Prof. FREDERICK LANGMEAD, M.D., F.R.C.P., Director of the Unit. London: William Heinemann (Medical Books), Ltd. 1929. Pp. 175. 7*s.* 6*d.*

THE student will be somewhat disappointed in this book, after reading the excellent introduction by Prof. Langmead, for Dr. Alport in surveying the inflammation and degeneration of the kidney does not succeed in elucidating the confusion which surrounds their classification. From Chapter VI., dealing with the Degenerative Group or Nephrosis, no very clear conception of what the term "nephrosis" connotes is obtained, and the author makes no mention of the absence of all cardiovascular change in this condition. This is a grave omission, and in the chapter dealing with Subacute Parenchymatous Nephritis Dr. Alport fails to point out the essential distinction between cases of albuminuria and œdema with cardiovascular change and those in which such change is absent. The failure would be more understandable if these chapters were not enlarged by the inclusion of copious references to recent literature. In the chapter dealing with Chronic Interstitial Nephritis it is hard to reconcile the inclusion of many recent references with the omission of all reference to the classical work of Gull and Sutton, who many years ago laid down accurately the pathology of the majority of cases included in this book. The chapters devoted to biochemistry are not up to a standard which would be favourably received by expert laboratory workers; for example, the description of methods for the estimation of the nitrogenous constituents of the blood contain no reference to the classical methods of Folin and Wu. We are well aware of the difficulties surrounding the subject, but hold that the exposition of modern ideas of classification is only profitable if the essential differences between the old and the new conceptions are made clear.

Dr. Alport's survey contains much interesting material, but he has not given a clear picture of nephritis as distinct from nephrosis.

DIETETICS.

Chemistry of Food and Nutrition. Third edition. By HENRY C. SHERMAN, Ph.D., Sc.D. Mitchell Professor of Chemistry, Columbia University. London: Macmillan and Co., Ltd. Pp. xii. + 636. 12*s.* 6*d.*

The progress of the science of nutrition in recent years has necessitated the frequent revision of textbooks. Prof. Sherman's book has been almost completely rewritten and now includes several new chapters as well as considerable additions to the valuable lists of references which are appended to each chapter. This work is not a treatise dealing merely with the chemical composition of food and the mode of utilisation of foodstuffs in the animal body, but is a clear and connected account of the physiological principles concerned in the normal nutrition of mankind. It is intended primarily for those who are making a special study of nutrition, although it can be recommended also for those who are interested in a more general way in modern conceptions of the relation between diet and health. As an illustration of the difficulty of keeping a text-book up to date it may be noted that no mention is made of ergosterol as the precursor of the antirachitic vitamin, and the water-soluble vitamin B complex is still dealt with as a single entity.

A Laboratory Handbook for Dietetics. Third edition. By MARY SWARTZ ROSE, Ph.D., Professor of Nutrition, Teachers College, Columbia University. Same publishers. 1929. Pp. 269. 12*s.* 6*d.*

A handbook written by Prof. Mary Swartz Rose consists essentially of tables indicating the average chemical constitution of common foods in respect of well recognized constituents such as protein, fat, carbohydrate, calcium, phosphorus, and iron. The tables are preceded by instructions on how to use them to devise diets containing the required amounts of any of these constituents, together with the requisite energy values. The tables are designed so that all unnecessary calculations can be avoided, hence the amounts of the various food constituents are given not merely as a percentage of the raw or cooked food, but as the actual amount present in one gramme, one ounce, one pound, and one portion furnishing 100 calories of energy. The book has already proved of value to those engaged in constructing diets either for individual hospital patients or for healthy inmates of institutions. It should not be forgotten, in using a reference book of this kind, that even the most elaborate calculations of the dietetic needs of an individual are liable to many sources of error. In the first place the interpretation of the results of chemical analyses is not always a simple matter. For example, recent work done in this country on the carbohydrate content of fruits and vegetables makes it clear that considerably larger amounts of such foods may often be allowed to diabetic patients than would be calculated from the food analysis tables included here. Again, it is assumed in certain of the tables that we have a working knowledge of man's daily average requirements of mineral salts such as calcium, iron, and phosphorus. But on the contrary the body's needs for these substances vary enormously with other factors in the diet or environment, and it is clear that the giving of an accurately calculated quantity of each mineral element may not itself necessarily secure the desired physiological result. These criticisms do not affect the main usefulness of the book, which will enable diets of any particular character to be designed with the minimum amount of labour.

CHEMISTRY AND BACTERIOLOGY OF PUBLIC HEALTH.

By C. L. DUNN, C.I.E., D.P.H. Lond., Director of Public Health, United Provinces of Agra and Oudh; and D. D. PANDYA, D.P.H. Camb., Professor of State Medicine, University of Lucknow. Calcutta: Butterworth and Co. (India), Ltd. 1929. Pp. 412. 12*s.* 6*d.*

THIS is a publication primarily intended for students in India who are preparing for the Part I. Course of the Diploma in Public Health, and is a companion volume to an earlier work by the same authors entitled "Indian Hygiene and Public Health." Its scope is a wide one, embracing public health chemistry, bacteriology, and parasitology, and in the small compass of some 400 pages the student will find that most of the essential subject matter has been dealt with.

In the chemical section the practical tests are well chosen. A valuable section is that devoted to Indian milk products and substitutes. There is only a brief reference to British regulations for preservatives in foods, or to methods of estimation, and no mention is made of Royal Commission Standards for Sewage Effluents, or of the theory of action of natural waters upon lead. The small quantities recommended for some tests for water and the high dilutions for its bacteriological examination are no doubt connected with the low degree of purity commonly found in Indian water-supplies. Details of technique are not always correct, and this applies both to chemical and bacteriological sections. For example, phenolphthalein is recommended in the standardisation of sulphuric acid with sodium carbonate, and, again, methyl orange for acidity of waters, ignoring carbonic acid. In Winkler's method for dissolved oxygen a serious error would be introduced by the exposure in pouring before acidification; and it is stated that all vegetable oils have a clarifying temperature (Valenta test) above 80° C., and that the silver nitrate precipitate with CO_2 is insoluble in nitric acid.

In the bacteriological section, also, there are several misleading statements. For instance, the spore *B. anthracis* is contrasted with that of *B. tetani*, and only the former is termed an endospore. Such misstatements as those made on p. 249, giving the temperature range for cultures of *B. typhosus* as 40° C. to 46° C., and on p. 261, where for preventive inoculation a dose of "500 to 1000 units of *toxin* is advised," require correction. The discussion of agglutination in diagnosis is inadequate; such important points as the inhibition zone, variation in the agglutinability of suspensions, and delay in the appearance of agglutinins are not mentioned. In the description of typhoid agglutinations the series of diagnostic titres given show that the authors do not appreciate Dreyer's method, although they give it in detail. References to food poisoning and other pathogenic organisms in food, and to methods of isolation, are too brief. Four chapters are devoted to spirochæta, protozoa, animal parasites and hosts, and these contain much useful information, with classification of these organisms, and a detailed study of mosquitoes. The work suffers from the lack of illustrations which are really necessary for the study of all branches of hygiene.

It will be clear that the work can only be recommended as a text-book, where it is supplemented by practical laboratory instruction under capable teachers, so that defects in the descriptions and in the technique prescribed may be corrected verbally.

TUBERCULOSIS.

Laboratory Diagnosis and Experimental Methods in Tuberculosis. By HENRY STUART WILLIS, The Johns Hopkins University and Hospital. London: Baillière, Tindall and Cox. Pp. 330. 16*s.*

THIS is primarily a book on the laboratory diagnosis of tuberculosis, but since it is written from a very wide angle the reader is given a good understanding of the rationale of the methods adopted. Furthermore, Dr Willis has been generous in his interpretation of the term laboratory diagnosis, so that much information is included, notably in Part 3, on tuberculin, which is not supplied in ordinary laboratory text-books. The book is divided into five sections. The first gives a general description of the various secretions and excretions which must be examined in the study of tuberculosis. The second deals with bacteriological diagnosis and includes the well-known staining reactions for the tubercle bacillus, concentration methods, animal inoculation, culture media, and so forth. It also contains two chapters worthy of special comment. One forms a useful summary of the three main types of tubercle bacilli with their characteristics and includes a suggestive section on the probable basis of acid fastness; the other is concerned with the non-pathogenic acid-fast bacteria, which are too often tactfully ignored in laboratory manuals. The third part of the book is devoted to tuberculin, its preparation and its diagnostic application to tuberculosis. A welcome chapter describes the standardisation of tuberculin. The fourth part is devoted to the serological diagnosis of tuberculosis, and here a full description is given of the tuberculo-complement-fixation test. The other serological tests are described very briefly, rather less than four pages being devoted to them all, including the sedimentation-rate test. The reason that the author has not considered it worth while to give more space to their consideration is clear from his comment that, although certain of these tests are of value in prognosis, none is dependable for diagnosis. Perhaps nothing more damning could be said about them. The fifth part deals with histological technique; the whole process is traced from the technique of handling and fixing tissues to the various staining methods, and the types of stains suitable for different tissues are described. This part of the book also includes a careful account of the methods of animal inoculation for tuberculosis, together with a description of experimental tuberculosis as induced in various animals.

Numerous diagrams and illustrations of laboratory apparatus add to the value of this work, which supplies an equipment list for a tuberculosis laboratory compiled from the inventory of the laboratory of the Kenneth Dows Tuberculosis Research Fund. An adequate bibliography is appended.

THE ESSENTIALS OF HISTOLOGY.

Twelfth edition. By Sir EDWARD SHARPEY SCHAFER, F.R.S., Professor of Physiology at the University of Edinburgh. With the coöperation of H. M. CARLETON, Ph.D., Lecturer in Histology in the University of Oxford. London: Longmans, Green and Co. 1929. Pp. 628. 15*s*.

THIS most familiar of medical school text-books has again been exhaustively revised and brought up to date. Practically every section has received detailed attention in the process. The section on blood has been recast and much extended, and the appendix on histological methods thoroughly modernised. Many excellent new illustrations have been added, while few of the old ones have been discarded, so that the book is even more liberally illustrated than ever. Indeed, this liberality is carried almost to a danger-point, in that the authors have permitted the retention of some of the old figures which are hardly up to modern standards of photomicrography, and fall notably below the general high standard of the book as a whole.

One point arises out of the teaching matter, and this touches the question of the identity of the "proximal" renal tubule. Schafer remains a steadfast supporter of the claims of the second convoluted tubule to the title, while a large body of teachers now favour the first convoluted tubule. This is one of the questions which medicine has so far failed to solve.

DENTAL ANATOMY.

A Graphic Presentation of Tooth Forms with an Original Technique for their Reproduction. By M. DIAMOND, D.D.S. Associate Professor of Dentistry, Columbia University Dental School. New York: Macmillan Company. 1929. Pp. 300. 21*s*.

IN America the investigation of tooth forms has been developed in considerable detail, and the training of the student in many dental schools comprises the reproduction of the teeth in wax or other material. This book provides a detailed study of the naked-eye anatomy of the teeth which corresponds to the descriptions in text-books on osteology of every mark on the skeletal bones. There is no doubt that the macroscopic anatomy of the teeth is important, and that the dentist should be thoroughly familiar with the normal structure of the organs which he has to repair or closely to imitate. A book devoted to the subject can scarcely make light reading, and must be used as a laboratory manual rather than a text-book for systematic study. If it is used in conjunction with laboratory exercises in the carving of tooth forms it should prove useful. Presumably it was designed for this purpose, since considerable space is allotted to precise instructions for carving teeth out of blocks of wax. In view of the detailed descriptions of every cusp and fissure on each tooth, it is surprising that the author does not deal fully with the deciduous teeth other than the first deciduous molar. The idea that the deciduous teeth are only a replica in miniature of the permanent ones is widespread, but in many points their anatomy differs, and the five pages devoted to the deciduous dentition are inadequate. The value of conservative treatment of the deciduous tooth is now firmly established, and a detailed knowledge of their anatomy is therefore necessary. We trust that this defect in a useful book will be remedied in future editions.

INFANT WELFARE.

The Infant and Young Child. Second edition. By JOHN LOVETT MORSE, A.M., M.D., EDWIN T. WYMAN, M.D., and LEWIS WEBB HILL, M.D. London and Philadelphia: W. B. Saunders Company, 1929. Pp. 220. 9*s*.

THE intelligent public now demands authoritative and up-to-date information about its health and more especially about the health of its children. This book, by three well-known members of the staff of Harvard Medical School, should be popular, for it is well written, up to date, and thoroughly sound. In this new edition the sections on rickets and ultraviolet light have especially been revised and rewritten because in the authors' opinion there exists a great deal of misinformation about these subjects. New sections have been included on whole milk modifications, green vegetables, poor appetite, and sunshine. In many details the book is excellent and the authors are to be congratulated on their courage in including a small but wise section on the religious education of children.

OUTLINES OF ZOOLOGY.

Eighth edition. By J. ARTHUR THOMSON, M.A., M.D., Regius Professor of Natural History in the University of Aberdeen. London: Humphrey Milford, Oxford University Press. 1929. Pp. 972. 21*s*.

THIS excellent manual for students of zoology has now reached its eighth edition. Numerous original figures have been added, more account has been taken of the physiological aspect of the subject, and more space has been devoted to the structure and development of certain types, such as the Mud-fishes. As a manual for the zoology lecture-room, museum, and laboratory this book has a deservedly high reputation.

The medical and veterinary student will find the chapter on physiology valuable as a preparatory study for his future work. The chapters on morphology and embryology are presented in a readable style. Throughout the book the author links up general with medical zoology. He gives clear accounts of the malaria parasites, the coccidia, trypanosomes, and disease vectors. The details of the process of rumination (page 581) might have been given a little more precisely. We are told (page 220) that "the young fluke makes its way up the bile-duct and its tributaries" to the liver, whereas in fact it burrows its way through the bowel wall and penetrates Glisson's capsule to reach the liver parenchyma. It is this fact which makes the disease so disastrous.

In some places the nomenclature used is not up to date; for example, *Distomum hepaticum* is now generally called *Fasciola hepatica*, and *Eustrongylus* becomes *Dioctophyme*. The volume is well bound, clearly printed, and profusely illustrated.

THE LANCET.

LONDON: SATURDAY, DECEMBER 28, 1929.

AIR-BORNE INFECTION IN PUERPERAL SEPSIS.

In the early days of the antiseptic theories air-borne infection as a factor in the causation of wound infections was given a prominent place; however, it gradually receded into the background and for a time was discarded, though not as whole-heartedly as the carbolic spray designed to counteract its dangers. The possibility that pathogenic organisms might reach the wound surfaces from the air was not entirely banished from the minds of surgeons, and thus, after a long interval, the face-mask was introduced and generally adopted at operations in order to lessen the risk of spray infections from the mouth and respiratory passages of the persons surrounding the patient. The adoption of a mask during the dressing of wounds and attendance on maternity cases has never become general, but in a recent paper on Air-borne Infection in Puerperal Sepsis[1] Dr. Richard Armstrong brings us back to the original Listerian position, and, since the evidence produced is convincing, a wider use of the mask by accoucheurs and nurses should be encouraged. Dr. Armstrong's paper gives clinical data and a scientific basis for air-borne wound infections, and describes three epidemics of puerperal sepsis in two of which full bacteriological examinations were made of patients and their attendants. One of these epidemics took place some years before the other two, and no bacteriological investigations were made, but there was strong evidence that the resident medical officer was a carrier of *Streptococcus pyogenes.* The hospital records showed not only a higher incidence of morbidity during his term of office than in those of his predecessor and successor, but also a lull in the epidemic during his absence on holiday. He had a hæmatoma which suppurated, although the overlying tissues were intact, and, after his hospital appointment was over, developed erysipelas after a facial injury—both strong indications that he was a carrier. Besides these three outbreaks of puerperal infection, a smaller one of erysipelas in a surgical ward was studied by Dr. Armstrong. Here the epidemic was traced to staff nurses responsible for the dressing of wounds, who were found to have streptococcal throat infections.

Dr. Armstrong quotes other spray infections such as the one in the Aberdeen Maternity Hospital described in the ten-year maternal mortality investigation made by Dr. Parlane Kinloch; and the epidemic of puerperal fever in the Sloane Hospital, New York, recorded by Watson and others, both of which support his thesis. From consideration of these, from observation of the origin and spread of other infections, and from animal experiments, he draws the conclusion that the rate of spread in air-borne sepsis is by geometric progression; each carrier infects several persons, and each of these a corresponding number, so that once infection is introduced into a maternity ward, all in it, mothers and attendants alike, become liable to harbour the organism though the maternal placental site is the most susceptible. On admission into an area in which the density of infection is already high, each batch of later and susceptible entrants meets also the increased bacterial virulence that is likely to follow the passage of infection from case to case, and hence the disease tends to assume a more serious form. There appears to be a period of three to five days between infection and the appearance of symptoms, and this incubation period is taken to represent the *passage upwards from vulva to uterine cavity,* probably by the suction of diaphragmatic respiratory movements. Since attendants and patients may both be infected by carriers and yet show no clinical signs of illness, prevention and detection of an air-borne epidemic in its earliest stages may not be easy, but Dr. Armstrong has established a case for special precautions in maternity hospitals and wards. Prevention by the investigation and exclusion of all with sore-throats or other suggestive symptoms, by the wearing of face-masks, and by the early detection and isolation of both patients and attendants in order to lessen spread and the effects of heightened virulence, are clearly necessary precautions, and point to the need of a pathologist with adequate laboratory facilities attached to all institutions which provide maternity beds.

Precautions against air-borne infections must not, however, be allowed to dominate the situation, for, by themselves, they will not succeed in effecting a substantial reduction in the incidence of puerperal sepsis. Dr. Armstrong draws attention to the greater mortality risk in streptococcal infections arising from operative interference and trauma, and quotes the result of a study of 2000 cases delivered in the extern *maternity district of St. Bartholomew's Hospital* where the morbidity-rate amongst the forceps deliveries was found to be increased tenfold. The introduction of infection during parturition is still the most important factor in the production of sepsis, and the avoidance of operative interference and trauma is the measure that will diminish the mortality from puerperal fever.

GOOD FAITH AND REASONABLE CARE.

The Court of Appeal has given an important decision in an action brought against two medical practitioners by a patient whom they had certified under the Lunacy Act. Not only is the decision significant in view of the attempt in Clause 16 of the Mental Treatment Bill to strengthen the protection afforded to the medical profession by Section 330 of the Act of 1890; it is also valuable as evidence of a welcome tendency on the part of His Majesty's judges to interpret the existing law in such a manner as not to deprive the doctor of a useful first line of defence. As the profession well knows, Section 330 declares that a doctor who takes any step in the certification of a lunatic is not to be liable to any civil or criminal proceedings if he has "acted in good faith and with reasonable care." The Section goes on to enact that proceedings may be stayed by the High Court or a Judge thereof if the Court or Judge is "satisfied that there is no reasonable ground for alleging want of good faith or reasonable care." It has never been an easy matter to obtain the aid of the Court under this latter provision. Judges are conscious that they must protect the liberty of the subject and must not lightly intervene between a plaintiff and a jury. The Court of Appeal's recent intervention is the more notable because of the terms used by Lord Justice Scrutton in expressing it.

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[1] St. Bartholomew's Hospital Reports, vol. lxii., p. 169.

Mrs. JANE EASTON, of Lancaster-gate, brought an action against Dr. WILLIAM ALEXANDER POTTS, of Edgbaston, and Dr. A. V. JOHNSON, of Aldridge, claiming damages for alleged negligence on their part in certifying her in 1926. The defendant doctors applied to have the action stayed on the ground that they had acted in good faith and with reasonable care. The Master, before whom the application first came in Chambers, was satisfied of their good faith but did not feel able to say that there was no evidence of a failure to use reasonable care. Mr. Justice FINLAY agreed with the Master. The Court of Appeal has reversed this view and has ruled that the defendants acted with reasonable care and that there was no evidence on which a jury could reasonably find to the contrary. Mrs. EASTON, at the material date, was on a visit to Staffordshire. The friend with whom she was staying took a serious view of her condition and sent for her sister. The sister agreeing, a doctor was called in. One of the first two doctors refused to certify; next day Dr. POTTS and Dr. JOHNSON certified Mrs. EASTON and she was sent to an institution for treatment. Evidence of her mental state can be gathered from the Lord Justice's judgment. She was, it seems, between 48½ and 50 years old. She had suffered from malaria and she admitted she was in a very depressed condition. A belief in hypnotism, telepathy or thought transference is, as the Court observed, no proof of insanity. This patient, however, seems to have had the delusion that people could, by hypnotic influence, have carnal intercourse without touching each other, and that a doctor whom she saw for the first time had in this spiritual fashion criminally assaulted her in London some years earlier. If a woman thought this, said Lord Justice SCRUTTON, no reasonable jury ought to find that she was not reasonably certified. He was also impressed by her belief that everybody had a sort of aura of smell; she had apparently told the doctor that she smelt him through the door; her letters and postcards, too, though the certifying doctors had not seen them at the time, would have been significant evidence to put before a jury.

Protection offered by Section 330 of the Lunacy Act has thus for once proved not less substantial than the medical profession originally believed it to be. There should, however, be no relaxation of the endeavours to obtain a further strengthening of it in the Mental Treatment Bill. The proposed new Clause seeks this object by throwing upon the plaintiff the burden of proving that the certifying doctor acted in bad faith or without reasonable care. Although English law has always insisted that this burden must be discharged by the plaintiff as a general principle, Section 330 of the Lunacy Act is so drafted as to suggest that the defendant doctor cannot avail himself of the statutory protection unless he positively proves his own good faith and reasonable care. The proposed amendment falls a long way short of the security to which the medical profession is entitled, but, for what it is worth it is a welcome instalment. Lord Justice SCRUTTON emphasised the importance of protecting those who, at the invitation of Parliament, fulfil a duty in the interests of the community as well as of the patient. "If any doctor certifying is to be exposed to the cost and danger arising after the event of judgment (by people who did not see the patient at the time) that the patient at that time was not of unsound mind, the only effect and the natural effect would be that no doctor would certify, and that the community, which is to be protected as well as the individual, would be exposed to the risk of having persons of unsound mind wandering about without adequate control to the danger of themselves and possibly to the danger of the community. We have had a series of cases in recent years showing the risks to which doctors are exposed by actions alleging that they have certified improperly either dishonestly or without due care. It is common knowledge that the result of these cases has been that many doctors will not certify at all. They would not run the risk of undertaking the duty Parliament seeks to put upon them." Other judges have used similar language, and Parliament should take note of the warning.

It is, of course, a difficult matter for one judge to say that there is no possible case for a jury when another judge has taken a different view. This difficulty was remarked by Lord Justice VAUGHAN WILLIAMS in 1913, when the Court of Appeal similarly overruled Mr. Justice ROWLATT in Shackleton *v.* Swift. But in the present case Mr. Justice FINLAY relied upon the affidavit of Dr. RISIEN RUSSELL, and Lord Justice SCRUTTON patently did not. Remarking that he intended no reflection upon Dr. RUSSELL in describing him as usually the principal witness for the plaintiff in lunacy cases, the Lord Justice observed that Dr. RUSSELL'S affidavit said nothing whatever about Mrs. EASTON'S case. Dr. RUSSELL had not seen her; he did not say he had seen the other doctor's affidavits; he said in general terms that a thorough physical and mental examination should always be made before certifying in a case of suspected insanity; he detailed an elaborate system of tests which he said should be applied. But, said Lord Justice SCRUTTON, a doctor coming to examine a patient in this way is not employed by the patient, and has no authority to conduct these detailed operations to all of which the patient would strenuously object. On this same point Lord Justice GREER added that if it were intended to lay down a general rule that no medical man can safely sign a certificate without carrying out all these tests enumerated in Dr. RUSSELL'S affidavit, "then I have no hesitation in saying that the affidavit ought not to be accepted by any court which knows anything about the matter." It was ridiculous, he continued, to suppose that a doctor could not without all those tests under any circumstances certify that a person should be placed under control. This common-sense and highly authoritative ruling may act as a corrective which has long been wanted.

CLINICAL RESULTS WITH ŒSTRIN.

THE progress made during the last few years in the study of the hormones of the ovary has recently been described in our columns. A longer survey made by Dr. A. S. PARKES is reviewed on p. 1367 of this issue of THE LANCET. The reason for the rapid advance is the development of methods of biological assay on the one hand, and of preparation and purification on the other, until at the present time it is possible to prepare very potent extracts from ovaries and placenta. To these sources must now be added the urine of pregnant women, a particularly rich source of the hormone. Not all material from these sources is active and it is therefore of the utmost importance that all clinical trials with these extracts of the ovary and placenta should be carried out upon biologically standardised preparations. The most definite and certain property of these extracts is their action upon the ovariectomised animal, particularly the mouse and rat, discovered by ALLEN and DOISY a few years ago. To ascertain whether any particular extract is active and to determine its potency, it is only necessary to observe whether it will restore the sexual cycle in the ovariectomised animal and to discover what dose is necessary to bring about this result. The discredit attached to ovarian therapy in the past was due to ignorance of a reliable method of testing the activity of the preparations employed. Whether the use of standardised preparations will restore faith in this method of treatment depends on clinical results, which are not easy to assess. Mr. WILFRID SHAW[1] in this country and Dr. E. L. SEVRINGHAM and Dr. J. S. EVANS[2] in America have been trying respectively the oily and water-soluble preparations on a group of cases and have published their experiences which are encouraging though not conclusive. This is not surprising, for there is little analogy between the œstrus of the laboratory rodents, coincident as it is with the period of sexual activity, and menstruation in man and the higher primates; the difference is held to be connected at least in part with the functions of the corpus luteum. It is clear that in those patients in whom the deficiency, whilst it may be hormonal, is not primarily one of the œstrus-producing hormone of the ovary no effect can be anticipated. Moreover, the problem of dosage is not yet solved. If the correct dose is proportional to the body-weight, a woman with complete ovarian deficiency will require a dose of some 1500 rat units, an almost impracticable quantity. With the small doses available at present too much must not be expected. The distribution of the dose, however, can be controlled. The preparations used are of two kinds: oily and water-soluble. The earlier oily preparations suffer from the disadvantage that they are liable to give pain on injection, and SHAW refers to the severity of the local reaction produced. The fact that they are slowly absorbed, however, may be an advantage, since the effect of the dose is spread over an appreciable time. In animals a single injection of the aqueous preparation is much less effective than that of the same total amount of material given at frequent intervals. Aqueous preparations such as those used by SEVRINGHAM and EVANS are not followed by any local reaction, but they have to be given frequently, probably daily, to get the best results.

The hysterical tendencies associated with some of the conditions studied tend to increase the difficulties of the clinical work. In view of the fact that one of the most striking properties of œstrin is its action in promoting uterine growth in experimental animals Mr. SHAW examined the effect of the hormone in 15 cases of spasmodic dysmenorrhœa, with the typical ill-developed uterus associated with this condition. In six of these no improvement was observed, even when 50 units were given at weekly intervals; all were severe cases. In nine others the treatment was successful either in completely freeing the patients from pain or in alleviating it. The size of the uterus, however was increased only in two cases and in all the symptoms returned when the injections were stopped. The author recommends trial of the treatment in young women and where dilatation of the cervix is not successful. Not all cases respond, and if after eight weeks there is no improvement the injections should be discontinued. In five cases of primary amenorrhœa no definite effect was observed and menstruation was not established in any of the subjects. Two cases of amenorrhœa of secondary type also gave negative results. Both of these were combined with adiposity, and in each of six further patients who were not adipose menstruation followed the administration of œstrin. The results indicate that the treatment may be of value when the symptoms are of recent date. Other cases in which good results have been observed include women with irregular menstrual periods. According to SEVRINGHAM and EVANS, relief is also given in menopausal disturbances, particularly those associated with vasomotor phenomena, in which good results are reported in 10 or 11 out of 15 cases treated. Both the English and American investigators refer to the handicap of the lack of an objective index of ovarian activity in the human subject, a circumstance which together with the spontaneous improvement well known to occur in young patients, makes the scientific evaluation of any drug extremely difficult. The workers themselves consider the results obtained to be in many ways encouraging.

Annotations.

"Ne quid nimis."

HOSPITAL ASSESSMENT.

WHY is it that the attempt to lighten the burden of rates borne by the voluntary hospitals has achieved so little success? The hope of total de-rating has been frustrated because it spoilt the symmetry of recent enactments framed by reformers who forgot the hospitals. The Central Valuation Committee's advisory functions have failed to achieve the uniformity in valuation which it is that body's statutory duty to promote. The Committee most helpfully suggested an equitable basis for assessing hospitals; it would have meant an advantage only less valuable than total de-rating; but the suggestion has been largely ignored and the utmost diversity of practice flourishes. The hospitals' prospect of swollen demands for rates is deplorable. The recent report on the Voluntary Hospitals in Great Britain[1] (excluding London) contains a memorandum on the present situation which makes gloomy reading. The revision of assessments consequent upon the Rating and Valuation Act of 1925 means that the provincial voluntary hospitals in England and Wales will have to pay £66,000 annually in rates where formerly they paid £44,000. It is a crushing imposition, unjust in its haphazard and anomalous incidence. Stated in terms of assessment per patient bed, the amounts vary from nothing at all in one place to £20 in another. Only 19 per cent. of the new assessments are less than £1 per patient bed; more than 12 per cent. are £5 and over. The British Hospitals Association has done its best. It has tried to obtain general support for a uniform and preferential assessment which would not exceed £1 per patient bed, such assessment to cover all those parts of the hospital that are necessary to enable it to carry out the purpose for which it is established. Unanimity in support of this reasonable proposal has been lacking. Many hospitals are willing to uphold it; a few favour independent action and other remedies. Meanwhile the financial prospect is uncertain and dark. Some local authorities are making contributions under the Public Health Act—that is to say, they take with one hand and give back with the other; this process may be satisfactory locally but it does nothing to solve the problem as a whole. If hospitals elsewhere have a greatly increased bill for rates, is the deficit to be met by a contraction of the hospital's facilities or by begging from generous donors whose charitable donations may be diminished in view of impending new taxation? There is general sympathy for the voluntary hospitals; nobody wants to see them unfairly harassed. Cannot some sensible formula be framed which will give them equitable treatment and which can be submitted to the valuation authorities with unanimous support?

THE BLOOD COUNT IN RHEUMATIC FEVER.

IT has long been recognised that rheumatic fever in children is associated with a mild leucocytosis, and the work of Swift and his collaborators[2] seemed to show that its degree bears some rough relationship to the severity of the joint manifestations. Could such a relationship be demonstrated in cases where infection falls rather on the heart muscle than on the joints, it might help us in gauging cardiac damage and the response to treatment. This possibility has recently been investigated by Dr. C. Bruce Perry,[3] working in the University Centre of Cardiac Research, Bristol. He finds that some degree of leucocytosis is common to all cases of rheumatic fever, whether the predominant feature is arthritis, carditis, or chorea. The presence of eosinophilia—which has been described as characteristic of the condition—is, he notes, associated with subsidence of the acute symptoms, and with the relative lymphocytosis which is seen when many kinds of infection are subsiding. As in most other infections, the increase of white cells in the more acute stage mainly affects the neutrophiles. The subacute and smouldering cases of carditis show only a slight and varying leucocytic response, and since it is just in these cases that an indication of the activity of the infection is most needed, Dr. Perry concludes that the leucocyte count can give us little or no assistance in measuring the progress of this disease.

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[1] Wilfrid Shaw: Observations on the Therapeutic Value of the Œstrus-producing Hormone of the Ovary, Quart. Jour. Pharmacy and Pharmacol., 1929, ii., 373.

[2] Sevringham, Elmer L., and Evans, Joseph S.: Clinical Observations on Use of an Ovarian Hormone: Amniotin, Amer. Jour. Med. Sci., November, 1929, p. 638.

[1] Tenth Annual Report for the Year 1928. Published by the Central Bureau of Hospital Information, 19, Berkeley-street, London, W. 1s., post free 1s. 5d.

[2] Swift, H. F., Miller, C. P., and Roots, R. H.: Jour. Clin. Invest., 1924, i., 197.

X RAY APPARATUS.

To realise how rapid has been the growth and development of the X ray industry one had only to compare the exhibits at the recent annual meeting of the British Institute of Radiology with those of former years. High tension installations, radiographic and therapeutic equipment formed the three main groups of apparatus shown, and in each group there was a welcome tendency to simplification and standardisation in design. The X ray transformer has become more and more popular. The advantages of economy and freedom from contact troubles, associated with the inductive devices for the control of transformers, have no doubt led many to adopt the transformer instead of the resistance-controlled coil unit. With the erection of the grid system for the supply of alternating current to large areas, the use of the X ray transformer to the exclusion of direct current instruments would appear almost inevitable. It seems that the rating of a transformer in kilo-volt ampere hours is still widely used, although this unit is inadequate for the special requirements of radiology, and a specification for the electrical performance of transformers for X ray purposes was issued more than a year ago by the British Electrical Standards Association. General acceptance of this specification by manufacturers would materially help the buyer of high tension equipment. As a means of rectifying the current from a transformer the mechanical rectifier is fast disappearing. The majority of the transformer units of to-day are fitted with valves, the noiseless rectification of which appeals to the radiologist. Accumulated experience in the manufacture of valves has led to the production of a rectifier which, though expensive, is generally claimed to have a long life. The insertion of high tension condensers in the secondary circuits of transformers is quite common especially in deep therapy units. By means of condensers and an ingenious switch-gear some manufacturers have produced a plant which will develop a heavy milliamperage at medium voltages for radioscopy, or alternatively a small current at a high voltage for therapy. The exhibit of X ray tubes suggested that the gas tube has almost disappeared. The majority of hot cathode tubes shown were of the metalix type. The ray-proof shield which allows only a cone of rays to issue from the tube, together with the single central suspension of the latter, has led to simplification in the design of tube carriers, and supports for this type of tube are now made by most X ray firms. Attempts have been made to produce a shock-proof X ray apparatus, and a unit of this type for radioscopy was to be seen at the exhibition. In this case the transformer and tube were enclosed in an earthed metal tank which was mounted after the manner of an X ray tube. Apart from the advantage of being shock-proof, a greater flexibility of movement than is usually possible is claimed for this method of mounting both transformer and tube. A noteworthy feature of the radiographic equipment was the attempt made by some manufacturers to facilitate the taking of stereoscopic pictures in rapid succession. The stereoscopic binocular gives an excellent, though reduced, stereoscopic picture at any distance from a pair of stereoscopic radiograms placed side by side. To obviate the distortion often seen in earlier radiograms, most firms now incorporate in their equipment means whereby the X ray tube may be placed at a distance of six feet from the film. X ray manufacturers have sought to obtain greater flexibility and smoother travel of the movable parts of radiological apparatus, and the exhibits in general bore testimony to the success they have achieved.

THE ACTION OF LEAD ON THE CHORIONIC EPITHELIUM.

EARLY in 1925 a paper was published in the *Journal of Obstetrics and Gynæcology of the British Empire* by Prof. Blair Bell and others in which it was demonstrated that lead, in suitable doses of a suitable preparation intravenously administered, produced coagulation necrosis of the chorionic epithelium in the pregnant rabbit without damage to the maternal tissues—an effect not produced by the other metals tested. A subsequent investigation by M. M. Datnow, also a member of the staff of the Liverpool Medical Research Organisation, published in the same journal (1928, xxxv., 693), confirmed these findings, but showed that this property is more evident with certain preparations of lead than with others, and that in regard to all the preparations examined the chemotherapeutic index was not high. The importance of these observations was related to the working hypothesis of Blair Bell that malignant development in a somatic cell is a structural and functional reversion to the chorion epithelial type which is able to live independently and parasitically, and is in other respects also normally malignant, and that a toxic agent which will destroy the chorionic epithelium should—other conditions being equal—also be lethal to the cancer cell. The work at Liverpool has met both with support and criticism, the latter being no doubt often founded upon the results obtained from the employment of inefficacious preparations, but, until recently, there seems to have been no satisfactory attempt by independent workers to confirm or refute the clearly stated results obtained in Liverpool—results that, in so far as they were new, conflicted with previous views as to the manner in which lead causes abortion, of itself a well-known fact. In the recent issue, however, of the beautifully produced and illustrated *Archivio dello Istituto Biochimico Italiano*, edited by Prof. Lorenzini (1929, i., 193), N. Dallera has published with coloured histological drawings a considerable research on this subject, entitled "L'azione del piombo sulla cellula coriale," from which the work of the Liverpool School receives much confirmation.

Dallera, in his investigations concerning the abortive action of lead in rabbits, studied the action of doses smaller than those which provoked abortion, and ascertained the effects of different doses on the chorionic epithelium and on the placenta generally. In all the animals submitted to experiment the urine was examined, and subsequently a histological investigation was made of the liver and kidneys. Fifty-three animals between the eighth and twentieth day of pregnancy were used. Of these, 21 received injections of Christoni's colloidal sulphite of lead, chemically prepared. Twenty-five animals received the colloidal lead electrically prepared by Prof. Ganassini, with the addition of sodium thiosulphate, the action of which has been extensively studied by Prof. Lorenzini and Dr. Simon; to seven animals

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[3] Perry, C. Bruce: Arch. Dis. Childhood, 1929, iv., 247.

Dezani's organic non-colloidal preparation of lead was administered. The following conclusions were reached: 1. Lead, when introduced intravenously into the pregnant rabbit in small repeated doses, shows a selective poisonous action on the chorionic epithelium. 2. The following changes in the chorionic epithelium, and further in the placenta are progressive, and depend on the dosage: (*a*) Swelling of the syncytial layer of the chorionic villi, with alterations of the protoplasm and consequent ischæmia in regard to the maternal blood-spaces of the placenta. (*b*) Necrosis of the syncytium with congestion of the placental blood-spaces. (*c*) Complete disappearance of the syncytium, breaking down of the supporting septa, and the production of hæmorrhagic areas with necrosis of the fœtal placenta. 3. The pregnant rabbit reacts to lead with toxic symptoms with smaller doses than when not pregnant. (Dallera did not attempt to define the abortion dose as was done by Blair Bell and his fellow-workers.) 4. There are no essential differences between the changes of the placenta in relation to the different periods of pregnancy. 5. The action of lead may not always be confined to the fœtal ectoderm, but some derivatives of lead may also affect the maternal organs to a degree that varies with different preparations. 6. The colloidal lead prepared at the Institute of Biochemistry of Italy acts chiefly on the placenta, and in order to produce slight temporary lesions in the liver it is necessary to inject doses four to five times greater than those which markedly damage the chorionic epithelium. (This preparation appears, therefore, to have a higher chemotherapeutic index than the preparations used in Liverpool.) 7. The metallic colloidal lead is that which best realises the essential postulate of chemotherapy—that is, the greatest divergence between the active dose and the toxic dose. 8. The distribution of the lead conveyed in different preparations varies. The colloidal lead localises itself specially in the placenta, and only in very heavy doses also in the liver (which, however, does not present any alteration). The lead sulphite and Dezani's soluble salt are found only in small quantities in the placenta, and in large amounts in the liver and kidneys with evident lesions in these organs. From these data it appears that the colloidal state of the lead is of great importance.

THE MORALE OF THE BLUEJACKET.[1]

A LITTLE book, described on its appropriately blue "jacket" as a social study of the lower deck, is worth the serious attention which its modest contents hardly claim for it. In a recent issue of THE LANCET we reviewed a study of the mental reactions of the sailors of the fleet in war by Dr. Thomas Beaton, *himself then* a Temporary Surgeon-Lieutenant, R.N., and thus possessing full opportunity for his investigations; and this skilled alienist concluded that "the training of the sailor has for its first aim the rendering of the individual, not into a precise automaton, but into a intelligent and coöperating personality, and in the achievement of its purpose it cannot be too highly praised"—in other words, the object of training was to turn out a good ship-mate, since incorrect conduct makes a man a bad ship-mate. How the education which has earned so high an encomium effects its purpose, what are its reactions in daily life on the lower decks of ships, we learn from Mr. Trystan Edwards's account of his three years' service wearing "the three rows of tape" on his blue collar as a seaman "for the duration" (1915–18). Judged even in comparison with the life of the public school and university man, he did not find the training wanting. It is disciplinary training, he says, which while it saves the seaman from carelessness and from panic in times of stress, gives him health, a sense of cleanliness, and steadiness of nerve, and makes him energetic and alert, as well as good-mannered. On the lower deck there is no word for good manners—they are a sine qua non; the few and new without them are called "ignorant," but it is charitably expected that they will soon acquire them. The author found the men habitually cheerful, often singing, working very hard, and always wanting sleep. And there is a significant comment that the men of exceptionally fine physique and character were nearly always from large families whose parents had both married young. He covets the bluejacket training for more of the youth of England, and concludes his important study thus: "Complete liberty and equality there can never be . . . . .fraternity finds nowhere a greater measure of fulfilment than in the humane company of those who serve under the White Ensign." But it will surprise everyone, and especially parsons, to learn why it is the seamen like church on board (p. 123).

THE STUDY OF TROPICAL MEDICINE.

THE transactions of the seventh congress of the Far Eastern Association of Tropical Medicine appear in a volume[1] containing 97 communications which occupy some 871 pages. The chief subjects discussed are plague, cholera, dysentery, sprue and intestinal infections, bacteriophage, leprosy, tuberculosis, typhus-like diseases, leptospiræ, and malaria in all its aspects. To the section on plague such well-known authorities as F. P. Mackie, Wu Lien-Teh, Fabian Hirst, and N. H. Choksy appear. The Joint Meeting of the Expert Plague Committee of the League of Nations Health *Organisation and of this Association* stressed the importance of further inquiries into the methods of destruction of rats and fleas, the comparative epidemiological rôle of various species of fleas in plague transmission in selected areas in India, the survey of plague in wild rodents in Northern Asia, and the part played by grain and cotton in the dissemination of plague. As regards prophylaxis and therapeutics, the speedy preparation of antiplague vaccine, the possibility of producing a plague antitoxin serum, further studies on anti-plague bacteriophage and its practical application were considered. Pneumonic *plague is dealt with separately in these Transactions;* the incidence of bubonic plague, and its relation to pneumonic plague, is considered important, as well as the possible existence of a special ultra-virus or filter-passing form of *B. pestis*. The subject of cholera stimulated a number of communications. Lieut.-Colonel A. J. H. Russell is responsible for statistical studies in its epidemiology. C. L. Dunn and S. Khan show that cholera is not endemic in Hardwar, but is an accompaniment of pilgrimages. J. W. Tomb and G. C. Maitra, from experiences gained in Asansol Mining Settlement, believe that the non-agglutinating intestinal vibrios take on the agglutinating characteristic under certain still unrecognised conditions in the human intestine.

The dysenteries of Bengal have been studied by A. C. Ukil, who finds mild forms of bacillary dysentery to be the form most prevalent. F. P. Mackie, N. H. Fairley, and the staff of the Haffkine Institute, Parel, Bombay, contribute a report of progress on the sprue inquiry. P. Manson-Bahr, L. M. Maybury, and P. H. Martin testify to the therapeutic value of blood transfusion in sprue anæmia. S. S. Sokhey writes upon the pancreatic and liver functions in sprue. Special interest centres on the accounts of bacteriophagy and bacteriophage by F. d'Herelle. He sets out clearly his reasons for regarding the bacteriophage as a living being, an ultra-virus parasitic on bacteria and which provokes in them an extremely contagious disease. With Major R. H. Malone and M. N. Lahiri he believes that in the treatment of cholera with bacteriophage the cultures of this substance should be endowed with maximum virulence and maximum activity. Lieut.-Colonel Morrison and Major C. de C. Martin state that bacteriophage alone has been proved as effective in the treatment of bacillary dysentery as is orthodox treatment given in control cases.

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[1] Three Rows of Tape. By A. Trystan Edwards (ex-Able Seaman, R.N.). London: William Heinemann, Ltd. 1929. Pp. 167. 6s.

[1] Transactions of the Seventh Congress, British India, 1927. Edited by Lieut.-Colonel J. Cunningham, C.I.E., B.M., M.D., I.M.S., Director, Pasteur Institute of India, Kasauli, British India; Chief Organising Secretary for the Seventh Congress. Calcutta: Thacker's Press and Directories, Ltd. Vol. II. 1929. Pp. 871.

The leprosy section is particularly full. E. Muir propounds his latest views on the treatment with special reference to the employment of potassium iodide; R. Row amplifies his well-known work on the curative value of tubercle bacillary autolysate in leprosy; it must be remembered that it is still doubtful whether this action is specific or whether it is due to non-specific protein. E. V. Pineda contributes an important paper on the presence of the leprosy bacillus in 53 per cent. of the placenta and umbilical cord of advanced sufferers of the disease. R. Inada contributes a short comparative study of leptospiræ. R. McGuire writes on colour variations in the fungus of Dhobie's itch, and D. G. Panja believes he has cultivated the organism responsible for dandruff, which he has termed *Malassezia ovalis*. Typhus and typhus-like diseases also attracted much attention, notably from J. W. D. Megaw and C. Strickland. Under the section of Protozoology, R. Knowles and B. M. das Gupta have studied the influence of the thyroid gland on the course of a protozoological infection.

No less than 30 papers are devoted to the question of malaria, divided under three headings—control, general considerations, and treatment. Sir Malcolm Watson writes informatively on the future of malaria control in the Federated Malay States. Colonel S. P. James, Drs. W. D. Nicol and P. G. Shute have studied the habits of anopheles in relation to their rôle in the spread of malaria from observations made in England, and they have also made experiments on the treatment of malaria, from which it appears that thorough and prolonged quinine treatment of the primary attack has no more effect in preventing a true relapse than has intensive treatment by quinine during the acute phase.

A MEMORIAL TO JOHN THOMSON.

ON Saturday, Dec. 14th, a memorial to the late Dr. John Thomson was unveiled by Sir Thomas Barlow in the Royal Hospital for Sick Children at Edinburgh. The memorial takes the form of an inscribed marble panel with a bronze portrait medallion by Mr. Pilkington Jackson, placed opposite the entrance of Dundas Ward, where Thomson did such a large part of his work. In addition, a medal is to be awarded by the University of Edinburgh for a thesis or original investigation of special merit and dealing with children. Recalling Thomson's appointment in 1884 to one of the resident medical posts at the Hospital for Sick Children in London, Sir Thomas confessed that at the outset of their acquaintance he was not impressed by Thomson's personality, while some of his contemporary residents esteemed him but lightly. They little knew then what a reserve of quiet power, sound method, and good judgment lay beneath that modest, half-deprecating demeanour. A slight hesitancy of speech was the outcome of a resolute determination to cultivate accuracy of statement. Good botanist that he was, he had been trained in sound observation. When his two years at Great Ormond-street were completed and he returned to Edinburgh, Thomson was almost immediately appointed physician to the New Town Dispensary, where he soon developed a successful children's clinic, and shortly afterwards he was elected assistant physician to the Children's Hospital. His most important contribution to medical knowledge was, in Sir Thomas's opinion, his account of pyloric stenosis in infants; an exhaustive report of 100 cases under his own care during a series of years opened the eyes of medical men to the serious importance of its early recognition, and the vital indications for its treatment. In this as in all his work he was keen to share his knowledge in the give and take of real fellow workers. He was generous in acknowledging the help of his colleagues, whether older or younger; jealousy and self-advertisement were both unknown to him. Later in his career Thomson set himself to engage the interest of the mothers of mentally deficient children in simple methods of wakening intelligence and cultivating self-control. He was determined in his instructions to use no word or phrase which might discourage or humiliate the mothers, holding by the maxim, "By hope are ye saved." To those that knew him best, Sir Thomas concluded, the memory of John Thomson would always be that of a modest gentle true-hearted soul, with a passion for verification and a deep desire to widen the boundaries of beneficent knowledge. The same sentiments were expressed in other ways by Prof. G. F. Still, Dr. Logan Turner, and Dr. Robert Hutchison, who were also present to do honour to a great pædiatrician. In accepting the commemorative medal on behalf of Edinburgh University the Principal, Sir Thomas Holland, pointed out its economic as well as its humanitarian value. There was, he said, as yet no organised research into the psychology of the child under the age of five years, with the result that much harm was done in our schools through ignorance.

TREATMENT OF CATARACT AND GLAUCOMA IN MADRAS.

Lieut.-Colonel R. E. Wright's professional report[1] of the Government Ophthalmic Hospital, Madras, for the year 1928 will be of interest to ophthalmic surgeons everywhere. The average number of operations for senile cataract alone is over 1500 a year. Precautions to prevent squeezing on the part of the patient while on the table and to secure quiet afterwards include novocain injections to block the seventh nerve and into the orbit, and the drugging of the patient to such an extent as sometimes to amount to a kind of twilight sleep. Various forms of conjunctival bridge flaps have been tried during the year in order to maintain the lips of the section in contact, but the natives, it seems, are more liable to conjunctival bleeding than Westerners, and blood clot under the bridge sometimes interferes with healing. In Colonel Wright's opinion no form of bridge is so efficient as suturing the lips of the section. Various types of operation are performed, but in the great majority of cases the capsulotomy operation is chosen, usually with a peripheral iridectomy. In a proportion of cases Barraquer's intracapsular extraction is performed, a procedure not now popular in this country; but no mention is made of Colonel Henry Smith's intracapsular method.

In the Madras Hospital they classify all their primary cases of glaucoma, whether acute or chronic, into posterior segment types and anterior segment types. In the former the important factor is the increase in the volume of the vitreous: the anterior chamber early becomes shallow, but the cupping of the disc does not appear till late. In the anterior segment type, on the other hand, the anterior chamber is not shallow and cupping of the disc is an early symptom, and in these cases it is suggested the blocking of the angle of the anterior chamber takes a more important part in causation. A systematic investigation of 100 cases was undertaken along these lines, which may help towards resolving the perennial controversies. As to non-operative treatment or treatment preliminary to operation, eserine drops are the great stand-by, but in certain cases their effect was greatly enhanced by simultaneous employment of adrenalin. Glaucosan and amino-glaucosan are not so highly spoken of. In well-marked cases a decompression operation, preferably trephining, was always necessary eventually.

Elsewhere in the report there is reference to an epidemic of superficial punctate keratitis which occurred in 1928. Over 800 cases were seen before the end of that year. Like herpes febrilis it appears to be due to a non-filtrable virus, and is probably identical with the keratitis described by Herbert in

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[1] Madras Government Press, 1929. Rs. 2.

Bombay in 1901, and by Kirkpatrick in Madras in 1920. The affection is known to Western ophthalmologists but not in an epidemic form.

AN IDEAL OPERATING TABLE LAMP.

WHAT the surgeon needs when he is operating is an illumination of the field, concentrated and yet practically shadowless, along with a high vertical component of intensity, ensuring penetration into deep cavities. The intense light must be confined to the wound area, but at the same time the room must be sufficiently illuminated to prevent difficulties from mal-adaptation of the eye. The high intensity should be produced without striations or glare, and the source of light should be as unobtrusive as possible. At a meeting of the Illuminating Engineering Society, held at the Home Office Industrial Museum on Dec. 10th, Mr. Ernest Stroud described a special unit designed to fulfil all these conditions. It consists of a number of prismatic plates formed into a panel or false ceiling of relatively large area. The construction of the plates is such as to refract the light rays which reach them into a converging beam of high intensity. Each plate is 12 in. square, and made up of quarter-concentric prisms, and four plates are grouped into one large lens 24 in. square of 12 in. focus length. The complete unit contains 15, 18, or 21 of these 4-plate groups, its dimensions being 6 ft. wide by 10, 12, or 14 ft. long. Over each group of plates is fitted a lamp and reflector in such relation to each other that the maximum beam strikes the centre of the operating area; thus with a 15-group system the combined 15 concentrating beams coming from different directions build up and focus their rays over the predetermined area. The method differs from a reflector system in the largeness of the area whence the light comes, which secures adequate diffusion, avoids harmful shadows, and absolutely avoids glare. The overflow from the lens system gives sufficient general illumination to avoid contrast glare, and the optical characteristics of the lens are such as to allow for the varying thicknesses of bodies and heights of tables. With a 15-lens system employing 15 lamps of 150 watts each, or 2250 watts in all, the maximum horizontal illumination is 1050 ft. candles, on a plane 45° from the vertical it is 725 ft. candles, and on a vertical plane facing the centre of the table 175 ft. candles; these high intensities being developed without any semblance of glare. The smooth sides of the glass plates are towards the source of light, and since the complete unit can be totally enclosed so as to form the ceiling of the operating theatre there need be no collection of dust and no obstruction projecting into the operation theatre.

A SCULPTOR OF YOUTH.[1]

A BEAUTIFUL book has recently appeared describing the work in marble and bronze of that accomplished sculptor, Tait Mackenzie, a professor in the medical school of the University of Pennsylvania. The importance of Tait Mackenzie's sculpture lies in the fact, as Mr. Christopher Hussey says in a critical résumé of Mackenzie's work, that we have here the first considerable attempt since the marvellous accomplishments of Athens to take for the sculptor's main subject the athletic ideal. For many years before his present appointment Mackenzie was director of physical education at McGill University, and in 1894, when he first occupied that chair, he had made few or no attempts in sculpture, though undoubtedly it was then that he was receiving the formative influences which enable him to-day to express his ideals of motion and rhythm in the human body. When, as now, athletics occupy so prominent a place in educational life it is certain that the Greeks have once again shown the way to great accomplishments for those who have the necessary receptive attention, instruction, and fine thought. The contents of Mr. Hussey's book consist largely of excellent representations of Mackenzie's best known work, with a running commentary of appreciation which though enthusiastic appears always to be justified. While the large imaginative groups will command most of our admiration—and rightly so—medical men will be interested in the portrait medallions, for they include representations of, among others, William Osler, Crawford Long, Wilfred Grenfell, Chevalier Jackson, Robert Jones, Weir Mitchell, W. W. Keen, and Charles Brockden Brown. Brockden Brown's chief claim to public interest is that he is always cited as the first American novelist, with the funny suggestion that he imitated William Godwin, but medically speaking he is remarkable in that he wrote in "Arthur Mervyn" a wonderful description of an epidemic of plague from personal observation of the horrors that fell upon Philadelphia at the end of the eighteenth century.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LVIII.

INTERPRETATION OF RADIOGRAMS OF THE ALIMENTARY TRACT.

PART V.*—LARGE INTESTINES.

THE food arrives in the cæcum in about four hours and should be somewhere near the splenic flexure in nine hours, but the times at which it arrives at different parts are so extremely variable that even approximate figures are far too definite. The normal colon as seen after feeding with barium is shown on Fig. 23. A typical picture of a normal colon distended by an enema is shown in Fig. 24. Individuals vary to an amazing degree, and even yet the movements of the large intestine are not clearly understood. There is no peristalsis in the ordinary sense and the shadow of the food in the colon remains inert hour after hour. Wingate Tod, using serial films over a long period (a very risky procedure for the subject), thinks that he detects a very slow rhythmic peristaltic movement which we certainly do not detect on screen examination. Whether it is or is not present, however, the main factor in the movement of food through the large bowel is one that is unique and is not comparable to any other in the body. It is difficult to obtain observations, for the movement occurs only occasionally, at no fixed time, and without the slightest subjective sensation. What we observe is that the haustral shadows, the divisions in the intestinal shadow, disappear and that, quite suddenly, the whole column makes a forward rush, usually from the region of the hepatic flexure, the column passing quite rapidly on, perhaps as far as the sigmoid or even to the rectum. Sometimes there is a partial rebound, but within a minute or so the haustral segmentation has again appeared and it is once more a picture of still life. Movements such as this—mass movements as they are called—occur perhaps three times a day, but we do not know, for we only detect that they have occurred by the completely altered disposition of the shadows. The first mass movements that were seen were estimated to have occurred in three seconds, but later observations suggest a quarter of a minute as a more usual time. Naturally, therefore, the rate of progress through the large bowel cannot be gauged accurately. The limits of the normal, which are wide enough in the stomach, become wider and wider as we go further down the alimentary tract until in the large intestine

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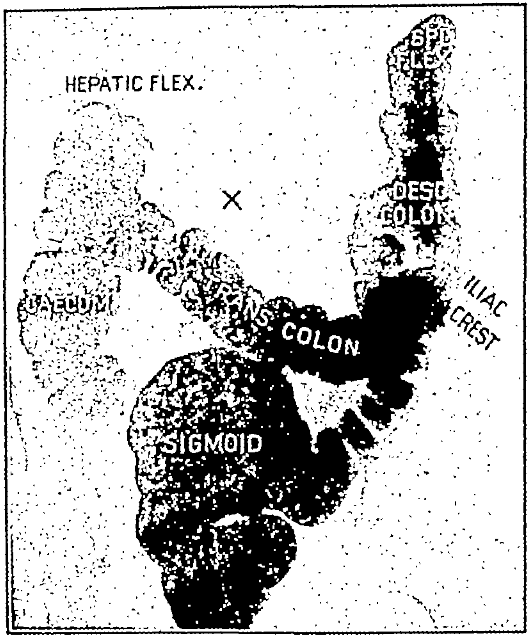
[1] Tait Mackenzie, a Sculptor of Youth. By Christopher Hussey. London: Country Life, Ltd. 1930. Pp. 107. With 14 figures and 91 plates. 25s.

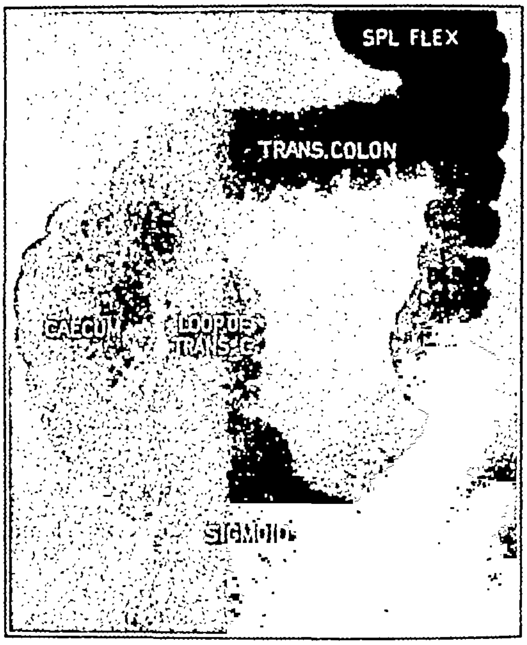
[1] Parts I., II., III., and IV., respectively on the Œsophagus, the Stomach, the Duodenum, and the Small Intestine with the Appendix, appeared in THE LANCET of Nov. 30th, Dec. 7th, 14th, and 21st.

FIG. 23.



Well-filled large intestine. Note the haustral segmentation. The hepatic flexure is rather higher and the splenic flexure rather lower than usual. The transverse colon is looped down over the descending colon. Such a loop is more common on the right than on the left—there is nearly always more or less of a loop. The ascending and descending parts of the splenic flexure are superimposed. The cæcum is not well filled—note the close anatomical relationship between the loaded sigmoid and the cæcum.

FIG. 24.



Normal colon distended with a rather large enema. Note the big loop of the transverse colon that drops down over the cæcum. The shadows in the right iliac fossa are blotted out by this loop. The haustral segmentation is usually not noted just after the enema is given but is noted within a few minutes—as the colon accommodates itself to the enema and as the discomfort passes off.

FIG. 25.

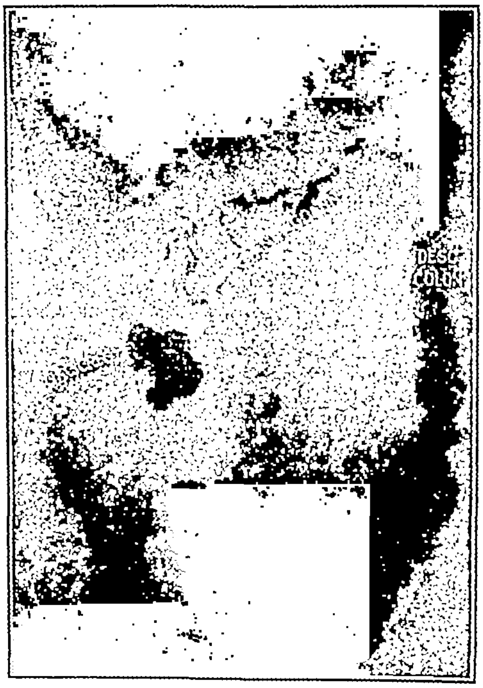


FIG. 26.

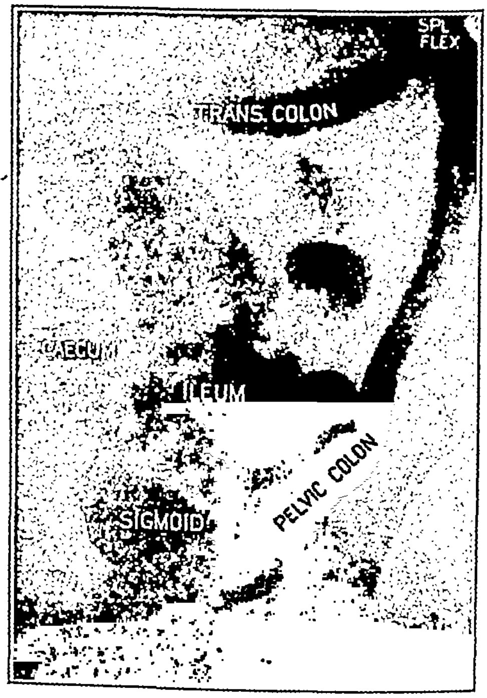


Fig. 25 shows "string" sign of colitis of the transverse colon. In Fig. 26 the opaque enema has flowed through the length of the colon and a portion of it has passed into the coils of small intestine. The "ribbon" appearance of the colon, with its absence of haustral segmentation is often associated with some forms of colitis. It is not pathognomonic, and in many cases disappears after an interval, especially if the bowels act.

FIG. 27.

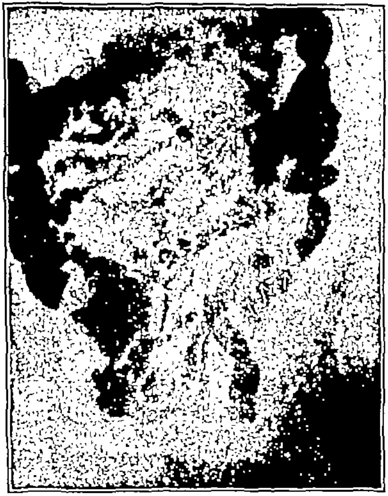


FIG. 28.

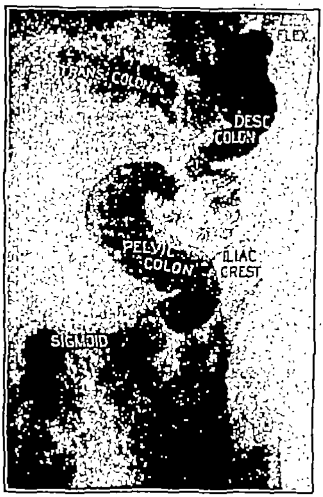


Fig. 27 shows a growth of large intestine after a barium meal, and in Fig. 28 the same growth is seen radiographed after an opaque enema.

they are almost impossible to define, making the study of constipation one of the most tricky and treacherous of subjects. Our very foundations are a quicksand of possible variables in which we make marks for our guidance—four hours to the cæcum, four and a half hours to the hepatic flexure, and so forth, but we know quite well that we shall be doing an injustice to any patient if we erect the structure of our diagnosis on such flimsy foundations. In the study of constipation, therefore, we can only accept definite extremes as our guides—incidentally never accepting the patient's statement as to whether he or she has had a satisfactory motion. On numerous occasions patients have stated that they have only had a very small motion when observation has shown that the whole of the opaque food has passed out. And sometimes they give the same reply on the following day, when we know that everything they have eaten between the two opaque meals has been voided within 24 hours. The number of patients who have an obsession as to bowel movement is not small.

We have been drilled into imagining that a movement of the bowels once in 24 hours is the normal habit to acquire, although certain extremists are nowadays trying to persuade us that this is not sufficient. But the fact of the matter is that there are extremely wide variations and what is normal for one subject is not necessarily normal for another. Two or three stools a day may be normal for some individuals, while others may live to as ripe, happy and healthy an old age on one evacuation a week. Such cases are, of course, rare, but I have seen one rosy-cheeked girl whose habit was one a month.

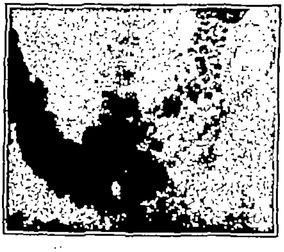
In the study of *constipation* we thus have to depend on following through from day to day and determining where the delay is occurring and why. Three types can be noted, namely: 1. Where the cæcum remains filled, and is of the large, sloppy type. 2. Where the food gets into the large intestine and remains inert for days. 3. Where the food reaches the rectum but there is no call to stool (dyschezia).

There are many forms of *colitis*, and there are no typical X ray pictures, with the single exception of what is known as the "string sign," that is, a string of opaque food running along the lumen of the gut (Fig. 25), but this is only seen in certain cases. There are various other appearances, none of them typical, which cannot be discussed in a brief space. The "ribbon" appearance of the colon which is often associated with colitis, but is not pathognomonic, is shown in Fig. 26.

Growths.

Growths of the large intestine may remain latent for long periods before giving symptoms. Obstruction is often the first, and probably the only, sign. The opaque food given by the mouth may fail to be held up at the obstruction. In the early stages we may find the affected area partially filled with traces of opaque food, lying in inequalities of the canal, but one can deduce nothing from the absence of such shadows. It is only in the latest stages of an obstructive lesion that the opaque food is held up actually behind the growth—apparently the food is thrown back either by the associated spasm or by the rebound when the mass movement takes place. Whatever the mechanics, however, the fact remains that it is only in the latest stages that the gut immediately behind the obstruction becomes distended and allows the opaque food to gather in it.

FIG. 29.



Diverticulitis. Note the small "currant" shadows left in pockets. These are usually left filled or partially filled after the bowels have been emptied.

The picture of scattered air spaces, bounded below by fluid lines that indicate extending back pressure from an obstruction has already been referred to under the small intestine—it is obviously a case for the surgeon and the sooner he deals with it the better.

A number of fallacies in interpretation have given rise to many mistakes, the main one being the obstruction to the flow of the enema that may be caused by the brim of the pelvis or other bony projections. By raising the pelvis and other posturing this difficulty can usually be overcome. A pint of enema fluid should flow easily as far as the splenic flexure and even beyond. With two pints it is usually possible to fill the whole of the large intestine. *Definite obstruction at a certain point, coupled* perhaps with the presence of a tumour, makes the diagnosis of a growth reasonably certain. Fig. 27 shows a radiogram of growth of the large intestine after an opaque meal. Fig. 28 shows a radiogram of the same growth taken after an opaque enema. The *presence of filling defects must be looked for through*out the whole length, more particularly, in my experience, in the region of the splenic flexure. Rotation of the patient is always necessary to show this flexure properly—it may, however, be difficult to get satisfactory photographic records in this position. There is one fallacy connected with the palpation of thickening of the colon which should be pointed out—namely, that one can frequently palpate the pelvic colon as a sausage-shaped mass which is not always present, and seems to be due to an intermittent and painless spasm. Sometimes, at any rate, it appears to be associated with a chronic appendix, but what the connexion is I do not know.

The presence of *Hirschsprung's disease*, like that of an acute obstructive lesion, is indicated by collections of air and fluid, but the chronic clinical picture and the distended abdomen make the diagnosis clear. Incidentally some of these cases at any rate are not congenital, but are acquired, being due to some adhesion or thickening in the sigmoid or rectum. The X ray picture of these cases shows the large, distended and redundant colon. In extreme cases it would take several times the normal quantity of enema to fill the large intestine. There is no difficulty in getting the enema to flow and the obstructive lesion, if it is still present, is of a valvular type and only interferes with the downward passage of the fluid.

Diverticula of the large intestine (Fig. 29) are common and may give rise to considerable palpable thickening, but radiographically the presence of pockets of opaque material like currants, left around the intestine after the bowels have been moved, is quite positive evidence as to the nature of the condition. It is a curious fact that these pockets are much more certainly demonstrated by the residue of the opaque meal than by giving an enema. The appearances of a well-established case are quite typical, but in the early stages the diagnosis is not by any means certain or straightforward.

CONCLUSION.

As to the value of the opaque meal investigation—it depends entirely on the experience and skill of the man who conducts the examination. No elaboration of apparatus or perfection of technique in the production of X ray films can make up for lack of skill and experience in this highly specialised work in which a thorough knowledge of the medical problems involved is fundamental. The time has almost if not quite come when a surgeon should not open an abdomen, at any rate for certain lesions, unless the report of the radiologist is positive. The responsibility for operation or refraining is knocking more and more at the door of the radiologist.

A. E. BARCLAY, M.D. Camb.,
Lecturer in Radiology, University of Cambridge.

THE CITY DISPENSARY.—This old City of London charity, which dates from 1789, reports a deficiency of income over expenditure of £227 and, not for the first time a portion of the very small invested capital has had to be sold. The patients of the dispensary, who are attended free by an honorary medical staff, have made 12,707 attendances in the last two years. The Lord Mayor, who is President, is appealing for help.

Special Articles.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

ON Dec. 17th a meeting of the President and General Council of King Edward's Hospital Fund for London was held at St. James's Palace for the purpose of awarding grants to hospitals and convalescent homes, including the Thank-offering Fund Distribution.

The Prince of Wales, who was in the chair, read the following message:

Buckingham Palace.

> "The King is glad to hear that King Edward's Hospital Fund is again able to distribute £250,000 and that the hospitals will also benefit so greatly by the Thank-offering Fund. His Majesty wishes the Council every success during the coming year.—STAMFORDHAM."

Continuing, the Prince said that if he took as his texts, first, the impressive little table at the end of the Distribution Committee's list of grants (see page 1382) and, secondly, the different sums of which the total was made up, he would have covered the chief activities of the Fund during the year. The ordinary distribution was again £250,000. Last year, when the Fund had reached the round quarter million, that sum was thought of as a mile-stone where it might be good policy to rest awhile, lest they went too fast and perhaps be forced to retreat; but the Distribution Committee's report showed that the work of the hospitals did not stand still and, if the distribution remained at £250,000 for more than two years, the hospitals would suffer. The Thank-offering Fund had enabled them to meet the increased demands of hospitals this year, but the continued increase in hospital work would have to be met next year by distribution beyond the £250,000. The Pension scheme for nurses and hospital officers now covered some 30,000 beds, but the growth of the scheme would mean larger grants from the King's Fund. The amount available from the Thank-offering Fund to the King's Fund was £220,000 and of this, £105,000 represented the splendid gift of "Audax" which would be invested. The special distribution of this fund included a large grant to the new King George Hospital for the extreme east of Greater London. But the £220,000 was only a fraction of the sums subscribed to Thank-offering Funds throughout the country. The whole of the 4 grammes of radium purchased with Sir Otto Beit's gift of £50,000 had been allocated among 20 hospitals, and they had this morning received for the Radium Fund £10,000 from Mr. Roger C. Parr, whom he thanked for his generous gift. After referring to the report of the committee dealing with the Local Government Act and the hospital system, His Royal Highness pointed out that coöperation between the King's Fund, the Teaching Hospitals, and the British Hospitals Association had been effected and a joint committee appointed to devise a representative Voluntary Hospital body for the consultations with the London County Council required by the Local Government Act.

The Prince closed his speech by thanking all those who had helped to carry on the work of the Fund during the year, mentioning especially Sir Cooper Perry, Chairman of the Distribution Committee, Mr. Eardley Holland, Chairman of the Radium Subcommittee, Prof. Russ, the technical adviser, Lord Donoughmore, Chairman of the Management Committee, who had also been treasurer of the Thank-offering Fund, Lord Luke, Chairman of the Revenue Committee, and, in connexion with the thanksgiving for the

King's recovery His Highness asked how could he omit to mention the name of Lord Dawson. He added that a testator, happily still living and vigorous and most emphatically anonymous, was, by his will, making the King's Fund the permanent landlord, so to speak, of a large house and grounds to be used as a convalescent home, and was setting aside a trust fund to help with its maintenance.

Treasurer's Statement.

Mr. E. R. Peacock (the hon. treasurer) said that the estimates laid before the Council in November justified a distribution of £250,000 for the second year in succession, but left no margin. Last year the cost of special pension grants was met from unexpected legacies received after the ordinary distribution had been fixed. This year the position was similar. A legacy of £20,000 had been received, and as the pensions grants amounted to £13,734, there was every reason to anticipate that they could be covered in the same way as last year. Invested funds had been increased by further sums of £7000 from the estate of Mr. Samuel Lewis and £1520 from that of Sir Julius Wernher, and by £15,000, the first of the seven yearly instalments of the gift of £105,000 from "Audax" through the Thank-offering Fund. Taking into account the additions made to general fund legacies since the date of the estimates, the receipts from that source amounted to £67,000, a figure almost exactly the same as that of last year. Annual subscriptions were slightly larger. But a smaller amount than usual had been received in donations this year. Every endeavour to ensure that the receipts from voluntary sources, which now came to £90,000 a year, must be fully maintained.

The League of Mercy.

Lord Marshall then made the annual statement on behalf of the League of Mercy. (The report of the annual meeting of the League of Mercy was published in THE LANCET of Dec. 21st, p. 1320).

Grants to Hospitals and Convalescent Homes.

The Chairman of the Distribution Committee (Sir Cooper Perry) presented the report of the Committee on the Distribution to Hospitals (including Recovery and Convalescent Branches). The report showed that 143 hospitals had applied for grants as against 141 in 1928. Ninety-four hospitals had joined the Pension scheme, as against 89 in the previous year. The total annual distribution amounted to £261,784, and when the Thank-offering Fund was added, the grand total reached £376,784. Of this, £239,709 was for maintenance, and £136,035 for schemes of capital expenditure, and it also included a grant for the building fund of the new King George Hospital at Ilford. The proposal for the provision of a single large hospital on the Ilford site, he said, was the result of the amalgamation of several schemes for providing for the needs of the increasing population of the eastern part of Greater London. It was drawn up at a series of conferences for which the King's Fund acted as convener, and in which representatives of the London County Council, the Ilford Hospital, and the local hospital funds of Barking and Becontree took part. The King's Fund made a grant of £10,000 out of the Wells legacies distribution on the understanding that the London County Council would contribute a similar sum. A grant of £2000 set aside for the extension of the Ilford Hospital had also been transferred to the building fund of King George Hospital. 2300 mg. of radium had been actually delivered to 15 hospitals out of Sir Otto Beit's gift, the remaining 1700 mg. were being delivered as fast as containers and needles could be supplied.

Lord Somerleyton (hon. secretary) presented the schedule containing the lists of awards to hospitals (including Recovery and Convalescent Branches) as follows.

*List of Awards.**

	£
Acton Hospital (of which £250 to deficit on extension)..	951
All Saints' Hospital	78
Baby Clinic Hospital (Kensington) (of which £100 towards the acquisition and adaptation of new premises)	186
Beckenham Cottage Hospital	450
Belgrave Hospital for Children	1,700
Bermondsey Medical Mission Hospital	50
Blackheath and Charlton Hospital (of which £50 towards improvements)	221
Bolingbroke Hospital (of which £100 to deficit on new block)	2,218
Brentford Hospital (of which £150 towards additional staff accommodation)	267
British Hospital for Mothers and Babies, Woolwich ..	550
Bromley (Kent) and District Hospital (of which £200 towards extension)	375
Carshalton and District Hospital (of which £250 towards extension)	335
Catholic Nursing Institute	15
Central London Ophthalmic Hospital (of which £350 towards extension)	706
Central London Throat, Nose and Ear Hospital (of which £500 to deficit on extension)	866
Charing Cross Hospital (of which £500 towards new casualty department, &c.)	4,500
Chelsea Hospital for Women (including Convalescent Home at St. Leonards)	1,115
Cheyne Hospital for Children (including Country Branch at St. Nicholas-at-Wade) (of which £100 towards improvements at country branch hospital)	450
City of London Hospital for Diseases of the Heart and Lungs (Victoria Park)	3,664
City of London Maternity Hospital	1,304
Clapham Maternity Hospital	301
Connaught Hospital	1,550
Croydon General Hospital	1,068
Deptford and Greenwich Babies' Hospital (of which £100 towards rebuilding and extension on new site) ..	150
Dreadnought Hospital (Seamen's) (including Albert Dock Hospital, Hospital for Tropical Diseases, Sanatorium at Liphook, and Convalescent Home at Cudham) ..	1,525
East End Maternity Hospital (of which £250 to deficit on acquisition of adjoining building and its adaptation for nurses' quarters)	925
East Ham Hospital (of which £500 to reduce deficit on equipment of new general hospital)	1,545
East London Hospital for Children (including Convalescent Home at Bognor) (of which £250 to reduce debt)	3,336
Elizabeth Garrett Anderson Hospital (including Recovery Branch at Barnet) (of which £250 to deficit on reconditioning the existing hospital building in connexion with recent extension)	2,392
Eltham and Mottingham Cottage Hospital	50
Enfield War Memorial Hospital	350
Evelina Hospital for Children	1,290
Finchley Memorial Hospital (of which £200 towards new nurses' dining-room)	621
Florence Nightingale Hospital for Gentlewomen ..	311
Forest Hospital (Buckhurst Hill) (of which £100 to deficit on extension)	313
French Hospital	350
General Lying-in Hospital (of which £500 towards new nurses' home)	1,265
German Hospital	500
Golden-square Throat, Nose and Ear Hospital	495
Gordon Hospital for Fistula	80
Grosvenor Hospital for Women (of which £100 towards accommodation for resident medical officer and for nurses)	650
Guy's Hospital (of which £1000 towards provision of site for out-patient department extension)	12,818
Hampstead General and North-West London Hospital (of which £200 to deficit on new operating theatre and emergency beds)	3,022
Hampstead Hospital for Children (in consideration of the fact that curable cases are admitted)	200
Hanwell Cottage Hospital	50
Harrow Hospital (of which £200 towards extension) ..	376
Hendon Cottage Hospital	300
Hornsey Central Hospital (of which £150 towards new nurses' home)	380
Hospital for Consumption, Brompton (including Sanatorium at Frimley) (of which £200 to deficit on improvements)	1,687
Hospital for Epilepsy and Paralysis (of which £150 towards extension)	2,103
Hospital for Sick Children (including Country Branch at Tadworth)	4,378
Hospital for Women (Soho-square)	1,131
Hospital of St. John and St. Elizabeth (of which £200 towards nurses' home extension)	1,000
Hostel of St. Luke (of which £25 towards new larder) ..	125
Ilford Emergency Hospital	653
Infants Hospital (including Convalescent Home at Burnham) (of which £250 towards extension) ..	605
Invalid and Crippled Children's Society's Hospital (Canning Town)	500
Invalid Children's Aid Association Heart Hospital, West Wickham	300
Italian Hospital	300

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* The Distribution Committee draw attention to the fact that it must not be assumed that the reduction or absence of a grant implies dissatisfaction.

	£
Jewish Maternity Home (of which £100 towards provision of clinical laboratory)	210
Kensington, Fulham, and Chelsea General Hospital (of which £250 towards extension)	351
King Edward Memorial Hospital (Ealing) (of which £200 to deficit on extension)	1,000
King Edward VII.'s Hospital for Officers	300
King George Hospital (see end of list)	
King's College Hospital (of which £100 towards improvements)	7,542
Kingston-upon-Thames Victoria Hospital	75
London Fever Hospital	600
London Homœopathic Hospital (of which £150 towards nurses' home extension)	1,908
London Hospital (including Recovery Branch at Reigate)	15,179
London Jewish Hospital (of which £100 to deficit on acquisition of adjoining site)	700
London Lock Hospital (of which £773 to Harrow-road Hospital and £397 to Dean-street Hospital, £250 of the latter being towards extension of out-patient department at Dean-street)	1,170
London Temperance Hospital (of which £750 to reduce debt, and £1,000 towards provision of new special departments and pay beds)	3,844
Marie Curie Hospital (of which £100 towards out-patient accommodation)	115
Medical Mission of the Good Shepherd, Babies' Home (Hoxton)	25
Metropolitan Hospital (of which £500 to deficit on nurses' home and accident wards)	4,444
Middlesex Hospital (including Convalescent Home at Clacton (of which £1,000 towards reconstruction) ..	9,119
Middlesex Cancer Hospital..	1,205
Mildmay Memorial Hospital (of which £100 towards extension of maternity pay block)	400
Mildmay Mission Hospital	1,100
Miller General Hospital for South-East London (including Convalescent Home at Bexhill) (of which £1,000 to reduce debt, and £500 to deficit on extension) ..	5,860
Mothers' Hospital of the Salvation Army	650
Mount Vernon Hospital (Fitzroy-square and Northwood)	842
National Hospital for Diseases of the Heart (of which £100 to deficit on extension of out-patient department)	512
National Hospital, Queen-square (including Convalescent Home at Finchley) (of which £250 to reduce debt and £250 towards extension)	4,512
Nelson Hospital for Wimbledon, Merton, and District (of which £250 towards provision of maternity pay-bed block)	1,000
North Islington Infant Welfare Wards	75
Norwood and District Cottage Hospital	304
Paddington Green Children's Hospital (including Convalescent Home at Slough)	620
Passmore Edwards Hospital for Wood Green, &c. ..	152
Phillips Memorial Homœopathic Hospital (Bromley) ..	15
Plaistow Maternity Hospital (of which £250 towards extension)	850
Poplar Hospital for Accidents (including Convalescent Home at Walton-on-the-Naze) (of which £100 towards extension of X ray department)	325
Prince of Wales's General Hospital (including Convalescent Home at Nazeing) (of which £1,000 to reduce debt and £250 towards new out-patient department)..	5,850
Princess Louise Kensington Hospital for Children (of which £200 towards further stage of new hospital) ..	600
Queen Charlotte's Maternity Hospital (of which £1,000 towards rebuilding and extension on new site) ..	2,703
Queen Mary's Hospital for the East End	4,644
Queen's Hospital for Children (including Convalescent Home at Bexhill)	4,019
Ross Institute and Hospital for Tropical Diseases (to the Hospital)	20
Royal Dental Hospital of London	320
Royal Eye Hospital	837
Royal Free Hospital (of which £1,000 towards extension)	7,424
Royal Hospital (Richmond) (of which £200 towards new operating theatre)	1,467
Royal London Ophthalmic Hospital (of which £250 towards provision of additional nurses' accommodation and wards)	2,963
Royal National Orthopædic Hospital (including Country Branch at Stanmore) (of which £250 to reduce debt and £500 to deficit on extension of country branch) ..	4,746
Royal Northern Hospital (including Royal Chest Branch in City-road, Recovery Branch at Southgate, and Convalescent Home at Clacton) (of which £500 to reduce debt and £250 towards provision of pay beds) ..	9,145
Royal Waterloo Hospital for Children and Women ...	2,820
Royal Westminster Ophthalmic Hospital (of which £500 to deficit on rebuilding and extension on new site) ..	1,206
St. Andrew's Hospital, Dollis Hill	303
St. Bartholomew's Hospital (of which £1,000 towards new operating theatres)	7,461
St. Columba's Hospital (of which £15 towards sun-blind for balcony)	431
St. George's Hospital (including Recovery and Convalescent Branch at Wimbledon) (of which £1,000 to reduce debt)	9,008
St. John's Hospital (Lewisham)	1,623
St. John's Hospital (Twickenham)	75
St. John's Hospital for Diseases of the Skin	302
St. Luke's Hospital for Advanced Cases	300
St. Mark's Hospital	484
St. Mary's Hospital	6,302
St. Mary's Hospital for Women and Children (Plaistow) (of which £250 to reduce debt and £500 to deficit on first stage of new out-patient department)	2,828
St. Monica's Home Hospital	125
St. Paul's Hospital	75
St. Peter's Hospital for Stone (of which £150 towards extension)	600
St. Saviour's Hospital for Ladies of Limited Means (Osnaburgh-street)	159
St. Thomas's Hospital	11,621
St. Thomas's Babies' Hostel (of which £100 towards new out-patient department)	125
Samaritan Free Hospital for Women (including Convalescent Home at Amersham)	1,337
Santa Claus Home (of which £25 to reduce debt and £20 to deficit on recent improvements)	120
Seamen's Hospital Society (*see* Dreadnought Hospital)	
South-Eastern Hospital for Children (Sydenham) (of which £100 towards new casualty department and pay beds)	1,235
South London Hospital for Women (of which £500 to deficit on new out-patient department)	1,682
Stoke Newington Home Hospital for Women	75
Streatham Babies' Hospital (of which £25 towards new sun-room)	50
University College Hospital (of which £250 towards extension of nurses' home)	9,187
Victoria Cottage Hospital (Barnet)	91
Victoria Hospital for Children (including Convalescent Home at Broadstairs)	2,671
Weir Hospital (Balham)	75
Wembley Hospital	100
West End Hospital for Nervous Diseases	1,538
Western Ophthalmic Hospital (of which £250 towards rebuilding)	553
West London Hospital (of which £250 to reduce debt)..	5,336
Westminster Hospital	5,505
Willesden General Hospital (of which £500 to reduce debt and £250 to deficit on completed stages of extension)..	3,074
Wimbledon Hospital (of which £200 to deficit on provision of children's wing)	700
Winifred House Invalid Children's Convalescent Hospital Home	25
Woodford Jubilee Hospital	105
Woolwich and District War Memorial Hospital ..	1,500

Special Grant.†

King George Hospital Building Fund (towards first stage of new hospital)	2,000
Total	£261,734

Summary.

	£
Grants to hospitals (including recovery and convalescent branches) for the year 1920 out of the ordinary distribution, per list above :	
Ordinary grants	248,000
Special grants towards expenditure under the Federated Superannuation Scheme for Nurses and Hospital Officers	13,734
Total grants	261,734
Grants to hospitals, out of the special distribution of the Thank-offering Fund for the King's Recovery ..	115,000
Total grants to hospitals and branches for 1920 ..	376,734
Grants to non-hospital convalescent homes	2,000
Total distribution for the year 1920, besides allocation of radium purchased with the gift of £50,000 from Sir Otto Beit	£378,734

Lord Ebbisham having seconded, the report was carried.

Sir Cooper Perry then presented the report of the Committee on the Distribution to Convalescent Homes not attached to particular hospitals, which stated that the number of applications eligible for consideration amounted to 53, as compared with 49 last year.

Colonel H. A. Wernher (hon. secretary) presented the list of awards.

Thank-offering Fund for the King's Recovery.

The Chairman of the Management Committee (the Earl of Donoughmore), in presenting the report of the Committee on the Thank-offering Fund for the King's recovery, said that he did so with profound thankfulness, and would like to say how much they had been encouraged all through by His Royal Highness's own great help and assistance at every stage of the work. He would like to emphasise the fact that the costs of collection had been nil.

The report showed the origin, history, and results of the Thank-offering Fund, and stated that it was realised from the moment the gift of "Audax" was received that the King's Fund could not by itself put forward a claim to be regarded as the sole channel for an expression of the feelings of the whole country, though the Committee pointed out that the hospitals of London were national institutions in the sense that they treated patients from all parts, and formed the largest centre of medical education and research. To this extent, and also because of its peculiar relation to its Royal Presidents, the King's Fund might be regarded as a national institution, but for the purposes of a thank-offering it was desirable that the public outside London should have an opportunity of selecting local charities; so provision had been made for earmarking contributions for local hospitals. The expenses were kept low, and would be more than covered by the bank interest on the money received while on deposit. The Management Committee recommend that an address be presented in the name of H.R.H. the President and the General Council to the King as Patron of the King's Fund, referring to the origin, history, results, and distribution *of the Thank-offering Fund, and tendering* to His Majesty their loyal congratulations on his recovery, and on his return to the full discharge of his high functions in Church and State.

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† See (supra) Distribution Committee's report.

Lord Luke, in seconding the recommendation of the report, said that the difference between the £118,397 contributed in addition to the gift of "Audax," and the £115,000 distributed, was, like the expenses, covered by the interest received.

Mr. Leonard L. Cohen (hon. secretary) presented the list of awards as follows:—

	£
Acton Hospital (to reduce deficit on extension) ..	750
Baby Clinic Hospital (Kensington) (towards the acquisition and adaptation of new premises)	150
Belgrave Hospital for Children (to enable the hospital to extinguish the deficit on the completed stages of the extension)	1,000
Bolingbroke Hospital (towards provision of new block)	150
Brentford Hospital (towards provision of additional staff accommodation)	250
British Hospital for Mothers and Babies, Woolwich (to reduce deficit on the completed stages of the new hospital)	1,500
Bromley (Kent) and District Hospital (towards extension)	300
Carshalton and District Hospital (towards extension) ..	250
Central London Ophthalmic Hospital (towards extension)	750
Central London Throat, Nose and Ear Hospital (to reduce deficit on extension)	1,000
Charing Cross Hospital (towards provision of new *casualty department*, and other improvements) ..	1,000
Connaught Hospital (towards extension)..	600
Deptford and Greenwich Babies' Hospital (towards rebuilding and extension on new site)	250
Dreadnought Hospital (Seamen's), Greenwich (towards first stage of extension)	1,000
East End Maternity Hospital (to reduce deficit on acquisition of adjoining building and its adaptation for nurses' quarters)	1,250
East Ham Hospital (to reduce deficit on equipment of new general hospital)	2,500
Elizabeth Garrett Anderson Hospital (to reduce deficit on reconditioning of existing hospital in connexion with recent extension)	750
Finchley Memorial Hospital (towards provision of new nurses' dining-room)	300
General Lying-in Hospital (towards provision of new nurses' home)	2,500
Grosvenor *Hospital for Women (towards provision of* accommodation for resident medical officer and for nurses)	100
Guy's Hospital (towards provision of site for out-patient extension and to reduce deficit on recent improvements)	3,000
Hampstead General and North-West London Hospital (to reduce deficit on provision of new operating theatre and emergency beds)	200
Harrow Hospital (towards extension)	300
Hornsey Central Hospital (towards new nurses' home)..	600
Hospital for Consumption, Brompton (to reduce deficit on recent improvements)	800
Hospital for Epilepsy and Paralysis (towards extension)	350
Hospital for Sick Children (towards provision of wards for recovery cases at country branch)	700
Hospital of St. John and St. Elizabeth (towards enlargement of nurses' home)	800
Infants Hospital (towards extension)	750
Kensington, Fulham, and Chelsea General Hospital (towards extension)	1,250
King Edward Memorial Hospital (Ealing) (to reduce deficit on extension)	800
King George Hospital (to the building fund for the first stage of the new hospital)	10,000
King's College Hospital (towards improvements) ..	150
London Homœopathic Hospital (towards nurses' home extension)	600
London Jewish Hospital (to reduce deficit on acquisition of adjoining site)	100
London Lock Hospital (towards extension of out-patient department at Dean-street)	750
London Temperance Hospital (towards provision of new special departments and pay beds)	1,000
Marie Curie Hospital (towards provision of permanent out-patient accommodation)	100
Metropolitan Hospital (to reduce deficit on new nurses' home)	3,500
Middlesex Hospital (towards reconstruction)	14,000
Mildmay Memorial Hospital (towards extension of maternity pay block)	100
Miller General Hospital for South-East London (to reduce deficit on extension)	12,000
National Hospital for Diseases of the Heart (to reduce deficit on extension of out-patient department) ..	500
National Hospital, Queen-square (towards extension) ..	750
Nelson Hospital for Wimbledon, Merton, and District (towards provision of maternity pay-bed and child welfare block)	1,250
Plaistow Maternity Hospital (towards extension) ..	500
Poplar Hospital for Accidents (towards extension of X ray department)	150
Prince of Wales's General Hospital (towards provision of new out-patient department)	1,500
Princess Louise Kensington Hospital for Children (towards next stage of new hospital)	800
Queen Charlotte's Maternity Hospital (*towards* rebuilding and enlargement on new site)	9,000
Queen Mary's Hospital for the East End (to extinguish deficits on out-patient department and on maternity isolation block)	2,000
Royal Free Hospital (towards centenary extension scheme)	5,500
Royal Hospital (Richmond) (towards provision of new operating theatre)	300
Royal London Ophthalmic Hospital (towards provision of additional nurses' accommodation and wards) ..	750
Royal National Orthopædic Hospital (to reduce deficit on extension of country branch at Stanmore) ..	4,500
Royal Northern Hospital (towards provision of pay beds)	1,500
Royal Westminster Ophthalmic Hospital (to reduce deficit on rebuilding and enlargement on new site) ..	1,000
St. Bartholomew's Hospital (towards new operating theatres)	2,000
St. Luke's Hospital for Advanced Cases (to reduce deficit on new hospital)	100
St. Mark's Hospital (to reduce deficit on extension) ..	100
St. Mary's Hospital for Women and Children (Plaistow) (to reduce deficit on first stage of new out-patient department)	3,500
St. Peter's Hospital for Stone (towards extension) ..	400
St. Thomas's Babies' Hostel (towards provision of new out-patient department)	100
Seamen's Hospital Society (*see* Dreadnought Hospital)	
South-Eastern Hospital for Children (Sydenham) (towards provision of new casualty department and pay beds)	600
South London Hospital for Women (to reduce deficit on new out-patient department and nurses' quarters) ..	1,500
University College Hospital (towards extension of nurses' home)	750
Western Ophthalmic Hospital (towards rebuilding) ..	500
Westminster Hospital (towards provision of annexe for radium patients)	1,000
Willesden General Hospital (to reduce deficit on completed stages of extension)	750
Wimbledon Hospital (to reduce deficit on provision of children's wing)	500
Woolwich and District War Memorial Hospital (to reduce deficit on first stage of new hospital)	5,000
Total	£115,000

Voluntary Hospitals and the Local Government Act.

In the absence of the Vice-Chairman of the Voluntary Hospitals (Local Government Bill) Committee (the Rt. Hon. Hugh P. Macmillan, K.C.), Sir Edward Penton presented a report describing a draft scheme for a body representative of the Voluntary Hospitals of London to confer with the London County Council, under Section 13 of the Local Government Act.

The Voluntary System and the L.C.C.

The Chairman of the London County Council (Lord Monk Bretton) said that he thought the London County Council would welcome most cordially the coöperation of the Voluntary Hospitals of London in the extremely difficult and onerous duty of making adequate provision for the sick of London, and he was glad to be able to say that the draft scheme of representation *referred to had been approved by the* Central Public Health Committee of the Council, subject to one or two minor observations. It would, of course, in its final form be subject to the approval of the Council itself. It was the well-known policy of the Council for the last 20 years to do everything in its power to promote the welfare of the Voluntary Hospitals of London, and to seek their active coöperation in carrying out the various duties of the Council in connexion with the treatment of the sick. He believed that the County Council desired that the harmonious coöperation and happy relationship which had always existed between it and the Voluntary Hospitals should not only continue, but, if possible, should be still further extended, in the near future.

Sir William Collins trusted that the future of the voluntary system would be safeguarded, whatever might be the progress of municipalisation.

Hospitals and Motor Accidents.

Lord Ebbisham referred to the very important Bill before the House of Lords that day on which a proposal had been made which would be very helpful to the Voluntary Hospitals.

Lord Luke said that his amendment to the Motor Traffic Bill would provide that in the event of any patient being carried to a hospital, the hospital should receive recompense for curing that patient. At the present moment, in regard to more than nine-tenths of those who were taken to hospital, the hospital had to pay. If the amendment were added to the Bill, then in future the compulsory insurance would include up to £4 a week for the hospital for the out-of-pocket expenses, up to a maximum of £25. It would only cost the owner of a motor a premium of 5s. a year, and he should think the motorist would feel more comfortable if he held such a policy.

Arrangements for 1930.

The Prince of Wales said that Viscount Ullswater, whose wise advice the Fund would miss, had been compelled to discontinue his service on the Council owing to the pressure of his numerous duties. The Rev. Owen Spencer Watkins was being invited to serve in the place of the Rev. W. T. A. Barber, who had left London and was unable to continue his membership. There would be a change in the title of the Voluntary Hospitals (Local Government Bill) Committee which would now be called the Voluntary Hospitals (Parliamentary) Committee, thus enabling it to consider any other Bills that might affect hospitals. His Royal Highness also mentioned that during his forthcoming absence in South Africa he proposed to delegate his powers, as President, to a Committee consisting of the Lord Chancellor, the Speaker of the House of Commons, and the Governor of the Bank of England.

On the motion of Lord Donoughmore resolutions delegating powers to committees were passed, and the usual votes of thanks terminated the proceedings.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

School Health Administration.

THE Department of Health for Scotland and the Scottish Education Department have issued a joint memorandum on school health administration as affected by the new Local Government Act. This document, which is an excellent summary of the whole system of school health administration, is too condensed to be summarised further; but medical officers and school medical officers, as well as members of the new education committees, ought to make themselves familiar with every word of it. The new committees will be responsible for over 800,000 children—that is, roughly one-sixth of the whole population of Scotland—and the supervision of this large group continues during nine or ten of the most critical years of life. The school-child spends some 2000 days in the school environment, and the school health service has a long and unique opportunity for influencing the health and habits of the rising generation.

Proposed Clinic for Rheumatic Children in Edinburgh.

The public health committee of Edinburgh town council have agreed to recommend the establishment of a clinic for rheumatic children. Dr. William Robertson, the medical officer of health, suggests that a system of voluntary notification of rheumatism should be started, the notifying practitioner being invited to say whether hospital or other special treatment is required. The notification will give a rough indication of the incidence of early rheumatism—under which heading Dr. Robertson includes rheumatism, growing pains, chorea, St. Vitus's dance and pains in the joints accompanied by fever—and medical men will be invited to send patients for critical examination at the hands of an expert.

Dr. A. S. M. Macgregor, in his current bulletin on the health of Glasgow, says that November proved a favourable month. The general death-rate was 12·2, against 12·8 for November, 1928, and in one of the weeks it fell to 10·5, the lowest figure yet recorded for the month. Measles and pneumonia, though prevalent, showed a relatively low mortality, but a testing time for these diseases will come in January and February.

At the recent conference of the Scottish National Poultry Council, Mr. J. M. Caie, of the Department of Agriculture, sketched what has been done in arranging egg-laying tests during the last five years in Scotland. It has been found, he said, that the average number of eggs per bird of all breeds, and for the whole five years, ranged from 182 to 193. In 1908 there were just over 4,000,000 fowls in Scotland, and the average production of eggs per hen in that year was estimated at 72. In 1913 the number of eggs per hen in Scotland was given as 84, and in 1925, when the last census of production was taken, the estimate had risen to just over 100 eggs per hen per annum. These figures are not, of course, absolutely accurate; but they probably represent pretty fairly an actual increase in production.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Treatment of Drug Addicts in New York City.

WHEN Commissioner Richard C. Patterson, Jr., took charge of the New York City Department of Corrections in 1928, he found no uniform plan in operation for handling the 1500 drug addicts that come under the supervision of the department. A committee under the chairmanship at first of Dr. William R. Williams, and later of Dr. Alexander Lambert was appointed, and has issued its report.[1] Two major problems are dealt with in this report: (1) The problem of withdrawal of the drug in the shortest possible time; and (2) the ultimate rehabilitation of the addict. In a special ward at Bellevue Hospital, a number of different methods of withdrawal were studied. In order to have a standard on which to base results, it was agreed to use 100 patients in each method, and the symptoms selected as giving the best index of the condition of these patients on withdrawal were (1) gastro-intestinal symptoms; (2) muscular symptoms; (3) restlessness, both physical and mental; and (4) prostration, subjective and objective. Each of these symptom groups was recorded as absent, moderate, marked or excessive. Narcosan was first studied, and it was found to be no specific for drug addiction, nor to diminish the craving for narcotics after withdrawal. Withdrawal symptoms were influenced unfavourably, the gastro-intestinal symptoms being more severe than in abrupt withdrawal without any drug. Among other drugs tested were atropine, scopolamine, a number of depressants of the central nervous system (chloral hydrate, phenobarbital, paraldehyde, bromides), magnesium sulphate and iso-amylethyl barbiturate. The results in every case were unsatisfactory. The research was then turned to gradual withdrawal without substitute drugs. They find that "the reduction treatment, especially if carried out over a period of 14 days or more, is the most humane, in that it involves the least suffering. It is also the safest, as regards danger to life, and can be used in any case of drug addiction." They recommend that all addicts undergoing treatment be under capable medical supervision, that those whose general condition warrants it, be subjected to abrupt withdrawal, and that those not included in this class be given the reduction treatment.

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[1] Jour. Amer. Med. Assoc., 1929, xciii., 1297.

It is recognised that after their release addicts will suffer again from the craving for the drug. The committee feels that much may be learned from past and present attempts at rehabilitation in New York, but that a new plan must evidently be developed to meet local conditions. Certain basic principles are laid down. The addict must learn a trade or line of work by which he may be self-supporting. A position must be found for him when he is ready for it. His progress for a number of years must be supervised, and he must be brought to a state of mind whereby he becomes coöperative and honestly desires to be permanently free of his habit. They dwell also on the importance of making careful choice in the personnel and location of the centre, and in its equipment. Some arrangement must also be made whereby the addicts will not be free agents until finally discharged.

Consumption of Water.

The average daily consumption of water in 58 cities of Great Britain is said to vary from 17 to 84 U.S.A. gallons per capita. In most American cities the consumption exceeds 100 gallons per capita, though in some cities, such as San Francisco, where the water supply is metered, the consumption does not greatly exceed 70 gallons. Why do we use so much more water than Europeans? This question is discussed in a recent paper by Mr. Abel Wolman, the editor of the *Journal of the American Water Works Association.* He believes that only a part of our excess consumption is to be attributed to waste, and to the greater availability of sources. Much, he thinks, must be due to the greater demand in this country for sanitary conveniences. The sale of bath tubs here increased, it appears, from 415,400 in 1919, to 1,101,000 in 1927, in which period the population increased by only 15 per cent. Whether or not the use of so many bath tubs should be considered wasteful Mr. Wolman admits may be a matter of opinion. In Beverley Hills, California, the per capita consumption is over 400 gallons, although the water is metered. The residents are wealthy, and indulge in private swimming pools, as well as numerous bath-rooms in their luxurious homes. Does this spell "waste" or "a higher standard of living"?

Drug Stores and Venereal Disease.

The corner drug store, so-called because almost every street corner can boast of at least one of them, is a shop where you may buy ice-cream, "soft" drinks, newspapers, tobacco and many other things besides drugs. But like his English equivalent, the chemist, an American drug-store clerk is not unwilling to offer also medical advice for which he makes no charge, and the people seem ready enough to accept his recommendations. Thus an investigator for the American Social Hygiene Association who asked 100 young men, selected at random in public places, where he might get advice for venereal disease, was advised by no less than 42 to get it at a drug-store. Twenty-four directed him to a physician, 10 to a clinic, four offered home remedies, and 14 withheld advice. A questionaire was sent to all druggists in this same city, asking how many applicants they had for venereal disease advice. Replies were received from 237, who between them acknowledged 2355 applications from alleged venereal disease patients for advice, remedy without a physician's prescription, or treatment. One-third of the druggists admitted giving treatment to such patients without prescriptions. Forty-four per cent. had suggested that the patient go to a clinic or to a physician, while 23 per cent. did not state what their advice had been.

Blood Calcium.

The importance of maintaining blood calcium at the normal level is brought out in two recent reports. Drs. E. V. McCollum and Henry Klein, of the Johns Hopkins School of Hygiene, have conducted a series of experiments on pigs with diets of varying calcium content. These animals were selected on account of their omnivorous habits, because of the comparatively long suckling period, and because they have two sets of teeth. Three types of diet were offered to three groups of pigs, one of normal calcium content and one each of subnormal and high calcium content. Although the diet deficient in calcium was softer than the other diets, the teeth of pigs eating this diet were rapidly worn down to the gum margin. The teeth grew more slowly, and were less calcified (as shown by X rays) than those of the controls. Malpositions were about three times as common. Malocclusion was found to be characteristic of pigs that had an inadequate calcium allowance during the first year and adequate calcium thereafter. The experiments were carried out under a grant from the Research Committee of the American Dental Association. At the same time, Dr. Walter Timme, of the Neurological Institute, announces that parathyroid deficiency, leading to abnormally low blood calcium, has very definite influence on behaviour. Patients with hypoparathyroidism are prone to sudden anger on very slight provocation, and are unadaptable and uncompromising. They constitute problem cases in the home, at school and in every environment where they may be found. Their behaviour eccentricities may indeed become so extreme as to lead to certification.

Medical Service by Easy Payments.

A private corporation has offered one solution for the problem of the high cost of medical care. It has been chartered in California with the avowed object of applying the instalment system to the purchase of medical and dental service. If a patient needs operative treatment, the company will take care of the charges under contract for repayment over a specified period of time.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Yellow Peril.

AMONGST many tribulations India has much to be thankful for in the immunity she has so far enjoyed from certain tropical diseases which might have been expected to find easy entry. Jigger, for example, never seems to have obtained a real hold, though sufferers from the disease must continually be arriving from East Africa. The outstanding instance is, of course, the importation of yellow fever, a danger which has been much increased by the development of air travel. In a recent number of the *Indian Medical Gazette* the Surgeon-General of Madras commenting on the situation made good two points. One is that the Indian stegomyia, *Aëdes ægypti*, is capable of conveying the infection; the other that a person who has been infected in West Africa may cross the Indian frontier by air before the infective stage of the disease has been reached. It would be quite possible for an attack of yellow fever to escape recognition by being mistaken for influenza or febricula, and if such an unrecognised case were introduced to a place where suitable mosquito vectors exist no ordinary precautions could prevent the rapid extension of the disease. Dengue, says the Surgeon-General, is known to spread like wildfire when infection occurs amongst a susceptible population, and as yellow fever is carried in exactly the same manner it is reasonable to believe that an outbreak would speedily grow beyond control. Under these circumstances, he argues, we have to choose between the comparatively slight inconvenience which would be caused by interference with air traffic between West Africa and the eastern countries and the appalling results which might follow the spread of yellow fever to India and the Far East. It is satisfactory to know that the Public Health Commissioner, the Government of India, and the Secretary of State are alive to the danger, and that international regulations are likely to be framed to meet it.

Jail Reports.

One Indian jail report is very like another, and that which furnishes a text for these remarks is no exception to the rule. There is much in it to justify a feeling of pride in the department. It is common knowledge that the general arrangements in the jails are excellent, the housing is up to date and adequate, the food sound and plentiful, and even if there is technically some overcrowding, the normal scale is so ample that it is not likely to have an injurious effect. The general health of the inmates is good; the mortality of 8·6 per 1000 is far below that of the population outside the walls. A great majority of the discharged prisoners show an increase in weight, and no doubt many of them carry away something more on the credit side, having been taught a trade. What, then, it may be asked could be further desired? The answer is to be found in a chapter headed "Educative, Moral and Religious Influences in Prisons" of Sir Evelyn Ruggles Brise's "The English Prison System" (1921). In British prisons books of a moral and instructional character are issued freely to all who can make use of them, lectures are given, and discussions take place on subjects chosen by the prisoners themselves. A summary of current news is read out weekly. Daily religious services are made attractive by the aid of music. Music is also offered in the form of entertainments by choral societies, and in a large American prison musical training has long been given to convicts, with the result that many of the men were able to earn a livelihood after discharge, and the percentage of relapse to crime was definitely lowered. Surely the time has arrived when every Indian provincial prison return should have a heading for educative, moral, and religious influences, and show some substantial progress under it every year. Assistance to discharged prisoners is another direction to which philanthropic effort might be usefully directed.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg.-Lt. R. M. Buchanan to be Surg.-Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. C. Stubbs is secd. for serv. under the Colonial Office.

Capt. B. C. W. Pasco relinquishes his temp. commn. and retains the rank of Capt.

ARMY DENTAL CORPS.

Lt. A. F. D. Shapland, temp. Dental Surg., Gen. List, to be Lt. (on prob.).

TERRITORIAL ARMY.

Maj. H. E. McCready to be Lt.-Col. and to comd. the 143rd (S. Midland) Fd. Amb., vice Lt.-Col. (Bt. Col.) H. F. Humphreys, vacated.

Lt. F. W. Crook (late 5th Bn. K.R.R.C., Spec. Res.) to be Lt.

ROYAL AIR FORCE.

W. J. Cotter is granted a temporary commission as a Flying Officer.

Flying Officer B. A. Porritt is transferred to the Reserve, Class Di.

BRITISH HOSPITAL FOR MOTHERS AND BABIES.—Princess Mary recently opened a new administrative block and clinic department of this Woolwich Hospital, which has been built at a cost of £40,000.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of seven English administrative counties, the island of Guernsey, and of the "landward" or extraburghal areas of two Scottish counties:—

Name of district and estimated (R.-G.) population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Durham (949,300)* ..	21·1	11·5	1·01	1·01	2·2	1·4	80	37	5·5
Staffordshire.. (712,080)*	19·2	10·5	0·73	1·19	1·6	1·3	62	—	3·6
Cheshire .. (663,280)	14·9	11·1	0·75	1·41	1·6	2·0	58	28	5·2
Hampshire .. (427,100)	17·1	10·7	0·71	1·18	1·2	2·0	46	16	2·9
Cumberland .. (210,600)	17·9	12·3	0·81	1·48	1·8	1·9	63	27	5·3
Huntingdonshire (56,320)	16·9	12·6	0·82	1·07	1·3	2·0	45	16	5·2
Rutland .. (17,960)	14·5	11·3	0·50	1·44	0·9	2·5	46	19	7·6
Guernsey .. (39,000)	20·8	12·4†	0·82	1·61	1·2	1·6	59	23	1·2
Fife .. (110,372)	19·2	11·3	0·62	1·02	1·5	1·4	82	38	6·1
Dumfries .. (45,800)	18·8	13·7†	1·03	1·20	2·0	2·3	73	21	3·5

* Adjusted for alteration of boundaries during the year.

† Standardised—Guernsey 9·9, Dumfries 12·0.

Relation of stillbirths to live births: Durham, 2·8 per cent.; Huntingdonshire, 3·0 per cent.; Rutland, 2·7 per cent. Guernsey, 3·6 per cent.

Durham County.

Dr. T. Eustace Hill says that the infant mortality-rate is the lowest ever recorded in the county. As an unsatisfactory feature of 1928, he notes the very marked reduction in the number of new dwellings available for a population over 30 per cent. of which is overcrowded. The much needed substitution of water-closets for privies has not made satisfactory progress, possibly owing to the prevalent trade depression. The prevalence of small-pox was less, 1124 notifications with 3 deaths, as compared with 5111 cases and 19 deaths in 1927. The notifications of encephalitis lethargica numbered 21, and the deaths 33. There were 180 notifications of puerperal fever and pyrexia with 9 deaths, whilst the deaths from other accidents and diseases of pregnancy and parturition numbered 103. This low proportion of maternal deaths due to sepsis was somewhat increased by the investigation of 88 maternal deaths. The principal causes of these investigated deaths were:—puerperal sepsis, 13; eclampsia, 16; embolism, 9; toxæmia, 7; postpartum hæmorrhage, 5; and antipartum hæmorrhage, 10. The notified cases of ophthalmia neonatorum numbered 140, and all cases of inflammation of the eyes of new-born children were followed up by the health visitors. The damage done to survivors from ophthalmia was one case of total blindness and another of impaired sight in one eye. Of the 563 stillbirths, 535 were legitimate and 28 illegitimate; 149 occurred in a first pregnancy; 1 in a twenty-third; 1 in a twentieth; 3 in a sixteenth; 1 in a fifteenth; and 3 in a fourteenth. The total pregnancies of these 563 mothers was 2453, of which 735 resulted in stillbirths. Among the stillbirths there were 30 sets of twins, including one of joined twins.

During the year a progressively increasing number of cases of skin tubercle (chiefly lupus, some scrofuloderma, and a few cases of tuberculosis cutis verrucosa) were sent to the skin department of the Newcastle Infirmary for ultra-violet therapy. Sir Robert Bolam says the most striking feature of the treatment is the disappearance of unsightly lesions attendant upon secondary pus infection, enabling the patient to go about with less physical and mental discomfort, but he finds that exposure to ultra-violet rays is not by itself sufficient to eradicate tuberculous lesions of the skin, but needs to be combined with other methods. Cases are also sent to Newcastle for radiographic examination by Dr. H. E. Gamlen, and considerable use was made of radiography in the oblique position of the thorax as an aid to the diagnosis of enlarged tuberculous glands in the mediastinum. The high death-rate from tuberculosis in Jarrow is the subject of a special investigation, the death-rate in 1928 from lung tuberculosis being 1·29 and from all forms 1·65. Young adults suffer in particular, and in many the disease tends to produce scattered foci with rapid caseation, and to terminate fatally after a short illness in spite of sanatorium or other treatment. This type of lung tubercle is met elsewhere on Tyneside and in other parts of the county, and resembles the acute type met with in races which have developed no immunity.

There is still much room for improvement in the effluents from collieries and by-product works. The department of scientific and industrial research held a conference of interested authorities and industries in October with regard to a proposed thorough biological survey of the river Tees, which was to be the first of its kind. The local representatives objected to being saddled with the cost of an investigation which was admitted to be one of national importance.

Staffordshire.

Dr. W. D. Carruthers includes in his report many details as to improvements and deficiencies in the water-supplies, sewage disposal works, and housing conditions of the 20 urban and 18 rural districts which make up the administrative county. The new houses built in 1928 were 2488, compared with 4210 in 1927. The local authorities built 1360, as compared with 2613 in 1927. However, at the end of the year there were 1480 houses in course of erection, compared with 210 in 1927. Much overcrowding still exists, and until it is possible to construct houses at lower rentals overcrowding, unhealthy areas, and slum dwellings cannot be dealt with in any drastic fashion. The systematic examination of milk samples for tubercle began in March, and during the first year 88, or about 6 per cent. of 1340 samples were found to be tuberculous. Eighty-two outside complaints of tuberculous milk produced in the county were received, and as a result 48 animals were slaughtered under the Tuberculosis Order. In addition, two cows had died and seven been disposed of by the owners for slaughter. Staffordshire made 18 complaints of tuberculous milk sent in to the county from outside, but the investigation by the outside authorities had a negative result in nine instances. The county began the year with one farm licensed for Certified milk, and three licensed for Grade A (T.T.), and ended the year with six licences for Grade A (T.T.), the Certified milk licence having been relinquished. Samples of all graded milks, including Grade A, were examined every month. Of 607 such samples, 526 were satisfactory, 72 not satisfactory, and 4 contained tubercle bacilli. It is not mentioned whether the tubercle bacilli were confined to Grade A milk or indicated a failure to maintain a tuberculin-tested herd tubercle free.

Both the death-rate from all causes and the infant mortality-rate were the lowest ever recorded in the county. There were 150 notifications of small-pox and one case in an old man proved fatal. There was an increase in diphtheria, chiefly in urban districts; the cases numbered 973 and the deaths 60. In some of the most affected southern districts immunisation work was arranged for in 1929. Of 23 cases of encephalitis lethargica, 21 ended fatally. There were 188 notifications of dysentery in the rural districts, 136 being at two mental hospitals. In one of the mental hospitals, which suffered simultaneously from an outbreak of typhoid fever (17 cases), there were 101 cases of dysentery, and the specimens examined showed that the causal organism was the Flexner bacillus. The new cases of venereal disease treated at the clinics were about the same as in the previous year, but the attendances were considerably better, and the defaulting was less. The confinements attended by midwives numbered 10,523, being 76·5 per cent. of the total births. The midwives notified 208 stillbirths (i.e., 2 per cent.) in their practices, and sent for medical help in 26 per cent. of their cases.

Cheshire.

Dr. Meredith Young reports among the features of *the county tuberculosis scheme:—a slight increase* in the number of notifications and deaths; a large increase in the attendances at orthopædic clinics, owing to the fact that the after-care scheme is now functioning throughout the country; the attendances at hospitals for special treatment were doubled, largely owing to the increase in artificial sunlight treatment; and a specially gratifying feature was the larger number of consultations between practitioners and tuberculosis officers. The bona fide midwives, who numbered 226 when the county took over inspection, are now only 37, and with the passing of the old-fashioned midwife many old superstitions associated with childbirth also pass, says Dr. Young. There are still nine midwives who cannot take the temperature or pulse. The new midwives do not receive adequate remuneration. The county council subsidise five midwives in districts where they cannot make a living. Four receive £60 and one £80 in addition to the fees they earn. A grant is made to two midwives annually towards attendance at a month's refresher course at Plaistow Maternity Hospital. In the 30 registered maternity homes there were 363 births, 18 of which were stillbirths. Of these births, 118 occurred in Bromborough Pool Home. There are still a number of unnotified births, knowledge of which is only obtained through the registrars. Investigation showed that at the end of the sixth month 65 per cent. of the mothers in rural districts were breast-feeding and 61 per cent. of those in urban districts. The illegitimate births numbered 368, of whom 39 died—an infant mortality-rate of 106. An inquiry into the circumstances of 114 illegitimate infants showed that the conditions were quite satisfactory in 103, fairly satisfactory in 9, and unsatisfactory in 2 cases. Towards the end of 1928 the first antenatal clinics were arranged for, under the care of obstetrical specialists, at Congleton, Runcorn, and Sale respectively, to begin work in 1929. Expectant mothers from the surrounding district have also been enabled to attend the antenatal clinic at Ashton-under-Lyne Infirmary.

Increased interest, Dr. Young states, is being manifested by the dairy industry in the purity of milk. The experience of Manchester and Salford, however, is that a larger percentage of tuberculous milks come from Cheshire than from other counties. Dr. Young mentions that as the result of outside complaints of tuberculous milk 152 tuberculous cows were slaughtered. There is a good deal of slackness shown by local authorities, both as to the removal of refuse and the management of tips. There is much variation in water-supplies—thus in Nantwich R.D. there are no fewer than 18 townships with no public water-supply, whereas Northwich R.D. is carrying out its water-supply duties "in a highly laudable fashion." The appointment of a new sanitary officer has led to an improvement in sewage disposal and the prevention of rivers pollution. Dr. Young hopes that all the authorities concerned will support the county council's scheme for a joint committee to deal with the pollution of the river Dee.

Hampshire.

Dr. W. J. Hart, acting county medical officer, describes the arrangements for maternity beds. An antenatal clinic is held bi-monthly at the Royal Hants Hospital, by means of which abnormal cases are booked for the hospital and normal cases for the maternity home managed by the Winchester Maternity Society, and subsidised by the county council. During 1928, 130 cases were admitted to the hospital and 157 to the home. In addition, 31 county cases were admitted to ten other hospitals and homes. The net cost to the county council for these 318 patients was £7 per case. The M. & C. W. centres now number 100, and are managed by a body of 550 voluntary workers. The county council's contribution to the expenses of these centres is £600 a year. Arrangements have been made for the establishment of 14 antenatal clinics. The clinic at Basingstoke will be under the charge of a practitioner with considerable obstetric experience, but the obstetric qualifications of the medical officers of the other 13 clinics are not mentioned. For the purpose of the puerperal fever, &c., regulations, 12 consultants have been appointed, and during the year this facility was utilised in 13 instances. Midwives attended 76 per cent. of the 7818 births, and more than half of their patients paid the insurance fee of 5s. per case to cover the expense of medical aid. For the 2087 insured women a doctor was called in in 48 per cent. and the net cost to the county council was £1100; for the 2724 uninsured women a doctor was summoned in 20 per cent. and the net cost to the council was £585.

The Hants County Council decided not to delegate their powers under the Nursing Homes Registration Act, and in response to applications registered 25 premises. There are still isolated districts without midwives, and the county council undertakes the refund of the expenditure up to £600 a year of the County Nursing Association in providing for these districts. The Nursing Association during last year only spent £118 in this extension of service. In Hampshire it is not found advantageous for district nurses to act as school nurses, tuberculosis nurses, or health visitors. Owing to the unreasonable delay in the notification of tuberculosis an arrangement was made in June for the registrars to report deaths from tuberculosis as they occurred. During the rest of the year the registrars reported 136 deaths, and of these 50 had not been notified! The 71 county council shelters are well used and appreciated. The sanatorium at Chandler's Ford has been fully occupied by 26 women and 20 children, and the sanatorium at The Mount, Bishopstoke, with 72 beds, gradually filled with suitable cases, and has been fully occupied since January, 1929.

Cumberland.

Dr. F. H. Morison reports that he has been instructed to draw up a complete antenatal scheme, and as a preliminary he gives statistical information to show that maternal mortality is higher in Cumberland than most counties, and has progressively increased both in the urban and rural districts during the last three quinquennia. Since the Housing (Rural Workers) Act, 1926, came into force, applications have been received for 94 dwellings, and sanctioned in 93. In the case of 14 the applications were withdrawn and, at the time of writing the report, £1403 had been paid in grants and £50 as a loan. Owing to the heavy incidence of diphtheria in the Brampton rural area immunisation was extensively carried out in 1926, and no cases of diphtheria were notified there in 1928. Notification of puerperal fever was not satisfactorily carried out. There were five notifications and six deaths, and five of the six fatal cases were unnotified. Dr. Morison also complains bitterly of the imperfect notification of tuberculosis. During the last three years 65 per cent., 61 per cent., and 65 per cent. of the deaths from tuberculosis were notified less than six months before deaths, or not notified at all. The accommodation for the two V.D. clinics at the Cumberland and Whitehaven hospitals is reported to be unsatisfactory in several respects.

Huntingdonshire.

Dr. C. B. Moss-Blundell reports that the towns have adequate supplies of good water, with the exception of Godmanchester, and that "the rest of the county derives its water from wells and ponds, all of which are 'shallow' and the water of which is grossly polluted." The water-supply of schools is similar to that of the area in which they are situated. No action has been taken to check pollution of rivers and streams, and very little action with regard to the adulteration of foods and drugs. There were ten cases of small-pox, all in the neighbourhood of Peterborough where this disease was prevalent. Isolation hospital accommodation is quite inadequate, and the whole situation requires revision. Of the 954 births registered 225 were notified by midwives, 3 by parents and handy women, 704 by doctors, and 22 by registrars only. There were 28 stillbirths, equivalent to 3·0 per cent. of the live births. The county health visitors and the district nurses visit expectant mothers but there are no antenatal clinics.

Rutland.

Dr. Christopher Rolleston reports that the village of Ketton, "the pride of Rutland," is to be invaded by large cement works, which, however, will employ 100 men and are not likely to pollute the atmosphere. Electrification and possibly industrialisation of the whole county is foreshadowed. Owing to the smallness of the figures the statistics fluctuate much from year to year. Rutland had the lowest still-birth-rate among the counties, Lancashire and Cheshire the highest. Over a period of years Rutland has a low maternal mortality, but during 1928 two deaths from sepsis in the Oakham R.D. gave a maternal mortality of 7·6, the highest among the English counties. Dr. Rolleston urges the establishment of antenatal centres. Of 11 illegitimate children three died, an infant mortality-rate of 272·7. The county council subsidises a considerable number of approved nursing associations. The schemes for dealing with tuberculosis and mental deficiency compare very favourably with those of other counties. The 30 new houses included 16 erected by local authorities and 9 subsidised houses by other enterprise. Dr. Rolleston thinks that the benefits of the Housing (Rural Workers) Act, 1926, are not sufficiently known. Nevertheless, during last year, grants were agreed to for nine houses and refused for four, so that as much progress has been made in Rutland as elsewhere. Three veterinary surgeons have inspected the dairy herds, and one cow was condemned for tuberculosis. In addition, the inspection of a herd, as the result of an outside complaint, resulted in the biological examination of the milk of seven individual cows, four of which contained tubercle bacilli.

Guernsey.

This isolated community has points of special interest to the epidemiologist. Thus, the cows are free from tubercle, and there ought to be no human tubercle from that source. The three deaths from non-pulmonary tubercle in 1928 were from meningitis (aged 2–5), from peritonitis (aged 5–15), and from tuberculosis of the kidney (aged 25–65), respectively. The two chief industries are the culture of fruit and vegetables and granite quarrying. If the ingestion of tuberculous milk in childhood (as some believe) prevents tuberculosis of the human type, Guernsey should be badly off but, on the other hand, it has to be considered that granite quarrying and cutting has a phthisigenic effect, that the fruit and vegetables are chiefly grown under glass (hardly a healthy form of gardening!), that Guernsey has its housing question, 23 "terribly insanitary houses" being demolished in 1928, and that persons stricken with consumption may take up their residence in Guernsey owing to its reputation as a health resort, and that all these causes may help to keep up the death-rate from pulmonary tuberculosis, rather than the lack of immunisation by tuberculous milk. Dr. H. Draper Bishop reports that the cases of diphtheria were of a severe type, with a case fatality of about 10 per cent., and that most of the 18 cases of scarlet fever were also of a severe character. For many years previously scarlet fever had been practically unknown, with the exception of 1926, when a small outbreak occurred as the result of a fatal but unrecognised case being landed from a ship. An elderly man and his wife were notified as suffering from encephalitis lethargica and both died. Guernsey has had a law for the prevention of smoke since 1858. Recently the smoke nuisance has been increasing. A successful prosecution was undertaken against one firm in 1928, and as a result all the firms are installing appliances to prevent smoke. Better methods for the collection and disposal of refuse are under consideration. Dr. Bishop suggests that a scheme should be devised to enable sufferers from cancer to be sent to England for radium treatment.

Fife.

Dr. G. Pratt Yule says the infant mortality-rates of the four county districts were: St. Andrews, 81; *Dunfermline, 80; Cupar, 88; and Kirkcaldy, 93.* Dunfermline and Kirkcaldy include coal-mining areas and were the most likely to be affected by the aftermath of the mining trade crisis of 1926. There was no death from typhoid fever in 1928 and only one in 1927, although this disease was formerly common in Fife. Dr. Yule attributes its decline to better water-supplies and improved conveniences. The tuberculosis scheme embraces 20 burghs and a population of over 200,000. The scheme is unusual in that there are no dispensaries, and the work is done by home visitation. During the year the notification of new cases has been satisfactory, and medical practitioners have coöperated cordially. Most of the new cases come from the smaller unhealthy dwellings. The accommodation at the V.D. centres at Kirkcaldy and Dundee has been improved, but the premises at the Dunfermline centre are "most unsuitable and inadequate." Centres have not hitherto been established for the M. & C.W. scheme. Dr. Yule points out that these will be necessary if progress is to be made in prenatal and postnatal work for mothers, and in the care of pre-school children. The 13 childbirth deaths gave a mortality of 6·1 per thousand births, and in the three previous quinquennia the annual deaths were 14, 18, and 18 respectively. Efficient antenatal supervision, maternity beds for cases from unsuitable homes, and the early removal to hospital of cases with puerperal morbidity are given by Dr. Yule as some of the remedies for this high death-rate. Housing efforts in the Dunfermline and Kirkcaldy districts have hitherto been chiefly concerned *with the mining areas, but Dr. Yule points out* that much might be done profitably under the Rural Workers Act of 1926 for the improvement of the stone-built rural cottages, which are structurally substantial, but in their present condition hopelessly insanitary. The dairy cattle undergo veterinary inspection twice a year, and 42 cows with tuberculosis of the udder were discovered. Certified milk is produced at two farms, and Grade A (T.T.) at one.

Dumfries County.

Dr. John Ritchie renews his *plea for hospital beds* for puerperal fever. Two dairy farms were licensed for Certified milk and 12 for Grade A (T.T.). One licence was revoked, owing to the farmer refusing to remove from his herd 10 cows which had reacted to the tuberculin test during the summer. A clean milk competition attracted 22 entrants. The competition lasted from Feb. 15th to May 10th, and three surprise visits were paid to each competitor. At the end of each round a competitor was notified of his marks and the standard, high to begin with, improved during the competition. The county veterinary *inspectors,* Messrs. F. A. Davidson and G. A. Sangster, submit a very interesting report on milk production in the county. The district committees adopted by-laws in 1926, and since then the veterinary surgeons have been laying the foundations for improved methods and premises. There are 881 dairy farms housing 14,024 *cows. Attention is drawn to a prevalent* type of mastitis associated with a diplococcus. This type of the disease is of a chronic and mild nature, and unlike ordinary streptococcal mastitis the acidity of the milk from the affected quarter is low. Infectious abortion is reported to be on the increase and "probably as big a scourge to the dairy farmer as tuberculosis." The veterinary inspectors further state that the supply of milk from tubercle-free herds has been in excess of the demand for some time. Their experience leads them to emphasise two important factors in the maintenance of tubercle-free herds. First, it is practically impossible to maintain such a herd unless it is isolated from untested stock, either by natural barriers or double fencing; secondly, the incubation period may last months, so that a newly purchased cow may pass the test, be added to the herd, and subsequently develop tuberculosis. They, however, affirm their strong belief in the reliability of the tuberculin test.

SCHOOL MEDICAL SERVICE.

—	No. on roll.	Aver. E.S. attendance.	Routine inspections.	Special exams. and reinspections.	Percentage of defects.
Blackburn ..	10,433	14,489	4,526*	8,961	20·3
Smethwick ..	11,683	11,538	4,521	9,087	23·2

E.S. = Elementary school.

* With 1114 of 11 to 12 year groups equals 5640.

Blackburn.

THE report of Dr. V. T. Thierens, in succession to Dr. Holden, has coördination and continuity as its keynotes. The school medical officer and assistant are also medical officer of health and assistant, while the tuberculosis officer and the woman assistant medical officer also help in the school work. Record cards are transferred from the child welfare centre to the school medical service. For young children nursery classes have just been opened, whose main aim is to cultivate good habits in the widest sense. An important feature is the afternoon siesta, when for 45 minutes the babies sleep on bed rests which they fix up themselves. Milk and cocoa are supplied at a charge of a halfpenny a day, or in exceptional cases gratuitously. The medical inspection is carried through by frequent visits from the nurse, with whose help it is hoped to eliminate many of those minor defects which retard educational and physical progress in later life. Those who fear nervous or mental strain from sending babies to school should study a typical time-table which includes handkerchief inspection, nature chat, preparation for lunch, play and music, with sleep time in the afternoon. In Blackburn there are 1300 children under five attending school, and Dr. Thierens submits the need for extension and special class-rooms built on the open-air principle, with slipper-baths and gardening facilities.

During ordinary school life the *children of Blackburn* receive close medical attention, with an extra age-group for medical inspection at 11–12, and special supervision is exercised over the rheumatic children. The establishment of a rheumatic supervisory centre is suggested to link up the work of the school medical service, the after-care committee, and the certifying factory surgeon. For many of the defects left over on leaving school treatment is ensured by coöperation between the service and the juvenile employment committee. Mr. Duckworth, who serves the educa*tion committee as juvenile employment officer,* gives 31 examples of untreated defects in about half of which his efforts secured attention. There is still the question of defects arising after school age, but the decision to raise the leaving age to 15 will halve the gap before the care of the Insurance Acts is reached.

Smethwick.

Dr. Hugh Paul gives a thorough consideration to the influence of Vita glass. His experiments point to a definite increase in the hæmoglobin content of the blood of the children who worked in class-rooms so glazed, but their heights and weights showed no superiority, *nor did educational tests detect any* influence. In his opinion the experiments would not justify the education committee in reglazing all the old schools. Of the great value of sunshine in the open-air he is keenly aware; an open-air school on the Fors Estate site, to be ready for pupils by May, 1929, will compare favourably, he writes, with the best in the country. He puts in a plea for more open spaces for children to play in; the street playgrounds of the past are now unsafe and other spaces should be provided within easy reach of the home. One new recreation ground has been provided through the generosity of Messrs. Guest, Keen, and Nettlefold. Dr. Paul suggests that future housing schemes should set apart small areas for recreation purposes.

The education committee have no orthopædic scheme, nor any special school of their own, but Smethwick Cripples Union, a voluntary body, works in close harmony with the school medical service, which refers to it cases of crippling defect. The union employs an orthopædic surgeon, Mr. Wilson Stuart, and a full-time masseuse and orthopædic nurse, and their clinic is equipped with an ultra-violet installation. Children requiring in-patient treatment are sent to Northfield or Bromsgrove, where the most modern methods are available. Pulmonary tuberculosis is dealt with at the chest clinic, where 108 cases were under observation, though only one child was found definitely suffering from phthisis. The only note of regret in the report concerns the large amount of uncleanliness (9·9 per cent.) in the borough; in the year 1928 no child, Dr. Paul writes, ought to come to school dirty. The number of cleanliness examinations was increased from 32,000 in 1927 to 43,000 in 1928; it is, he remarks, primarily the duty of parents to keep their children clean, and in a town like Smethwick where they take more than an average interest in the medical inspections it is astonishing to find so many dirty children; 18 of the cases reported were in the secondary school. The trouble should yield to the influence of the nursery school which is hoped for, and which should also prevent the large percentage (26·4) of medical defects among school entrants.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 14TH, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 265; scarlet fever, 3157; diphtheria, 1749; enteric fever, 31; pneumonia, 985; puerperal fever, 57; puerperal pyrexia, 100; cerebro-spinal fever, 11; acute polio-myelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 13; dysentery, 8; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 17th–18th was as follows: Small-pox, 379 under treatment, 8 under observation (last week 363 and 15 respectively); scarlet fever, 2715; diphtheria, 2680; enteric fever, 64; measles, 540; whooping-cough, 122; puerperal fever, 19 (plus 8 babies); encephalitis lethargica, 123; poliomyelitis, 3; "other diseases," 11. At St. Margaret's Hospital there were 13 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 27 (13) from measles, 8 (2) from scarlet fever, 19 (1) from whooping-cough, 57(16) from diphtheria, 54 (12) from diarrhœa and enteritis under two years, and 44(3) from influenza. The figures in parentheses are those for London itself.

The death from enteric fever outside London was reported from Chesterfield. Wigan reported 4 deaths from measles, Stoke-on-Trent 3. Three deaths from whooping-cough were reported each from Birmingham, Leeds, and Sheffield Diphtheria claimed 4 deaths in Hull; diarrhœa 6 deaths in Liverpool, and 3 each in Nottingham, Manchester, and Salford. Influenza claimed 5 deaths in Sheffield.

The number of stillbirths notified during the week was 227 (corresponding to a rate of 38 per 1000 births), including 32 in London.

Correspondence.

"Audi alteram partem."

THE APPROACHING CHANGES IN THE HOSPITAL SYSTEM IN THIS COUNTRY.

To the Editor of THE LANCET.

SIR,—The inadequacy of the provision for institutional treatment of the injured and sick of the working classes has been a sad spectacle in this country ever since the means at the disposal of doctors for better treatment became appreciable. It has been reported that there are 5000 potential patients on the waiting-list for admission into the Royal Infirmary, Edinburgh, an institution that meets, and is expected to meet, the needs of only a small section of the population. The disparity between the capacity of such hospitals and the needs of the people has rapidly increased, is still on the increase, and, indeed, is likely to increase further, and at a greater speed. Treatment of fractures, for example, was, even 30 years ago, in the main domiciliary, and that for pneumonia and typhoid was also the same; to-day each of these conditions needs the facilities of an adequately equipped institution to provide the advantages to which it is now realised every patient is entitled. In former days the charity hospitals, as I will term them here, did all they could to meet the needs of the poor, and the medical profession responded by giving their services on conditions acceptable and honourable to all concerned. The chief hospitals, maintained on a charity basis, have medical schools which are the pride of the country. The subsidiary ones have served the community and the doctors in a way that is reflected in each locality. Of late years it has been thought desirable to re-christen all these hospitals—those with and without medical schools—"voluntary" in replacement of the time-honoured "charity." The motive for that change in name is not apparent; but it in no way disguises the real nature of the hospitals, but only gives a pretence where none is necessary. Unfortunately, it has been impressed upon the public that these hospitals, whether with and without medical schools, are incomparably superior to others in this country and outside it. The directions in which they once occupied that proud position were especially: in being spaciously constructed and staffed competently by nurses. But the world has caught us up in these and many other directions and our hospitals have been outstripped.

Our machinery for providing institutional treatment for the workman under the Insurance Act is dependent upon charity, with a recent addition on the pseudo-provident system worthily supported by many working men and women. Owing to a stationary state in medicine there was until recent years no greater need for institutional treatment than could be met by the large charity hospitals, because the technical means for the care of accidents and of disease were not then as fully appreciated as they are at present.

But to-day, under totally new circumstances and conditions, the technical treatment of accidents and diseases demands a great increase in the facilities for institutional treatment. Charity and pseudo-provident schemes in these times are totally inadequate for such a purpose. The hospitals, with medical schools attached, need to be greatly increased in numbers rather than in size if medical education is to be promoted as it should be and has been until recent years in this country. Book-learning is excellent, but without technical training it is next to useless and often dangerous. As a direct consequence of the policy, or rather lack of a policy, of the General Medical Council in regard to the education and training of the doctor a young man is qualified by an examining body registered by the State to practise medicine in all its branches when he has often had insufficient clinical experience.

Not only is the young doctor inadequately trained for the professional work in front of him but there is, in this country, no separate hospital provision for the training of physicians, of surgeons, of obstetricians, and other specialists to prepare the best graduates for the higher work they should undertake. Indeed, these exceptional men are now neglected, and their neglect will assuredly react to the detriment of the science and art of medicine.

The system for the poor-law hospitals or infirmaries, still in being, was originally planned to provide institutions for the treatment of the working people throughout the country, and an adequate machinery was created for the purpose. But in consequence of the rapid development of industrial prosperity during the nineteenth century the charity hospital was considered more in keeping with the sentiments of the age. Quickly hospitals, supported by the charitable, *made their appearance throughout the* country in growing centres of population. Recently these hospitals have been in great part brought under the support of a pseudo-provident system which the working men have evolved to a remarkable degree of perfection. Charity has, therefore, been assisted by a pseudo rather than a true provident system, with the approval of the working men. The hospitals in existence to-day, then, are the charity hospitals with and without medical schools attached, and these are regarded as the proper institutions for the working-classes. Unfortunately they are not large nor numerous enough to meet the needs of those classes in the community. Besides there are the hospitals under the poor-law, which have of recent years been greatly extended, to serve the dense populations of the big cities and towns. The last far outnumber the first group and all together fall far below the needs of the community since the progress that has been made in *medical science* during the last 50 years.

Especially more hospitals with medical schools for the technical training of young doctors are urgently needed; also more for the institutional treatment of the working men and their families; and, at the moment, more urgent still is the need for hospitals in which future physicians, surgeons, obstetricians, and other specialists can be adequately trained. Although no coherent scheme has been put forward for meeting the hospital needs of the present nor of the future, the situation fortunately is in a plastic state. The great hospitals with medical schools attached are appealing to charity so that medical education may be properly upheld in this great and wealthy country, and on the score that such hospitals will be at the service of the community as well as that of medical education. These great hospitals should, in my opinion, not be at the service of the ordinary patient but only at the service of the extra-ordinary, certified as such by the members of the medical profession. They indeed are worthy of being placed on a pedestal which will ensure the most careful investigation of the diseased states of a person and where every remedy shall be tested as to its merits. They should be enhanced in their position rather than be kept under or reduced to the level of those in which the recognised means of diagnosis and treatment of the day are duly and properly carried out. Indeed, they should be super hospitals if they are to attain the highest aim in front of medicine. Super hospitals properly and adequately run the country sorely needs—ordinary hospitals it must have and in adequate numbers here, there, and everywhere. Charity hospitals might continue to exist alongside public hospitals for all who care to avail themselves of them, but not under the guise that they might be sufficient to meet the needs of the people. Such is the selection that confronts us, and where is the organisation to consider it? None exists. The Royal Colleges of Physicians and Surgeons are absorbed in examining; the General Medical Council appears to me to fail to grasp the real qualifications needed by a young doctor, and it is compelled to spend much of its time in protecting the public against the doctor who will not abide by the ordinary rules of practice, and it was unfortunate that when a few years ago a Ministry of Health was constituted its amalgamation with the Local Government Board produced a mongrel of but little value either to local government or to public health. A change is imperative, and it may be that now the Ministry of Health will, in turn, split itself and give birth to disparate twins, a new local government service and a public health department in control solely of the medical services.

What is needed above all things is, I believe, a board of medical men, acquainted with the various aspects of medicine, to organise a new hospital service for the country, to regularise the existing institutions, to arrange for the provision of sufficient hospitals for adequate technical training of young doctors; to train young doctors of exceptional ability and promise to acquire further knowledge and extensive practice in medicine, in surgery, in midwifery, and in all special branches so that there may be a proper succession of well-trained doctors to fill the many offices that become vacant in the hospital services throughout the country. As changes are impending, now is the time to draw attention to the actual state of affairs. I am, Sir, yours faithfully,

Cambridge, Dec. 18th, 1929. JOSEPH GRIFFITHS.

MUTILATING OPERATIONS.

To the Editor of THE LANCET.

SIR,—On p. 1338 of your last issue an excellent report is given of the admirable speech made in the House of Commons by the Duchess of Atholl on the subject of mutilating operations performed, ritually, upon women and girls in certain of our Colonies or Dependencies. I do not propose to comment further upon this speech, but I am impelled to say something, with your permission, concerning mutilating operations performed, in this country, upon boys and young women. For some years past I have noticed, as many must do, the very obvious evidence of the gross mutilation that is inflicted upon young male children under the plea of circumcision as a necessary operation. (I firmly believe that the circumcision of male infants *is seldom, if ever, necessary, for the defect is not so* much in preputial redundance as in penile insignificance, a fault that is usually remedied in a few weeks or months by natural growth.) Nor is there any reason why the so-called adhesions which so often form the excuse for the operation should not be broken down by a little manipulation, or the judicious use of a lubricated director. This is not, however, my point. I refer rather to the effects of the operation in producing a state, literally, of gross mutilation, by the time the unfortunate boy, or youth, has reached puberty.

To what extent the gross mutilation that is the frequent result of the careless performance of circumcision in early infancy interferes directly with due performance of sexual function I cannot say. But no physician, who being interested in the of Pensions. For many years he had been keenly interested in politics, and after the war he twice stood as a Parliamentary candidate in the Liberal interest, but without success.

Sir William Milligan was fortunate in his home life, and his large family of brothers and sisters was a singularly united clan. He spent perhaps the happiest days of his life with a rod or a gun on his beautiful estate, Polmood, in Peeblesshire. Married, in 1890 to the daughter of Mr. James Anderson, of Liverpool, he leaves a son and a daughter.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Christmas Adjournment.

The House of Lords adjourned on Dec. 20th for the Christmas recess. They will reassemble on Jan. 21st. Among the Acts which received the Royal Assent before the adjournment was the Highlands and Islands (Medical Service) Additional Grant Act. The House of Commons adjourned on Christmas Eve.

The Mental Treatment Bill Considered on Report.

The Mental Treatment Bill was considered on Report in the House of Lords on Dec. 17th.

Power to Receive Voluntary Boarders.

On Clause 1 (which gives power to receive voluntary boarders) Earl Russell moved an amendment, which was agreed to, reducing the age at which persons could be received as voluntary boarders at the request of their parents or guardians from 18 to 16. Another amendment was agreed to omitting the word "unmarried," Earl Russell explaining that with the reduction of the age those words were unnecessary, because now by law young people could not be married under 16. These amendments would meet objections raised during the Committee stage.

Lord Danesfort moved a new subsection to ensure that a young person should not be sent to an institution on a doctor's recommendation which was old or out of date. It was, he said, founded on the analogy of Clause 5 (5) which made provision for putting a man into a place of mental treatment if he was incapable of volition. The recommendation of the doctor under Clause 1 of the Bill had to state that the person was likely to benefit from treatment for mental disorder. That might be true at or very shortly after the time when the person was examined, but if the recommendation were used a month or two after the examination the statement might be quite untrue, because the patient might have recovered, and possibly might no longer be likely to benefit by being put in a place for mental treatment. Therefore his proposal was that the medical recommendation should cease to have effect at the expiration of 14 days from the last date of examination.

Earl Russell said that the amendment was perfectly proper. The object was to avoid a stale recommendation. He would accept the amendment if it could be moved in the following form:—

> 4. "The medical recommendation shall cease to have effect for the purposes of this section on the expiration of fourteen days from the last date on which the person to whom the recommendation relates was examined by the medical practitioner for the purposes of making the recommendation."

Lord Danesfort agreed to the alteration and the amendment was carried.

A drafting amendment moved by Earl Russell, to omit the words "superintendent or other person in charge, or to the person with whom he is residing in single care," and to substitute "person in charge," was agreed to.

Persons Incapable of Volition.

Clause 2 deals with notice of reception, death, and departure of voluntary boarders, and makes provisions as to boarders who become incapable of volition.

On the motion of Earl Russell, a new Subsection (4) was agreed to, providing that if a voluntary boarder under 16 ceased to have any parent or guardian, or if his parents or guardians were incapable of performing, or refused or persistently neglected to perform their duty as such, the person in charge should report the circumstances of the case and the condition of the boarder to the Board of Control and the Board should consider the report and give such directions as they thought fit.

Clause 5 makes provision for treatment without certification of persons temporarily incapable of volition.

Earl Russell moved to amend Subsection 3 so as to provide that an application should be accompanied by a recommendation signed by two registered medical practitioners of whom one should be a medical practitioner (not being the usual medical attendant of the person to whom the application related) approved by the Board of Control for the purpose of making recommendations under this section, and the other should be, if practicable, the usual medical attendant of the person to whom the application related.

The Earl of Onslow said that as originally drafted the Bill said that it should be the family doctor, or if not then a person approved by the Board. In the event of there being no family doctor would two doctors be approved by the Board?

Earl Russell said that the clause would read that it should be a medical practitioner approved by the Board, and if practicable a family doctor. If there was no family doctor it would be any doctor that could be obtained.

Lord Merrivale said that Earl Russell was justified in what he was doing. He had been very much surprised on the previous day, among various communications from medical men, to receive one from a medical man with, he supposed, as large a private practice as there was in relation to matters of unsound mind and defective mentality, endorsing insistence that there should be some additional safeguard. He hoped that this additional safeguard would be agreed to.

The amendment was agreed to.

On the motion of Earl Russell another new Subsection (12) was agreed to as follows:—

> "A person received as a temporary patient shall not be detained as such for more than 28 days after the date at which he regains volition, unless in the meantime he again becomes incapable of volition."

He explained that this gave effect to Lord Cranbrook's proposal that a temporary patient should be discharged 28 days after recovering volition unless he relapsed in the meantime. The effect would be to give him more avenues of discharge than any other patient.

Power to Make Rules.

Considerable discussion took place on Clause 15, which gives power to make rules.

Earl Russell moved in a different form a new subsection which had been accepted in Committee, providing that rules made, under section 338 of the principal Act, after Jan. 1st, 1931, should be laid before both Houses of Parliament, and if within 21 days an address was presented to His Majesty by either House praying that a rule should be annulled it should be void.

On the suggestion of Viscount Brentford the date of Jan. 1st. 1931, was omitted, the noble Lord pointing out that power to make rules began long before the Act otherwise came into operation.

Viscount Brentford then moved a further amendment to the new subsection providing that the rules which not only the Ministry of Health but, under other clauses, the Board of Control were empowered to make, should not come into force where they modified or adapted this measure or any other enactment until the rule had been approved by each House of Parliament. He urged that if there was to be any change made in this legislation it should be done only by Parliament. In the subsection power was given to the department to make rules which would alter this Bill.

Earl Russell pointed out that the rule-making power which the subsection proposed would not enable them to alter the Bill. The rules, apart from the administrative rules, which would not come under Viscount Brentford's amendment, would not make new laws. They would be the most trifling adaptations of an old Act to new circumstances, and would in no sense alter anything that Parliament had agreed to. He hoped the House would not insist on the amendment.

After further discussion, Earl Russell suggested that the matter should stand over till the third reading for further consideration and consultation.

Viscount Brentford's amendment to the subsection was agreed to.

The report stage of the Bill was concluded.

The Third Reading.

On Dec. 19th the Bill was read the third time.

On Clause 2 (notice of reception, death and departure of voluntary boarders, and provisions as to boarders who become incapable of volition),

Earl Russell moved to omit from subsection (8) the words "in the opinion of the medical superintendent or such other person as aforesaid." These words, he said, were inserted at the instance of Lord Sandhurst on the committee stage, but they were found to be inappropriate to the Bill. The question of whether a patient was capable of volition or not was a question of fact, and it had to be ascertained, and was naturally founded on the opinions of the people who had observed it.

The amendment was agreed to and the Bill was passed.

SCOTTISH HEALTH VOTE.

On Dec. 16th the House of Commons went into Committee on a supplementary estimate of £10,050 for the *Scottish Department of Health, including grants in aid of* the Highlands and Islands Medical Service. The estimate was agreed to. The report stage of the same estimate was agreed to on the 17th.

HOSPITALS AND MOTOR ACCIDENTS.

On Dec. 18th the House of Commons went into Committee on the Road Traffic Bill, the Earl of DONOUGHMORE, Chairman of Committees, in the chair.

Third Party Insurance.

On Clause 34 (requirements in respect of policies for third party insurance),

Lord LUKE moved an amendment to provide that a third party risk insurance policy should ensure to any hospital treating any bodily injury caused by a motor accident payment of the cost of such treatment up to a maximum payment of £25. He said that in 1927 the hospitals of the provinces treated 20,000 in-patients and 89,000 out-patients in their wards as a result of motor accidents. The cost to those hospitals was approximately £230,000. The actual money received from insurance offices and patients was £26,000, so that to the extent of eight-ninths of the cases the hospitals bore the expense. If these cases were divided over all the hospitals of the kingdom evenly, probably it would not be so unfortunate for the few hospitals which now received these cases in excess—the hospitals near to the great trunk roads. All good motorists would pick up an injured person and take him to the nearest hospital, but the cure was usually at the expense of that hospital, and the hospitals were continually saying that these casualties from the roads were using the beds that had been provided for meeting local hospital needs. The maximum payment which he proposed was based on £4 per week for six weeks. That £4 was supposed to cover the out-of-pocket expenses of a hospital treating such a case, and the figures he had quoted would show that the average expense would not be greater than about £4. If such a risk were added to the present risk in anyone's policy the insurance offices said that the cost would only be about 1s. or 2s. additional. It seemed only *reasonable that hospitals should have this first charge on* the insurance, because if the hospitals were not handy to deal with these motor accidents motorists would be placed in a very difficult position.

Viscount KNUTSFORD said of course this amendment would not deal with all the accident cases brought to hospitals through motor accidents, but only with those where a person was insured against third-party risks, and where the accident was due to his negligence. It seemed really unfair that if a man was injured in an accident and was taken to a nursing home and treated by a doctor the insurer should pay the expenses as a liability in consequence of his negligence, but that if the same patient was taken to a hospital the insurer was not liable, because the hospital had no legal claim *to recover the costs incurred by it. In fact the* insurance company might refuse to pay, as it was not a legal liability, and they would be justified from the point of view of their shareholders. Although the treatment of these cases had increased enormously, and although this was a very serious burden on the hospitals, they made no complaint. They were only too glad to help injured people, but they did think that the present position was very unfair. He was sure that the amendment was a fair one.

Lord SOMERLEYTON, as one who had been connected for over thirty years with three central funds—the Saturday Fund, the Sunday Fund, and King Edward's Hospital Fund—said he desired to support the amendment.

Viscount BERTIE of THAME moved an amendment to the amendment to the effect that any surgeon or medical practitioner rendering first-aid in a motor accident should have a claim under the policy. He said that one often read in the press letters from doctors who lived nearby the scenes of frequent accidents stating that they were scandalously treated by persons who not only did not pay them but who went away with articles which had been lent to them and did not return them.

Lord STANLEY of ALDERLEY supported the amendment, but not the amendment to the amendment. He said that if the injured person were taken to a medical practitioner the claim of that medical practitioner would be part of the damages to be paid by the motorist and would be a proper claim against the insurance company. But that was not the case in regard to hospitals, he understood. Hospitals were voluntary associations, and as such could not institute an action or make any legal claim against the injured person, or against the person who caused the injury. If they were to deal voluntarily in future with motor casualties he thought that some of the small hospitals might find even greater difficulty in carrying on than at present.

Lord ATKIN said that it might be that there were insuperable difficulties in a hospital making a charge against a person who came for attention and who was treated by them, but he did not know what those difficulties were in law. He saw no reason why a hospital should not say that they would make a charge for any person who came to them who was injured in a motor accident, and that they would remit that charge if in fact it was not covered by insurance. If that were done the object of the amendment would be covered. If there were insuperable difficulties the real remedy was to make some such provision as that any person who had been injured by the negligence of a motorist should be entitled as part of his damages to recover a reasonable sum, not exceeding £25, which he might have paid, whether legally liable or not, to a hospital for treatment of his injuries. That would enable him to recover *from the insurance company. He doubted whether that* would mean any extra premium, because medical attention was always one of the elements in the damages which an insurance company laid themselves out to pay. The form of provision contained in the amendment would be very difficult to enforce.

Lord DANESFORT supported the amendment. The point raised by Lord Atkin was a good technical point, but was only technical. All that would be necessary would be to change the form of the amendment to meet it.

Lord EBBISHAM, in supporting the amendment, said that he had some experience in connexion with four small hospitals in Surrey. They found that in the last completed year an expenditure had been made for patients injured by motor-cars, but resident outside their locality, of at least £2000. A great injustice was being done to hospitals throughout the country.

The Government's Reply.

Earl RUSSELL, replying for the Government, said that he was aware of the grievance of the hospitals in this matter. It had become much more acute in the last two or three years. But this particular amendment in this particular part of the Bill was not the way to remedy the grievance. It would be inconsistent with the general scheme of insurance in Part II. of the Bill and it would not be by any means the best way to do it. It would not include all cases. There seemed to be in their lordships' House a practically unanimous feeling that something of this sort should be done. He suggested that the proper course would be to draft a separate clause which would provide in one way or other, not for the insurance only of some persons who were injured, but for the insurance of all persons who were injured—at any rate of all motorists. If Lord Luke and Lord Knutsford would confer with him and his advisers before the Report stage he would see if a separate clause could be drafted to meet the case. There was only one word of warning he would utter for the consideration of those interested in hospitals. If once a hospital began to receive contributions from any source in a manner which was not voluntary it seemed to him that it would be altering its character in a way which might be embarrassing and which might in the end, if the income from that source was considerable, expose it to some form of public management.

Viscount BRENTFORD, speaking on behalf of the British Hospitals Association, said he hoped that Earl Russell would approach this matter from the point of view of Lord Luke's amendment and not from the point of view of an imposition of a certain sum per head on motorists to raise a fund. What was needed was to enable the hospitals to do what the ordinary doctor or the ordinary nursing home could do.

Earl RUSSELL said that he proposed to consider the matter with a perfectly open mind and to consider any suggestions from those able to make them with a view to producing the best agreed clause, if one could be drawn.

Viscount CECIL of CHELWOOD said that the grievance would not be dealt with by approaching it in the manner proposed.

Viscount BRENTFORD: Why?

Viscount CECIL: Because the beds are actually filled. That was the real point. Country doctors would tell them pitiful stories of how the poor were utterly unable to get hospital treatment because the hospitals were absolutely filled with motorists at a certain period of the year.

Replying to Viscount BERTIE, Earl RUSSELL said that he thought that doctors who rendered assistance to these cases were protected, if they were entitled to sue.

The amendment and the amendment to it were both withdrawn.

The Bill passed through Committee.

The National Radium Fund.

On Dec. 10th, on the motion for the Second Reading of the Consolidated Fund (No. 1) Bill,

Sir Kingsley Wood said he wished to deal with a matter which had aroused a considerable amount of interest not only in the House, but outside, in relation to a considerable sum of money raised for the National Radium Fund. A large number of people had looked with the greatest hope and many of them with a good deal of anxiety to the use to which that fund would be put. He (Sir Kingsley Wood) was not questioning the belief that a great deal of good might be accomplished by the use of this large sum of money. He supposed that cancer was one of the most terrible diseases that afflicted mankind. The use of radium in the treatment of cancer, at any rate in its early stages, was one of the most hopeful methods. This considerable sum of money had been vested in the hands of specially constituted trustees who had been very carefully chosen. He had not seen a word of criticism in relation to the men who were serving as trustees of the fund. He admitted at once in putting the question as to what had been done and what purchases of radium had been made that there was very great difficulty in relation to the purchase of radium in this country at the present time. He understood that the only place to which the trustees could go to purchase radium was the Belgian Congo. That raised a very important point of view as to the outlook of the trustees. He agreed that unless they were very careful they might very well be held up and have to pay a very high price for radium.

Mr. Kelly: Why not go to Canada?

Sir Kingsley Wood said that that was one of the difficulties of the position. It was stated in the report upon which this question was largely founded that attempts were being made to find radium in other countries in the world and hopes were held out that radium might be found in the British Dominions. He thought there could be nothing finer for mankind, especially mankind suffering from a terrible disease like cancer, if it was possible to find radium in any other country than the one he had mentioned. He would like to know how much money had been expended in the purchase of radium in this country and whether it had been possible to obtain radium in any of the Dominions or any foreign country other than the Belgian Congo.

Miss Susan Lawrence (Parliamentary Secretary to the Ministry of Health) said that she could not reply at any length on this question. The Radium Trustees were not appointed by the Ministry of Health but by Royal Charter. Therefore, the Ministry of Health was not responsible for the work of the Radium Commission in so direct a way. It was an independent body set up by Parliament and would present an annual statement and accounts in a short time. In reply to the specific questions put by Sir Kingsley Wood she might say that they had agreed to purchase 10 grammes of radium at $50 per milligramme from the Union Minerale of Belgium, and they had another 4 grammes already in their possession with option to purchase. All the radium had been purchased from the Belgian company.

The Bill was read a second time.

HOUSE OF COMMONS.

Wednesday, Dec. 18th.

Overcrowding in Greater London.

Mr. Mills asked the Minister of Health if his attention had been called to the decreasing sleeping accommodation to the acre in London by the destruction of dwelling-houses and their conversion into shops and factories; whether he was aware that in many areas of London the sleeping accommodation had reached the density of 90 to the acre; and what steps he proposed to take to stop this danger to the inhabitants of inner London.—Miss Lawrence (Parliamentary Secretary to the Ministry of Health) replied: The difficulties of housing the population of Greater London were considered by the Royal Commission on the Local Government of Greater London. The proper control of development in Greater London is a matter which is being considered by the Greater London Regional Committee. I may add that my right hon. friend hopes to introduce legislation extending town-planning powers to build up areas.

After-care of Mental and Physical Defectives in Scotland.

Dr. Forgan asked the Secretary for Scotland the total amount of Government grants made last year to committees in Scotland concerned with the after-care of mental and physical defectives; the number of the committees among which this amount was divided; and the average sum received by each.—Mr. Adamson replied: The total amount of Government grants made last year to societies in Scotland assisting and supervising uncertified mental defectives was £750. Of this sum £600 was paid to a central association, with headquarters at Paisley, which operates through local care committees in various parts of Scotland, and £150 to a society in Edinburgh. Of the £600 grant to the central association a sum of £200 was allocated last year to 11 local care committees—an average of approximately £18 each.

Thursday, Dec. 19th.

Health Insurance Administration.

Mr. Llewellyn-Jones asked the Minister of Health whether he would furnish a list of advisory or other committees set up by the Ministry of Health in connexion with the administration of national health insurance or of public health generally since the commencement of 1925; and whether he would indicate on which of these committees provision had been made for the inclusion of members from Wales, including Monmouthshire, and the number of such members on each committee.—Mr. Greenwood replied: I am not in a position to reply specifically to the second part of the question, since I am advised that in many instances it has not been considered relevant to the object for which the committee was set up to inquire whether all or any of the members could be considered to belong to particular parts of Great Britain. The following is the list of committees set up by the Ministry of Health in connexion with the administration of national health insurance or public health generally since the commencement of the year 1925:—

Committee on Post-Graduate Medical Education; Committee on Vaccination; Dental Benefit Joint Committee—which has now been replaced by the Dental Benefit Council; Advisory Committee under Therapeutic Substances Act, 1925; Medical Advisory Committee on Decennial Revision of International List of Causes of Death; Committee on the Optical Practitioners (Registration) Bill; Advisory Committee under Article 41 of Medical Benefit Regulations, 1928; Committee on Ethyl Petrol; Committee on Training and Employment of Midwives; Committee on Maternal Mortality; Pharmaceutical Distribution Committee under Article 25 of Medical Benefit Regulations, 1928; Joint Advisory Committee on Pollution of Rivers and Streams; Advisory Committee on the Definition of Drugs for the Purposes of Medical Benefit under the National Health Insurance Acts.

Nursery Schools.

Mr. Day asked the President of the Board of Education how many new nursery schools had been approved by the Board during the previous 12 months.—Sir Charles Trevelyan replied: Fourteen new nursery schools have been approved by the Board since Nov. 1st, 1928.

Overcrowding of Public Mental Hospitals.

Mr. Sorensen asked the Minister of Health what action he was taking to prevent the present overcrowding of public mental hospitals.—Mr. Greenwood replied: Though there is a shortage of accommodation in public mental hospitals, there are relatively few cases of serious overcrowding. The position has already received my attention. Approval has been given to certain proposals for extending mental hospital accommodation, and others are under consideration. It is anticipated that these extensions will largely meet the present shortage; and further alleviation of the position may result from the survey of institutional accommodation which may become available under the Local Government Act.

Care of Mentally Deficient Children.

Mr. Sorensen asked the Minister of Health what action he was taking to provide suitable accommodation and care for the many cases of mentally deficient children who had been recommended for institutional treatment by mental deficiency committees but who were not receiving it.—Mr. Greenwood replied: I am aware of the existing inadequacy of institutional accommodation for mental defectives, both adults and juveniles, and local authorities are being urged to carry out their statutory duty to provide institutional accommodation.

Hours of Industrial Employment.

Lady Cynthia Mosley asked the Minister of Labour when she would introduce a Bill for the regulation of hours in industry.—Miss Bondfield replied: The Hours of Industrial Employment Bill is in course of preparation.

Replying to a further question by Mr. Louis Smith, Mr. Greenwood said he hoped to introduce the Bill on an early day after the Christmas recess.

Inspection of Vivisection Experiments.

The Duchess of Atholl asked the Home Secretary the number of visits of inspection per annum paid on an average by the inspectors of experiments on living animals; and whether the dates of these visits were known beforehand to the persons conducting these experiments.—Mr. Short replied: During the five years 1924–28 inclusive, 3315 visits were made or an average of 663 per year. Of the total, 140 (or an average of approximately 20 a year) visits were made by appointment for the special inspection of premises; for interviews with applicants for a licence; or for discussing with licensees questions arising out of their work under the Act. In all other instances (8160) the visits were made without previous notice.

Unsplintable Glass in Public Vehicles.

Commander SOUTHBY asked the Home Secretary whether he would consider taking steps to make it compulsory for all hackney carriages and other vehicles plying for hire to be fitted with unsplinterable glass.—Mr. SHORT replied: The jurisdiction of my right hon. friend in this matter is limited to London. He has considered it in consultation with the Commissioner of Police and he is afraid that it is not practicable at present to enforce the use of unsplinterable glass in public service vehicles generally on account of *the cost, but the matter will not be lost sight of.*

Medical News.

UNIVERSITY OF OXFORD.—At recent examinations the following candidates satisfied the examiners in the undermentioned subjects:—

Medicine, Surgery, and Obstetrics.—J. A. Brown, L. J. Clapham, C. M. Duncan, W. B. Fiddian-Green, J. K. Marshall, *G. St. L. Myles, R. S. B. Pearson, C. R. Salkeld, G. Secker* Walker, W. B. Williams, Annie D. M. Adams, and Ruth Sandeman.

Pathology.—R. E. Adam, I. M. Bell, W. D. W. Brooks, G. H. Buck, J. M. Cribb, F. R. Crookes, Shelton Durham, N. A. Gillespie, Newton Heath, G. W. Hinchliff, J. E. Jenkins, H. de B. Kempthorne, G. B. Malone-Lee, J. H. Peel, W. S. Tegner, H. A. Treble, F. M. Trefusis, O. S. M. Williams, and Elspeth W. Smellie.

Forensic Medicine and Public Health.—H. H. Aitchison, Fairfax Bell, W. D. T. Brunyate, G. H. Buck, J. L. Clapham, C. M. Duncan, W. B. Fiddian-Green, C. R. Greene, Arthur Guirdham, Francis Hawking, W. H. McMenemey, J. K. Marshall, W. E. S. Merrett, R. D. Newton, J. N. *O'Reilly, N. C. Parfit, R. S. B. Pearson, F. M. Trefusis,* Amy C. E. Clarke, and Victoria M. Robinson.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

M.CHIR.

F. J. Milward.

THIRD EXAMINATION FOR M.B. AND B.CHIR.

Part I., Surgery, Midwifery, and Gynæcology.—G. G. Allan, G. N. Bailey, G. O. Barber,* R. E. Barnsley, J. H. Bentley, R. M. Bolam, W. V. Bowman, A. D. D. Broughton, A. C. Crooke, A. M. Cunningham, H. Curtis, M. Ellis, R. B. Floyd, M. S. M. Fordham, I. J. Franklen-Evans, A. W. Franklin, *A. S. Hall, P. E. T. Hancock, A. G. J. Harris, J. E. M.* Harrison, F. T. J. Hobday, W. V. Howells, E. H. Hudson, C. G. Jobbins, M. M. StG. Johnstone, J. G. Jones, H. V. Knight, E. Landau, R. S. C. McDade, S. McDonald, A. P. McEldowney, R. W. Malim, C. E. P. Markby, R. A. Maynard, B. C. Nicholson, G. L. Ormerod, R. G. Orr, V. P. Paxon, J. O. Poynton, C. H. Prowse, T. G. Reah, G. H. Sanderson, J. E. Semple, R. H. B. Snow, G. H. G. Southwell-Sander, R. S. Stacey, R. T. W. Starkie, B. C. Thompson, C. P. K. Toland, F. S. Winton, C. H. England, and D. P. Firmin.

*Passed in Surgery only.

Part II., Physic, Pathology and Pharmacology.—R. Anderson, A. R. Banham, C. M. Barker, D. W. Bawtree, J. V. Broad, A. T. Curnow, C. J. M. Dawkins, Digges la Touche, R. H. *Dyer, J. H. L. Easton,* P. H. Fox, *S. E. F. Gooding,* G. J. Gross, A. H. Gurney, W. Heath, A. C. de B. Helme, J. S. Hensman, G. Herbert, H. P. Hutchinson, T. C. Jameson Evans, C. G. Jobbins, E. R. Keeble, R. W. Knowlton, C. L. Lander, R. W. McConnel, S. R. Matthews, R. B. Mayfield, E. J. Neill, T. N. Parish, J. A. Pocock, C. D. Politeyan, R. B. Pringle, A. W. Williams, J. K. Wilson-Pepper, G. N. Wood, F. G. Wood-Smith, B. Wright, and M. A. Willcox.

UNIVERSITY OF EDINBURGH.—At a graduation ceremonial on Dec. 20th the following degrees were conferred:—

M.D.—Flora H. M. Calder, **T. C. Mitchell, **R. M. Murray-Lyon, †Eustace Russell, G. S. Scott, *Ta-Ming Tso.

Ch.M.—**Alice Bloomfield.

M.B., Ch.B.—W. S. Anderson, Reginald Austin, Ismay Bannerman, T. M. Beveridge, G. F. Bradbury, R. M. Bremner, J. F. C. du Toit, F. G. M. Fraser, E. E. Goldman, James Gorman, D. H. Hooper, E. G. Hurd-Wood, Isidor Kaplan, H. I. Labouri, L. E. Lucas, K. C. Mackenzie, A. G. M'Laren, D. J. A. MacLean, Daniel Macleod, H. J. Melville, G. R. Parker, J. L. Parker, R. A. P. Paul, G. A. G. Peterkin, J. C. Robertson, †Nirodbaran Talukder, Anne Tillema, and S. C. H. Watters.

Diploma in Psychiatry.—†T. A. H. Munro.

Diploma in Public Health.—†K. V. R. Choudari.

AWARD OF FELLOWSHIP.

The Syme Surgical Fellowship was awarded to Dr. Thomas Carlyle Mitchell.

* Commended for Thesis. ** Highly commended for Thesis.
† In absentia.

UNIVERSITY OF SHEFFIELD.—At recent examinations the following were successful:—

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—K. G. A. Barlow, Clem England, N. B. Hallam, Firth Hudson, Constance N. Jenkinson, S. K. Panniker, and Allan Spencer.

Part II.—Abraham Cohen, R. B. Gould, Bessy Hatherley, and J. H. Wilbourn.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following were successful:—

M.CH. ORTH.

W. J. Eastwood, W. L. MacDonald, and J. F. Shepherd.

M.D.*

K. M. Cobban, L. Earlam, R. R. Evans, J. F. Galloway, and Mary S. Share-Jones.

FINAL EXAMINATION FOR M.B. AND CH.B.

Part II. (1923 Regulations).—M. L. Kaufman.

Part III. (1923 Regulations).—J. P. Flanagan, R. N. Johnson, I. Lipschitz, and J. L. Walker.

Part A. (1924 Regulations).—W. Dodd, J. J. M. Erskine-Young, M. Glynn-Morris, C. K. Holland, H. D. Owen, J. Polonsky, and H. E. C. Sutton.

Public Health.—D. I. A. Williams.

* To graduate July, 1930.

DIPLOMA IN TROPICAL MEDICINE.

S. D. Ahuja, R. E. Anderson, C. G. Booker, W. A. Bullen, *E. N. Callum, P. P. D. Connolly,* J. A. Cowan, G. Graham-Cumming, A. V. Greaves, G. S. Hale, A. T. Howell, C. N. Latham, J. E. McMahon, A. A. Miller, A. Rosenbloom, C. K. Row, R. N. Sewal, H. Singh, G. A. Talwrn-Jones, and H. N. Turner.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College on Dec. 18th, with Dr. J. Haig Ferguson, the President, in the chair, the following 23 candidates (out of 70 entered) who passed the requisite examinations between Sept. 26th and Oct. 4th, were admitted Fellows:—

Frans Bekker, Philip William Hulme Bleasdale, John Boyd Colquhoun, John Comrie, Cedric Duncombe, Andrew May Duthie, Duncan Hugh Fraser, Cecil Alexander Gardiner, Wallace John Gill, Alastair Livingston Gunn, Hukam Chand Gupta, James Haslam, Elinor Drinkwater Jackson, Laurence Henry Leggett, Arthur Cecil Liesching, Vivian Mercer Metivier, David Ritchie Paterson, John Edward Piercy, Manindra Nath Sarkar, Sher Singh, George Ferguson Skinner, Oscar John Stahl, and Ryno Stockenstrom Verster.

PRINCESSES AT HOSPITALS. — Princess Louise, Duchess of Argyll, recently opened a new wing of the Plaistow, E., Maternity Hospital and District Nurses' Home. The hospital now has 66 beds and is the fifth largest of its kind in London. The addition contains two wards of eight beds each, two single-bed wards, a labour ward, and infants' nursery. There has hitherto been such heavy pressure upon the accommodation that temporary beds have had to be in use continuously. The institution trains 200 midwives annually and 6000 mothers are attended every year. During the last decade the hospital's maternal mortality has been approximately 1 in 2000. The working expenditure exceeds £22,000.—Extensive additions to the South-Eastern Hospital for Children at Lower Sydenham were opened last week by Princess Marie Louise. The *out-patients' department and the nurses' home have been* enlarged, rooms have been provided for the medical and surgical staffs, for sunlight and massage treatment, and for children being treated for tonsils and adenoids.

Appointments.

Bristol General Hospital: WOOD, D., F.R.C.S. Eng., Honorary Surgeon; GRIFFITHS, S. J. H., M.B., Ch.B. Bristol, F.R.C.S. Eng., Honorary Assistant Surgeon; BURGESS, N., M.D., B.Chir. Camb., M.R.C.P. Lond., Honorary Assistant Physician in the Skin Department; TAYLOR, A. L., M.D., Ch.B., Leeds, Honorary Pathologist; KETTLEWELL, N. H., L.D.S. R.C.S. Eng., L.M.S.S.A. Lond., Honorary Dental Surgeon.

City of London Maternity Hospital: PRICE, J. A., M.B., B.Ch., Belf., Resident Medical Officer; SIMMONS, R. W. A., B.M., B.Ch. Oxf., Assistant Resident Medical Officer.

Queen Charlotte's Maternity Hospital: HUGHES, TOM. L., L.R.C.P. Lond., M.R.C.S., Senior Resident Medical Officer; JENNINGS, H. T., M.B., Ch.B. N.Z., F.R.C.S. Edin., Assistant Resident Medical Officer.

Certifying Surgeons under the Factory and Workshop Acts: FARMER, M. L., M.B., Ch.B. Liverp. (Shefford, Bedford); MEAD, G. H., L.R.C.P. Lond., M.R.C.S. (Eckington, Derby); SMITH, E. F., M.B., B.S. Lond. (Wokingham); and CREIGHTON, J. A., M.B., C.M. Glasg. (Calvert, Buckingham).

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital, W.—Res. M.O. £150.
Belfast, Joint Nursing and Midwives Council, Northern Ireland.—Examiner of Midwives.
Birmingham, Dudley-road Hospital.—Gynæcologist and Obstetrician. £700.
Birmingham, Monyhull Colony, King's Heath.—Res. Asst. M.O. £250–£350.
Birmingham, Selly Oak Hospital.—Two Cas. O.'s. Each at rate of £200.
Blackburn and East Lancashire Royal Infirmary.—Res. H.P. £150.
Bolton, Townley's Hospital, Farnworth.—Second Asst. M.O. £225.
Bootle Borough Hospital.—Hon. Laryngologist and Aurist.
Bradford Children's Hospital.—H.S. and H.P. Each £120.
Bradford Royal Infirmary.—Res. Surg. O. £250.
Burnley, Victoria Hospital.—H.S. At rate of £125.
Canterbury, Kent and Canterbury Hospital.—H.S. and H.P. Each at rate of £125.
Cardiff, Prince of Wales' Hospital.—H.S. for Crossways Country Branch Orthopædic Hospital. £120.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £120 and £100 respectively.
Charing Cross Hospital, Strand, W.C.—Non-resident House Anæsthetist.
Durham County Mental Hospital.—Jun. Asst. M.O. £350.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Great Yarmouth County Borough.—Asst. M.O.H. and Asst. Tub. O. £600.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Clin. Asst. M.O. for Venereal Dept. £1 1s. per session.
Hull Royal Infirmary.—Third H.S. Also Asst. H.P. At rate of £150 and £130 respectively.
Leeds University.—Tutor in Obstetrics and Gynæcology. £475.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150. Also Hon. Obstet. Surg.
London Hospital Medical College, Mile End, E.—Liddle Triennial Prize. £120.
Manchester, Ancoats Hospital.—Asst. Pathologist. £350.
Manchester, Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.
Manchester, Salford Royal Hospital.—H.S. for Orthopædic Dept. At rate of £125.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Northampton Education Committee.—Asst. School Dentist. £150.
Queen Mary's Hospital for the East End, Stratford, E.—Cas. O. £150. Also Hon. Asst. S.
Redruth, Cornwall, West Cornwall Miners, and Women's Hospital. Res. M.O. £200.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
St. John's Hospital, Lewisham, S.E.—Radiologist.
St. Mary's Hospital, W.—Asst. Pathological Chemist. £300.
Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. Each at rate of £100.
Southampton County Borough.—School Dentist. £150.
Swansea County Borough.—Asst. M.O. £600.
Walsall General Hospital.—Cas. H.S. At rate of £120.
West London Hospital, Hammersmith-road, W.—Asst. Dental. S.
Westminster Hospital, Broad Sanctuary, S.W.—House Anæsthetist. At rate of £100.
Wigan Infirmary.—Third H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

FINLAY.—On Dec. 14th, at The Gables, Honiton, Devon, the wife of Dr. J. E. Finlay, of a son.

MARRIAGES.

JONAS—PETLEY.—On Dec. 19th, at All Saints', Ennismore-gardens, William Howard Powning Jonas, B.A., M.R.C.S., L.R.C.P., of "Brooklands," Hemel Hempstead, Herts, to Kathleen Isabel, only daughter of Mr. and Mrs. C. Ralph Petley, of Vert Lac, Lausanne, Switzerland.

DEATHS.

CANDY.—On Dec. 16th, George Spence Candy, M.B., B.S. Lond., M.R.C.S., L.R.C.P. Lond., aged 44.

DWYER.—On Dec 16th, at "The Mount," Lapworth, Warwickshire, after a short illness, Henry Hamilton Dwyer, L.R.C.P. & S.I., L.M.

EGAN.—On Dec. 11th, at Kingston, Jamaica, Major William Egan, R.A.M.C., D.S.O., O.B.E.

MILLIGAN.—On Dec. 19th, at a nursing home, Sir William Milligan, M.D., LL.D., of Westbourne, Rusholme, Manchester, and Polmood, Broughton, Peeblesshire.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE.

Prince of Wales's General Hospital, Tottenham, N.

The same arrangements will be made as were announced in THE LANCET of Dec. 14th.

Notes, Comments, and Abstracts.

THE USES OF X RAYS.

THE exhibition of radiography just concluded by the Royal Photographic Society of Great Britain is to be the first in a series illustrating the "uses of photography in the service of man"; it attempted especially to illustrate the history and development of the scientific and industrial value of X rays. Various forms of early X ray tubes, as well as recent apparatus, were lent by the Davy Faraday Laboratory, by Mr. Cuthbert Andrews, and Mr. Geoffrey Pearce. Dr. W. H. George lent an exhibit demonstrating the use of photographic grids in X ray crystallography.

The medical section showed a number of radiograms of those surgical and medical conditions in which diagnosis is materially helped by use of X rays. Advances in dental work included simultaneous photography of the profile and the jaw, so that artificial teeth may be made to conform to the normal shape of the face as much as possible. Excellent photographs demonstrating the use of tetraiodophenolphthalein in cholecystography and collargol in pyelography were shown, while the uses of barium in defining œsophageal obstruction, carcinoma of the stomach, and intestinal conditions of various kinds, were illustrated. The number and variety of photographs shown was somewhat limited from a medical point of view, but as the intention was to demonstrate the photography rather than the innumerable occasions of its utility, this was not surprising. The radiograms in this section were lent by Kodak, Ltd., by Mr. H. T. Ferrier, and by the Ilford X ray Department.

In the section devoted to transparencies various recent improvements in apparatus were demonstrated, including a portable X ray apparatus made by the "Solus" Electrical Company. Mr. Herbert Flower lent an interesting series of negatives showing X ray exposures versus screen exposures on various bone subjects. The X ray exposures showed a marked gain in contrast without loss of detail. Photographs of old forms of apparatus, including early patterns of couches in which the tube was unprotected, were sent by Messrs. Schall and Son, Ltd., and could be compared with the latest types which were shown with the transparencies.

The use of X rays in detecting flaws in metal castings was demonstrated in the industrial section, and the value of this one function in the service of man is hard to estimate. It was unfortunate that the absence of a photographic aspect excluded deep ray therapy from representation in an exhibition designed to demonstrate the value of the Röntgen ray.

TWO DIARIES FOR 1930.

THE Anglo-French Drug Company (238A, Gray's Inn-road, London, W.C. 1) have sent us a copy of their block diary for 1930, measuring 6 by 4½ inches, and showing a page to a day. It serves as a useful accessory to the writing table, and attached to the inside of the front cover is a concise list of the pharmaceutical products manufactured and distributed by the firm.—We have also received the medical diary issued by Messrs. Burroughs Wellcome and Company. It comprises 404 pages, measuring 6¼ by 3¾ inches, bound in a case, and gives therapeutic notes, an index of diseases and treatments, symptoms and treatment of poisoning, notes on diet, and other useful information, including a list of the firm's well-known "Tabloid" products. Either of these diaries may be obtained on application.

Radium Needles.—Prof. F. L. Hopwood writes that in the paper presented by Miss Smallman and himself at the Radiological Congress (THE LANCET, Dec. 14th, p. 1270) it was stated that with half a gramme of radium distributed in needles and containers 800 cases were treated in *two* years (not one year) at St. Bartholomew's Hospital.

THE address of the National Association for the Prevention of Tuberculosis is now Tavistock House North, Tavistock-square, London, W.C. 1.

A HOSPITAL'S CLAIMS FOR PAYMENT.—Some time ago the statutes of the Royal Salop Infirmary at Shrewsbury were altered to enable the governors to charge motor accident patients with the cost of their treatment and maintenance. It is now officially reported that the result has been disappointing. Sixty-four such patients have since been discharged, and were presented with accounts amounting to £808. Eight patients only have paid, the entire refund amounting to £94 11s.